

ICREA MEMOIR 2019



Antonio Acín

Institut de Ciències Fotòniques (ICFO)
Engineering Sciences

Antonio Acín is an ICREA Research Professor at ICFO-The Institute of Photonic Sciences. He has a degree in Physics from the Universitat de Barcelona (UB) and in Telecommunication Engineering from the Universitat Politècnica de Catalunya. He got his PhD in Theoretical Physics in 2001 from the UB. After a post-doctoral stay in Geneva, in the group of Prof. Gisin (GAP-Optique), he joined ICFO in 2003. At ICFO, Acín leads the Quantum Information Theory group. His research has been awarded with 4 grants from the European Research Council: 1 Starting, 1 Proof of Concept, 1 Consolidator and 1 Advanced Grant, the latter starting in 2020. He also received an AXA Chair in Quantum Information Science in 2016.

Research interests

Acín's main research interest is in quantum information theory. This is a scientific area that studies how information is processed and transmitted when encoded on quantum particles. Using quantum effects, new information tasks become possible: more powerful computers, novel cryptographic protocols with unprecedented levels of security or more precise sensing devices. It is a highly inter-disciplinary area combining tools and concepts from mathematics, computer science, physics and engineering. Acín's research activity also covers aspects of foundations of quantum physics, quantum thermodynamics, many-body physics and quantum optics.

Selected publications

- De Santis D, Johansson M, Bylicka B, Bernardes NK & **Acín A** 2019, 'Correlation measure detecting almost all non-Markovian evolutions', *Physical Review A*, 99, 1, 012303.
- Gomez S, Mattar A, Machuca I, Gomez ES, Cavalcanti D, Jimenez Farias O, **Acín A** & Lima G 2019, 'Experimental investigation of partially entangled states for device-independent randomness generation and self-testing protocols', *Physical Review A*, 99, 3, 032108.
- Bourdoncle B, LinP-S, Rosset D, **Acín A** & Liang Y-C 2019, 'Regularising data for practical randomness generation', *Quantum Science And Technology*, 4, 2, 025007.
- Baccari F, Tura J, Fadel M, Aloy A, Bancal J-D, Sangouard N, **Lewenstein M**, **Acín A** & Augusiak R 2019, 'Bell correlation depth in many-body systems', *Physical Review A*, 100, 2, 022121.
- Mehboudi M, Parrondo JMR & **Acín A** 2019, 'Linear response theory for quantum Gaussian processes', *New Journal Of Physics*, 21, 083036.
- Tura J, Aloy A, Baccari F, **Acín A**, **Lewenstein M** & Augusiak R 2019, 'Optimization of device-independent witnesses of entanglement depth from two-body correlators', *Physical Review A*, 100, 3, 032307.
- Pozas-Kerstjens A, Rabelo R, Rudnicki L, Chaves R, Cavalcanti D, Navascues M & **Acín A** 2019, 'Bounding the Sets of Classical and Quantum Correlations in Networks', *Physical Review Letters*, 123, 14, 140503.
- Augusiak R, Salavrakos A, Tura J & **Acín A** 2019, 'Bell inequalities tailored to the Greenberger-Horne-Zeilinger states of arbitrary local dimension', *New Journal Of Physics*, 21, 11, 113001.
- Aloy A, Tura J, Baccari F, **Acín A**, **Lewenstein M** & Augusiak R 2019, 'Device-Independent Witnesses of Entanglement Depth from Two-Body Correlators', *Physical Review Letters*, 123, 10, 100507.

ICREA MEMOIR 2019



Jordi Agustí

Institut Català de Paleoecologia Humana i Evolució Social (IPHES)
Humanities

PhD in Biological Sciences by the Univ. of Barcelona in 1981. Director of the Inst. of Paleontology M. Crusafont from 1985 to 2005. ICREA Research Professor at IPHES since 2005. Member of the Royal Academy of Sciences and Arts of Barcelona. Narcís Monturiol Medal of the Catalan Government for his scientific merits. Scientific Literature Prize of the Catalan Government (2001). President of the Regional Committee on Neogene Mediterranean Stratigraphy from 1999 to 2009 and voting member of the Subcommission on Neogene Stratigraphy (IUGS, UNESCO). He is author or co-author of 134 papers published in indexed journals (WOS), among them *Nature* (4), *Science* (1) and *Proceedings of the National Academy of Sciences USA* (3), as well as 162 papers in non-indexed Spanish and international journals. He is author or co-author of 52 book chapters. He has edited 14 monographs and written 14 books. He has directed 13 PhD thesis and 9 Master thesis. H-Index:36

Research interests

My main field of interest is the environmental and biogeographic changes in the Mediterranean terrestrial ecosystems in the last 10 million years. I accomplish this goal throughout the study of the fossils of small mammals. This key time includes a number of critical climatic phases, such as the onset of the Northern Hemisphere Glaciation at 2.6 Ma, the early Pleistocene crisis at 1.8 Ma and the early-middle Pleistocene transition at 0.8 Ma. These crises have modelled the evolution of our own lineage, the hominids, which experienced significant changes following these climatic events. My research has therefore been developed in those areas having extraordinary conditions to follow these changes, either in the Iberian Peninsula (Vallès-Penedès and Guadix-Baza basins) or outside (northern Africa and, most specially, Georgia). Most of these areas are also key ones in order to elucidate the evolution of our lineage during the last 10 Ma, in relation with climatic and environmental changes.

Selected publications

- Krijgsman W, Tesakov A, Yanina T, Lazarev S, Danukalova G, Van Baak CGC, **Agustí J** et al. 2019, 'Quaternary time scales for the Pontocaspian domain: Interbasinal connectivity and faunal evolution', *Earth-Science Reviews*, 188, 1-40.
- **Agustí J** & Lordkipanidze D 2019, 'An alternative scenario for the first human dispersal out of Africa', *L'anthropologie*, 123, 682-687.
- Cappellini E et al. 2019, 'Early Pleistocene enamel proteome sequences from Dmanisi resolve *Stephanorhinus* phylogeny', *Nature*, 574, 103-107.
- Piñero P & **Agustí J** 2019, 'The rodent succession in the Sifón de Librilla section (Fortuna Basin, SE Spain): implications for the Mio-Pliocene boundary in the Mediterranean terrestrial record', *Historical Biology*, vol. 31, no. 3, pp 279-321.
- Quintana J & **Agustí J** 2019, 'First evidence of faunal succession in terrestrial vertebrates of the Plio-Pleistocene of the Balearic Islands, Western Mediterranean', *Comptes rendus Palevol.*, 18, 3, 317-324.
- Lozano-Fernández I, Blain H-A, **Agustí J**, Piñero P, Barsky D, Ivorra J & Bourguignon L 2019, 'New clues about the late Early Pleistocene peopling of western Europe: Small vertebrates from The Bois-de-Riquet archeopaleontological site (Lézignan-La-Cèbe, southern France)', *Quaternary Science Reviews*, 219, 187-203.
- Lozano-Fernandez I, Perez-Criado L, Cuenca-Bescos G & **Agustí J** 2019, 'Morphometric evolution of *Mimomys savini* (Rodentia, Mammalia): A new view of its morphological changes', *Quaternary Science Reviews*, 224, UNSP, 105965.

ICREA MEMOIR 2019



Tomás Alarcón

Centre de Recerca Matemàtica (CRM)

Experimental Sciences & Mathematics

I obtained my PhD in Theoretical Physics from the University of Barcelona in 2000. After that I spent many wonderful years working as a postdoc at the University of Oxford, UK (2001-2003), University College London, UK (2003-2006), and Imperial College London, UK (2006-2009). I briefly held a senior researcher and group leader position at BCAM, Bilbao, Spain (2009-2010), after which I moved to the Centre de Recerca Matemàtica where I lead the Computational & Mathematical Biology Group. I have also held visiting fellowships at the Universidad Complutense de Madrid, IIMAS (UNAM, Mexico DF), OCCAM (University of Oxford, UK), the Mathematical Institute (University of Oxford, UK), and the Mathematical Biosciences Institute (Columbus, Ohio, USA). In October 2015, I was appointed to an ICREA Research Professorship at the Centre de Recerca Matemàtica.

Research interests

My research focuses on Mathematical Biology, particularly in multi-scale and stochastic modelling of tumour growth and tumour-induced angiogenesis. The main aim of my research is to understand the mechanisms involved in drug resistance and formulate therapeutic strategies which are robust to such mechanisms. Although tumour growth is my main field of specialisation, I am interested in other areas of Mathematical Biology, particularly regarding the effects of random fluctuations in cell regulatory systems and population dynamics, robustness and evolvability, and the stochastic dynamics of HIV-1-infection in patients treated with potent anti-retroviral therapy.

Selected publications

- Forners J, Sardanyes J, Lazaro T, **Alarcon T** & Elena SF 2019, 'Viral replication modes in single-peak fitness landscapes: a dynamical systems analysis.', *J. Theor. Biol.*, 460, 170-183.
- Ponce-Bobadilla AV, Arevalo J, Sarro E, Byrne HM, Maini PK, Carraro T, Balocco S, Meseguer A & **Alarcon T** 2019, 'Local migration quantification method for scratch assays', *J. R. Soc. Interface*, 16, 20180709.
- de la Cruz R, Perez-Carrasco R, Guerrero P, **Alarcon T** & Page KM 2019, 'Comment on "Minimum Action Path Theory Reveals the Details of Stochastic Transitions Out of Oscillatory States" Reply', *Physical Review Letters*, 122, 5, 059802.
- Folguera-Blasco N, Perez-Carrasco R, Cuyas E, Menendez JA & **Alarcon T** 2019, 'A multiscale model of epigenetic heterogeneity-driven cell fate decision-making.', *Plos Computational Biology*, 15, 4, e1006592.
- Ponce Bobadilla AV, Carraro T, Byrne HM, Maini PK & **Alarcon T** 2019, 'Age-structure can account for delayed logistic proliferation of scratch assays', *Bull. Math. Biol.*, 81, 2706-2724.
- Menendez J, Cuyas E, Folguera-Blasco N, Verdura S, Martin-Castillo B & **Alarcon T** 2019, 'In silico clinical trials for anti-aging therapies', *Aging*, 11, 6591-6601.

ICREA MEMOIR 2019



M. Mar Albà

Institut Hospital del Mar d'Investigacions Mèdiques (IMIM)

Life & Medical Sciences

Mar Albà graduated in Biological Sciences at the University of Barcelona (UB), and obtained her PhD at the same University in 1997. During 1997-1999 she studied for the MSc in Bioinformatics and Molecular Modeling at Birkbeck College while working as a postdoctoral researcher in the group of John Hancock at the MRC Clinical Research Centre, in London. Later she joined the group led by Paul Kellam at University College London to develop new computational tools to study herpesvirus evolution and function. She was awarded a Ramón y Cajal tenure track position in 2002 to work at Universitat Pompeu Fabra (UPF). In 2005 she was appointed ICREA Research Professor. She works at the Hospital del Mar Research Institute (IMIM) and teaches bioinformatics at Universitat Pompeu Fabra. She has directed 10 doctoral thesis and is author of more than 80 publications.

Research interests

As a result of a continuous process of gene birth and death, the genomes from different species contain different sets of genes. Some of these genes encode new functional proteins and facilitate the adaptation to a changing environment. Some new genes originate by gene duplication, but others emerge *de novo* from previously non-coding genomic sequences. We study the different mechanisms of gene birth using a combination of comparative genomics, high throughput RNA sequencing (RNA-Seq) and ribosome profiling data (Ribo-Seq). We have shown that transcription and translation are pervasive and result in many putative precursors of novel proteins. We are aiming at a quantitative and qualitative description of the still poorly understood process of *de novo* gene formation.

Selected publications

- Ruiz-Orera J & Albà MM 2019, 'Translation of small ORFs: roles in regulation and evolutionary innovation'. *Trends in Genetics*, Volume 35, Issue 3, 186-198.
- Blevins WR, Carey LB & Albà MM 2019, 'Transcriptomics data of 11 species of yeast identically grown in rich media and oxidative stress conditions'. *BMC Research Notes*, Volume 12, Issue 1, 250.
- Blevins WR, Tavella T, Moro SG, Blasco-Moreno B, Closa-Mosquera A, Diez J, Carey LB & Alba MM 2019, 'Extensive post-transcriptional buffering of gene expression in the response to severe oxidative stress in baker's yeast', *Scientific Reports*, Volume 9, 11005.
- Ruiz-Orera J & Albà MM 2019, 'Conserved regions in long non-coding RNAs contain abundant translation and protein-RNA interaction signatures'. *Nucleic Acids Research Genomics and Bioinformatics*, Volume 1, Issue 1, e2.

Selected research activities

Invited talks at the CRG Annual Proteomics Symposim (5 Nov 2019), Workshop Models of Evolution, a CONTRA Innovative Training Network Workshop 6 Jun 2019) and at the Barcelona Supercomputing Center Bioinfo4Women Seminar Series (16 Mar 2019).

ICREA MEMOIR 2019



Anna Alberni

Universitat de Barcelona (UB)

Humanities

Anna Alberni studied English Philology at the University of Barcelona. She obtained her PhD in Catalan Philology in 2003 at the same University. She has been a researcher and assistant lecturer at the University of Barcelona (1996-2000), and at the University of Girona (2005-2009). From 2003 to 2005 she was a postdoc researcher at the University of Rome-La Sapienza and at the University of L'Aquila. In 2005 she accepted an ICREA Junior position at the University of Girona. In 2009 she moved to the University of Barcelona, where she is ICREA Research Professor at the Department of Linguistics and Catalan Philology-IRCVM.

Research interests

Alberni's research focuses on the study of medieval Romance poetry as an essential part of Europe's cultural past. More specifically, she works on issues of poetic genre, intertextuality, discursive traditions and textual criticism. During the last years Alberni has extensively dedicated her efforts to the consolidation of the research group created in 2009 in order to develop her project *The Last Song of the Troubadours. Linguistic Codification and Construction of a Literary Canon in the Crown of Aragon* (ERC-StG-2008). Her actual research project, *Ioculator seu Mimus. Performing Music and Poetry in Medieval Iberia* (ERC-CoG-2017), intends to transform our understanding of medieval Romance poetry and music by establishing a corpus of archive records of unprecedented size and breath on the lives and careers of the minstrels who performed in the Crown of Aragon from the mid 13th to the mid 15th centuries. This new data will shed crucial light on the literary and musical repertoires circulating in the South of Europe in the late medieval period.

Selected publications

- **Alberni A** 2019, 'Guillaume de Machaut at the court of Aragon, 1380-1430', in *Digital Philology: A Journal of Medieval Cultures*, 7.2, Special Issue, Kevin Brownlee and Marta Marfany (ed), pp. 173-190.

Selected research activities

- Organization of the XXVII *Congrés de l'Associació Hispànica de Literatura Medieval* (Universitat de Barcelona, 2-6 September 2019)
- Organization of the Panel "Performing Music and Poetry in Medieval Iberia: a Reassessment", *XVI Congress of the International Courtly Literature Society* (University of Exeter, 22-26 July 2019)

Papers delivered in the following conferences:

- "King Peter the Ceremonious, the Royal Chapel and the Papal Court at Avignon: imitation of a secular or of a religious power?" (with Stefano M. Cingolani), *MALMECC Study Day Avignon as transcultural hub* (University of Oxford, St. Luke's Chapel, 9 February 2019)
- "Lingua poetica e tradizione manoscritta nella lirica catalana medievale", *Forme dell'innovazione linguistica nelle tradizioni manoscritte romanze medievali* (Università degli Studi di Milano, 9-10 May 2019)
- "Cultural encounters and intertextuality: the role of minstrels in medieval Catalan poetry", *XVI Congress of the International Courtly Literature Society* (University of Exeter, 22-26 July 2019)
- "Músics i joglars a la Corona d'Aragó medieval: una base de dades interrogable (MiMus)" (with Anna Fernàndez-Clot), *XXVII Congrés de l'Associació Hispànica de Literatura Medieval* (Universitat de Barcelona, 2-6 September 2019)
- "Minstrels and poets in the Crown of Aragon: a digital database (with Anna Fernàndez-Clot)", *MALMECC Conference Music and Late Medieval European Court Cultures* (University of Oxford, 26-27 September 2019)
- "MiMus DB. Giullari e menestrelli nella Corona d'Aragona medievale", *Eurythmia. Formae e rituali coreutici tra Medioevo e Rinascimento* (Università di Bologna-Ravenna, 10 December 2019)

ICREA MEMOIR 2019



Rosa María Albert

Universitat de Barcelona (UB)

Humanities

I obtained a PhD in Archaeology from the U. of Barcelona in 1999 after 3 years at the Weizmann Inst of Science. I pioneered in applying quantitative and morphological phytolith analyses to Prehistoric sites to identify fuel for human fires and plant collecting strategies. In 2005 I received the Blecu Award (UB). My research focuses on reconstructing the vegetation from different sites such as Olduvai Gorge (Tanzania), applying a combined study of modern soils and plants. In 2011 I created PhytCore, the most extensive phytolith database to date. I have directed more than 20 research projects and written more than 100 papers. From 2005-2013 I founded and directed GEPEG recognized as Quality Research Group by Catalan Government. At present, I am responsible for the "Paleoenvironmental and paleovegetation" research area within ERAAUB and I participate, among others, in a European funded Project "Terrace" to study the use cultivated plants.

Research interests

I am an archaeologist working on palaeovegetation and palaeoenvironmental reconstruction, through the study of vegetal microremains, in order to better understand the relationship between environment, humans and use of plants. My research focuses mostly on: i) The study of Fire in Prehistory, with special emphasis on Middle and Upper Palaeolithic. ii) Palaeoenvironmental reconstruction during African Human Evolution. iii) Agriculture and domestication practices in the Levant. iv) Plant uses and landscapes, including the study of prehistoric Terraces. v) Anthropogenic impact on the environment. vi) Development of digital platforms to exchange databases. For this I developed PhytCore (www.phytcore.org), the most extensive database integrating different research centers and universities databases. I am also a member of the International Committee for Phytolith Nomenclature who recently published the new International Code for Phytolith Nomenclature ICPN 2.0.

Selected publications

- Villaverde V, Real C, Roman D, **Albert RM**, Badal E, Bel MA, Bergadà M, de Oliveira P, Eixea A, Esteban I, Martínez A, Martínez Varela CM & Perez-Ripoll M 2019, 'The Early Upper Palaeolithic of Cova de les Cendres', *Quaternary International*, 515, 92-124.
- Neumann K, Stromberg C, Ball T, **Albert RM**, Vrydaghs L & Scott Cummings L 2019, 'International Code for Phytolith Nomenclature (ICPN) 2.0', *Annals of Botany*, 124, 2, 189-199.
- Toffolo MB, Ritchie M, Sellers I, Morin J, Lyons N, Caldwell M, **Albert RM**, Letham B & Berna F 2019, 'Combustion features from short-lived intermittent occupation at the 1300-year-old Coast Salish DjRr-4 rock shelter, British Columbia: the microstratigraphic data', *Journal of Archaeological Science Reports*, 23, 646-661.
- Daura J, Sanz M, Oms FX, Pedro M, Martínez P, Mendiola S, Oliva Poveda M, Gibaja JF, Mozota M, Alonso-Eguiluz M, **Albert RM**, Allue E, Bañuls-Cardona S, Lopez-García JM, Santos Arévalo FJ & Fullola JM 2019, 'Deciphering Neolithic activities from a Cardial burial site (Cova Bonica) on the western Mediterranean Coast. *Journal of Archaeological Science*', *Reports*, 23, 324-347.

Selected research activities

- Stay at the Weizmann Institute of Science (Rehovot, Israel) working with Prof. Steve Weiner and Prof. Elisabetta Boaretto. Two conferences were given and one paper has been finished and accepted at JAS reports.
- Publication of ICPN 2.0 (Neumann et al., 2019), which formulates the principles recommended for naming and describing phytoliths. An illustrated glossary of common terms for description is also provided.
- Member of the Jury for the Catalan National Research Awards of the Fundació Catalana per a la Recerca i Innovació.
- 2019-2022 Research Associate at the Faculty of Science of the Centre for Coastal Paleosciences of the Nelson Mandela Metropolitan University (NMMU).
- 2019-2022 Honorary Professor in the Evolutionary Sciences Institute (ESI). University of Witwatersrand (South Africa).

ICREA MEMOIR 2019



Vassil Alexandrov

Barcelona Supercomputing Center - Centro Nacional de Supercomputación (BSC - CNS)

Experimental Sciences & Mathematics

Vassil Alexandrov is an ICREA Research Professor in Computational Science at BSC since September 2010. He holds a MSc in Applied Mathematics from Moscow State University, Russia (1984) and a PhD in Parallel Computing from Bulgarian Academy of Sciences (1995). He has held previous positions at the University of Liverpool, UK (Depts. of Statistics and Computational Mathematics and Computer Science, 1994-1999), the University of Reading, UK (School of Systems Engineering, 1999-2010, as Professor of Computational Science leading the Computational Science research group until September 2010, and as the Director of the Centre for Advanced Computing and Emerging Technologies until July 2010). He is an Editorial Board member and a Guest Editor of the Journal of Computational Science and an editor of the Journal of Mathematics and Computers in Simulation. He has published over 120 papers in renowned refereed journals and international conferences in the area of his research expertise. Prof. Vassil Alexandrov was appointed Chief Science Officer of Hartree Centre at the Science and Technology Facilities Council (STFC). STFC is part of UK Research and Innovation in March 2019.

Research interests

My expertise and research interests are in the area of Computational Science and High Performance Computing focusing on tackling Data and Compute Intensive problems at scale and encompassing stochastic modelling, Monte Carlo methods and algorithms, parallel algorithms, Parallel Computing, Scalable Algorithms for Large Scale Systems and Applications. In particular, the emphasis is on novel scalable stochastic and hybrid mathematical methods and algorithms such as scalable hybrid Monte Carlo algorithms for variety of supercomputing architectures for Linear Algebra, Optimization, Computational Finance, Environmental Models, Computational Biology, etc. In addition the research focuses on scalable, fault-tolerant and resilient algorithms for petascale and exascale computing paradigms. These are applied through various collaborations to applications in diverse areas.

Selected research activities

Research:

- Led Extreme Computing Research Group at BSC (consisting of 9 researchers and postgraduate students) until March 2019.
- Led the SGR grant for Emerging Research Group in Extreme Scale Computing awarded by the Catalan Government.

Training:

- Taught part of the Big Data Analytics PATC course at Barcelona Supercomputing Centre 5-8 February 2019.

Editorships/Memberships:

- Editorial Board member and Guest Editor of Journal of Computational Science, Elsevier.
- Editor of Mathematics and Computers in Simulation Journal, Elsevier.

ICREA MEMOIR 2019



Núria Aliaga-Alcalde

Institut de Ciència de Materials de Barcelona (CSIC - ICMAB)
Experimental Sciences & Mathematics

I completed my doctorate in 2003 at the University of Indiana (USA). Then, I carried out post-doctorates at the Max Planck Institut für Bioanorganische Chemie (MPI, Germany, 2003-2005) and at the Leiden University (The Netherlands, 2005-2007). In 2007 I started as ICREA Researcher in the Department of Inorganic Chemistry at the University of Barcelona (UB) and in September 2012 became ICREA Researcher Professor and moved to the Institut de Ciències dels Materials de Barcelona (ICMAB-CSIC). Since 2014, I am the group leader of "Functional Nanomaterials & Surfaces" (FunNanoSurf, <http://departments.icmab.es/funnanosurf/>), included in the Research Unit of "Functional Surfaces and interfaces" at the same institute.

My research focuses on molecular-based materials, their nanostructuration and application taking advantage of their magnetic, electronic and/or fluorescent properties in the bulk, on surfaces and as active components in nanodevices.

Research interests

My work focuses on the relevance and necessity of molecular design in Nanoscience, where functional molecules play a key role since they provide homogeneous tunable nanometer-size units and properties ready to be exploited (as reliable sensors, switches, quantum computing materials or molecular electronics). Main targets are the design of specific molecules together with their control and organization on surfaces/nanodevices where their properties can be used. In my group, we synthesize different molecular-based systems (from 0D-3D, of curcuminoid nature and coordination compounds), characterize and study them on surfaces (eg.: graphene, gold, SWCNTs) and analyze their electronic behavior on nanodevices (eg.: nanoFETs). So far, our work has shown the advantages of our systems as (i) biomarkers and/or sensors, (ii) active components in nano-transistors and as (iii) Single-Molecule Magnets .

Selected publications

- Castro E, Ceron MR, Garcia Hernandez A, Kim Q, Etcheverry-Berrios A, Morel MJ, Diaz-Torres R, Qian W, Martinez Z, Mendez L, Perez F, Santoyo CA, Gimeno-Munoz R, Esper R, Gutierrez DA, Varela-Ramirez A, Aguilera RJ, Llano M, Soler M, **Aliaga-Alcalde N** & Echegoyen L 2019, 'A new family of fullerene derivatives: fullerene-curcumin conjugates for biological and photovoltaic applications (vol 8, pg 41692, 2018)', *RSC Advances*, 9, 5, 2379 - 2379.
- Buades AB, Arderiu VS, Maxwell L, Amoza M, Choquesillo-Lazarte D, **Aliaga-Alcalde N**, Vinas C, Teixidor F & Ruiz E 2019, 'Slow-spin relaxation of a low-spin S=1/2 Fe-III carborane complex', *Chemical Communications*, 55, 26, 3825 - 3828.

Selected research activities

- Research Stay of 6 months at the Department of Quantum Nanoscience at the Delft University of Technology, The Netherlands (Feb-Jul 2019)
- Master course instructor (Nanotechnology: from small molecules to nanoporous materials)
- Member of 3 evaluation committees for PhD degree (from the UB, UAB and URV, Barcelona and Tarragona, Spain)
- Member of 1 evaluation committee for Master degree (from Delft University of Technology, Delft, The Netherlands)
- Editorial board member of *Inorganica Chimica Acta*
- Management of Tmol4TRANS ERC Consolidator grant

ICREA MEMOIR 2019



Patrick Aloy

Institut de Recerca Biomèdica de Barcelona (IRB Barcelona)
Life & Medical Sciences

Dr Patrick Aloy is an ICREA Research Professor and Principal Investigator of the Structural Systems Biology lab at the IRB. He has a BSc in Biochemistry and a MSc in Biotechnology from the Univ. Autònoma de Barcelona, Spain, and spent six years as postdoctoral researcher and staff scientist at the European Molecular Biology Laboratory, Heidelberg, Germany. For twenty years, Dr Aloy has been developing and implementing new technologies and algorithms, applying state-of-the-art methods to specific problems and bridging the gap between theoretical models and experiments in different disciplines. In the last years, he has pioneered system-scale analyses of macromolecular assemblies and networks using high-resolution three-dimensional structures, which has become a new discipline in structure prediction. Dr Aloy has over 120 publications in first-rate journals, with over 11,950 citations and remarkable press coverage, illustrating the scientific and social impact of the work.

Research interests

The main goal of my laboratory is to combine computational and structural biology with interaction discovery experiments to unveil the basic wiring architecture of physio-pathological pathways. It is our believe that a deeper knowledge of the global topology of interactome networks related to human disease will have important bearings in the discovery of new drug targets and biomarkers, optimization of preclinical models and understanding how biological networks change from the healthy state to disease. Additionally, in the last years, we have incorporated a complementary research line on systems pharmacology, so that the group can now tackle complex diseases from the drugs' perspective, providing compound bioactivity descriptors that push the similarity principle beyond chemical properties, reaching various ambits of biology.

Selected publications

- Fernandez-Torras A, Duran-Frigola M & **Aloy P** 2019, 'Encircling the regions of the pharmacogenomic landscape that determine drug response', *Genome Medicine*, 11, 17.
- Duran-Frigola M, ... & **Aloy P** 2019, 'Fromatting biological big data for modern machine learning in drug discovery', *WIREs Comp Mol Sci.*, vol 9(6). e1408.
- Fehér C, ... **Aloy P** & García F 2019, 'Virological outcome measures during analytical treatment interruptions in chronic HIV-1_infected patients', *Open Forum Infectious Diseases*, vol 6 (12) ofz485.
- De Toma I, Ortega M, **Aloy P**, Sabido E & Dierssen M 2019, 'DYRK1A Overexpression Alters Cognition and Neural-Related Proteomic Pathways in the Hippocampus That Are Rescued by Green Tea Extract and/or Environmental Enrichment', *Frontiers In Molecular Neuroscience*, 12, 272.
- Torrico B, Shaw AD, Mosca R, Vivo-Luque N, Hervas A, Fernandez-Castillo N, **Aloy P**, Bayes M, Fullerton JM, Cormand B & Toma C 2019, 'Truncating variant burden in high-functioning autism and pleiotropic effects of LRP1 across psychiatric phenotypes', *Journal Of Psychiatry & Neuroscience*, 44, 5, 350 - 359.
- Iglesias V, Paladin L, Juan-Blanco T, Pallares I, **Aloy P**, Tosatto SCE & Ventura S 2019, 'In silico Characterization of Human Prion-Like Proteins: Beyond Neurological Diseases', *Frontiers In Physiology*, 10, 314.

ICREA MEMOIR 2019



Ramón Álvarez-Puebla

Universitat Rovira i Virgili (URV)

Experimental Sciences & Mathematics

Ramón Álvarez Puebla is an ICREA Research Professor at the Universitat Rovira i Virgili and the Center for Chemical Technology of Catalonia, both in Tarragona. He studied Chemistry at the Universidad de Navarra and got his PhD from the Universidad Pública de Navarra in Surface Science. In 2004 he joined the group of Ricardo Aroca at the University of Windsor (Canada) where he remained in a cross appointment with the General Motors Research and Development center until the end of 2005. In 2006, Dr Álvarez was promoted to Research Officer at the National Center for Nanotechnology (NINT) belonging to the National Research Council of Canada. In 2008 he moved to Spain at the Universidad de Vigo, Spain. He joined ICREA in October of 2012.

Research interests

Dr. Álvarez-Puebla is an expert in surface science and spectroscopy with emphasis on the fabrication and characterization of plasmonic particles and their integration into advanced “all optical” sensing devices for biomedicine, chemical biology and environmental monitoring. Currently he is interested in: - Design and development of plasmonic functional materials and their integration into real live “all optical” sensors. - Development of new technologies for pathogen/disease marker detection by using localized surface plasmon resonances, Raman and SERS. - In vivo intracellular monitoring and imaging of relevant cytoplasm metabolites under different conditions (health/disease). - Optical technologies for the ultrafast and ultrasensitive recognition of active compounds in combinatorial libraries.

Selected publications

- Palmer SJ, Xiao X, Pazos-Perez N, Guerrini L, Correa-Duarte MA, Maier SA, Craster RV, **Alvarez-Puebla RA** & Giannini V 2019, ‘Extraordinarily transparent compact metallic metamaterials’, *Nature Communications*, 10, 2118.
- Carrillo-Carrion C, Martinez R, Navarro P, Maria F, Pelaz B, Polo E, Arenas-Vivo A, Olgiati A, Taboada P, Soliman MG, Catalan U, Fernandez-Castillejo S, Sola R, Parak WJ, Horcajada P, **Alvarez-Puebla RA** & del Pino P 2019, ‘Aqueous Stable Gold Nanostar/ZIF-8 Nanocomposites for Light-Triggered Release of Active Cargo Inside Living Cells’, *Angewandte Chemie-international Edition*, 58, 21, 7078 – 7082.
- Guerrini L & **Alvarez-Puebla RA** 2019, ‘Surface-Enhanced Raman Spectroscopy in Cancer Diagnosis, Prognosis and Monitoring’, *Cancers*, 11, 6, 748.
- Phan-Quang GC, Han X, Koh CSL, Sim HYF, Lay CL, Leong SX, Lee YH, Pazos-Perez N, **Alvarez-Puebla RA** & Ling XY 2019, ‘Three-Dimensional Surface-Enhanced Raman Scattering Platforms: Large-Scale Plasmonic Hotspots for New Applications in Sensing, Microreaction, and Data Storage’, *Accounts Of Chemical Research*, 52, 7, 1844 – 1854.
- Guerrini L & **Alvarez-Puebla RA*** 2019, ‘Multiplex SERS Chemosensing of Metal Ions via DNA-Mediated Recognition’, *Analytical Chemistry*, 91, 11, 11778-11784.
- Blanco-Formoso M, Sousa-Castillo A, Xiao X, Mariño-Lopez A, Turino M, Pazos-Perez N, Giannini V*, Correa-Duarte MA* & **Alvarez-Puebla RA*** 2019, ‘Boosting the analytical properties of gold nanostars by single particle confinement into Yolk porous silica shells’, *Nanoscale* 11, 21872-21879.

ICREA MEMOIR 2019



Isabelle Anguelovski

Universitat Autònoma de Barcelona (UAB)

Social & Behavioural Sciences

Isabelle obtained a PhD in Urban Studies & Planning (MIT) before returning to Europe in 2011 with a Marie Curie fellowship. Situated at the intersection of urban planning and policy, social inequality and development studies, her research examines the extent to which urban plans, policies, and socio-environmental interventions contribute to more just, resilient, healthy, and sustainable cities. She also studies how community groups in distressed neighborhoods contest the existence or exacerbation of environmental inequities as a result of urban (re)development processes. Based at UAB-ICTA where she leads the research line on Cities & Environmental Justice, she is also an affiliated researcher at IMIM where she directs the Barcelona Lab for Urban Environmental Justice & Sustainability (BCNUEJ). Much of her work takes place in marginalized urban neighborhoods who are resisting displacement in Europe, the US, L. America, S. Africa, and S.E Asia.

Research interests

I am a social scientist trained in urban and environmental planning (PhD, MIT, 2011), nonprofit management (Harvard University, 2004), international development (University de Paris-1 Sorbonne, 2001), and political studies (Science Po, 2000). Before starting my PhD in 2006, I held several positions in international development NGOs in France and the US. As part of collaborative EU and international research projects, I study 1) the extent to which environmental gentrification processes lead to new forms of green locally unwanted land uses (GREENLULUs – ERC Starting Grant (2016-2021) in historically marginalized neighborhoods, 2) how municipalities protect vulnerable communities from climate risks and inequality, 3) what opportunities and constraints exist to transitioning towards a low-carbon economy within European urban regions, 4) how the governance of urban nature-based solutions planning in Europe addresses (or exacerbates) environmental injustices.

Selected publications

- **Anguelovski I**, Connolly J, Cole HV, Garcia-Lamarca M & Pearsall H 2019, 'New scholarly pathways on green gentrification: What does the urban "green turn" mean and where is it going?', *Progress in Human Geography*, 43, 6, 1064-1086.
- **Anguelovski I**, Connolly J, Pearsall H, Shokry G, Checker M, Maantay J, Gould K, Lewis T, Maroko A & Roberts JT 2019. "Opinion: Why green "climate gentrification" threatens poor and vulnerable populations", *Proceedings of the National Academy of Sciences* 116 (52):26139-26143.
- **Anguelovski I**, Irázabal-Zurita CI & Connolly JJT 2019, "Grabbed urban landscapes: Socio-spatial tensions in green infrastructure planning in Medellín" *International Journal of Urban and Regional Research*, 43 (1), 133-156.
- Harrison J, Delgado M, Derudder B, **Anguelovski I**, Montero S, Bailey D & De Propriis L 2019, 'Pushing regional studies beyond its borders', *Regional Studies*, 54:1, 129-139.
- Cole HVS, Triguero-Mas M, Connolly JJT & **Anguelovski I** 2019, 'Determining the health benefits of green space: Does gentrification matter?', *Health & Place*, 57, 1 - 11. (coordinating role, as in public health studies)

Selected research activities

- PI GreenLULUs (ERC Starting Grant 2016-2021)
- PI (UAB) Naturvation (H2020 collaborative grant 2016-2020)
- Scientific Advisory Board Member for the City of Barcelona and the implementation of the Plà de Ciència (selected member).
- "(In)justices in Urban Greening Strategies. V Culture and Citizenship Meeting. 23 & 24 October 2019. Ministry of Culture and Sports, Madrid (Spain) (invited speaker)
- "How do we demand access to green space as a right for everyone?" The Nature of Cities Summit. June 6 2019. Paris (keynote speaker).
- "Planning and designing green cities for all." 20 March 2019. Yale University (invited speaker).
- Dialogues for Nature-based Solutions and Green Infrastructure. Three Multi-stakeholder events with 50+ participants from public, nonprofit, private, and university institutions in Catalonia. 2017-2020 (co-organizer)

ICREA MEMOIR 2019



Jose Apesteguia

Universitat Pompeu Fabra (UPF)

Social & Behavioural Sciences

Jose Apesteguia received his PhD in Economics from the Public University of Navarra in 2001. Since then he has been at the University of Bonn as a post-doc and at the Universitat Pompeu Fabra, first as a “Ramón y Cajal” fellow and then as an ICREA Research Professor.

Research interests

In my research I study individual decision-making with an emphasis on its psychological foundations. I use theoretical tools as well as adopt an empirical approach to try to better understand individual decision-making, and to improve the predictive power of the decision-making models in economic environments.

Selected research activities

Invited Seminars:

- NYU-Abu Dhabi, November 2019; Ludwig-Maximilians-Universitat Munchen, November 2019; University of Edinburgh, July 2019; University of Zurich, April 2019; University of Surrey, March 2019; Luxembourg Institute of Socio-Economic Research (LISER), February 2019.

Workshop Participations:

- Structural Behavioral Economics, Briq Conference, Bonn, June 2019; Measuring Individual Well-being Workshop, Brussels, May 2019.

Short research visits:

- University of Edinburgh, July 2019; Luxembourg Institute of Socio-Economic Research (LISER), February 2019; NYU-Abu Dhabi, November 2019.

Grants:

- Spanish Commission of Science: PGC2018-098949-B-I00 (2019-2021).

Organizer:

- Barcelona GSE Summer Forum Workshop on “Stochastic Choice”, June 2019.

Scientific Committee:

- “Bounded Rationality in Choice” Annual Meetings, Spanish Economic Association Meeting, European Economic Association Meeting.

ICREA MEMOIR 2019



Jordi Arbiol

Institut Català de Nanociència i Nanotecnologia (ICN2)
Engineering Sciences

Studied Physics at Universitat de Barcelona (UB) in 1997, where also obtained his PhD (European Doctorate and PhD Extraordinary Award) in 2001. He also worked as Assistant Professor at UB. From 2009 to 2015 he was ICREA Prof. at Institut de Ciència de Materials de Barcelona, ICMA-B-CSIC. Since 2015 he is ICREA Prof. at Institut Català de Nanociència i Nanotecnologia (ICN2) and Leader of the Advanced Electron Nanoscopy Group. Since 2017 he is President of the Spanish Microscopy Society (SME), was Vice-President from 2013 to 2017 and since 2009 he is Member of its Executive Board. Member of the Executive Board of the International Federation of Societies for Microscopy (IFSM) (2019-2026). Scientific Supervisor of the Electron Microscopy Transversal Area at ICN2 and BIST. Awarded with the EU40 Materials Prize 2014 (E-MRS) & listed in the Top 40 under 40 Power List (2014) by The Analytical Scientist. ~350 publications; h-index: 67 (WoS); 77 (GoS).

Research interests

Exploring the limits of physical resolution in advanced electron microscopy and understanding the ultimate behavior of materials at the nanoscale and their related properties are the central aims of our research. Main research lines:

- 1) Single atom recognition and localization in embedded quantum and nanostructures. From the atomic resolution data we obtain in the aberration corrected electron microscopes we create 3D atomic models of the nanosystems studied to get full knowledge on their growth mechanisms.
- 2) Direct correlation between the structure and elemental composition at the atomic scale and the physical properties at sub-nanometer scale: study of the photonic, plasmonic and phononic properties of the nanomaterials, correlated to simulated theoretical models.
- 3) Development of in-situ / in-operando experiments in the TEM to understand the physical and chemical phenomena promoting energy mechanisms, correlating theoretical models with

Selected publications

- Tang PY, **Arbiol J*** et al. 2019, 'Boosting Photoelectrochemical Water Oxidation of Hematite in Acidic Electrolytes by Surface State Modification', *Adv. Ener. Mater.*, 9, 1901836.
- Mofarah SS, **Arbiol J** et al. 2019, 'Coordination Polymer to Atomically Thin, Holey, Metal-Oxide Nanosheets for Tuning Band Alignment', *Adv. Mater.*, 31, 1905288.
- de la Mata M, **Arbiol J*** et al. 2019, 'The Role of Polarity in Nonplanar Semiconductor Nanostructures', *Nano Lett.*, 19, 3396-3408.
- Tang P & **Arbiol J*** 2019, 'Engineering Surface States of Hematite Based Photoanodes for Boosting Photoelectrochemical Water Splitting', *Nanoscale Horiz.*, 4, 1256-1276.
- Aseev P, **Arbiol J** et al. 2019, 'Selectivity map for molecular beam epitaxy of advanced III-V quantum nanowire networks', *Nano Lett.*, 19, 218-227.
- Ibáñez M, **Arbiol J**, **Cabot A** et al. 2019, 'Tuning Transport Properties in Thermoelectric Nanocomposites through Inorganic Ligands and Heterostructured Building Blocks', *ACS Nano*, 13, 6572-6580.
- Güniat L, **Arbiol J** et al. 2019, 'III-V Integration on Si(100): Vertical Nanospades', *ACS Nano*, 13, 5833-5840.
- Aseev P, **Arbiol J** et al. 2019, 'Ballistic InSb nanowires and networks via metal-sown selective area growth.', *Nano Lett.*, 19, 9102-9111.
- Güniat L, **Arbiol J** et al. 2019, 'Hierarchical Porous Ni₃S₄ with Enriched High-Valence Ni Sites as a Robust Electrocatalyst for Efficient Oxygen Evolution Reaction', *Adv. Funct. Mater.*, 29, 1900315.
- Ibupoto ZH, **J. Arbiol**, et al. 2019, 'MoS_x@NiO Composite Nanostructures: An Advanced Nonprecious Catalyst for Hydrogen Evolution Reaction in Alkaline Media', *Adv. Funct. Mater.*, 29, 1807562.

Selected research activities

- 37 Publications in 2019 with average IF of 11.1 (28 D1, 35 Q1)
- 1 Plenary, 6 Keynote, 2 Invited Talks
- 2 Invited Seminars (Trivago, Microsoft Q-Lab Delft)
- President of the Spanish Microscopy Society (SME)
- Member of the Executive Board of the International Federation of Societies for Microscopy (IFSM)

ICREA MEMOIR 2019



Joaquín Arribas

Vall d'Hebron Institut d'Oncologia (VHIO)

Life & Medical Sciences

Dr. Arribas completed his undergraduate studies in biochemistry at Univ. Autónoma de Madrid (1987). At the same university he subsequently worked on the regulation of the catalytic activities of the proteasome and received his PhD in Biology (1991). Sponsored by a fellowship from the Spanish Ministry of Education and Science, he joined Memorial Sloan-Kettering Cancer Center, New York (USA), as a Postdoctoral Fellow with J. Massagué (1992-96) working on the proteolytic processing of transmembrane growth factors. In 1997 he joined the oncology department at Hospital Vall d'Hebron in Barcelona as a Staff Scientist, since then he has lead the Growth Factors research group. In 2010 he was appointed Director of VHIO's Preclinical Research Program. In 2017, he was appointed Scientific Director of CIBERONC. His research has been recognized by EMBO Young Investigator Program Award, Beckman Coultek Award for the Best Young Spanish Investigator in Biochemistry and Molecular Biology.

Research interests

- Development of novel therapeutic strategies to treat HER2-positive tumors and identify mechanisms of resistance to current therapies.
- Development and preclinical characterization of T cell-based therapies against HER2 positive tumors.
- Characterization of the role of premature senescence in breast cancer progression and treatment.
- Evaluation of the activity of novel anti-cancer therapies in breast and pancreatic cancer patient-derived xenografts.

Selected publications

- Gomez-Miragaya J, Díaz-Navarro A, Tonda R, Beltran S, Palomero L, Palafox M, Dobrolecki L, Vasaikar S, Huang C, Zhang B, Wulf G, Muñoz P, Paré L, Serra V, Prat A, Bruna A, Caldas C, **Arribas J**, Balmaña J, Cruz C, Pujana MA, Lewis M, Puente X, Gonzalez-Suarez E 2019, 'Chromosome 12p amplification in triple-negative breast cancer is associated with emergent docetaxel resistance and carboplatin sensitivity', *Cancer Research*, 79, 4258-4270.
- Triana-Martínez F, Picallos-Rabina P, Da Silva-Álvarez S, Pietrocola F, Llanos S, Rodilla V, Soprano E, Pedrosa P, Ferreirós A, Barradas M, Hernández-González F, Lalinde M, Prats N, Bernadó C, González P, Gómez M, Ikonopoulou MP, Fernández-Marcos PJ, García-Caballero T, Del Pino P, **Arribas J**, Vidal A, González-Barcia M, Serrano M, Loza MI, Domínguez E & Collado M 2019, 'Identification and characterization of Cardiac Glycosides as senolytic compounds', *Nat Commun*. 10(1):4731
- Lambies G, Miceli M, Martínez-Guillamon C, Olivera-Salguero R, Atanassov BS, Dent SYR, **Arribas J**, García de Herreros A & Díaz VM 2019, 'TGF beta-Activated USP27X Deubiquitinase Regulates Cell Migration and Chemoresistance via Stabilization of Snail1', *Cancer Research*, 79, 1, 33 - 46.
- Blasco-Benito S, Moreno E, Seijo-Vila M, Tundidor I, Andradás C, Caffarel MM, Caro-Villalobos M, Urigüen L, Díez-Alarcia R, Moreno-Bueno G, Hernández L, Manso L, Homar-Ruano P, McCormick PJ, Bibic L, Bernadó Morales C, **Arribas J**, Canals M, Casadó V, Canela EI, Guzmán M, Pérez-Gómez E, Sánchez C 2019, 'Therapeutic targeting of HER2-CB2R heteromers in HER2-positive breast cancer', *Proceedings Of The National Academy Of Sciences Of The United States Of America*, 116, 13, 6505 - 6505.

ICREA MEMOIR 2019



Salvador A. Benitah

Institut de Recerca Biomèdica de Barcelona (IRB Barcelona)

Life & Medical Sciences

Salvador Aznar Benitah is a group leader at the Institute for Research in Biomedicine (IRB Barcelona). He holds a BSc/MSc in Biochemistry from the University of McGill (Montreal, Canada), from where he moved to the Biomedical Research Institute (Madrid, Spain) to obtain a PhD in Molecular Biology. His professional career continued at the London Research Institute (Cancer Research UK) in the laboratory of Prof. Fiona Watt where he acquired extensive knowledge on adult stem cells. He started as a Junior ICREA researcher at the CRG in 2007 where he studied the role of adult stem cells in tissue homeostasis and cancer. Since September 2012 he is an ICREA Research Professor. In September 2013 he became a Senior Researcher in the Oncology Department at the Institute for Research in Biomedicine (IRB Barcelona).

Research interests

Our global aim is to characterize the molecular pathways that regulate the behaviour of normal stem cells during homeostasis, and how they become deregulated during carcinogenesis and ageing. Research Lines: - What intrinsic mechanisms regulate adult stem cell function, and how are they deregulated during ageing and cancer? - How do adult stem cells communicate with their local environment and how is the system coordinated to dictate stem cell function? - What systemic cues communicate with adult stem cells and how do distant adult stem cells coordinate their function at the level of the whole organism? - How does deregulation of pathways that control stem cell behaviour contribute to the maintenance and progression of carcinomas?

Selected publications

- Welz P, Zinna VM, Symeonidi A, Koronowski Kevin B, Kinouchi K, Smith JG, Marin Guillen I, Castellanos A, Crainiciuc G, Prats N, Martin Caballero J, Hidalgo A, Sassone-Corsi P & **Aznar-Benitah S** 2019, 'BMAL1-Driven Tissue Clocks Respond Independently to Light to Maintain Homeostasis', *Cell*, 177, 6, 1436 - +.
- Solanas G & **Benitah SA** 2019, 'Brain tumours reset their clocks', *Nature*, 574, 7778, 337 - 338.
- Koronowski KB, Kinouchi K, Welz P, Smith JG, Zinna VM, Shi J, Samad M, Chen S, Magnan CN, Kinchen JM, Li W, Baldi P, **Aznar-Benitah S** & Sassone-Corsi P 2019, 'Defining the Independence of the Liver Circadian Clock', *Cell*, 177, 6, 1448 - +. (Benitah and Sassone-Corsi are co-corresponding)

ICREA MEMOIR 2019



Àlex Bach

Institut de Recerca i Tecnologia Agroalimentàries (IRTA)

Life & Medical Sciences

Àlex holds a Master and a PhD in Dairy Science from the University of Minnesota. After a few years working as a research manager of a multinational company, Dr. Bach returned to academia as ICREA Research Professor and Head of the Department of Ruminant Production of IRTA. He has received several awards in recognition to his research activities (the last one this year from the 'Royal Academy of Veterinary Sciences of Spain'), has spoken at more than 140 international congresses, is author or co-author of more than 145 peer-reviewed publications, more than 95 extension articles, and more than 20 books (or book chapters). He has served as a scientific expert in several committees of the European Food Safety Authority. He is section editor and sits in the editorial boards of several scientific journals, and is member of various scientific committees.

Research interests

Àlex Bach conducts research in ruminant production systems. His research focuses on optimizing the growth curve of dairy replacement heifers, as well as their management and housing systems (group size, behavior, stocking densities...). He also uses mathematical models to simulate work flows of ruminant production systems with the aim of helping the decision-making process in dairy enterprises. In addition, Àlex conducts basic research to understand the physiology and metabolism of ruminants with especial emphasis on the impact of nutrition and management during early development on future metabolic function.

Selected publications

- Chahine M, de Haro MM, Matuk C, Arís A, Campbell J, PoloJ & **Bach A**. 2019, 'Effects of spray-dried plasma protein in diets of early lactation dairy cows on health, and milking and reproductive performance'. *Animal Feed Science and Technology*. 256:114266.
- Ahangarani MA, **Bach A**, Bassols A, Vidal M, Valent D, Ruiz-Herrera S & Terré M 2019. 'Short communication: Performance, intestinal permeability, and metabolic profile of calves fed a milk replacer supplemented with glutamic acid'. *J. Dairy Sci.* 103:433-438
- **Bach A** 2019, 'Effects of nutrition and genetics on fertility in dairy cows', *Reproduction Fertility And Development*, 31, 1, 40 - 54.
- Delgado B, Beatriz; **Bach A**, Guasch I, Gonzalez C, Elcoso G, Pryce JE & Gonzalez-Recio O 2019, 'Whole rumen metagenome sequencing allows classifying and predicting feed efficiency and intake levels in cattle', *Scientific Reports*, 9, 11.
- **Bach A**, Lopez-Garcia A, Gonzalez-Recio O, Elcoso G, Fabregas F, Chaucheyras-Durand F & Castex M 2019, 'Changes in the rumen and colon microbiota and effects of live yeast dietary supplementation during the transition from the dry period to lactation of dairy cows', *Journal Of Dairy Science*, 102, 7, 6180 - 6198.

ICREA MEMOIR 2019



Joan Bagaria

Universitat de Barcelona (UB)

Experimental Sciences & Mathematics

Born on 17 August 1958 in Manlleu (Catalonia). Fulbright Fellow at Univ. of California, Berkeley, 1985-87. PhD in Logic and the Methodology of Science, UC Berkeley, 1991. Postdoctoral researcher, UC Berkeley, 1991-92. Associate Professor at several Catalan universities, 1992-2001. ICREA Research Professor at Univ. of Barcelona, since 2001. Invited researcher at UC Berkeley, Kobe Univ., National Univ. of Singapore, Kurt Gödel Research Center (Vienna), Univ. Paris VII, CalTech, Mittag-Leffler Institut, Hebrew Univ., Harvard Univ., etc. First President of the European Set Theory Society, 2007-11; ICREA Director's Scientific Advisor, since 2005; Chairman of the INFTY ESF-Research Networking Programme, 2009-14; Simons Foundation Fellow at Isaac Newton Institute, Cambridge, UK, Aug. to Dec. 2015. Director of the Barcelona Research Group on Set Theory (BCNSETS), and coordinator and PI of the UB-based Barcelona Logic Group (BCNLOGIC).

Research interests

I am a mathematical logician working mainly in Set Theory, an extremely general theory whose objects of study are the abstract infinite sets. Set Theory is the strongest and most encompassing of mathematical theories. It is both the theory of infinity and the standard foundation for mathematics, in the sense that virtually all of mathematics can be formally reduced to it. I help to develop and apply sophisticated techniques, such as Forcing and Large Cardinals, towards the solution of hard problems in Set Theory itself and in other areas of logic and mathematics. More interestingly, it is sometimes possible to prove that a given problem cannot be solved using standard mathematical tools, which are embodied in the standard Zermelo-Fraenkel with Choice (ZFC) axioms of Set Theory, and therefore new axioms are needed for its solution. Finding and classifying new axioms, thereby expanding the frontiers of mathematical reasoning, is also an essential part of set theory, and of my work.

Selected publications

- **Bagaria J** 2019, 'Derived topologies on ordinals and stationary reflection', *Transactions of the American Mathematical Society*, vol. 371, no. 3, pp 1981-2002.
- **Bagaria J**, Koellner P & Woodin WH 2019, 'Large Cardinals Beyond Choice'. *Bulletin of Symbolic Logic*. September 2019, Volume 25, Issue 3, 283-318

Selected research activities

Invited Talks

- *The true universe of sets, Woodin's HOD Conjecture, very large cardinals, and class forcing*. Joint Quest for Absolute Infinity and the Continuum - From Cantor to Woodin. Turku (Finland).
- *On the preservation of very large cardinals under class forcing*. Higher Recursion Theory and Set Theory. IMS, National Univ. of Singapore.
- *Philosophical implications of some recent breakthroughs in Set Theory*. Set Theory: Bridging Mathematics and Philosophy. Univ. of Konstanz (Germany).
- *On Woodin's HOD-Conjecture, large cardinals beyond Choice, and class forcing*. 12th Panhellenic Logic Symposium. Anogia, Crete (Greece).
- *Some more applications of w_1 -strongly compact cardinals in General Topology*. Third Pan Pacific International Conference on Topology and Applications (3rdPPICTA). Chengdu (China).
- *The Weak Vopenka Principle for definable classes of structures*. RIMS Set Theory Workshop. Set Theory and Infinity. RIMS, Univ. of Kyoto (Japan).
- *The Weak Vopenka Principle for definable classes of structures*. Di Prisco Fest. Univ. de los Andes, Bogotá (Colombia).
- *Vopenka's Principle, the Weak Vopenka Principle, and large cardinals*. A tutorial. IPM Set Theory Conference. IPM (Tehran).

ICREA MEMOIR 2019



Pau Baizán

Universitat Pompeu Fabra (UPF)

Social & Behavioural Sciences

Pau Baizán is ICREA Research Professor at Pompeu Fabra University, where he teaches demography. Previously, he was research scientist at the Max Planck Institute for Demographic Research (2000-2002), doctoral student and teaching assistant at the University of Louvain (1996-1999), where he obtained his PhD in Demography, and research associate at the University of Cambridge (1994-1995).

Research interests

My research focuses in two main areas: a) the study of the trends and patterns of family formation dynamics and, b) the changing patterns and determinants of migration. I explore several theoretical perspectives to explain the observed behaviour and apply quantitative techniques to disentangle the relationships between processes. For instance, I investigate questions such as “To what extent do employment insecurity and de-standardisation of work patterns affect the likelihood to enter a partnership and to have a child?”, “How does this impact vary across countries, regions and different welfare state regimes?”, “What is the impact of changing gender roles on fertility behaviour?”, “What are the causes of African migration?”, “How migration influences family behaviour?”.

Selected research activities

Honors

- Appointed member of the International Advisory Board of *NCCR – on the move*, a center of excellence in the field of migration and mobility studies, funded by the Swiss National Science Foundation (nccr-onthemove.ch).

Research Grants

- Socio-Demographic Consequences of the Great Recession: Altered Class and Gender Relations?* (RECECON), Spanish Ministry of Economy, CSO2016-80484-R. (€ 91,960). PI: Pau Baizán and Clara Cortina.

Invited talks and conference presentations (selection)

- ‘Proposals to improve our research community around migration and mobility data’. *Neuchâtel Graduate Conference “Innovative Approaches to Migration and Mobility Studies”*, 12-13 September 2019, University of Neuchâtel.
- “Welfare regime patterns in the social class-fertility relationship: second births in Austria, France, Norway, and United Kingdom”, *International Sociological Association, Social Stratification RC28 Spring Meeting 2019*, 21-23 March, Frankfurt.
- with Kraus E., “The Role of Migrant Networks. A Comparison of Senegalese Migration to Europe (MAFE) and Mexican Migration to the US (MMP)”, *16th IMISCOE Annual Conference on “Conceptual and Methodological Approaches”*, June 26-28, 2019, Malmö University, Sweden.

Supervision of PHD students.

- Nie Wanli, “*The Interrelationship Between Migration and Family Behaviours: International Migration within China and International Migration from China to the U.S.*”

Courses

- “*Demographic Changes and Social Dynamics*” and “*Migration and Society*”. Master in Sociology and Demography, UPF.

ICREA MEMOIR 2019



Pablo Ballester Balaguer

Institut Català d'Investigació Química (ICIQ)

Experimental Sciences & Mathematics

Pablo Ballester studied Chemistry at the University of the Balearic Islands (UIB) where he also completed the PhD degree in 1986. In 1987 he was post-doctoral Associate with Prof. J. Rebek Jr. at the University of Pittsburgh. In 1988 after a post-doctoral stay at UIB he decided to return to Pittsburgh and moved to MIT in 1989. From 1991 to 2002 he held the positions of Assistant and Associate Professor at UIB and served as Secretary of the Chemistry Department, Vice-dean of the Faculty of Sciences and Head of Studies of Chemistry at UIB. In 2003 and while enjoying a sabbatical leave at the Scripps Research Institute (USA) with the rank of Associate Professor of Research he got an ICREA Research Professorship and joined ICIQ as Group Leader in 2004. He is the recipient of the 2012 Janssen Cilag Organic Chemistry Prize awarded by the Spanish Royal Society of Chemistry. From 2016 to 2018, he served as ICIQ Vice-Director for BIST affairs.

Research interests

My scientific background lies in the areas of organic chemistry (making molecules) and supramolecular chemistry (study how molecules fit together). My research is mainly focused in the design, synthesis, study and characterization of functional molecular aggregates. I consider myself a mixture between a molecular architect and a molecular engineer. We study matter but we also produce matter and new materials. We work in trying to understand molecular self-assembly processes (non-covalent synthesis) as a methodology to construct large and functional supramolecular assemblies, i.e., molecular machines. A second area of interest resides in the design and application of molecular containers. These are molecular or supramolecular structures with an internal cavity sufficiently large to include or encapsulate other molecules. Unfortunately, although we construct monumental and even artistic structures they are not visible to the naked eye due to their reduced nanometer size.

Selected publications

- Escobar L, Escudero-Adán EC, **Ballester P** 2019, 'Guest Exchange Mechanisms in Mono-Metallic PdII/PtII-Cages Based on a Tetra-Pyridyl Calix[4]pyrrole Ligand', *Angew. Chem., Int. Ed.*, **58**, 16105-16109.
- Escobar L, Villaron D, Escudero-Adán EC & **Ballester P** 2019, 'A mono-metallic Pd(II)-cage featuring two different polar binding sites', *Chem. Commun.*, **55**, 5, 604 - 607.
- Penuelas-Haro G & **Ballester P** 2019, 'Efficient hydrogen bonding recognition in water using aryl-extended calix[4]pyrrole receptors', *Chem. Sci.*, **10**, 2413 - 2423.
- Martinez-Crespo L, Sun-Wang JL, Ferreira P, Mirabella CFM, Aragay G & **Ballester P** 2019, 'Influence of the Insertion Method of Aryl-Extended Calix[4]pyrroles into Liposomal Membranes on Their Properties as Anion Carriers', *Chem.-Eur. J.*, **25**, 4775 - 4781.
- Helttunen K, Annala R, Suhonen A, Iloniemi J, Kalenius E, Aragay G, **Ballester P**, Tuononen HM & Nissinen M 2019, 'Oligoamide Foldamers as Helical Chloride Receptor: The Influence of Electron-Withdrawing Substituents on Anion-Binding Interactions', *Chem. Asian J.*, **14**, 647 - 654.
- Escobar L & **Ballester P** 2019, 'Quantification of the hydrophobic effect using water-soluble super aryl-extended calix[4]pyrroles', *Org. Chem. Front.*, **6**, 1738 - 1748.
- Monceli G & **Ballester P** 2019, 'Photoswitchable Host-Guest Systems Incorporating Hemithioindigo and Spiropyran Units', *Chemphotochem*, **3**, 304 - 317.
- Li Y, Escobar L, Zhu Y, Cohen Y, Ballester P, Rebek Julius Jr. & Yu Y 2019, 'Relative hydrophilicities of cis and trans formamides', *Proc. Natl. Acad. Sci. U. S. A.*, **116**, 19815 - 19820.

Selected research activities

- Theses: Giulia Moncesli (PhD-URV), Luis Escobar (PhD-URV).
- Scientific Advisory Board, Institute of Advanced Chemistry of Catalonia (IQAC), Spain
- Scientific Collaborator of the State Agency for Research, Spain

ICREA MEMOIR 2019



Marco Baroni

Universitat Pompeu Fabra (UPF)
Social & Behavioural Sciences

Marco Baroni received a PhD in Linguistics from the University of California, Los Angeles, in the year 2000. After several experiences in research and industry, he joined the Center for Mind/Brain Sciences of the University of Trento, where he became associate professor in 2013. In 2016, Marco joined the Facebook Artificial Intelligence Research team. In 2019, he became ICREA research professor, affiliated with the Linguistics Department of Pompeu Fabra University in Barcelona. Marco's work in the areas of multimodal and compositional distributed semantics has received widespread recognition, including a Google Research Award, an ERC Starting Grant and the ICAI-JAIR best paper prize. Marco's current research focuses on a better understanding of artificial neural networks, focusing in particular on what they can teach us about human language acquisition and processing.

Research interests

Marco is interested in human language and how it is acquired. To gain insights into these questions, he develops and studies computational systems, in particular deep neural networks, that acquire aspects of language from realistic input data. By analyzing the inner dynamics and external behaviour of these systems, we can gain insights into questions such as: how much linguistic knowledge is already implicitly present in input distributions, what are the minimal priors necessary for learning, what is the space of solutions to the communication challenges that led to the evolution of language, and so on. The ultimate goal of Marco's research is to bring about a more precise characterization of what is unique about the human language faculty.

Selected publications

- Lake B, Linzen T & **Baroni M** 2019, 'Human few-shot learning of compositional instructions'. Proceedings of CogSci, 41st Annual Meeting of the Cognitive Science Society. (Accepted as oral presentation).
- Chaabouni R, Kharitonov R, Lazaric A, Dupoux E & **Baroni M** 2019, 'Word-order biases in deep-agent emergent communication', Proceedings of ACL, , 5166 - 5175. (57th Annual Meeting of the Association for Computational Linguistics).
- Bouchacourt D & **Baroni M** 2019, 'Miss Tools and Mr Fruit: Emergent communication in agents learning about object affordances'. Proceedings of ACL 2019 (57th Annual Meeting of the Association for Computational Linguistics), East Stroudsburg PA: ACL.
- Kharitonov E, Chaabouni R, Bouchacourt D & **Baroni M** 2019 EGG: a toolkit for research on Emergence of lanGuage in Games. Proceedings of EMNLP 2019 (Conference on Empirical Methods in Natural Language Processing).
- Hahn M & **Baroni M** 2019. 'Tabula nearly rasa: Probing the linguistic knowledge of character-level neural language models trained on unsegmented text', Transactions of the Association for Computational Linguistics, vol. 7, pp 467-484.
- Chaabouni R, Kharitonov E, Dupoux E & **Baroni M** 2019, 'Anti-efficient encoding in emergent communication.' Proceedings of NeurIPS (33d Conference on Neural Information Processing Systems), Vancouver, BC: Neural Information Processing Systems Foundation.

Selected research activities

- **8 invited talks**, including:
 - Inaugural lecture at the CCIL master in Barcelona;
 - Plenary talk at the 7th Cambridge Neuroscience Symposium;
 - Plenary talk at the 4th Workshop on Representation Learning for NLP.
 - Co-organized the 2-days Understanding Human and Machine Intelligence Workshop at Facebook New York.
- **Co-organized** a week-long workshop on Compositionality in Humans and Machines at the Leiden Lorentz Center.
- **Open-sourced** the EGG toolkit (<https://engineering.fb.com/ai-research/egg-toolkit/>) (>100 stars on GitHub as of January 2020).
- **Member** of the ERC Consolidator Grant SH4 Panel (The Human Mind and Its Complexity).

ICREA MEMOIR 2019



Xavier Barril

Universitat de Barcelona (UB)

Experimental Sciences & Mathematics

Xavier Barril's research focuses on the discovery of bioactive molecules through a combined use of computational and experimental techniques. His group also develops new computational tools for drug discovery and strives to improve the fundamental understanding of molecular events involved in pharmacological response. Prof. Barril received his Ph.D. from the University of Barcelona (UB) in 2001 for theoretical studies on the molecular recognition processes. He then joined Vernalis (Cambridge, UK), where he was involved in a range of drug discovery projects. In 2005 he was appointed ICREA Research Professor and went back to the UB. Prof. Barril has co-authored 80 scientific publications and 10 patents. In 2011 he co-founded Minoryx Therapeutics to develop allosteric pharmacological chaperones as new treatments for rare diseases. In 2018 this activity was transferred to Gain Therapeutics where Prof. Barril acts as CSO.

Research interests

My main research interest is the discovery of bioactive molecules with novel mechanisms of action. These molecules can then be used as chemical probes to interrogate biological systems and validate new pharmacological targets, or as starting points to develop drug candidates. I aim to expand the so-called druggable genome by targeting untapped biological components, preferably through non-standard mechanisms of action, such as allosteric binding, conformational trapping or stabilisation of protein-protein complexes. To achieve this objective my group employs a multi-disciplinary and question-driven approach that combines computational, biophysical and biological techniques. We are particularly strong in computer-aided drug design and we develop new computational approaches that enable us to tackle such novel and difficult targets with confidence.

Selected publications

- Rachman M, Scarpino A, Bajusz D, Palfy G, Vida I, Perczel A, **Barril X** & Keseru GM 2019, 'DUckCov: a Dynamic Undocking-Based Virtual Screening Protocol for Covalent Binders', *Chemmedchem*, 14, 10, 1011 - 1021.
- Majewski M, Ruiz-Carmona S & **Barril X** 2019, 'An investigation of structural stability in protein-ligand complexes reveals the balance between order and disorder', *Communications Chemistry*, 2, 110.
- Pablo Arcon J, Defelipe LA, Lopez ED, Burastero O, Modenutti CP, **Barril X**, Marti MA & Turjanski AG 2019, 'Cosolvent-Based Protein Pharmacophore for Ligand Enrichment in Virtual Screening', *Journal Of Chemical Information And Modeling*, 59, 8, 3572 - 3583.

Selected research activities

Invited talks

- 2nd Molecules Medicinal Chemistry Symposium. Barcelona (Spain), 16 May 2018
- VI Symposium of Medicinal Chemistry Young Researchers, Madrid (Spain), 21 June 2019

Patent application

- Inhibitors of ERK nuclear translocation. Yeda Research and Development Co. Ltd; Universitat de Barcelona; ICREA. PCT Patent Application No. PCT/IL2019/051326

MSc thesis director

- A. Serrano, "Can structural stability predict activity cliffs in protein-ligand complexes?". MSc Bioinformatics (UPF/UB). Jul 2019

ICREA MEMOIR 2019



Frederic Bartumeus

Centre de Recerca Ecològica i Aplicacions Forestals (CREAF) &
Centre for Advanced Studies of Blanes (CSIC - CEAB)
Life & Medical Sciences

Frederic Bartumeus is an ICREA Research Professor in Computational and Theoretical Ecology at the Centre for Advanced Studies of Blanes (CEAB-CSIC) since November 2013. He also holds the same status at CREAM since 2016. He holds a MSc in Plankton Ecology (1997), and a PhD in Biological Sciences (2005) from the University of Barcelona, Spain, where he applied random walk and generalized diffusion theory to develop animal search theory. He joined the Department of Ecology and Evolutionary Biology at Princeton University, USA (2006-2009), where he went in depth on the stochastic modeling of animal movement and dispersal. Back to Spain, he completed his postdoctoral research on vector-borne diseases at the Institut Català del Clima (IC3). With a Ramón y Cajal position (2010) he founded his own lab, the Movement Ecology Laboratory, focused on animal movement (including humans) and search strategies, disease vectors, and computational ecology.

Research interests

My research is focused in the emerging field of movement ecology, which aims to reveal the complex forces that drive movement and dispersal patterns of animals (including humans). Improved tracking technology (GPS, bio-loggers, smart-phones) demands an integrative view, with new computational tools and modeling frameworks to understand unprecedented levels of detail from a constantly growing number of species. I am contributing to this scientific revolution based on a broad, highly collaborative and interdisciplinary research program, founded solidly on statistical physics and quantitative ecology. A central question in my research is how animals use information and their motor properties to optimize search strategies. The mechanistic linkage between behavioral processes and movement patterns is also key to understanding globalised problems such as the perpetuation of social inequality among humans or the spread of vector-borne infectious diseases.

Selected publications

- **Bartumeus F**, Costa GB, Eritja R, Kelly AH, Finda M, Lezaun J, Okumu F, Quinlan MM, Thizy DC, Toe LP & Vaughan M 2019, 'Sustainable innovation in vector control requires strong partnerships with communities', *Plos Neglected Tropical Diseases*, 13, 4, e0007204.
- Schunter C, Pascual M, Raventos N, Garriga J, Garza JC, **Bartumeus F** & Macpherson E 2019, 'A novel integrative approach elucidates fine-scale dispersal patchiness in marine populations', *Scientific Reports*, 9, 10796.
- Kembro JM, Lihoreau M, Garriga J, Raposo EP & **Bartumeus F** 2019, 'Bumblebees learn foraging routes through exploitation-exploration cycles', *Journal Of The Royal Society Interface*, 16, 156, 20190103.
- Aspillaga E, Safi K, Hereu B & **Bartumeus F** 2019, 'Modelling the three-dimensional space use of aquatic animals combining topography and Eulerian telemetry data', *Methods In Ecology And Evolution*, 10, 9, 1551 - 1557.
- Eritja R, Ruiz-Arrondo I, Delacour-Estrella S, Schaffner F, Álvarez-Chachero J, Bengoa M, Puig MA, Melero-Alcíbar R, Oltra A, **Bartumeus F** 2019 'First detection of *Aedes japonicus* in Spain: an unexpected finding triggered by citizen science', *Parasites & Vectors*, 12, 53.

Selected research activities

- February 2019. Participation in the evaluation committee of the Premi Ciutat Barcelona 2018 Ciències de la Terra i del Medi Ambient.
- 3-4 October 2019. Organisation of the 1st PhD Ecology Symposium (national level) at CEAB-CSIC, Blanes, Spain. Web: <http://www.theelab.net/the-ephd-symposium/>
- 25-27 March 2019. Organisation of an International Workshop (COST ACTION CA17108) entitled "Aedes Invasive Mosquitoes: Linking Citizen Science to Epidemiological Models" at CEAB-CSIC, Blanes, Spain. Web: <http://www.theelab.net/news-and-events-2/>

ICREA MEMOIR 2019



Quique Bassat

Institut de Salut Global Barcelona (ISGlobal)

Life & Medical Sciences

Quique Bassat is an ICREA Research Professor at the Barcelona Institute of Global Health (ISGlobal). He has a degree in Medicine from the Universitat de Barcelona (UB, 1999), a specialization in pediatrics (UaB, 2004), and Masters in Tropical Medicine and International Health (UB, 2004) and Epidemiology (LSHTM, 2008). He obtained his PHD in the year 2009 (UB) with work on the treatment and clinical characterization of malaria in Africa. He has been based for several years at the Centro de Investigação em Saúde de Manhiça (CISM), in Mozambique, where he currently conducts most of his research, although in recent years he has started projects in other countries, including Morocco, Papua New Guinea, Brazil or Bhutan.

Research interests

As a paediatrician, my research is based on the premise that there is no greater public health intervention than that which can reduce child mortality, particularly in poor contexts. To do these, I have worked in low and middle-income countries to understand and prevent malaria, pneumonia and other infectious diseases that most impact child survival. I have investigated in Mozambique, Morocco, Papua New Guinea, Brazil and now Bhutan, the epidemiology, aetiology and clinical characteristics of malaria, pneumonia, diarrhea, neonatal sepsis, Yaws and other infectious diseases significantly affecting child's health. I'm interested in biomarkers of host response as diagnostic and prognostic tools to help triage children and better target antibiotics. For malaria and yaws, my research is contributing to develop and test the new paradigm of disease eradication, by assessing the impact of drugs to specifically interrupt their transmission. More recently, my research has focused on improving the poor existing data on the causes of child mortality. An important contribution has been the validation of a radically innovative minimally invasive autopsy (MIA) sampling protocol, currently being implemented in several countries as part of mortality surveillance and research protocols.

Selected publications

- Salzberg NT, Sivalogan K, **Bassat Q** & Taylor AW et al. 2019, 'Mortality Surveillance Methods to Identify and Characterize Deaths in Child Health and Mortality Prevention Surveillance Network Sites', *Clinical Infectious Diseases*, 69, S262 - S273.
- Blau DM, Caneer JP, Philipsborn RP, Madhi SA, **Bassat Q**, Varo R et al. 2019, 'Overview and Development of the Child Health and Mortality Prevention Surveillance Determination of Cause of Death (DeCoDe) Process and DeCoDe Diagnosis Standards', *Clinical Infectious Diseases*, 69, S333 - S341.
- Li Y, Reeves RM, Wang X, **Bassat Q** et al. 2019, 'Global patterns in monthly activity of influenza virus, respiratory syncytial virus, parainfluenza virus, and metapneumovirus: a systematic analysis', *Lancet Global Health*, 7, 8, E1031 - E1045.
- Madrid L, Casellas A, Saco C, Quinto L, Siteo A, Varo R, Acacio S, Nhampossa T, Massora S, Sigauque B, Mandomando I, Cousens S, Menendez C, Alonso P, Macete E & **Bassat Q** 2019, 'Postdischarge Mortality Prediction in Sub-Saharan Africa', *Pediatrics*, 143, 1, e20180606.
- Garcia-Basteiro AL et al. 2019, 'Unmasking the hidden tuberculosis mortality burden in a large post mortem study in Maputo Central Hospital, Mozambique', *European Respiratory Journal*, 54, 3, 1900312.

ICREA MEMOIR 2019



Eduard Batlle

Institut de Recerca Biomèdica de Barcelona (IRB Barcelona)
Life & Medical Sciences

Eduard Batlle joined the Institute for Research in Biomedicine (IRB Barcelona) as ICREA Research Professor and Head of the Oncology Program in 2004. His research activity has focused on the mechanisms that drive colorectal cancer (CRC) initiation and progression. Amongst other findings, his research originally identified the transcription factor Snail as a repressor of E-Cadherin gene expression during the EMT (2000); the connection between intestinal stem cells and CRC (2002-2011); and more recently a key role for TGF-beta signaling in stromal cells during metastatic colonization (2012-2015). His track record has been recognised through several awards/honours such as the Sabadell Banc Award for Biomedical Research (2010), Josef Steiner Award (2013), ERC Starting and Advanced Grants (2007, 2013), the Pezcoller foundation-EACR award (2014), the Lilly Foundation Award for Pre-clinical research (2016) and the Carmen & Severo Ochoa Foundation Prize (2016).

Research interests

The inner layer of the intestinal tube, the intestinal epithelium, is in a constant process of renewal. Hundreds of millions of terminally differentiated intestinal cells are replaced by new cells every day during the life of an adult organism. This tremendous regenerative power is ultimately sustained by a small population of intestinal stem cells. It is believed that alterations in the functioning of intestinal stem cells account for the pathophysiology of various bowel disorders. Our laboratory studies the connection between the biology of Intestinal Stem Cells and Colon Cancer. We are also interested in the process of metastasis, the cause of death of most colorectal cancer (CRC) patients. Neither conventional chemotherapy nor current targeted therapies offer significant benefits once the disease has spread to distant organs. Furthermore, current CRC staging based on histopathology and imaging has a limited ability to predict the evolution of the disease. We have recently discovered that vast majority of genes that distinguish poor prognosis CRC subtypes are expressed by stromal cells rather than by epithelial tumor cells. It appears that metastasis relies on a tumor cell non-autonomous program driven by TGF-beta in the tumor microenvironment.

Selected publications

- **Batlle E** & Massagué J 2019, 'Transforming Growth Factor- β Signaling in Immunity and Cancer', *Immunity*, Vol.50 (4), pp. 924-940
- Campbell K, Rossi F, Adams J, Pitsidianaki I, Barriga FM, Garcia-Gerique L, **Batlle E**, Casanova J & Casali A 2019, 'Collective cell migration and metastases induced by an epithelial-to-mesenchymal transition in Drosophila intestinal tumors', *Nature Communications*, 10, 2311.
- Altay G, Larrañaga E, Tosi S, Barriga FM, **Batlle E**, Fernández-Majada V & Martínez E 2019, 'Self-organized intestinal epithelial monolayers in crypt and villus-like domains show effective barrier function', *Sci Rep.* 9(1):10140.

Selected research activities

- Barcelona City Council Award in Life Sciences
- Member of the scientific board of the FERO Foundation.

ICREA MEMOIR 2019



Giuseppe Battaglia

Institut de Bioenginyeria de Catalunya (IBEC)

Engineering Sciences

Giuseppe, or as most people call him, Beppe, holds a Laurea in Chemical Engineering from the University of Palermo and a PhD in Physical Chemistry from the University of Sheffield. Beppe joined the Catalan Institution for Research and Advanced Studies (ICREA) and the Institute of Bioengineering of Catalunya (IBEC) in 2019 and he's also currently affiliated with the University College London in UK where he holds EPSRC Established Career fellowship until 2022 and, the Chair in Molecular Bionics in the Department of Chemistry. Prior to UCL Beppe held positions as Lecturer -2006, Senior Lecturer -2009 and Professor -2011 in the Departments of Materials Sci. Eng. (2006-2009) and Biomedical Science (2009-2013) at the University of Sheffield.

Research interests

I have put together a truly interdisciplinary collection of research activities where we address biological challenges (often associated with a specific clinical need) using a constructionist approach. I have christened this approach Molecular Bionics and I mimic biological complexity in the form of design principles to produce functional units from simple building blocks and their interactions. We employ Chemistry and Physics together to engineer synthesis and characterization of novel hierarchical materials whose properties are the result of the holistic combination of its components (Molecular Engineering). We apply these for tackling clinical challenges associated with drug delivery and diagnostics where we engage with clinicians to design new therapies (Nanomedicine). We study in detail transport phenomena in our body to shed light on how material is transported and processed as well as biological barriers can be overcome (Physical Biology).

Selected publications

- Gouveia VM, Rizzello L, Nunes C, Poma A, Ruiz-Perez L, Oliveira A, Reis S & **Battaglia G** 2019, 'Macrophage Targeting pH Responsive Polymersomes for Glucocorticoid Therapy', *Pharmaceutics*, 11, 11, 614.

ICREA MEMOIR 2019



Maria Carme Belarte

Institut Català d'Arqueologia Clàssica (ICAC)

Humanities

PhD in Geography and History (1995), University of Barcelona, for my research on proto-historic societies in Catalonia through the analysis of domestic architecture. From 1996 to 1998 I was a post-doctoral researcher at the CNRS (Unité Mixte de Recherche 5140 - Lattes, France). From 1999 to 2003, I worked at the University of Barcelona as a post-doctoral researcher, with research periods in France. In 2004, I took a position at the ICAC to start a research programme about the complex societies of Western Mediterranean. I joined ICREA in 2006 as an ICREA researcher, and became an ICREA research professor in 2010. I develop my research at the ICAC in collaboration with researchers of Catalan, French and Tunisian Institutions. I made stays as invited researcher at the Universities of Chicago and Montpellier. In 2013, I received Positive Assessment from the AQU Catalunya (Catalan Evaluation Agency) in order to apply for a university full professor position.

Research interests

The general goal of my research is to study the processes that transformed the Late Bronze Age local-scale groups into the complex societies based on large territorial organizations of the Central and Western Mediterranean Iron Age. My topics of research include urbanization and state formation, settlement patterns, architecture, funerary practices and rituals. My current research is conducted in North-eastern Iberian Peninsula, South of France and North of Africa, and mainly focuses on two issues: on the one hand, the urbanization process and its connection with state formation in the central and western Mediterranean; on the other hand, the study of protohistoric societies through an interdisciplinary analysis of domestic architecture and activities.

Selected publications

- **Belarte MC**, Noguera J, Plana-Mallart R & Sanmartí J 2019, *Urbanization in Iberia and Mediterranean Gaul in the first millennium BC*. Treballs de la Mediterrània Antiga, 7, Institut Català d'Arqueologia Clàssica, Tarragona.
- Gailledrat E & **Belarte MC** 2019, 'Architecture and Urbanism in the Fortified Settlement of Pech Maho (Sigeon, France) in the Third Century BC: A Social and Economic Perspective', *Oxford Journal Of Archaeology*, 38, 3, 271-301.
- **Belarte MC** & Principal J 2019, 'Modèles d'habitat et d'architecture domestique dans le nord-est de l'Hispanie citérieure aux IIe et Ier siècles avant notre ère', Guichard V, Vaginey M (dirs), *Les modèles italiens dans l'architecture des IIe et Ier siècles avant notre ère en Gaule et dans les régions voisines*. Actes du colloque de Toulouse, 2-4 octobre 2013. Collection Bibracte, 30, Bibracte, 159-170.

Selected research activities

Principal Investigator (PI)

- Caracterización de los asentamientos urbanos en la costa de la Iberia septentrional (Siglos VI-III a.C.): teledetección, documentación y restitución de estructuras constructivas (I+D HAR2015-67946-C2-2-P)
- Formes d'ocupació del territori i evolució del poblament a la Cessetania occidental durant la protohistòria (CLT009/18/00095)

Invited talks

- 'Forme, fonction et signification des foyers à l'Âge du Fer dans l'aire ibérique (s. 700 - 200 av. J.-C.)'. International workshop *Autour du foyer: pratiques rituelles et modes de commensalité dans la Méditerranée de l'Âge du fer, de l'Égée à la Péninsule Ibérique*, Paris (France), June 2019.
- 'Entre autochtones et allochtones en Ibérie: la formation d'une société urbaine dans un contexte non colonial'. International conference *Être autochtone, devenir autochtone : définitions, représentations*. Gammarth (Tunisia), October 2019.

Teaching at the UAB-URV-ICAC Classical Archaeology Master.

Academic Supervisor, Advanced Training Area of the ICAC, Master of Classical Archaeology (ICAC-UAB-URV).

ICREA MEMOIR 2019



Verònica Benet-Martínez

Universitat Pompeu Fabra (UPF)

Social & Behavioural Sciences

Before joining ICREA and Pompeu Fabra U. in 2010, I held professorships at the U. of California Riverside and the U. of Michigan. I obtained a PhD in Psychology from the U. of California Davis and was a funded Postdoctoral Research Fellow at the U. of California Berkeley. I am an appointed Fellow of the Society for Personality and Social Psychology, SPSP, was an Associate Editor for the Journal of Personality and Social Psychology (2009-2015), and I am an Editorial Board Member for several top-tier scientific journals in social-personality and cultural psychology. My research has been funded by government and private grants from the US, Catalonia, and the EU. I have received awards from SPSP (*Outstanding Mid-Career Contributions in Personality Psychology*) and the American Psychological Association (*Otto Klineberg Intercultural and International Relations Award*; *U. Global Psychology award*).

Research interests

Using observational and experimental research designs and different types of data (survey, behavioral, social network) I examine the following issues: ACCULTURATION/MULTICULTURALISM: Dynamics and socio-cognitive correlates of managing two or more cultural affiliations and identities; Individual differences in bicultural identity structure; Biculturalism and social-networks; Consequences of biculturalism (social, cognitive, and adjustment-related). CULTURE AND PERSONALITY/SELF-CONCEPT: Identification and measurement of culture-specific and -general personality constructs; Interplay of cultural values and personality in predicting well-being; Bilingualism and self-schemas. CROSS-CULTURAL RESEARCH METHODS: Cultural/linguistic issues in the development and adaptation of psychological scales and tests; Combined emic-etic methodology.

Selected publications

- Manzi C, Paderi F, **Benet-Martínez V** & Coen S 2019, 'Age-based stereotype threat and negative outcomes in the work place: Exploring the role of identity integration'. *European Journal of Social Psychology*. 49, 705 - 716.
- Schwartz S, Meca A, Ward C, Szabo A, **Benet-Martínez V** et al. 2019, 'Biculturalism dynamics: A daily diary study of bicultural identity and psychosocial functioning', *Journal of Applied Developmental Psychology*, 62, 26 - 37.
- Ferrari L, Manzi C, **Benet-Martínez V** & Rosnati R 2019, 'Social and Family Factors Related to Intercountry Adoptees and Immigrants' Bicultural Identity Integration. *Journal of Cross-cultural Psychology*, 50, 789 - 805.
- Repke L & **Benet-Martínez V** 2019, 'The Interplay between the One and the Others: Multiple Cultural Identifications and Social Networks', *Journal of Social Issues*, 75, 436 - 459.

Selected research activities

- *Academic Service*: member of the EC and various scientific subcommittees for the Society for Personality and Social Psychology (SPSP) & the European Association of Personality Psychology (EAPP).
- 3 *invited talks*: Centre for Culture and Evolution, Brunel University, London, UK; Interdisciplinary Experimental Working Group (ECO/SPS), European University Institute, Florence, Italy; Department of Psychology, University of California at Riverside, USA;
- 2 *conference presentations*: both at the 20th SPSP convention, Portland, OR.
- *Grant Reviewer*: Social Psychology panel, MINECO, Spain; National Science Foundation (USA).
- *PhD & Master theses direction*: 2 master theses
- Carol and Ed Diener Award for Outstanding Mid-career Contribution in Personality Psychology

ICREA MEMOIR 2019



Jens Biegert

Institut de Ciències Fotòniques (ICFO)

Experimental Sciences & Mathematics

PhD in 2001 with distinction from TU Munich, group leader at ETH Zürich Habilitation. Since 2007 at ICFO, he has pioneered mid-IR photonics, attosecond soft X-rays and laser-induced electron diffraction which led to breakthroughs in imaging chemical dynamics and carrier motion in condensed phase. He is Associate Editor of APL Photonics, Fellow of the German Academic Scholarship Foundation, Fellow of the Optical Society, Fellow of the American Physical Society, recipient of the Thousand Talents Program Award China, the OSA Allen Prize, and Bessel Prize of the Humboldt Foundation, ERC Advanced Grant and ERC Proof of Concept Grant holder. He is actively involved in the scientific community, e.g. co-author of the whitebook for European Extreme Light Infrastructure, chair of the Networking Board, Management Board Member of Laserlab-Europe, Panel Member of the ERC and Volkswagen Foundation, and on the Scientific Advisory Board of FORTH in Crete.

Research interests

Our research in attosecond science accesses the natural time scale of electronic motion, thus providing a unique tool to study the dynamic behaviour of the quantum world within atoms molecules and solids. Presently, we are witnessing an amazing convergence of attosecond physics, ultrafast x-ray science and x-ray free-electron laser research to address fundamental problems across physics, chemistry and material science with revolutionary new tools and methodologies. The power of these investigations with attosecond soft x-ray pulses and quantum microscopy with single electrons is the ability to investigate fundamental problems such as molecular isomerization, energy harvesting, or e.g. superconductivity.

Selected publications

- Amini K, Sclafani M, Steinle T, Anh-Thu L, Sanchez A, Mueller C, Steinmetzer J, Yue L, Martinez Saavedra JR, Hemmer M, **Lewenstein M**, Moshhammer R, Pfeifer T, Pullen MG, Ullrich J, Wolter B, Moszynski R, **Garcia de Abajo FJ**, Lin CD, Graefe S & **Biegert J** 2019, 'Imaging the Renner-Teller effect using laser-induced electron diffraction', *Proceedings Of The National Academy Of Sciences Of The United States Of America*, 116, 17, 8173 - 8177.
- Kowligy AS, Timmers H, Lind AJ, Elu U, Cruz FC, Schunemann PG, **Biegert J** & Diddams SA, 2019, 'Infrared electric field sampled frequency comb spectroscopy', *Science Advances*, 5, 6, eaaw8794.
- Elu U, Steinle T, Sanchez D, Maidment L, Zawilski K, Schunemann R, Zeitner UD, Simon-Boisson C & **Biegert J** 2019, 'Table-top high-energy 7 μ m OPCPA and 260 m Ho:YLF pump laser', *Optics Letters*, 44, 13, 3194 - 3197.
- Amini K, **Biegert J**, Calegari F, Chacon A, Ciappina MF, Dauphin A, Efimov DK, De Morisson F, Figueira C, Giergiel K, Gniewek P, Landsman AS, Lesiuk M, Mandrysz M, Maxwell AS, Moszynski R, Ortmann L, Perez-Hernandez AJ, Picon A, Pisanty E, Prauzner-Bechcicki J, Krzysztof S, Suarez N, Zair A, Zakrzewski J & **Lewenstein M** 2019, 'Symphony on strong field approximation', *Reports On Progress In Physics*, 82, 11, 116001.

Selected research activities

Our pioneering work in ultrafast mid-IR photonics has led to source architectures which were patented and are being marketed by Thales Optronique SA in France.

ICREA MEMOIR 2019



Bart Bijmens

Institut d'Investigacions Biomèdiques August Pi i Sunyer (IDIBAPS)
Engineering Sciences

Bart Bijmens obtained an MSc in Electronic Engineering and PhD in Medical Sciences (1997, KULeuven, Belgium). He was tenured Professor of Cardiovascular Imaging&Dynamics at the Medical Faculty in Leuven (1998-04), supervised clinical research at St. George's Hospital in London (2005-6) and was resident Visiting Professor at the University of Zagreb (2007), Croatia. Since Sept. 2008, he is ICREA Research Professor in Barcelona, first at the UPF and currently at IDIBAPS, leading the 'Translational Computing in Cardiology' group. He is recognised as international expert in pathophysiological concepts and (image-based) assessment of CV diseases, with a reputation of being able to explain basic pathophysiology principles and put technical developments in context. This resulted in many international collaborations/publications/lectures as well as being requested by centres all over the world for advice on research in cardiovascular mechanics and imaging.

Research interests

Translational Cardiovascular Pathophysiology, focussing on assessing cardiac function and understanding changes induced by disease and how treatment can modulate this remodelling. This is approached by integrating information handling and computing, combined with basic pathophysiology knowledge in order to advance clinical sciences. This implies an approach from basic understanding of disease towards a clinical study; selecting/designing appropriate investigational tools to assess relevant clinical parameters; quantifying diagnostic information (from clinical information to imaging data) to extract pertinent information and interpreting results and relate them to pathophysiology. Recent projects include the combination of computational modelling with interpretable machine learning in order to find easy to implement/deploy techniques for the identification of patients at risk for adverse events, as well as to improve our understanding of disease and decision making.

Selected publications

- Martinez V, Sanz-de la Garza M, Grazioli G, **Bijmens BH**, Trape J, Garcia G, Corzan P, Clemente A, Gonzalez B & Sitges M 2019, 'Cardiac performance after an endurance open water swimming race', *European Journal Of Applied Physiology*, 119,4,961-970.
- Sanz-de la Garza M, Giraldeau G, Marin J, Sarvari SI, Guasch E, Gabrielli L, Brambila C, **Bijnens B** & Sitges M 2019, 'Should the septum be included in the assessment of right ventricular longitudinal strain? An ultrasound two-dimensional speckle-tracking stress study', *International Journal Of Cardiovascular Imaging*, 35,10,1853-1860.
- Cikes M, Sanchez-Martinez S, Claggett B, Duchateau N, Piella G, Butakoff C, Pouleur AC, Knappe D, Biering-Sorensen T, Kutiyfa V, Moss A, Stein K, Solomon SD & **Bijnens B** 2019, 'Machine learning-based phenogrouping in heart failure to identify responders to cardiac resynchronization therapy', *European Journal Of Heart Failure*, 21,1,74-85.
- Dejea H, Garcia-Canadilla P, Cook AC, Guasch E, Zamora M, Crispi F, Stampanoni M, **Bijnens B** & Bonnin A 2019, 'Comprehensive Analysis of Animal Models of Cardiovascular Disease using Multiscale X-Ray Phase Contrast Tomography.', *Scientific Reports*, 9,1,6996-6996.
- Garcia-Canadilla P, de Vries T, Gonzalez-Tendero A, Bonnin A, Gratacos E, Crispi F **Bijnens B** & Zhang C 2019, 'Structural coronary artery remodelling in the rabbit fetus as a result of intrauterine growth restriction', *Plos One*, 14,6,e0218192.
- Valenzuela-Alcaraz B, Serafini A, Sepulveda-Martinez A, Casals G, Rodriguez-Lopez M, Garcia-Otero L, Cruz-Lemini M, **Bijnens B**, Sitges M, Balasch J, Gratacos E & Crispi F 2019, 'Postnatal persistence of fetal cardiovascular remodelling associated with assisted reproductive technologies: a cohort study', *Bjog-an International Journal Of Obstetrics And Gynaecology*, 126,2,291-298.

ICREA MEMOIR 2019



David Block

Universitat Pompeu Fabra (UPF)
Humanities

I am ICREA Research Professor in Sociolinguistics in the Departament d'Humanitats at the Universitat Pompeu Fabra. There I am a member of the Grup de Recerca en Espais Interculturals, Llengües i Identitats (GREILI). I am also Fellow of the Academy of the Social Sciences (UK); Visiting Professor at University College London, Institute of Education; and editor of the Routledge book series Political Economy and Applied Linguistics. I joined ICREA in September 2012 after 16 years at the University College London Institute of Education, where I was Professor of Languages in Education. Prior to that, I worked in Barcelona for 18 years as an English teacher in centres such as ESADE, and as a Lecturer in Applied Linguistics at the Universitat de Barcelona and the Universitat Autònoma de Barcelona. I completed my PhD in Applied Linguistics at the University Lancaster (UK) in 1995.

Research interests

I have published articles, chapters and books on a variety of topics. At present, I draw on a range of social sciences sources, especially Marxist political economy, to develop frameworks for understanding globalization, internationalisation, multiculturalism, bi/multilingualism, politics and identity. I am especially interested in neoliberalism and its effects on 21st-century societies, especially the inequality and class conflict that it engenders. I am author (with John Gray and Marnie Holborow) of *Neoliberalism and Applied Linguistics* (Routledge, 2012) and author of *Social Class in Applied Linguistics* (Routledge, 2014), *Political Economy in Sociolinguistics* (Bloomsbury, 2018) and *Post-truth and Political Discourse* (Palgrave Macmillan, 2019). I am currently working on two books for Routledge, a monograph entitled *Innovations and Challenges in Identity Research* and a co-edited book (with Sarah Khan) entitled *The Secret Life of English-medium Instruction in Higher Education*.

Selected publications

- **Block D** 2019, *Post-Truth and Political Discourse*. Palgrave Macmillan, London.
- **Block D** 2019. 'What on earth is 'language commodification?', In B. Schmenk, S. Breidbach & L. Küster (eds) *Sloganization in Language Education Discourse: Conceptual Thinking in the Age of Academic Marketization* (pp. 121-141), Multilingual Matters, Bristol.
- **Block D** 2019, 'El poder hablando a los que hablan al poder: construcciones discursivas derechistas de la Plataforma de Afectados por la Hipoteca', In J. Sánchez, E. Ballesté & C. Feixa (eds). *Qué fue de la primavera indignada?* (pp. 39-62), Milenio, Lleida.

ICREA MEMOIR 2019



Cedric Boeckx

Universitat de Barcelona (UB)

Humanities

Cedric Boeckx is Research Professor at the Catalan Institute for Advanced Studies (ICREA), a member of the Universitat de Barcelona Institute of Complex Systems (UBICS), and a member of the section of General Linguistics at the Universitat de Barcelona. Before joining ICREA, he was Associate Professor of Linguistics at Harvard University. He is the author of numerous books, including *Islands and Chains* (2003), *Linguistic Minimalism* (2006), *Bare Syntax* (2008), *Language in Cognition* (2009), *Syntactic Islands* (2012), *Elementary Syntactic Structures* (2014), and the editor of numerous volumes. He serves as Principal Investigator of the “Cognitive Biology of Language” research group.

Research interests

My current research focuses on developing new ways to shed light on the neurobiological foundations of the human language faculty. My graduate training and early career were in theoretical linguistics, but my more recent work has a more explicit biological, and experimental orientation. My current projects are all intended to facilitate integration among disciplines (linguistics, neuroscience, evolutionary biology, and genetics), and lead to better experimental testing of theoretical hypotheses, as well as to more solid interpretations of experimental findings. I also seek to exploit the full pluralism characteristic of the life sciences to force a rethinking of long-held assumptions in theoretical linguistics and other domains of cognitive science.

Selected publications

- Kuhlwil M & **Boeckx CA** 2019, ‘Catalog of single nucleotide changes distinguishing modern humans from archaic hominins’, *Scientific Reports*, 9, article number: 8463.
- Martins PT & **Boeckx C** 2019, ‘Language Evolution and complexity considerations’, *Plos biology*, 17(11), e3000389.
- Zanella M, Vitriolo A, Andirko A, Martins PT, Sturm S, O’Rourke T, Laugsch M, Malerba N, Skaros A, Trattaro S, Germain P, Mihailovic M, Merla G, Rada-Iglesias A, **Boeckx C** & Testa G 2019, ‘Dosage analysis of the 7q11.23 williams region identifies *baz1b* as a major human gene patterning the modern human face and underlying self-domestication’, *Science advances*, 5(12), eaaw7908.

ICREA MEMOIR 2019



Gemma Boleda

Universitat Pompeu Fabra (UPF)
Engineering Sciences

Gemma Boleda is an ICREA Research Professor in the Department of Translation and Language Sciences of the Universitat Pompeu Fabra, where she heads the Computational Linguistics and Linguistic Theory (COLT) research group. She previously held post-doctoral positions at the Department of Linguistics of The University of Texas at Austin and the CIMEC Center for Brain/Mind Sciences of the University of Trento. In her research, currently funded by an ERC Starting Grant, Dr. Boleda uses quantitative and computational methods to better understand the semantics of natural languages.

Research interests

I want to understand how language works; in particular, how humans convey meaning through language. I address this research question from an interdisciplinary perspective, integrating methodologies from Linguistics and Artificial Intelligence, with an emphasis on computational modeling of linguistic data.

Selected research activities

Prior to my ICREA appointment - Selected Publications

- Aina, L., K. Gulordava, G. Boleda. 2019. Putting words in context: LSTM language models and lexical ambiguity. In *Proceedings of ACL 2019 (57th Annual Meeting of the Association for Computational Linguistics)*, 3342-3348, Florence, Italy. Association for Computational Linguistics.
- Del Tredici, M., R. Fernández, G. Boleda. 2019. Short-term meaning shift: a distributional exploration. In *Proceedings of NAACL-HLT 2019 (Annual Conference of the North American Chapter of the Association for Computational Linguistics)*, 2069-2075, Minneapolis, USA. Association for Computational Linguistics.
- Aina, L., Silberer, C., Sorodoc, I., Westera, M., Boleda, G. 2019. What do entity-centric models learn? Insights from entity linking in multi-party dialogue. In *Proceedings of NAACL-HLT 2019 (Annual Conference of the North American Chapter of the Association for Computational Linguistics)*, 3772-3783, Minneapolis, USA. Association for Computational Linguistics.

Prior to my ICREA appointment - Most relevant invited conference presentations

- Boleda G. Distributed methods and the interplay between language and reality. Invited keynote lecture, RELATIONS - Workshop on meaning relations between phrases and sentences, co-located with IWCS 2019, Gothenburg, Sweden. May 2019.
- Boleda G. Talking about you: Deep Learning models of linguistic reference. Invited keynote lecture, Vector Space Semantics for Dialogue and Discourse workshop, co-located with IWCS 2019, Gothenburg, Sweden. May 2019.

ICREA MEMOIR 2019



Luca Bonatti

Universitat Pompeu Fabra (UPF)
Social & Behavioural Sciences

I graduated in Philosophy at the University of Milan, Italy, and received my PhD in Philosophy of Mind at Rutgers, N.J.. I have been a member of the Laboratoire de Sciences Cognitives et Psycholinguistique, Paris, where I learned the little experimental psychology I know of, thanks to the help of friends and colleagues. I then entered the University of Paris 8, France as an associate professor. I moved to Italy at SISSA, Trieste, then to the University of Nantes, France, as a full professor, and finally to Barcelona, at the Universitat Pompeu Fabra, as an ICREA professor. I have also been visiting professor at the University of Budapest, Hungary, at the University of the Balearic Islands, Spain, and at New York University.

Research interests

I am fascinated by thinking, by the very fact that we conceive structured states of mind that can be true or false, that can be imaginary or real. I am fascinated by how pervasively thinking populates our mental life. We reason when we read, or when we speak, but also when we walk around, or when we dream. Indeed, thinking is at the roots of the unique cognitive place humans have in the animal kingdom. I investigate its early structure, finding ways to describe the potential primitives of the scaffoldings supporting the combinatorial structure of human thought. I try to reveal bits and pieces of the representations underlying our abilities to come to conclusions, to form expectations, or to find what happens next. When time allows, I also work on how infants and adults find linguistic structure in speech, and how we can pack so much conceptual information inside those tiny and odd bits of sounds that we call words.

Selected research activities

Posters presented at International Workshops

- Canudas-Grabolosa, I, Pagliarini, E and Bonatti, L.L., The relationship between numerals and logical connectives: the case of 'AND'. 44th Boston University Conference on Language Development, Boston, MA, USA (2019, November).
- Canudas-Grabolosa, I, Pagliarini E, Chierchia G and Bonatti L. L.. Perception of entailment in numerals, 'and' and 'or': experimental evidence. Brain, Language & Learning, Siena, Italy (2019, September).
- Canudas-Grabolosa, I, Pagliarini E, Chierchia G and Bonatti L. L., Perception of entailment in numerals, 'and' and 'or'. James S. McDonnell Plenary Workshop 2019, Martha's Vineyard, MA, USA (2019, June)
- Bohus, K.A., McGill, M. & Bonatti, L.L., Exploring the representations of early logical reasoning: the power and limits of neural network models. Budapest CEU Conference on Cognitive Development, Budapest, Hungary (2019, January)
- Martín, A., Pallier, C., Reverberi, C., Solari, A., Filippin, L. & Bonatti, L. L., Behavioral and neural correlates of logical inferences. Budapest CEU Conference on Cognitive Development, Budapest, Hungary (2019, January)
- Martín, A., Bonatti, L.L. & Gervain, J., Behavioral markers and neural representations of logical inferences in 12 month old infants. James S. McDonnell Plenary Workshop 2019, Martha's Vineyard, MA, USA (2019, June)

Selected Invited Conferences

- Jan 25 Pontificia Universidad Católica de Chile, Escuela de Psicología, Santiago, Chile. Invited Speaker.
- Feb 4 Collège de France, Paris. Invited Speaker, La naissance du raisonnement.
- Jun 24 McDonnell Network on the Origins of Abstract, Combinatorial Thought Plenary Meeting, Martha's Vineyard, USA. Invited Speaker.
- Sept 12 International Congress "Healthy and Active Children", Verona, Italy. Plenary Lecturer.
- Sept 14 14th Generative Approaches to Language Acquisition conference (GALA 14), Milan, Italy. Keynote Address.

ICREA MEMOIR 2019



Christian Brander

Institut de Recerca de la Sida - IrsiCaixa (IrsiCaixa)
Life & Medical Sciences

Christian Brander obtained his PhD in Immunology from the University of Bern in 1994 for his studies on T-cell hypersensitivity to Penicillin and work on the mechanisms of exogenous antigen re-presentation on HLA class I. He completed his post-doctoral training at Harvard Medical School focusing on T cell immunity to HIV and studying the impact that host genetics have on these immune responses. He joined ICREA in 2008 with an appointment at the IrsiCaixa AIDS Research Institute. He has a special interest in the neurological consequences of HIV infection and the brain as a site of the viral reservoir. He works on the development of therapeutic HIV vaccine candidates and is a co-inventor of the HIV “HTI” immunogen, which is developed clinically by Aelix Therapeutics where he is a co-founder and CSO. He serves as the scientific director of the HIVACAT program, as a curator of the Los Alamos HIV Database and is an Associate Professor at the University of Vic.

Research interests

Our group aims to understand the cellular immunity to viral infections in the immune compromised host, including HIV infected subjects and individuals undergoing organ transplantation. Using complementary sets of immune analyses and integrated -omics approaches, we seek to identify functional correlates of virus control and to explore their underlying cellular and molecular mechanisms. A main focus lies on the definition of biomarkers of controlled HIV infection, for which we have established unique cohorts of HIV-infected and HIV-exposed, yet uninfected individuals. We developed (“boosted”) flow cytometry tools and combine methylome, communicome, transcriptomics analyses to assess to what degree and at what stages of HIV infection the effector function profiles of virus-specific T cells are epigenetically controlled. We also pay special attention to the effect of HIV infection on neurological function and how a viral reservoir in the brain may impact HIV cure strategies.

Selected publications

- Guillen Y, Noguera-Julian M, Rivera J, Casadella M, Zevin AS, Rocafort M, Parera M, Rodriguez C, Arumi M, Carrillo J, Mothe B, Estany C, Coll J, Bravo I, Herrero C, Saz J, Sirera G, Torrella A, Navarro J, Crespo M, Negredo E, **Brander C**, Blanco J, Calle ML, Klatt NR, Clotet B & Paredes R 2019, ‘Low nadir CD4+T-cell counts predict gut dysbiosis in HIV-1 infection’, *Mucosal Immunology*, 12, 1, 232 - 246.
- Ruiz-Riol M & **Brander C** 2019, ‘Can we just kick-and-kill HIV: possible challenges posed by the epigenetically controlled interplay between HIV and host immunity’, *Immunotherapy*, 11, 11, 931 - 935.
- Kilpelainen A, Saubi N, Guitart N, Olvera A, Hanke T, **Brander C** & Joseph J 2019, ‘Recombinant BCG Expressing HTI Prime and Recombinant ChAdOx1 Boost Is Safe and Elicits HIV-1-Specific T-Cell Responses in BALB/c Mice’, *Vaccines*, 7, 3, 78.
- Mothe B, Manzardo C, Sanchez-Bernabeu A, Coll P, Morón-López S, Puertas MC, Rosas-Umbert M, Cobarsi P, Escrig R, Perez-Alvarez N, Ruiz I, Rovira C, Meulbroek M, Crook A, Borthwick N, Wee EG, Yang H, Miró JM, Dorrell L, Clotet B, **Martinez-Picado J**, **Brander C** & Hanke T 2019, ‘Therapeutic Vaccination Refocuses T-cell Responses Towards Conserved Regions of HIV-1 in Early Treated Individuals (BCN 01 study)’, *EClinicalMedicine*, 11:65-80.
- Rosás-Umbert M, Llano A, Bellido R, Olvera A, Ruiz-Riol M, Rocafort M, Fernández MA, Cobarsi P, Crespo M, Dorrell L, Del Romero J, Alcamí J, Paredes R, **Brander C** & Mothe B 2019, ‘Mechanisms of abrupt loss of virus control in a cohort of previous HIV controllers’, *J Virol*, 93(4). pii: e01436-18.

ICREA MEMOIR 2019



Stefan T. Bromley

Universitat de Barcelona (UB)

Engineering Sciences

Stefan Bromley (1971) heads the Nanoclusters and Nanostructured Materials group at the Institute of Theoretical and Computational Chemistry at the University of Barcelona (IQTC-UB). He obtained his PhD in Computational Physics (University of Southampton, UK) in 1997 and has held research posts in the UK (Postdoctoral fellow, Royal Institution), the Netherlands (Associate Professor, Delft University of Technology) and Spain (Ramón y Cajal fellow, UB). He has published >160 WoS-listed articles and 8 book chapters, which have received >5000 citations (h-index = 35). He has given many invited talks about his work at international conferences and academic institutions and has edited two books on the theme of computational modelling of nanomaterials and nanoparticles.

Research interests

With the constant technological drive for device miniaturisation, materials are increasingly being used at scales of only a few 100s or 1000s of atoms (i.e. the nanoscale). Such nanomaterials often display novel size-dependent properties compared to materials at everyday length scales. Employing classical atomistic and quantum chemical modelling methods implemented on powerful supercomputers, we aim to provide a detailed predictive understanding of the structural, electronic and chemical properties of nanomaterials. Our focus is on how nanomaterials evolve with increasing size, and designing new materials from nanoscale building blocks. Our research follows three main themes: (i) nanoclusters and nanostructured materials for energy applications (e.g TiO₂, ZnO), (ii) nucleation and properties of astronomically important nanomaterials (e.g. TiC, silicates), (iii) design of nanostructured materials using organic molecular building blocks for electronics/spintronics.

Selected publications

- Morales-Garcia A, Macia Escatllar A, Illas F & **Bromley ST** 2019, 'Understanding the interplay between size, morphology and energy gap in photoactive TiO₂ nanoparticles', *Nanoscale*, 11, 18, 9032-9041.
- Macia Escatllar A, Morales-Garcia A, Illas F & **Bromley ST** 2019, 'Efficient preparation of TiO₂ nanoparticle models using interatomic potentials', *Journal of Chemical Physics*, 150, 21, 214305.
- Macia Escatllar A, Lazaukas T, Woodley SM & **Bromley ST** 2019, 'Structure and Properties of Nanosilicates with Olivine Mg₂SiO₄_N and Pyroxene MgSiO₃_N Compositions', *ACS Earth & Space Chemistry*, 3, 11, 2390-2403.
- Zamirri L, Macia Escatllar A, Marinoso Guiu J, Ugliengo P, **Bromley ST** 2019, 'What Can Infrared Spectra Tell Us about the Crystallinity of Nanosized Interstellar Silicate Dust Grains?', *ACS Earth & Space Chemistry*, 3, 10, 2323-2338.
- Castells-Gil J, Manas-Valero S, Vitorica-Yrezabal IJ, Ananias D, Rocha J, Santiago R, **Bromley ST**, Baldovi JJ, Coronado E, Souto M & Minguez Espallargas G 2019, 'Electronic, Structural and Functional Versatility in Tetrathiafulvalene-Lanthanide Metal-Organic Frameworks', *Chemistry-a European Journal*, 25, 54, 12636-12643.
- Prats H, Pinero JJ, Vines F, **Bromley ST**, Sayos R & Illas F 2019, 'Assessing the usefulness of transition metal carbides for hydrogenation reactions', *Chemical Communications*, 55, 85, 12797-12800.
- Prats H, Gutierrez RA, Pinero JJ, Vines F, **Bromley ST**, Ramirez PJ, Rodriguez JA & Illas F 2019, 'Room Temperature Methane Capture and Activation by Ni Clusters Supported on TiC(001): Effects of Metal-Carbide Interactions on the Cleavage of the C-H Bond', *Journal Of The American Chemical Society*, 141, 13, 5303-5313.

Selected research activities

Conference talks:

- 'Understanding the Interplay between Size, Morphology and Energy Gap in Photoactive TiO₂ Nanoparticles', EMRS, Warsaw.
- 'Using Atomistically Detailed Simulations to Understand the Formation, Structure and Composition of Astrophysical Silicate Dust Grains', IAU S350 Lab. Astrophysics, Cambridge.

ICREA MEMOIR 2019



Sandra Brucet

Universitat de Vic - Universitat Central de Catalunya (UVic)

Experimental Sciences & Mathematics

I graduated in 1998 and obtained my PhD in Biology in November 2003 at University of Girona. After that I was a postdoc at the University of Oslo (2006) and the National Environmental Institute of Denmark (2006-2008). From 2009 to 2012, I worked as a research scientist at the European Commission-Joint Research Centre (Italy). In 2013, I was awarded a Marie Curie Intra European Senior Fellowship to work at the University of Aarhus (Denmark) for two years. In 2013, I was also a Visiting Scientist at the Middle East Technical University, Turkey. In September 2015, I was appointed ICREA Research professor at University of Vic and I am heading the Aquatic Ecology Research Group (GEA) that hosts ten members. GEA researchers are members of the Chair on Water, Nature and Wellness.

Research interests

Our research focuses on the response of aquatic ecosystems and their biodiversity to global changes (e.g. eutrophication, habitat destruction, climate change). We use the organisms' size structure, in combination with taxonomical approaches, to assess biodiversity and ecosystem processes. We are also interested in basic and applied aspects of ecological theories relating organisms' body size, metabolism and temperature. Our research includes the whole trophic structure from phytoplankton to fish. We focus on different aquatic ecosystems (lakes, rivers, ponds) and use complementary approaches such as experiments, latitudinal comparisons and models. Ultimately, we aim to apply our research results to solving problems related with the conservation of aquatic ecosystems. We also pay particular attention at transferring our knowledge into European policies and platforms (e.g. Water Framework Directive, Biodiversity Strategy, IPBES) and the general public.

Selected publications

- Arranz I, Hsieh CH, Mehner T & **Brucet S** 2019, 'Systematic deviations from linear size spectra of lake fish communities are correlated with predator-prey interactions and lake-use intensity', *Oikos*, 128, pp 33-44.
- Gozlan RE, Karimov BK, Zadereev E, Kuznetsova D & **Brucet S** 2019, 'Status, trends and future dynamics of freshwater ecosystems in Europe and Central Asia', *Inland Waters*, 9, 1, pp 78-94.
- Vila-Martínez N, Caiola N, Ibáñez C, Benejam L & **Brucet S** 2019, 'Normalized Abundance Spectra of fish community reflect hydropeaking on a Mediterranean large River', *Ecological Indicators*, 97, pp 280-289.
- Sgarzi S, Badosa A, Leiva-Presa A, Benejam L, Lopez-Flores R & **Brucet S** 2019, 'Plankton Taxonomic and Size Diversity of Mediterranean Brackish Ponds in Spring: Influence of Abiotic and Biotic Factors', *Water*, vol 11, 1, 106.
- Ersoy Z, **Brucet S**, Bartrons M & Mehner T 2019, 'Short-term fish predation destroys resilience of zooplankton communities and prevents recovery of phytoplankton control by zooplankton grazing', *Plos One*, 14, 2, e0212351.

Selected research activities

2019-2021. SizeEcoFun: Size-based approaches to understand impacts on river ecosystem functioning. Funded by Spanish Ministry of Science and Technology. Program I+D+i Retos. 54821€. PIs: S Brucet /L Benejam

2018-2021. Size spectra of coastland wetland invertebrate communities in Chile: the role of disturbance. Funding entity: Conycit-Fondecyt Iniciación Chile. 97131€. PI: C Coccia

2019. SOS-Temporales: Mediterranean temporary ponds, biodiversity refuges that need protection. Funded by Fundación Biodiversidad, Ministerio de Agricultura, Alimentación y Medio Ambiente. 37528€. PI: S Brucet

2019. Contract: Diagnosi de la biodiversitat de la bassa temporània de Cap Gros, Parc Natural de Cap de Creus. Funded by Parc Natural del Cap de Creus. Co-PI: S Brucet

Plenary Talk at IBES (Institute of Evolutionary Biology) Scientific Retreat 2019. Biodiversity of freshwater ecosystems: alternative measures, status and trends in Europe.

ICREA MEMOIR 2019



Francesc Burjachs

Institut Català de Paleoeologia Humana i Evolució Social (IPHES)
Humanities

Born on 3rd August 1955 in Blanes, Catalonia. Dissertation on Paleopalynology, Autonomous University of Barcelona (UAB, 1985). DEA on Quaternary, MNHN-IPH, Paris (1986). PhD in Biological Sciences (UAB, 1990). Contributor of the Botany Department (UAB, 1979-1990). Director and co-director of several archaeological excavations. Hired researcher at Institute of Earth Sciences Jaume Almera, CSIC, Barcelona (1990-1998). Research Assistant at Catholic University of Louvain-La-Neuve (1994). Associate Professor at University Rovira i Virgili (URV), Tarragona since 1998. ICREA Research Professor at URV (2001-2007) and at the Catalan Institute of Human Palaeoecology and Social Evolution (IPHES) since 2008. Training stages of palynological research abroad: CRA, Sophia Antipolis, France (1978) with Prof. M. Girard; IPH, Paris (1985-1987) with Prof. J. Renault-Miskovsky, and University La Sapienza, Roma (1991) with Prof. M. Follieri. He has published more than 360 papers and reports.

Research interests

My investigation seeks to understand the climatic changes that happened along human evolution. This information is important to appreciate some of the factors which have influenced our evolution towards the current species. More precisely, my work is developed in the science of Palynology, which basically consists in the study of the fossil pollen trapped in the soil that our ancestors stepped on. In this way, we can describe the landscape in which they lived, the climate they endured, the vegetables they ate, etc.

Selected publications

- Biltekin D, **Burjachs F**, Vallverdú J, Sharp WD, Mertz-Kraus R, Chacón MG, Saladié P, Bischoff JL & Carbonell E 2019, 'Vegetation and climate record from Abric Romaní (Capellades, Catalonia, Spain) during the Upper Pleistocene (MIS 5d-3)', *Quaternary Science Reviews*, vol. 220, pp 154-164.
- Marco-Barba J, **Burjachs F**, Reed JM, Santisteban C, Usera JM, Alberola C, Expósito I, Guillem J, Patchett F, Vicente E, Mesquita-Joanes F & Miracle MR 2019, 'Mid-Holocene and historical palaeoecology of the Albufera de València coastal lagoon', *Limnetica*, vol. 38, no. 1, pp 353-389.
- Mercuri AM, Florenzano A, **Burjachs F**, Giardini M, Kouli K, Masi A, Picornell-Gelabert LL, Revelles J, Sadori L, Servera-Vives G, Torri P & Fyfe R 2019, 'From influence to impact: the multifunctional land-use in Mediterranean prehistory emerging from palynology of archaeological sites (8.0-2.8 ka BP)', *The Holocene*, vol. 29, no. 5, pp 830-846.
- Val-Peón C, Expósito I, Soto M & **Burjachs F** 2019, 'A taphonomic approach to the pollen assemblage from Layer M of the Abric Romaní archaeological site (NE Iberian Peninsula)', *Review of Palaeobotany and Palynology*, vol. 270, pp 19-39.
- Fyfe R, Woodbridge J, Palmisano A, Bevan A, Shennan, S, **Burjachs F**, Legarra-Herrero B, García-Puchol O, Carrión J, Revelles J & Roberts N 2019, 'Prehistoric palaeodemographics and regional land cover change in eastern Iberia', *The Holocene*, vol. 29, no. 5, pp 799-815.

Selected research activities

Organizing Committee of V Reunió OIKOS de Bioarqueologia, Universitat Autònoma de Barcelona, Catalonia. 24th-25th Mai 2019.
IP project *Environmental dynamics and human responses during the Postglacial in the Mediterranean facade of Iberia (c. 12700-8000 cal BP)* (HAR2017-88503-P).
Contributor to project *Late Glacial and Postglacial Population History and Cultural Transmission in Iberia (c. 15,000-8,000 cal BP)* (ERC-CoG-2015).
MedPalyno Symposium. 9-11 July 2019, Bordeaux (France). Vegetation history and human (...) Iberia. New pollen record from the Pego-Oliva basin.

ICREA MEMOIR 2019



Andreu Cabot

Institut de Recerca en Energia de Catalunya (IREC)
Engineering Sciences

I graduated in Physics in 1998 and completed my PhD in 2003 from the University of Barcelona. From 2004 to 2007 I was a postdoctoral researcher at the University of California at Berkeley and in the Lawrence Berkeley National Laboratory, under Prof. A. Paul Alivisatos' guidance. I returned to the Electronics Department of the University of Barcelona in 2007, and in 2009 I joined the Catalonia Institute for Energy Research - IREC to create the Functional Nanomaterials Group. Now, as ICREA Research Professor, I lead a team of approximately 15 people devoted to the preparation and characterization of metal and semiconductor nanostructures, the assessment of their functional properties and their bottom-up assembly to fabricate high efficiency and cost-effective energy conversion and storage devices.

Research interests

My research focuses on the design, production and manipulation of nanocrystals and nanomaterials, their functional characterization and their technological application in the energy field. I use solution-based processes to produce these nanocrystals and to assemble them to the macroscale. Solution-based methods allow both a unique control over composition and crystal phase at the nanometer scale and a high versatility in the development of socially and economically-relevant technologies. From an application point of view, I have centered my work in the development of materials for energy conversion and storage. In particular, my group develops solution-processed thermoelectric nanocomposites from the bottom-up assembly of colloidal nanocrystals, catalysts and photocatalysts and electrode materials for fuel cells and batteries.

Selected publications

- Liu J, Yu X, Du R, Zhang C, Zhang T, Llorca J, **Arbiol J**, Wang Y, Meyns M & **Cabot A** 2019, 'Chromium phosphide CrP as highly active and stable electrocatalysts for oxygen electroreduction in alkaline media', *Applied Catalysis B: Environmental*, 256, 117846.
- Liu J et al. 2019, 'Graphene-supported palladium phosphide PdP₂ nanocrystals for ethanol electrooxidation', *Applied Catalysis B-environmental*, 242, 258 - 266.
- Yu X, Zhang C, Luo Z, Zhang T, Liu J, Li J, Zuo Y, Biendicho JJ, Llorca J, **Arbiol J**, Morante JR & **Cabot A** 2019, 'A low temperature solid state reaction to produce hollow Mn_xFe_{3-x}O₄ nanoparticles as anode for lithium-ion batteries', *Nano Energy*, 66, 104199.
- Ibanez M et al. 2019, 'Ligand-Mediated Band Engineering in Bottom-Up Assembled SnTe Nanocomposites for Thermoelectric Energy Conversion', *Journal of the American Chemical Society*, 141, 8025-8029.
- Ibanez M et al. 2019, 'Transport Properties in Thermoelectric Nanocomposites through Inorganic Ligands and Heterostructured Building Blocks', *ACS Nano*, 13, 6572 - 6580.
- Zhang C et al. 2019, 'Catalytic Activity and Efficient Polar Tubular Nanostructure in Urchin-Like Metallic NiCo₂Se₄ for High-Performance Lithium-Sulfur Batteries', *Advanced Functional Materials*, 29, 1903842.
- Zuo Y et al. 2019, 'In Situ Electrochemical Oxidation of Cu₂S into CuO Nanowires as a Durable and Efficient Electrocatalyst for Oxygen Evolution Reaction', *Chemistry Of Materials*, 31, 7732 - 7743.
- Urbain F et al. 2019, 'Upscaling high activity oxygen evolution catalysts based on CoFe₂O₄ nanoparticles supported on nickel foam for power-to-gas electrochemical conversion with energy efficiencies above 80%', *Applied Catalysis B-environmental*, 259, 118055.

Selected research activities

- 2 Graduated PhD Students
- 2 New PhD Students
- 4 New Research Projects, including H2020-FETOPEN: UncorrelaTEd
- 2 New European Patents

ICREA MEMOIR 2019



Jordi Cabot

Universitat Oberta de Catalunya (UOC)
Engineering Sciences

Jordi Cabot received his PhD degree in Computer Science from Universitat Politècnica de Catalunya (UPC) in 2006 and his Habilitation (French HdR) from the École Doctorale in Nantes in 2012. He has been a visiting researcher in Milan (Politecnico di Milano) and Toronto (University of Toronto) and an Associate Professor and Inria International Chair at École des Mines de Nantes where he led an Inria Research team in Software Engineering. Since May 2015, he is an ICREA Research Professor at Internet Interdisciplinary Institute (IN3), a research center of the Universitat Oberta de Catalunya (UOC) where he leads the SOM (Systems, Software and Models) research lab. Beyond his core research activities, he books some time for blogging and other dissemination and technology transfer actions.

Research interests

My research falls into the broad area of systems and software engineering, especially promoting the rigorous use of software models and engineering principles in all software engineering tasks while keeping an eye on the most unpredictable element in any project: the people involved in it. Current research topics include the development of pragmatic formal verification techniques to assess the quality and security of software systems, the analysis and data mining of open source projects (and the communities around them) to optimize their collaboration and organizational structures, the study of scalability challenges in the design and deployment of large systems and the role AI can play in software development (and vice versa).

Selected publications

- Loli Burgueño, **Jordi Cabot**, Sébastien Gérard 2019, ‘An LSTM-Based Neural Network Architecture for Model Transformations’, *MoDELS* 294-299
- Javier Luis Cánovas Izquierdo, **Jordi Cabot**, 2019 ‘Analysis and modeling of the governance in general programming language’, *SLE* 179-183
- Bruneliere H, Burger E, **Cabot J** & Wimmer M 2019, ‘A feature-based survey of model view approaches’, *Software And Systems Modeling*, 18, 3, 1931 – 1952.
- Mattia Gasparini, Javier Luis Cánovas Izquierdo, Robert Clarisó, Marco Brambilla, **Jordi Cabot** 2019, ‘Analyzing rich-club behavior in open source projects’. *OpenSym*: 6:1-6:9
- Daniel G, Sunye G & **Cabot J** 2019, ‘Advanced prefetching and caching of models with PrefetchML’, *Software And Systems Modeling*, 18, 3, 1773 – 1794.
- Clariso R, Gonzalez CA & **Cabot J** 2019, ‘Smart Bound Selection for the Verification of UML/OCL Class Diagrams’, *Ieee Transactions On Software Engineering*, 45, 4, 412 – 426, 2019
- Palazzi MJ, **Cabot J**, Canovas Izquierdo JL, Sole-Ribalta A & Borge-Holthoefer J 2019, ‘Online division of labour: emergent structures in Open Source Software’, *Scientific Reports*, 9, 13890.
- Daniel, Gwendal; Cabot, Jordi; Deruelle, Laurent; Derras, Mustapha 2019, ‘Multi-platform Chatbot Modeling and Deployment with the Jarvis Framework’, *Advanced Information Systems Engineering (CAiSE 2019)*, 11483, 177 – 193.

Selected research activities

- PC Chair of the 23rd International Conference on Fundamental Approaches to Software Engineering (FASE)
- Co-supervised the thesis “Model-driven Round-trip Engineering of REST APIs” defended at the Universitat Oberta de Catalunya
- Started the MDE Intelligence workshop series (Workshop on the synergies between Artificial Intelligence and Model-driven Engineering)
- Released a new open-source platform for (chat)bot development

ICREA MEMOIR 2019



Xavier Cabré

Universitat Politècnica de Catalunya (UPC)

Experimental Sciences & Mathematics

Born in 1966 in Barcelona. PhD in Mathematics (area: Partial Differential Equations), Courant Institute, New York University, 1994. Kurt Friedrichs Prize, New York University, 1995. Member of the Institute for Advanced Study, Princeton, 1994-95. Habilitation à diriger des recherches, Université Pierre et Marie Curie-Paris VI, 1998. Harrington Faculty Fellow, The University of Texas at Austin, 2001-02. Tenure Associate Professor, The University of Texas at Austin, 2002-03. ICREA Research Professor at the Universitat Politècnica de Catalunya since 2003. Fellow of the American Mathematical Society, inaugural class, 2013.

Research interests

My research field is the mathematical analysis of Partial Differential Equations. These equations arise in mathematical physics, differential geometry, finance, and biology. My focus is on elliptic and parabolic equations, and on the analytical understanding of the regularity, symmetry, and other qualitative properties of their solutions. This often involves the use of geometric tools such as isoperimetric inequalities, whose study is an important part of my research. My main current project concerns a recently flourishing area: reaction problems for fractional diffusions associated to jump or Lévy processes. These are the so called 'anomalous diffusions', well noticed in the last decades in some reaction and biological fronts, as well as in mathematical finance.

Selected publications

- **Cabré X** & Cozzi M 2019, 'A gradient estimate for nonlocal minimal graphs', *Duke Mathematical Journal*, 168, 5, 775 - 848.
- **Cabré X** 2019, 'A new proof of the boundedness results for stable solutions to semilinear elliptic equations', *Discrete And Continuous Dynamical Systems*, 39, 12, 7249 - 7264.

Selected research activities

- Editor** of 'Calculus of Variations and Partial Differential Equations' and of 'Publicacions Matemàtiques'.
- Director** of one 2019 Ph.D. Thesis: Tomás Sanz-Perela. Adviser of four PhD students and one Postdoc.
- Former Ph.D. student Xavier Ros-Oton** (graduated 2014): PI of an ERC Starting Grant and Premio Fundación Princesa de Girona en Investigación Científica 2019.
- Former Ph.D. student Joaquim Serra** (graduated 2014): Premio José Luis Rubio de Francia 2019 (RSME) and Premio Antonio Valle 2019 (SEMA).
- Organizer** of the 17th Summer School JISD2019 (CRM, Bellaterra, June 2019).

Most relevant Plenary Talks:

- 'Analytic and Geometric Aspects of PDEs'. Milano, Italy. May 27-30, 2019.
- 'Geometry and PDE in front of the Alhambra'. Granada, Spain. January 22-15, 2019.

ICREA MEMOIR 2019



Mario Cáceres

Universitat Autònoma de Barcelona (UAB)

Life & Medical Sciences

Mario Cáceres obtained his PhD at the Universitat Autònoma de Barcelona (UAB) working on *Drosophila* chromosomal rearrangements (1995-2000). He then moved to the USA as a postdoc at the Salk Institute for Biological Studies (2001-2003) and Emory University (2003-2006), where his research shifted to the use of novel genomic techniques to compare gene-expression levels in humans and non-human primates, as a way to study human unique characteristics. In 2006 he got a Ramón y Cajal position at the Centre for Genomic Regulation in Barcelona, and focused on the identification of genomic changes with potential functional consequences in the human lineage, such as those associated with expression differences and structural variants, especially inversions. In 2010 he joined ICREA and since then he leads the Comparative and Functional Genomics group at the Institut de Biotecnologia i de Biomedicina (IBB) of the UAB, where he is also an associate professor.

Research interests

The genomic revolution has unveiled extraordinary possibilities unthought-of before. In particular, we are interested in understanding genomic structural variation and gene-expression changes, and how they relate to individual and species differences. To address these questions, we use humans as a model and take a multidisciplinary approach that combines experimental and bioinformatic analysis of the great wealth of data available, generating results of interest to many diverse fields. Our main line of research is the global analysis of polymorphic inversions in the human genome, which aims to investigate the biological significance of one of the less known types of variants in humans. This ranges from the development of new methods for inversion study and the first database of human polymorphic inversions, to the characterization of their population distribution, functional effects and selection signatures, as a way to ultimately determine their contribution to complex traits.

Selected publications

- Giner-Delgado C, Villatoro S, Lerga-Jaso J, Gaya-Vidal M, Oliva M, Castellano D, Pantano L, Bitarello BD, Izquierdo D, Noguera I, Olalde I, Delprat A, Blancher A, Lalueza-Fox C, Esko T, O'Reilly PF, Andres AM, Ferretti L, Puig M & **Cáceres M** 2019, 'Evolutionary and functional impact of common polymorphic inversions in the human genome', *Nature Communications*, 10, 4222.
- Laplana M, Villatoro S, Zaurin R, Royo JL, Puig M & **Cáceres M** 2019, 'Efficient and high-throughput genotyping of elusive human polymorphic inversions mediated by inverted repeats', *European Journal Of Human Genetics*, 27, 1704-1705.

Selected research activities

- Jon Lerga Jaso Doctoral Thesis. Title: Integrative analysis of the functional consequences of inversions in the human genome. Universitat Autònoma de Barcelona, December 20, 2019.
- Co-organizer of the VII Bioinformatics and Genomics Symposium of the Societat Catalana de Biologia. December 17, 2019. Barcelona, Spain.
- Coordinator of the Genomics and Proteomics Section of the Societat Catalana de Biologia.
- BMC Genomics Associate Editor.
- Genes Journal Associate Editor.
- NAR Genomics and Bioinformatics Associate Editor.

ICREA MEMOIR 2019



Caterina Calsamiglia Costa

Institute for Political Economy and Governance (IPEG)

Social & Behavioural Sciences

Currently a Research Professor at IPEG and affiliate researcher at CEPR. She obtained her PhD from the Department of Economics at Yale University in 2005. She was an assistant and associate professor at UAB until 2015. In 2014 she obtained an ERC Starting Grant to work on understanding the importance of the design of school choice procedures for the educational landscape. Since 2011 she is a member of the Human Capital and Economic Opportunity group at the University of Chicago. In 2015 she moved to CEMFI as a Research Professor, where she remains an affiliate researcher. She recently started working on measuring and assessing non cognitive traits by leading an interdisciplinary group of researchers. She's the scientific advisor of Escola Nova 21, an alliance of schools and other public and civil society institutions for an advanced education system.

Research interests

Her research focuses on Public Economics with an emphasis on school choice, educational policies, affirmative action, measurement of non-cognitive skills and welfare economics in general. Her work includes theoretical, experimental and empirical analysis.

Selected publications

- **Calsamiglia C** & Flamand S 2019, 'A Review on Basic Income: A Radical Proposal for a Free Society and a Sane Economy by Philippe Van Parijs and Yannick Vanderborght', *Journal Of Economic Literature*, 57, 3, 644 - 658.
- **Calsamiglia C** & Loviglio A 2019, 'Grading on a curve: When having good peers is not good', *Economics Of Education Review*, 73, UNSP 101916.

ICREA MEMOIR 2019



Paula Casal

Universitat Pompeu Fabra (UPF)

Humanities

Casal works at UPF's Law Department, having held positions at Reading University (2004-8) and Keele University (1996-2004). She was also Fellow in Ethics at Harvard University (1999-2000), Keele Junior Research Fellow, also at Harvard (2000-1), Hoover Fellow at Université Catholique de Louvain (2001-02), Leverhulme Research Fellow at the University of Oxford (2002-4) and Christopher Family Fellow at Stanford University (2018). Her work has appeared in journals like *Ethics*, *Economics and Philosophy*, *Journal of Medical Ethics*, *Journal of Moral Philosophy*, *Journal of Political Philosophy*, *Hypatia*, *Political Studies* and *Utilitas*. She is Associate Editor of *Politics, Philosophy & Economics*, and *LEAP*, President of the Great Ape Project-Spain, Academics Stand Against Poverty-Spain, and co-director of the UPF Center for Animal Ethics.

Research interests

My main field is distributive justice, a part of political philosophy that examines how social institutions should distribute benefits and burdens. This requires assessing general *principles* (including equality, priority, and sufficiency) as well as *policy* responses (such as taxation and public spending proposals) to specific problems like gender inequality, local and global poverty or climate change. I have written on some particular problems, such as those involving gender, nonhuman animals, personhood, or the distinction between natural and social inequality from a biologically-informed perspective. I have also written about how to distribute the costs of child-rearing, sea-access for landlocked states, the moral limits on religious and cultural accommodation, xenotransplantation and the distinction medical ethicists draw between therapy and enhancement.

Selected publications

- Casal P & Williams A 2019, 'Human iPSC-Chimera Xenotransplantation and the Non-Identity Problem', *Journal of Clinical Medicine* 8 (1), pp 95.
- Casal P 2019 'Nothing We Do is Outside the Context of Our Biology. Interview with Robert Sapolsky', *Mètode* 101(2), pp 32-39.

Selected research activities

Papers:

- 'Sea Access and Collective Responsibility', ASAP Conference on *Collective Responsibility*, Tribhuvan University, Kathmandu, 14/3;
- 'Conservative and Conservationist Sufficiency', Conference on *New Directions in Political Philosophy*, University of California at San Diego, 24/5;
- 'Conservationist Sufficiency' and 'Whaling, Bullfighting and the Conditional Value of Tradition', Workshop on Casal's work, Utrecht University, 21/6;
- 'Intergenerational Justice, Climate and Sufficiency', Conference on *Climate Change's Ethical Challenges*, Javeriana University, Bogotá, 6/8.
- 'Legal Personhood for Animals', expert opinion on animal Habeas Corpus, Colombia's Constitutional Court, Bogotá, 8/8;
- 'Equality', Javeriana University, 8/8;
- 'Intergenerational Justice and Climate Change', Climate Conference, EAFIT University, Medellín, 'What Can Academics Do Against Poverty?', Launch of ASAP-Colombia, EAFIT, 16/8;
- 'Gender Equality Today', EAFIT, 13/8;
- "Whaling and Bullfighting", *Conference on Animals and Social Welfare*, Duke University. Nov 1-2. 'Why Inequality Matters', Catalunya-Europa Foundation, 4/12; 'Distributive Justice and Female Longevity', Barcelona Institute of Analytical Philosophy, 18/12.

Summer course: 'Distributive Justice', EAFIT.

Theses supervised:

- E Santos Trevisani's MA, *A Defense of Prisoner's Voting Rights*;
- V Lund's MA, *Working Hours and the Basic Structure*;
- A Lorente's MA, *Self-Driven Cars*;
- SM Krumpelman's MA, *Educational Basic Income*.

Conferences organized:

- Collective Responsibility*, Launch of ASAP-Nepal, Kathmandu;
- A Better Future for Our Planet. The International Panel on Social Progress*,
- Academics Stand Against Poverty & Planetary Wellbeing: A Triple Encounter*, UPF 17/6.

ICREA MEMOIR 2019



Gustau Catalán

Institut Català de Nanociència i Nanotecnologia (ICN2)

Experimental Sciences & Mathematics

Gustau Catalán graduated in Physics at the Universitat de Barcelona (1997) and gained his PhD, also in Physics, at the Queen's University of Belfast (2001). This was followed by a one-year round-the-world climbing expedition, the highlights of which were the setting up of a new route in the Dogon country of Mali ("The man with no name", 6c-250 metres, Ouro N'guérou) and the first ascent of a peak in the Indian Himalayas (Draoich Parvat, 6200m, Garwhal). Upon returning to research, he has been a scientist at the Mediterranean Institute for Advanced Studies (2002-2004), at the University of Groningen (2004-2005) and at the University of Cambridge (2005-2009). He joined ICREA in 2009 as a Research Professor and leader of the Oxide Nanophysics group at the Institut Català de Nanociència i Nanotecnologia (ICN2). His research centres on the physics of materials at the nanoscale.

Research interests

A common denominator of my work is the search for original physics and emerging effects at the nanoscale. Recently, most of my research has focused on the effects of strain gradients on electrical polarization (a phenomenon known as flexoelectricity); the European Research Council (ERC) has funded me to set up in Barcelona the world's first specialized laboratory dedicated to this phenomenon. Prominent discoveries in this area have been the giant flexoelectricity of semiconductors, and the existence of flexoelectricity in bones, where the effect is thought to play a physiological role in bone repair. In parallel, I have also worked on other nanoscale phenomena, mostly to do with ferroelectric oxides: the physics of domain walls (domain wall nanoelectronics), antiferroelectricity and giant photovoltaic effects in polar materials.

Selected publications

- Abdollahi A, Domingo N, Arias I & **Catalán G** 2019, 'Converse flexoelectricity yields large piezoresponse force microscopy signals in non-piezoelectric materials', *Nature Communications*, 10, 1266.
- Cordero-Edwards K, Kianirad H, Canalias C, **Sort J**, **Catalán G** 2019, 'Flexoelectric Fracture-Ratchet Effect in Ferroelectrics', *Physical Review Letters*, 122, 13, 135502.
- Menendez E, Sireus V, Quintana A, Fina I, Casals B, Cicheler R, Kataja M, **Stengel M**, Herranz G, **Catalán G**, Baro MD, Surinach S & **Sort J** 2019, 'Disentangling Highly Asymmetric Magnetoelectric Effects in Engineered Multiferroic Heterostructures', *Physical Review Applied*, 12, 1, 014041.
- Everhardt AS, Damerio S, Zorn JA, Zhou S, Domingo N, **Catalán G**, Salje EKH, Chen L & Noheda B 2019, 'Periodicity-Doubling Cascades: Direct Observation in Ferroelastic Materials', *Physical Review Letters*, 123, 8, 087603.
- **Catalán G** & Noheda B 2019, 'Surface polarization feels the heat'. *Nature* Vol 575, pp. 600.
- Langenberg E et al. 2019, 'Ferroelectric Domain Walls in PbTiO₃ Are Effective Regulators of Heat Flow at Room Temperature', *Nano Letters*, 19, 11, 7901-7907.

Selected research activities

- International Symposium on Integrated Functionalities (ISIF), Dublin "Flexoelectricity: one size fits all" (Keynote)
- Joint ISAF-ICE-EMF-IWPM-PFM meeting, Lausanne. "Flexoelectricity: beyond bending oxides" (IS)
- International School of Oxide Electronics (ISOE), Cargèse (Corsica) "Introduction to Ferroelectrics" and "Flexoelectricity" (two seminars).
- International Workshop on Topological Structures in Ferroic Materials (TOPO 2019), Prague. "Metal-insulator phase boundaries in VO₂ films" (IS).
- Workshop on Ferroic Domain Walls, Venice. "Boundaries in antiferroelectrics, metal-insulator materials and other strange beasts" (IS)

ICREA MEMOIR 2019



Miguel Ángel Cau

Universitat de Barcelona (UB)

Humanities

I am an archaeologist focused on the Roman and Late Antique Mediterranean and on archaeometry. After obtaining my PhD (1998) (University of Barcelona), I was a postdoctoral TMR-EU Research Fellow (1998-2001) at the University of Sheffield (UK). I returned to Catalonia with an AGAUR Return Grant (2001-2002) and as a researcher for the EU project CERAMED (2003). I am ICREA Research Professor since 2003 and director of the Equip de Recerca Arqueològica i Arqueomètrica, University of Barcelona (ERAAUB). I have participated in national and EU projects, such as GEOPRO, CERAMED, and Progetto Classe at the World Heritage site of Ravenna. I have been Visiting Professor at the universities of Cagliari, Sassari (Italy) and Brown (USA). I am a co-founder of the international conference LRCW, and of the series *Roman and Late Antique Mediterranean Pottery* and *Limina/Limites: Archaeologies, histories, islands, and borders in the Mediterranean (365-1556)*.

Research interests

I am a Mediterranean archaeologist with a major focus on Roman and Late Antique Archaeology, and in pottery studies especially in the analysis of coarse and cooking wares. I have specialised in the study of archaeological ceramics to investigate their provenance, technology, distribution and consumption using physico-chemical, mineralogical and petrographic techniques. I have a broad interest in the analytical study of ceramic materials including the theoretical foundations of the discipline and in the study of living pottery-making traditions. One of my main interests is to investigate the transformation of the Roman world with a particular interest in the Mediterranean islands. I am a scientific director of excavations, surveys, and ceramic ethnoarchaeology expeditions in the Balearics and Sardinia. I am leading the excavations at the Roman and Late Antique city of *Pollentia* and the Early Christian complex of Son Peretó (Mallorca).

Selected publications

- **Cau Ontiveros MÁ**, Fantuzzi L, Alberio Santacreu D, Tsantini E, Garcia Rosselló J & Calvo Trias M 2019, 'Archaeometric characterization of Iron Age indigenous pottery from the staggered turriform of Son Ferrer, Mallorca, Spain', *Geoarchaeology-an International Journal*, 34, 2, 149 - 168.
- **Cau Ontiveros MÁ**, Fantuzzi L, Tsantini E, Burriel Alberich JFM, Jiménez Salvador JL, Rosselló Mesquida M 2019, 'Archaeometric Characterization of Late Antique Cooking and Common Wares from the Rural Settlement of L'Horta Vella (Betera, Valencia)', *Sagvntvm-papeles del Laboratorio de Arqueología de Valencia*, 51, 215 - 232.
- **Cau Ontiveros MÁ** & Mas Florit C (eds) 2019, *Change and Resilience. The occupation of Mediterranean Islands in Late Antiquity*, Joukowsky Institute Publication 9, Oxbow Books, Oxford.
- **Cau Ontiveros MÁ**, Tsantini E, Fantuzzi L & Ramon J 2019, 'Archaeometric characterization of Late Antique pottery from the rural site of Ses Païsses de Cala d'Hort (Eivissa, Balearic Islands, Spain)', *Archaeological And Anthropological Sciences*, 11, 2, 627 - 649.
- Mas Florit C & **Cau Ontiveros MÁ** 2019, 'The Occupation of Mallorca (Balearic Islands, Spain) in Late Antiquity: Tracing Change and Resilience', in Cau Ontiveros MÁ & Mas Florit C. (eds.) 2019, *Change and Resilience. The occupation of Mediterranean Islands in Late Antiquity*, Joukowsky Institute Publication 9, Oxbow Books, Oxford.
- Fantuzzi L & **Cau Ontiveros MÁ** 2019, 'Amphora production in the Guadalquivir valley (Spain) during the Late Roman period: petrographic, mineralogical, and chemical characterization of reference groups', *Archaeological And Anthropological Sciences*, 11, 6785-6802.
- Tsantini E, Quintana C, Alberio D, **Cau Ontiveros MÁ** 2019, 'Iberian Amphorae Beyond the Mainland: Imports in Southwestern Mallorca (Balearic Islands, Spain)', *Archaeological and Anthropological Sciences*, 11, 5, 1793 - 1812.

Selected research activities

- Excavations at the Roman city of *Pollentia* (Mallorca)
- Field survey, project ARCHREMOTELANDS (Mallorca)

ICREA MEMOIR 2019



Andrea Cerutti

Institut Hospital del Mar d'Investigacions Mèdiques (IMIM)
Life & Medical Sciences

Andrea Cerutti, MD, PhD, is an ICREA Research Professor since 2010 and leads the B Cell Biology Group at FIMIM, which is a research center located in the PRBB complex. He serves as grant reviewer for the European Research Council and the National Institutes of Health, and as manuscript reviewer for journals such as *Cell*, *Cell Host&Microbe*, *Science*, *Nature*, *Immunity*, *Nature Immunology*, *Nature Medicine*, *Nature Communications*, *The Journal of Experimental Medicine*, *Proceedings of the National Academy of Sciences*, *Cell Reports*, etc. He is a member of The American Society for Clinical Investigation, The American Association of Immunologists, and The Henry Kunkel Society and serves as Associate Editor of *Mucosal Immunology*. He contributed to the organization of 2014 and 2016 Keystone Symposia meetings, published over 130 research articles in immunology journals, and lectures in international meetings as well as American and European universities.

Research interests

The splenic marginal zone and gut mucosa can be viewed as interfaces between the immune system and the circulation or external environment, respectively. My group studies how B cells strategically positioned in these “frontline” areas make antibodies against circulating or intraluminal antigens, including intestinal microbes. We are particularly interested in the mechanism whereby splenic stromal cells or splenic innate immune cells, including neutrophils, dendritic cells, macrophages and innate lymphoid cells, facilitate the activation of splenic marginal zone B cells. We are also analyzing how intestinal B cells generate antibodies to commensal bacteria and how these antibodies shape the composition of the gut microbiota. Finally, we study the alterations of B cells in patients with primary antibody deficiency, including selective IgA deficiency and common variable deficiency. Our research is relevant to infections, inflammation, autoimmunity, immunodeficiency, and vaccine development.

Selected publications

- Maglione PJ, Gyimesi G, Cols M, Radigan L, Ko HM, Weinberger T, Lee BH, Grasset EK, Rahman AH, **Cerutti A**, Cunningham-Rundles C 2019, ‘BAFF-driven B cell hyperplasia drives lung disease in common variable immunodeficiency’, *JCI Insight*, 4, 5, e122728.
- Perdiguero P, Martin-Martin A, Benedicenti O, Diaz-Rosales P, Morel E, Munoz-Atienza E, Garcia-Flores M, Simon R, Soletto I, **Cerutti A**, Tafalla C 2019, ‘Teleost IgD(+)IgM(-) B Cells Mount Clonally Expanded and Mildly Mutated Intestinal IgD Responses in the Absence of Lymphoid Follicles’, *Cell Reports*, 29, 13, 4223 - +.
- Galindo-Campos MA, Bedora-Faure M, Farres J, Lescale C, Moreno-Lama L, Martinez C, Martin-Caballero J, Ampurdanes C, Aparicio P, Dantzer F, **Cerutti A**, Deriano L & Yelamos J 2019, ‘Coordinated signals from the DNA repair enzymes PARP-1 and PARP-2 promotes B-cell development and function’, *Cell Death And Differentiation*, 26, 12, 2667 - 2681.

Selected research activities

ERC Evaluation Member, Panel LS6, ERC Consolidator Grant 2019, Step 1 (May 2019), Step 2 (October 2019).

ICREA MEMOIR 2019



Darrick Chang

Institut de Ciències Fotòniques (ICFO)

Experimental Sciences & Mathematics

Darrick Chang is an ICREA Research Professor at The Institute of Photonic Sciences (ICFO). He obtained his bachelor's degree in physics from Stanford University in 2001, and his PhD in physics from Harvard University in 2008. Subsequently, he held a prize postdoctoral fellowship at the California Institute of Technology. In 2011, Darrick joined ICFO as the leader of the Theoretical Quantum Nanophotonics group. He was awarded an ERC Starting Grant in 2015. He has participated in or currently participates in several international projects, including serving as a PI and scientific coordinator of European FET-Open project GRASP, as a PI in the Quantum Flagship project QIA, and as a foreign collaborator in US MURI projects QOMAND and Photonic Quantum Matter.

Research interests

The research of Prof. Chang and his Theoretical Quantum Nanophotonics group at ICFO is based upon a vision that quantum effects are at the forefront of future technologies and discoveries, and that nanophotonic systems will be a prominent platform for this frontier. Specifically, they aim to harness the unique configurability, large optical forces, and strong light-matter interaction strengths achievable in nanophotonic systems to produce new applications and phenomena involving matter and light, which have no analogue in macroscopic setups. The group also develops theoretical techniques that enable a better understanding of the complex phenomena at play. The work is highly interdisciplinary, and the group explores the potential impact across atomic physics, quantum optics, nonlinear optics, nano-mechanics, low-dimensional materials, and quantum information science. They also collaborate with leading experimental groups to bring their theoretical ideas toward reality.

Selected publications

- Mirhosseini M, Kim E, Zhang X, Sipahigil A, Dieterle PB, Keller AJ, Asenjo-Garcia A, **Chang DE** & Painter O 2019, 'Cavity quantum electrodynamics with atom-like mirrors', *Nature*, 569, 7758, 692 - +.
- Asenjo Garcia A, Kimble HJ & **Chang E** 019, 'Optical waveguiding by atomic entanglement in multilevel atom arrays,' *Proc. Natl. Acad. Sci. USA* 116, 25503.
- Albrecht A, Henriët L, Asenjo-Garcia A, Dieterle PB, Painter O & **Chang DE** 2019, 'Subradiant states of quantum bits coupled to a one-dimensional waveguide', *New Journal Of Physics*, 21, 025003.
- Henriët L, Douglas JS, **Chang DE** & Albrecht A 2019, 'Critical open-system dynamics in a one-dimensional optical-lattice clock', *Physical Review A*, 99, 2, 023802.
- Tollerton CJ, Bohn J, Constant TJ, Horsley SAR, **Chang DE**, Hendry E & Li DZ 2019, 'Origins of All-Optical Generation of Plasmons in Graphene', *Scientific Reports*, 9, 3267.
- Moreno-Cardoner M, Plankensteiner D, Ostermann L, **Chang DE** & Ritsch H 2019, 'Subradiance-enhanced excitation transfer between dipole-coupled nanorings of quantum emitters', *Physical Review A*, 100, 2, 023806.

ICREA MEMOIR 2019



Miguel Chillón

Universitat Autònoma de Barcelona (UAB) & Vall d'Hebron Institut de Recerca (VHIR)

Life & Medical Sciences

Born in Barcelona in 1966. PhD in Genetics at Hospital Duran i Reynals and Universitat de Barcelona, 1994. National Award in Human Genetics by the Spanish Association of Human Genetics in 1995. HHMI postdoctoral fellow on Gene Therapy for Cystic Fibrosis, at the Internal Medicine Dept, University of Iowa, USA (1994-1997). EMBO fellow in Genethon III (Evry, France) (1997-1999) on Development of viral vectors for Gene Therapy. Postdoctoral fellow on Gene Therapy (2000-2001) at the Universitat Autònoma de Barcelona (UAB). ICREA Research Professor at the UAB since 2001. Director of the Vector Production Unit, a technological platform to produce viral vectors, since 2004. Assistant Professor of the Biochemistry and Molecular Biology Dept. at the UAB since 2005. Co-founder of two spin-off companies in biotechnology, NanoTherapix in 2009, and Kogenix Therapeutics in 2016. He has published more than 70 papers and generated 7 patents in viral vectors.

Research interests

Medicine still has many challenges to solve specially on complex diseases where a large number of both, genetic and environmental factors, are involved. Among them, autoimmune disorders have attracted attention because there are no effective curative treatments for them. Some of these autoimmune diseases affect the central nervous system, which in addition, is difficult to access and to manipulate with classical pharmacological treatments. To address these problems we have focused our research interests in three main objectives: (1) gene therapy strategies for autoimmune diseases; (2) gene therapy strategies for diseases affecting the nervous system, such as neuromuscular and neurodegenerative disorders, and (3) development of more efficient and less immunogenic viral vectors.

Selected publications

- Pagès G, Giménez-Llort L, García-Lareu B, Ariza L, Navarro M, Ruberte J, Casas C, **Chillón M** & Bosch A 2019, 'Intrathecal AAVrh10 corrects Biochemical and Histological Hallmarks of Mucopolysaccharidosis VII Mice and Improves Behavior and Survival', *Human Molecular Genetics*: 1;28(21). pp: 3610-3624

ICREA MEMOIR 2019



Paul Christou

Universitat de Lleida (UdL)

Life & Medical Sciences

BS Chemistry & PhD Plant Biochemistry, University College London. Senior Scientist at Agracetus Inc., Madison, WI, USA, where he developed genetic transformation technology that led his group to generate the first commercial crop sold by Monsanto (Roundup Ready Soybean). Subsequently Head of Molecular Biotechnology Unit, John Innes Centre, Norwich, UK-led the Tropical Maize and Rice Biotechnology Laboratory sponsored by the Rockefeller Foundation. Head Crop Genetics & Biotechnology Department, Fraunhofer Institute Molecular Biotechnology & Applied Ecology, Aachen, Germany. Currently at Universitat de Lleida as an ICREA Professor & Head of the Applied Plant Biotechnology Laboratory. Founding Director Agrotecnio CERCA Center, 2013-2015. Recipient of ERC Advanced Grant BIOFORCE and ERC PoC Grant Multinutrient Maize. Received 2 Bill & Melinda Gate's grants, one ongoing. PI in 12 EU projects over past 25 years 2 as coordinator and 2 as deputy coordinator

Research interests

Our programs rely on our unique multi-gene/multi-pathway engineering capabilities to generate plants with high value recombinant pharmaceuticals for human health and veterinary medicine; cereals with enhanced nutrition, and novel strategies of sustainable agriculture with emphasis on developing countries, poverty alleviation and food security. A recent major focus is plant synthetic biology and genome editing. Our group is involved in training and capacity building in plant biotechnology focusing on developing countries. We also develop tools, methodology and a comprehensive understanding of the essential mechanisms underpinning the creation and performance of genome edited plants for the application of synthetic biology to major crops.

Selected publications

- Pérez L, Soto E, Farré G, Juanos J, Villorbina G, Bassie L, Medina V, Serrato AJ, Sahrawy M, Rojas JA, Romagosa I, Muñoz P, Zhu C & **Christou P** 2019, 'CRISPR/Cas9 mutations in the rice *Waxy*/GBSSI gene induce allele-specific and zygosity-dependent feedback effects on endosperm starch biosynthesis', *Plant Cell Rep*, 8:417-433
- Armario Najera V, Twyman RM, **Christou P**, Zhu C 2019, 'Applications of multiplex genome editing in higher plants.', *Current Opinion In Biotechnology*, 59, 93 - 102.
- Jin X, Bai C, Bassie L, Nogareda C, Romagosa I, Twyman RM, **Christou P** & Zhu C 2019, 'ZmPBF and ZmGAMYB transcription factors independently transactivate the promoter of the maize (*Zea mays*) beta-carotene hydroxylase 2 gene', *New Phytologist*, 222, 2, 793 - 804.
- Mir-Artigues P, Twyman RM, Alvarez D, Bennasser PC, Balcells M, **Christou P** & Capell T 2019, 'A simplified techno-economic model for the molecular pharming of antibodies', *Biotechnology And Bioengineering*, 116, 10, 2526-2539.
- Banakar R, Fernandez A, Zhu C, Abadia J, Capell T & **Christou P** 2019, 'The ratio of phytoalexins nicotianamine to deoxymugenic acid controls metal homeostasis in rice', *Planta*, 250:1339-1354.

Selected research activities

Third generation plant biotechnology products to address the Food-Feed-Nutrition-Health nexus. Cost Action EUROCAROTEN, Limassol, Cyprus. Keynote opening lecture
Redirection of terpenoid metabolism in rice through targeted interventions: Plant Biotechnology - Genomics and Genome Editing" Tel Aviv University. In memory of Prof. Zahir Eyal. Invited lecture

ICREA MEMOIR 2019



Rebekah Clements

Universitat Autònoma de Barcelona (UAB)
Humanities

Rebekah Clements is an ICREA at the Autonomous University of Barcelona. She completed degrees in law and Asian studies at the Australian National University where she was awarded the University Medal, before obtaining an MA in classical Japanese literature from Waseda University in 2008. She completed her PhD in East Asian History from the University of Cambridge (Trinity College) in 2011. Following her PhD she was a research associate at the Faculty of Asian and Middle Eastern Studies, University of Cambridge, working on the Leverhulme-funded project "Translation and vernacularisation in pre-modern East Asia" (PI: P.Kornicki), and held a junior research fellowship from Queens' College from 2012-2015 where she completed her first monograph, *A Cultural History of Translation in Early Modern Japan* (Cambridge University Press, 2015). From 2015-2018 she held a lectureship and then an associate professorship at Durham University. She joined ICREA in October 2018.

Research interests

Rebekah is a cultural historian of Japan, specializing in the Tokugawa period (1600-1868). Her research focuses on language, society, and the characteristics of Japanese early modernity, as understood in the broader context of East Asia. She is currently working on Korean exiles present in Japan following the Imjin War of 1592-1598. This work takes place within her project funded by the European Research Council, "The Aftermath of the East Asian War of 1592-1598" (2018-2023). The Aftermath project is a large scale attempt to understand the legacy of the Imjin War, also known as the East Asian War of 1592-1598 and Toyotomi Hideyoshi's Invasions of Korea. This conflict involved over 500,000 combatants from Japan, China, and Korea; up to 100,000 Korean civilians were removed to Japan. It was the largest conflict of the world of the sixteenth century and involved the largest successful overseas landings by that date.

Selected publications

- **Clements R** & Niimi A (eds) 2019, *Genji monogatari no kinsei: Zokugoyaku, hon'an, eiribon de yomu koten* (Tokyo: Benseisha).
- **Clements R** 2019, "Brush Talk as the 'Lingua Franca' of East Asian Diplomacy in Japanese-Korean Encounters, c.1600-1868", *The Historical Journal*, vo.62, Issue 2, pp.289.309.
- **Clements R** 2019, "Edo jidai ni okeru zokugoyaku no igi" in Rebekah Clements and Akihiko Niimi, eds., *Genji monogatari no kinsei: Zokugoyaku, hon'an, eiribon de yomu koten* (Tokyo: Benseisha), pp.1-23.
- **Clements R** 2019, "Nihon no kinsei ni okeru gengo hakken to zokugoyaku" in Kono Kimiko, Wiebke Denecke, et al eds. *Nihon "bun"gakushi dai sansatsu. "Bun" kara "bungaku" e: Higashi Ajia bungaku o minaosu/A New History of Japanese "Letterature" Vol.3. The Path from "Letters" to "Literature": A Comparative History of East Asian Literatures*, Tokyo: Benseisha.

Selected research activities

- **Invited Talk. 22 Dec, 2019** – “彼等自身の言葉で 江戸及び明治初期の『源氏物語』の訳者たち”, 日比較文学国際シンポジウムおよび2019年度広東外語外貿大学大学院生フォーラム, Guangdong University of Foreign Studies, Guangzhou. (in absentia) (China)
- **Keynote Lecture. 17 Dec, 2019** – “The Imjin War in Regional and Global History: New Perspectives”, Asia Oriental: paradigmas emergentes, política(s), dinámicas socioculturales y sus consecuencias, Barcelona Centre for International Affairs. (Spain)
- **Manuscript reviewer. 21 Nov 2019.** Routledge Press (Taylor and Francis).
- **Stay of Research. 17-20 Sep 2019.** Cambridge University.
- **Manuscript reviewer. 27 Aug 2019.** *Journal of the History of Ideas*, University of Pennsylvania Press.
- **Panel Chair. 12 Apr, 2019** – “Art and War: The Japanese Invasion of Korea of 1592-1598”, 29th Association of Korean Studies in Europe Conference 2019, Rome, 11-14 April 2019 (Italy)

ICREA MEMOIR 2019



Alejandro Coroleu

Universitat Autònoma de Barcelona (UAB)
Humanities

After studying Classics and Renaissance Studies at the Universitat de Barcelona, I undertook postdoctoral research at The Warburg Institute (University of London). I taught and researched at the University of Nottingham between 1995 and 2008. I have also been Visiting Lecturer at the University of Cambridge and at the University of Salzburg. In 2009 I accepted a Research Professorship at ICREA in the Department of Catalan at the Universitat Autònoma de Barcelona where I am conducting research on Renaissance literary culture.

Research interests

Classical and Comparative Literature: Latin literary culture in Europe (ca. 1480-ca. 1720)
Intellectual History and Renaissance Studies: Hispanic, Italian and European Humanism
The reception of Greek and Roman literatures in early modern Iberia (1450-1600)

Selected publications

- *Latin and Vernacular in Renaissance Iberia, II: Translations and Adaptations*, edited by Barry Taylor and **Alejandro Coroleu**, Splash Editions: London, 2019 [first edition, Manchester, 2006]
- *Latin and Vernacular in Renaissance Spain*, edited by Barry Taylor and **Alejandro Coroleu**, with an introduction by **Alejandro Coroleu**, Splash Editions: London, 2019 [first edition, Manchester, 1999]
- "Antoni Agustí i Erasme", in *Antoni Agustí, arquebisbe i humanista*, edited by Joan Carbonell, Barcelona, 2019, pp. 213-224
- "Notas sobre la tipología de las antologías poéticas latinas de los siglos XVI, XVII y XVIII", *Studia Aurea*, 13 (2019), pp. 213-25
- "Beyond Europe, beyond the Renaissance, beyond the Vernacular", *JOLCEL*, no. 2 (2019), pp. 73-77
- (with M. Ferrer) "Books and readers in fifteenth-century Valencia: the inventory of Joan Rix de Cura (1490)", *Digital Philology* 8. 2 (Fall 2019), pp. 213-24.
- "Marginalia in a Rare Edition of Virgil", *Translat Library* 1, no. 3 (2019), pp. 1-8
- "Bodas reales entre Viena y Barcelona: un epitalamio latino de 1708", *Liburna*, 14 (Mayo 2019), pp. 143-54
- Review of Poggio Bracciolini, *Historia disceptiva tripartita convivalis*, edd. T. Armignacco, F. Delle Donne, G.G. Visconti, Firenze, 2019, in *Anuario de Estudios Medievales*, 49, 2 (2019), p. 825
- Review of *Classics Transformed*, edd. G. Abbamonte and C. Kallendorf, Pisa, 2018, published online on 10 May 2019 in *International Journal of the Classical Tradition*.

Selected research activities

- General editor of the online journal *Translat Library* (University of Massachusetts Amherst-UAB)
- Member of the SGR research group "Cultura i Literatura a la Baixa Edat Mitjana" (2017-142)
- Member of the editorial board of *ITACA: Quaderns de Cultura Clàssica* (Barcelona) and of the advisory board of *FuturoClassico* (Bari), *Studia Aurea* (Girona) and *Humanistica Lovaniensia* (Leuven)
- Secretary of the Societat Catalana d'Estudis Clàssics
- Peer reviewer for 5 international journals
- Guest lecturer: University of Portland (Salzburg Program)

ICREA MEMOIR 2019



Alfred Cortés

Institut de Salut Global Barcelona (ISGlobal)

Life & Medical Sciences

After obtaining a PhD for work on *Drosophila* DNA binding proteins (CID-CSIC, Barcelona), he gave a strong turn to his career to apply his molecular biology skills to study malaria parasites. He worked for four years as Head of the Molecular Parasitology lab at the Papua New Guinea IMR, where his research mainly focused on basic malaria parasite biology, but also on epidemiological aspects of the disease. Back to Europe, he worked for over two years at the MRC-NIMR (London) on epigenetic regulation of gene expression and invasion of erythrocytes by malaria parasites. In 2006 he moved to IRB Barcelona with an ICREA jr contract. In 2011 he joined CRESIB-ISGlobal, and in 2012 he was appointed ICREA Research Professor. His current research focuses on epigenetic regulation of gene expression in malaria parasites, which plays a key role in their adaptation to changes in the environment and in the control of sexual conversion, among other host-parasite interactions.

Research interests

The malaria parasite *Plasmodium falciparum* regulates at the epigenetic level the expression of a multitude of genes that participate in host-parasite interactions (clonally variant genes). These genes can be found in either an active or a silenced state, which is clonally transmitted from one generation to the next. At the malaria epigenetics lab we study the chromatin-based mechanisms involved in the epigenetic regulation of clonally variant genes, and how transcriptional variation results in phenotypic variation and contributes to parasite adaptation to changes in the environment. We combine genome-wide studies with studies on specific clonally variant genes that control important processes in parasite biology. Among these, we are especially interested in the regulation of solute uptake and sexual conversion, which is necessary for malaria transmission. More recently, we started investigating the transcriptional changes that mediate parasite survival at febrile temperatures.

Selected publications

- Bancells C, Llorà-Batlle O, Poran A, Notzel C, Rovira-Graells N, Elemento O, Kafack BFC & **Cortés A** 2019, 'Revisiting the initial steps of sexual development in the malaria parasite *Plasmodium falciparum*', *Nature Microbiology*, 4 (1), 144 - 54.
- Mira-Martinez S, Pickford AK, Rovira-Graells N, Guetens P, Tinto-Font E & **Cortés A***, Rosanas-Urgell A* 2019, 'Identification of Antimalarial Compounds That Require CLAG3 for Their Uptake by *Plasmodium falciparum*-Infected Erythrocytes', *Antimicrobial Agents And Chemotherapy*, 63, 5, e00052-19. *Equal contribution
- Portugaliza HP, Llorà-Batlle O, Rosanas-Urgell A & **Cortés A** 2019, 'Reporter lines based on the gexp02 promoter enable early quantification of sexual conversion rates in the malaria parasite *Plasmodium falciparum*', *Scientific Reports*, 9, 14595.
- Ralph, SA.; **Cortés, A** 2019, 'Plasmodium sexual differentiation: how to make a female', *Molecular Microbiology*, 112 (6), 1627-1631.
- Llorà-Batlle O; Tinto-Font E; **Cortés A** 2019, 'Transcriptional Variation in Malaria Parasites: Why and How', *Briefings in Functional Genomics*, 18 (5), 329-341.

Selected research activities

- New grant awarded by "La Caixa Health Research". Title of the project: "Dissecting the initial molecular events that trigger sexual conversion and transmission in malaria parasites"
- Supervision of two completed and defended PhD Thesis: Elisabet Tintó (UB, "Identification of PfAP2-HS as the master regulator of the heat shock response in the human malaria parasite *Plasmodium falciparum*") and Oriol Llorà-Batlle (UPF, "Characterization of sexual commitment and the early steps of sexual development in the human malaria parasite *Plasmodium falciparum*")
- Appointed as organizer of the EMBL conference "BioMalPar XV: Biology and Pathology of the Malaria Parasite", to be held in Heidelberg (Germany) in May 2020.
- Invited conferences at University of Glasgow (UK) and University of Heidelberg (Germany).

ICREA MEMOIR 2019



Pia Cosma

Centre de Regulació Genòmica (CRG)

Life & Medical Sciences

ICREA Research Professor and Senior Scientist at Centre for Genomic Regulation (CRG), since Sep. 2010. From 2009-2015 Honorary Associate Investigator at CNR. 2003-2010 Associate Investigator at TIGEM, Naples. 2004-2010 Lecturer at European School of Molecular Medicine. 1997-2000 Marie Curie Postdoc at IMP, Vienna. PhD in Cellular and Molecular Genetics, Univ. Federico II of Naples, 2000. Visiting Scientist in many Universities in USA. Talks given at major international conferences and Research Institutes. Awarded several prizes including: EMBO Young Investigator (YIP), 2003; Marie Curie Excellence Award, 2005; "Vanguardia de la Ciència" prize, 2014; City of Barcelona prize, 2015. She is Order of Merit of the Italian Republic: Knight, 2007. ERC Starting Grant awardee, 2009 and HFSP Grant awardee, 2010. EMBO Member since 2010. She is coordinator of H2020 FET-Open since 2016 and associated FET Launchpad. La Caixa Health Reacher Award in 2018.

Research interests

Main interests of Cosma's group are to dissect mechanisms and factors controlling somatic cell reprogramming and tissue regeneration in mammals. We showed that activation of the Wnt/ β -catenin signalling pathway enhances reprogramming of somatic cells after their fusion with embryonic stem cells. We are dissecting gene networks and reprogramming factors controlled by the activation of Wnt/ β -catenin pathway. Furthermore, by using super resolution microscopy we are investigating on the remodelling and looping of the chromatin fiber during the reprogramming process. The activation of Wnt pathway controls regeneration in response to damage in lower and higher vertebrates. We found that the Wnt/ β -catenin signalling is also key to control cell-fusion-mediated regeneration in mammals. We recently showed that in vivo reprogramming of neurons and hepatocytes after fusion with hematopoietic stem and progenitor cells is a mechanism for tissue regeneration.

Selected publications

- Theka I, Sottile F, Cammisa M, Bonnin S, Sanchez-Delgado M, Di Vicino U, Neguembor MV, Arumugam K, Aulicino F, Monk D, Riccio A & **Cosma MP** 2019, 'Wnt/beta-catenin signaling pathway safeguards epigenetic stability and homeostasis of mouse embryonic stem cells', *Scientific Reports*, 9, 948.
- Pedone E, Postiglione L, Aulicino F, Rocca DL.... di Bernardo D, **Cosma MP** & Marucci L 2019, 'A tunable dual-input system for on-demand dynamic gene expression regulation', *Nature Communications*, 10, 4481.
- Otterstrom J, Castells-Garcia A, Vicario C, Gomez-Garcia PA & ***Cosma MP** & *Lakadamyali M 2019, 'Super-resolution microscopy reveals how histone tail acetylation affects DNA compaction within nucleosomes in vivo', *Nucleic Acids Research*, 47, 16, 8470 - 8484. * co-last and co-corresponding authors
- Frade Joao, Nakagawa Shoma, Cortes Paola, di Vicino Umberto, Romo Neus, Lluís, Frederic and **Cosma Maria Pia** 2019, 'Controlled ploidy reduction of pluripotent 4n cells generates 2n cells during mouse embryo development'. *Science Advances*, Vol. 5, no. 10.
- Sottile, Francesco; Pesaresi, Martina; Simonte, Giacomina and **Cosma, Maria Pia** 2019, 'Cell therapy for degenerative retinal disease: Special focus on cell fusion mediated regeneration'. *Stem Cell Biology and Regenerative Medicine, book series (STEMCELL)*, Springer
- Pesaresi M, Sebastian-Perez R & **Cosma MP** 2019, 'Dedifferentiation, transdifferentiation and cell fusion: in vivo reprogramming strategies for regenerative medicine', *Febs Journal*, 286, 6, 1074 - 1093.

Selected research activities

Invited Talks:

- Gordon Research Conference (GRC) on Genome Architecture, Hong Kong, 4-9 August 2019
- Single Cell Omics Symposium in the Greater Bay Area, Shenzhen, China, 27 August 2019
- La Sapienza University, Rome, 24 May 2019
- Transcribing the genome in 4D, Paris, 18-23 February 2019

ICREA MEMOIR 2019



Josep Dalmau

Institut d'Investigacions Biomèdiques August Pi i Sunyer (IDIBAPS)
Life & Medical Sciences

Dr. Dalmau received his MD, PhD from Autònoma University of Barcelona. He trained in Neuro-oncology at Memorial Sloan-Kettering Cancer Center, New York, and then joined the faculty. After 11 years, he became co-director of Neuro-oncology, University of Arkansas. In 2002 he was named Professor of Neurology at the University of Pennsylvania. Currently he is ICREA Research Professor, IDIBAPS-Clinic Hospital, Associate Professor Medicine, University of Barcelona, Adjunct Professor Neurology, University of Pennsylvania, and Guest Researcher, NIH, USA. He is Editor of *Neurology: Neuroimmunology and Neuroinflammation*, and member of many academic societies including the National Academy of Medicine, USA. He has received numerous awards, including the Jacoby Award (American Neurological Association), the Zülch Prize (Max Planck Society), and Premio Rey Jaime I (Spain). Since 2015 he is listed as a Highly Cited Researcher by Clarivate Analytics.

Research interests

My research focuses on immune-mediated diseases of the nervous system. Although this work initially focused on cancer associated (paraneoplastic) disorders, it evolved with our discovery of a category of diseases named antibody-mediated encephalitis. These diseases occur in association with antibodies against neuronal cell-surface proteins, ion channels, or synaptic receptors involved in synaptic transmission and plasticity. Antibody-mediated changes in the structure or function of these antigens result in several different syndromes characterized by psychosis, epilepsy, memory deficits, abnormal movements, sleep dysfunction, or cognitive decline. My research group carries out translational studies including the identification of novel diseases (e.g., anti-NMDAR encephalitis among others), the development of diagnostic tests and treatment strategies, as well as basic studies aimed at elucidating the cellular and molecular mechanisms underlying the immune-mediated brain dysfunction.

Selected publications

- Gaig C, Ercilla G, Daura X, Ezquerro M, Fernández-Santiago R, Palou E, Sabater L, Höftberger R, Heidbreder A, Högl B, Iranzo A, Santamaría J, **Dalmau J**, Graus F 2019, 'HLA and microtubule-associated protein tau H1 haplotype associations in anti-IgLON5 disease', *Neurol Neuroimmunol Neuroinflamm* 12;6(6). pii: e605.
- **Dalmau J**, Armangué T, Planagumà J, Radosevic M, Mannara F, Leypoldt F, Geis C, Lancaster E, Titulaer MJ, Rosenfeld MR, Graus F 2019, 'An update on anti-NMDA receptor encephalitis for neurologists and psychiatrists: Mechanisms and models', *Lancet Neurol*, 18, 11, 1045 - 1057.
- Armangué T, Baucells-Lokyer BJ, Vlasea A, Petit M, Esteve A, Deyá-Martínez A, Pérez de Diego R, **Dalmau J**, Alsina L 2019, 'Toll-like receptor 3 deficiency in autoimmune encephalitis post-herpes simplex encephalitis', *Neurol Neuroimmunol Neuroinflamm*, 6:e611.
- Geis C, Planaguma J, Carreño M, Graus F & **Dalmau J** 2019, 'Autoimmune seizures and epilepsy'. *J Clin Invest* 129:926 - 940.
- Balu R, McCracken L, Graus F, **Dalmau J*** & Titulaer MJ 2019, 'A simple score that predicts functional status at one year in patients with anti-NMDA receptor encephalitis', *Neurology*, 92: e244 - e252. (*corresponding author)
- Graus F & **Dalmau J** 2019, 'Paraneoplastic neurological syndromes in the era of immune checkpoint inhibitors', *Nat Rev Clin Oncol* 16:535-548.
- Gaig C, Iranzo A, Cajochen C, Vilaseca I, Embic C, **Dalmau J**, Graus F, Santamaria J 2019, 'Characterization of the sleep disorder of anti-IgLON5 disease'. *Sleep*, 42, 9, UNSP zsz133.

ICREA MEMOIR 2019



Xavier Daura

Universitat Autònoma de Barcelona (UAB)

Life & Medical Sciences

I studied Biological Sciences at UAB, Barcelona, where I graduated in 1991 and obtained the PhD in 1996. I then moved to the lab of WF van Gunsteren at ETH Zurich, a main reference in the field of computational modelling and simulation of biomolecular systems. These were extraordinary years in which we performed seminal work on the simulation of polypeptide folding by molecular-dynamics methods. In 2002 I was appointed as ICREA Research Professor and returned with this position to the Institute of Biotechnology and Biomedicine (IBB) of UAB, starting a new group in Computational Biology. Today, we focus our efforts on the identification and development of new strategies to combat infections by multidrug-resistant bacteria, using a range of computational and experimental approaches. In 2005 I was appointed Adjunct Professor at UAB to combine my research activities as an ICREA Professor with teaching at the post-graduate level. In the period 2011-2017 I served as Director of IBB.

Research interests

The main objective of our research group is the development of new strategies to combat infections by multidrug-resistant (MDR) bacteria, in particular of the Gram-negative (GN) group. The increasing emergence and spread of MDR pathogens constitutes at present one of the major threats to public health. The shortage of effective antimicrobials for the treatment of MDR GN infections is particularly critical as cases of pan-resistance accumulate. The discovery of new drug targets and modes of action (MoA), less propitious to the evolution of resistance, has therefore become a pressing need. In parallel, the development of effective vaccines may offer a solution for high-risk population groups. Our team combines a range of computational and experimental techniques for the identification of antimicrobial-target candidates with new MoA and vaccine candidates eliciting prescribed responses. Much of this work is done in collaboration with the group of Bacterial Molecular Genetics of IBB.

Selected publications

- **Daura X** 2019, 'Advances in the Computational Identification of Allosteric Sites and Pathways in Proteins', *Adv Exp Med Biol*, 1163, 141 - 169.
- Huedo P, Kumar VP, Horgan C, Yero D, **Daura X**, Gibert I & O'Sullivan TP 2019, 'Sulfonamide-based diffusible signal factor analogs interfere with quorum sensing in *Stenotrophomonas maltophilia* and *Burkholderia cepacia*', *Future Med Chem*, 11, 13, 1565 - 1582.
- Gaig C, Ercilla G, **Daura X**, Ezquerro M, Fernández-Santiago R, Palou E, Sabater L, Höftberger R, Heidbreder A, Högl B, Iranzo A, Santamaria J, **Dalmau J** & Graus F. 2019, 'HLA and microtubule-associated protein tau H1 haplotype associations in anti-IgLON5 disease', *Neurol Neuroimmunol Neuroinflamm*, 6, 6, e605.

Selected research activities

Invited seminar at Shanghai Jiaotong University, School of Medicine, Shanghai, China, April 10, 2019.

Invited speaker at 'One Health Perspectives on Infection and Immunity: Humans, Animals and the Environment', Chiang Mai, Thailand, October 19-22, 2019.

ICREA MEMOIR 2019



Ruth de Diego-Balaguer

Universitat de Barcelona (UB)

Social & Behavioural Sciences

After a Degree in Psychology I specialised at the University of Barcelona (UB) in Psycholinguistics and Cognitive Neuroscience during my PhD. I spent three years as a post-doc at the INSERM in Paris (Université Paris Est, Créteil, UPEC) where I studied the involvement of the striatum in the learning of new rules in language. I was a Research-Lecturer at the Ecole Normale Supérieure in Paris before I created my lab at the UB back in Barcelona as an ICREA Junior Researcher. After that I became an ICREA Research Professor and consolidated my group at the UB. My research is mainly focused on the cognitive functions and neural circuits engaged in the extraction of grammatical rules while learning a new language.

Research interests

My research combines information from brain-damaged patients, developmental populations and brain-imaging in healthy individuals to understand whether words and rules of language require different neural and cognitive mechanisms to be acquired since the earliest stages of contact with a new language. I am particularly interested in i) the role of the attentional systems in the acquisition of different aspects of language; ii) the role of the striatum as a brain structure that could make the interface between language and other cognitive functions necessary in the learning process; and iii) how is the acquired information consolidated and modified when we learn new additional information.

Selected publications

- Assaneo F*, Ripollés P*, Orpella J*, Ming Lin W, **de Diego-Balaguer R**+, Poeppel D+ 2019, 'Spontaneous synchronization to speech reveals neural mechanisms facilitating language learning', *Nat Neurosci* 22, 4, 627. *equally contributed/+shared seniorship.
- Assaneo FM, Rimmele JM, Orpella J, Ripollés P, **de Diego-Balaguer R** & Poeppel D 2019, 'The lateralization of speech-brain coupling is differentially modulated by intrinsic auditory and top-down mechanisms', *Frontiers in Integrative Neuroscience*, 13:28.
- García-Gorro C, Llera A, Martínez-Horta S, Pérez-Pérez J, Kulisevsky J, Rodríguez-Dechicha N, Vaquer I, Subira S, Calopa M, Muñoz E, Santacruz P, Ruiz-Idiago J, Mareca C, Beckmann CF, **de Diego-Balaguer R** & Camara E 2019, 'Specific patterns of brain alterations underlie distinct clinical profiles in Huntington's disease', *Neuroimage-clin* 23, UNSP 101900.
- De Paepe AE, Sierpowska J, García-Gorro C, Martínez-Horta S, Pérez J, Kulisevsky J, Rodríguez-Dechicha N, Vaquer N, Subira S, Calopa M, Muñoz E, Santacruz P, Ruiz-Idiago J, Mareca C, **de Diego-Balaguer R** & Camara E 2019, 'White matter cortico-striatal tracts predict apathy subtypes in Huntington's disease', *Neuroimage-Clin* 24:101965.
- García-Gorro C, Garau-Rolandi M, Escrichs A, Rodríguez-Dechichá N, Vaquer I, Subirà S, Calopa M, Martínez-Horta S, Pérez-Pérez J, Kulisevsky J, Muñoz E, Ruiz-Idalgo J, Mareca C, **de Diego-Balaguer R** & Camara E 2019, 'An active cognitive lifestyle as a potential neuroprotective factor in Huntington's Disease'. *Neuropsychologia* 122, 116-124

Selected research activities

- Adhoc reviewer for ERC Advanced Grants SH4
- Invited to Elife and PLoS One Editorial Boards

Supervisions

- 2 PhD Thesis: J. Orpella, C. García-Gorro
- 2 PhD Thesis committees: I. Torres (UPF), C. Sanches (Sorbonne Université, Paris)

Invited Talk

- Prediction Brain Workshop, Aix-Marseille Université, France

Outreach activities

- International Day of Women and Girls in Science: Round Table (Institute of Neuroscience UB)
- sLHam talks (IDIBELL and CMRB)

ICREA MEMOIR 2019



Gianni De Fabritiis

Universitat Pompeu Fabra (UPF)

Experimental Sciences & Mathematics

ICREA research professor and associate professor at Universitat Pompeu Fabra (UPF), group leader of the computational science laboratory. I have a background in applied mathematics (1997, University of Bologna) and a PhD in computational chemistry (2002, Queen Mary University of London). Previous work experiences include the CINECA supercomputing center (1998-1999), University College London (2003-2006) and Ramon y Cajal tenure-track fellowship at University Pompeu Fabra. The laboratory receives grants from national, international and leading industrial firms worldwide. I have published over 100 articles in international journals (PNAS, JACS, Nat. Chem., Nat. Commun., etc). I have been visiting professor at Stanford University in 2015 and IPAM-UCLA in 2019. My h-index is currently 36 with approximately 840 citations per year as in 2019.

Research interests

Prof. Gianni De Fabritiis leads the **computational science laboratory** whose interests are the application of computation to solve real world problems, where we define intelligence as a form of computation. The research group develops machine learning models with intelligent, useful behavior using reinforcement learning and deep learning, for specific environments. Biomedicine is one environment where physics-based simulations and machine learning to provide novel, innovative approaches. The group leads **GPUGRID.net**, one of the top distributed computing projects worldwide for running molecular simulations on GPUs and the open platform **PlayMolecule.org** that has around a thousand registered scientists. The group and its spin-off company Acellera have collaborated with major industries worldwide like Sony, Nvidia, HTC mobile, UCB, Pfizer, Biogen and Novartis.

Selected publications

- Skalic M, Sabbadin D, Sattarov B, Sciabola S & **De Fabritiis G** 2019, 'From Target to Drug: Generative Modeling for the Multimodal Structure-Based Ligand Design', *Molecular Pharmaceutics*, 16, 10, 4282 - 4291.
- Jimenez-Luna J, Perez-Benito L, Martinez-Rosell G, Sciabola S, Torella R, Tresadern G & **De Fabritiis G** 2019, 'DeltaDelta neural networks for lead optimization of small molecule potency', *Chemical Science*, 10, 47, 10911 - 10918.
- Wang J, Olsson S, Wehmeyer C, Perez A, Charron NE, **de Fabritiis G**, Noe F & Clementi C 2019, 'Machine Learning of Coarse-Grained Molecular Dynamics Force Fields', *Acs Central Science*, 5, 5, 755 - 767.
- Galvelis R, Doerr S, Damas JM, Harvey MJ & **De Fabritiis G** 2019, 'A Scalable Molecular Force Field Parameterization Method Based on Density Functional Theory and Quantum-Level Machine Learning', *Journal Of Chemical Information And Modeling*, 59, 8, 3485 - 3493.

Selected research activities

I am CEO and CSO of the technology company Acellera Ltd, of which I am also founder.

ICREA MEMOIR 2019



Coen de Graaf

Universitat Rovira i Virgili (URV)

Experimental Sciences & Mathematics

Graduated in Chemistry in 1993 at the University of Amsterdam. PhD student at the University of Groningen, the Netherlands, from 1994 to 1998 (supervisors: Prof. Wim Nieuwpoort and Prof. Ria Broer). Post-Doc in the group of Prof. Francesc Illas of the University of Barcelona with a Marie Curie fellowship from 1998-2000 (subject: magnetism in low-dimensional Heisenberg systems). Post-Doc in the Quantum Chemistry group of the University Rovira i Virgili (2000-2005) with a Ramón y Cajal fellowship. Presently ICREA Research Professor in the same group.

Research interests

Changing properties of materials by shining light on it is an interesting phenomenon. It becomes even more exciting when the initial state can be repopulated by irradiation with light of different wave length. The material becomes then switchable and technological applications appear at the horizon. Insight in the mechanisms of light-induced properties may eventually lead to new materials. We apply techniques from computational chemistry to obtain information about the light-induced electronic state and the deactivation to the final state. The interplay between the electronic structure and the movement of the nuclei plays an important role in the deactivation. We aim to go beyond the traditional static description by introducing the dynamics of the nuclear movement and obtain a more complete picture of the switching mechanism.

Selected publications

- Sole-Daura A, Notario-Estevez A, Carbo JJ, Poblet JM, **de Graaf C**, Monakhov KY & Lopez X 2019, 'How Does the Redox State of Polyoxovanadates Influence the Collective Behavior in Solution? A Case Study with [I@V18O42](q-) (q=3, 5, 7, 11, and 13)', *Inorganic Chemistry*, 58, 6, 3881 - 3894.
- Spivak M, Lopez X & **de Graaf C** 2019, 'Trends in the Bond Multiplicity of Cr-2, Cr-3, and Cr2M (M = Zn, Ni, Fe, Mn) Complexes Extracted from Multiconfigurational Wave Functions', *Journal Of Physical Chemistry A*, 123, 8, 1538 - 1547.
- Alias M, Alkhaldi ND, Reguero M, Ma L, Zhang J, **de Graaf C**, Huda MN & Chen W 2019, 'Theoretical studies on the energy structures and optical properties of copper cysteamine - a novel sensitizer', *Physical Chemistry Chemical Physics*, 21, 37, 21084 - 21093.
- Wu J, Sousa C & **de Graaf C** 2019, 'The Role of Vibrational Anharmonicity in the Computational Study of Thermal Spin Crossover', *Magnetochemistry*, 5, 3, 49.
- Ielasi G, Alcover-Fortuny G, Caselles J, **de Graaf C**, Orellana G & Reguero M 2019, 'Computer-aided design of short-lived phosphorescent Ru(II) polarity probes', *Dyes and Pigments*, 162, 168-176
- Sousa C, Alias M, Domingo A & **de Graaf C** 2019, 'Deactivation of Excited States in Transition-Metal Complexes: Insight from Computational Chemistry', *Chemistry, a European Journal*, 25, 5, 1152-1162.

Selected research activities

- Invited lectures at the American Physical Society meeting (Boston, USA), QBIC-V conference (Marseille, France) and the "Computation and understanding in quantum molecular science" conference (Toulouse, France)
- Grant for computer time on summit (#1 computer in the world) for development of the non-orthogonal configuration interaction code GronOR, a joint project of Oak Ridge National Laboratory, University of Groningen, University of Barcelona and Universitat Rovira i Virgili

ICREA MEMOIR 2019



Xavier de la Cruz

Vall d'Hebron Institut de Recerca (VHIR)
Life & Medical Sciences

My career revolves around the application of in silico tools to address biological questions. My Ph.D. was about the study of the protein structure principles underlying function, a work that I pursued in my stay at the NIH (1993-1997) and the UCL (1997-2000). After joining ICREA, this topic has focused most of my activities (PCB, 2001-2009; IBMB-CSIC, 2009-2012). However, my interests have gradually shifted towards the study of translational problems in biomedicine. In this direction, in 2012, I joined the Vall d'Hebron Institute of Research (VHIR), to enhance the applicability of our work on the pathogenicity of genetic variants, bringing it closer to healthcare stakeholders. Our efforts have recently (2018-2019) gained international recognition after our participation in the prestigious CAGI 5/ENIGMA contest, where we ranked in the second position in the groups' classification.

Research interests

Our main research aims at understanding the molecular basis of hereditary disease, integrating two complementary aspects: the molecular impact of causative variants and how genetic background regulates the propagation of this impact. At a technical level, to reach our objective, we integrate the results of the most advanced genomic experiments (single-cell, Hi-C, etc.) using state-of-the-art machine learning tools. To enhance the biomedical reach of our research, we work in collaboration with clinical groups from different hospitals. As a result of these efforts, we have recently made significant advances in understanding the functional effect of BRCA1/2 protein variants underlying hereditary breast and ovarian cancers. Finally, mention that we are also devoting an important part of our efforts to the fundamental study of epigenetic processes, to reach a full picture of which phenomena contribute to the generation of phenotype and, more precisely, of clinical phenotype.

Selected publications

- Padilla N, Moles-Fernandez A, Riera C, Montalban G, Özkan S, Ootes L, Bonache S, Diez O, Gutierrez-Enriquez S & **de la Cruz X** 2019, 'BRCA1- and BRCA2-specific in silico tools for variant interpretation in the CAGI 5 ENIGMA challenge', *Hum Mutat*, 40:1593 - 1611.
- Pappa S, Padilla N, Lacobucci S, Vicioso M, Alvarez de la Campa E, Navarro C, Marcos E, **de la Cruz X** & Martinez-Balbas MA 2019, 'PHF2 histone demethylase prevents DNA damage and genome instability by controlling cell cycle progression of neural progenitors', *P Natl Acad Sci USA*, 116:19464 - 19473.
- Marin O, Aguirre J & **de la Cruz X** 2019, 'Compensated pathogenic variants in coagulation factors VIII and IX present complex mapping between molecular impact and hemophilia severity', *Sci Rep*, 9, 9538.
- Sanchez-Mora C, Soler Artigas M, Garcia-Martinez I, Pagerols M, Rovira P, Richarte V, Corrales M, Fadeuilhe C, Padilla N, **de la Cruz X**, Franke B, Arias-Vasquez A, Casas M, Ramos-Quiroga J-A & Ribases M 2019, 'Epigenetic signature for attention-deficit/hyperactivity disorder: identification of miR-26b-5p, miR-185-5p, and miR-191-5p as potential biomarkers in peripheral blood mononuclear cells', *Neuropsychopharmacol*, 44:890 - 897.
- Blazquez-Bermejo C, Carreno-Gago L, Molina-Granada D, Aguirre J, Ramon J, Torres-Torronteras J, Cabrera-Perez R, Angel Martin M, Dominguez-Gonzalez C, **de la Cruz X**, Lombes A, Garcia-Arumi E, Marti R & Camara Y 2019, 'Increased dNTP pools rescue mtDNA depletion in human POLG-deficient fibroblasts', *Faseb J*, 33:7168 - 7179.
- Navio D, Rosell M, Aguirre J, **de la Cruz X** & Fernandez-Recio J 2019, 'Structural and Computational Characterization of Disease-Related Mutations Involved in Protein-Protein Interfaces', *Int J Mol Sci*, 20(7):1583.

Selected research activities

- Invited to give the Opening Lecture at the IX National Conference BIFI 2019.
- Participated (ranked 2nd) in the 5th Internat. CAGI/ENIGMA challenge for identifying risk variants in breast and ovarian cancer

ICREA MEMOIR 2019



Susana de la Luna

Centre de Regulació Genòmica (CRG)

Life & Medical Sciences

I obtained a BsC in Biology in 1985 at Universidad Autónoma de Madrid. For my PhD studies, I joined Juan Ortín's lab at the CBMSO and worked on the biology of influenza virus, characterizing molecularly and functionally the viral polymerase. After getting the PhD in 1989 at UAM, I stayed in Ortín's lab at CNB until 1994 when I moved to London to the lab of Nick La Thangue at the National Institute for Medical Research. There, I worked on the G1/S transition in the mammalian cell cycle focusing in the transcription factor E2F, with fellowships from the HFSO (at NIMR) and EU-Marie Curie (at Glasgow University) Programs. In 1998, I returned to Spain with a reintegration contract to join the HSA21/Down syndrome Research group led by Xavier Estivill (IRO, Barcelona). In 2002, I joined ICREA and established my own research group working on the functional characterization of the family of kinases DYRK and their relationship with disease at the Centre for Genomic Regulation-CRG.

Research interests

Protein kinases are central to all cellular processes in eukaryotes, and often linked to disease when they are altered. My group works on a family of protein kinases known as DYRK (dual-specificity tyrosine-regulated kinases), whose members -DYRK1A, DYRK1B, DYRK2, DYRK3, DYRK4- participate in the regulation of processes critical for cellular viability and homeostasis, and their dysregulation leads to disease in humans. Thus, DYRK1A overexpression in Down syndrome (DS) correlates with several DS pathological phenotypes. Moreover, mutations in one DYRK1A allele are associated with general growth retardation and microcephaly, defining a rare syndrome. DYRK1A alterations are also associated to tumor progression. My group aims at dissecting how DYRK activities are linked to human pathology. We are particularly interested on the DYRK-associated activities that impact on the regulation of expression programs either directly on chromatin or indirectly through modulation of signaling pathways.

Selected publications

- Luna J, Boni J, Cuatrecasas M, Bofill-De Ros X, Núñez-Manchón E, Gironella M, Vaquero EC, Arbones ML, **de la Luna S*** & Fillat C* 2019, 'DYRK1A modulates c-MET in pancreatic ductal adenocarcinoma to drive tumour growth', *Gut*, vol. 68, no. 8, pp 1465 - 1476. *, co-senior & co-corresponding authors.
- Roewenstrunk J, Di Vona C, Chen J, Borrás E, Dong C, Arató K, Sabidó E, Huen MSY & **de la Luna S** 2019, 'A comprehensive proteomics-based interaction screen that links DYRK1A to RNF169 and to the DNA damage response', *Scientific Reports*, vol. 9, no. 1, pp 6014-6028.
- Arranz J, Balducci E, Arató K, Sánchez-Elexpuru G, Najas S, Parras A, Rebollo E, Pijuan I, Erb I, Verde G, Sahun I, Barallobre MJ, Lucas JJ, Sánchez MP, **de la Luna S***, Arbonés ML* 2019, 'Impaired development of neocortical circuits contributes to the neurological alterations in DYRK1A haploinsufficiency syndrome', *Neurobiology of Disease*, vol. 127, pp 210-222. *, co-senior and co-corresponding authors.

Selected research activities

- Director of PhD thesis "DYRK1A in cancer: good or evil?. Defining properties of DYRK1A kinase as a novel tumor driver" by Jacopo Boni. Universitat Pompeu Fabra, June 2019.
- Director of PhD thesis "Exploring the role of DYRK1A in RNA polymerase III transcription: DYRK1A as a potential regulator of TFIIC" by Rianne Cort. Universitat Pompeu Fabra, December 2019.
- New grant awarded as Principal Investigator in La Marató call on Cancer "DYRK1A inhibition to remodel tumor stroma and sensitize immune checkpoint blockade therapies in pancreatic cancer".
- New grant awarded as Principal Investigator by the Fondation Jerome LEJEUNE "Organization of the DYRK1A interactome through docking domains: searching for novel targeting approaches".

ICREA MEMOIR 2019



Hugues de Riedmatten

Institut de Ciències Fotòniques (ICFO)
Engineering Sciences

Since Sep. 2010, Hugues de Riedmatten is an ICREA Research Professor and group leader in quantum optics at the Institute of Photonic Sciences (ICFO) in Barcelona. He obtained a Masters in Physics from the Swiss Federal Institute of Technology (EPFL) in 1999, and a PhD in experimental quantum optics from the University of Geneva in 2003, for his work on long distance quantum communication in optical fiber. He was then postdoctoral scholar at Caltech, where he worked on initial demonstrations of quantum networks with cold atomic ensembles and single photons. In 2006, he was appointed senior researcher at the Univ. of Geneva, where he led the solid state quantum memory activities. He has published more than 90 articles in peer-reviewed journals and has given over 60 talks, both in international conferences and in invited seminars. He was the recipient of the Barcelona City Prize 2017, of an ERC Starting Grant and of a Frontier Research grant from the US Moore Foundation.

Research interests

Hugues de Riedmatten leads the Quantum Photonics group at ICFO. His research interests are in quantum information science (QIS) and quantum optics. QIS is a research field that aims at controlling quantum coherence in light and matter in order to enable new information processing capabilities impossible with classical resources. He is interested in the quantum control of light matter interaction between single photons and atomic ensembles implemented with rare-earth doped solids and cold atomic gases. Other research lines include quantum non-linear optics with Rydberg atoms, and the detection and manipulation of single ions in the solid-state. The goal is to develop the quantum technology to implement quantum information networks and quantum repeaters. A more fundamental goal is to enable the observation of fascinating quantum effects, such as entanglement, with distant material systems and to explore the limits of quantum coherence in complex material systems.

Selected publications

- Kutluer K, Distant E, Casabone B, Duranti S, Mazzera M & **de Riedmatten H** 2019, 'Time Entanglement between a Photon and a Spin Wave in a Multimode Solid-State Quantum Memory', *Physical Review Letters*, 123, 3, 030501.
- Seri A, Lago-Rivera D, Lenhard A, Corrielli G, Osellame R, Mazzera M & **de Riedmatten H** 2019, 'Quantum Storage of Frequency-Multiplexed Heralded Single Photons', *Physical Review Letters*, 123, 8, 080502.
- Serrano D, Deshmukh C, Liu S, Tallaie A, Ferrier A, **de Riedmatten H** & Goldner P 2019, 'Coherent optical and spin spectroscopy of nanoscale Pr³⁺ : Y₂O₃', *Physical Review B*, 100, 14, 144304.

Selected research activities

Selected Invited talks

- *Quantum Repeaters*, Inside Quantum Technology Europe, The Future of Quantum Computing, Quantum Networking and Quantum Sensors, October 29-30, 2019, The Hague, NL
- *Photonic Quantum Memories and Interfaces*, Invited Focus Talk at the first DPG fall meeting, September 25th 2019, Freiburg Germany
- *Multiplexed Solid State Quantum Memories*, invited talk at the Photonics North conference, May 21st 2019, Québec, Canada
- *Multiplexed Spin Photon Interfaces in Solid State Quantum Memories*, Quantum Information and Measurements (QIM2019), April 5th 2019, Rome, Italy

Other Activities :

- Program committee member, CLEO-IQEC Europe 2019, SPIE Quantum Technologies 2020, Chairman QTech 2020, Barcelona
- Member of the European Quantum Flagship Strategic Research Agenda working group
- Work package Leader, Quantum Flagship project Quantum Internet Alliance

ICREA MEMOIR 2019



Gustavo Deco

Universitat Pompeu Fabra (UPF)
Engineering Sciences

Gustavo Deco is Research Professor at ICREA and Professor (Catedrático) at the Pompeu Fabra University where he leads the Computational Neuroscience group. He is Director of the Center of Brain and Cognition (UPF). In 1987 he received his PhD in Physics for his thesis on Relativistic Atomic Collisions. In 1987, he was a postdoc at the University of Bordeaux in France. From 1988 to 1990, he was postdoc of the Alexander von Humboldt Foundation at the University of Giessen in Germany. From 1990 to 2003, he led the Computational Neuroscience Group at Siemens Corporate Research Center in Munich, Germany. He obtained in 1997 his Habilitation (maximal academical degree in Germany) in Computer Science (Dr. rer. nat. habil.) at the Technical University of Munich for his thesis on Neural Learning. In 2001, he received his PhD in Psychology at the Ludwig-Maximilians-University of Munich. He was awarded an ERC Advanced Grant.

Research interests

Perceptions, memories, emotions, and everything that makes us human, demand the flexible integration of information represented and computed in a distributed manner. Normal brain functions require the integration of functionally specialized but widely distributed brain areas. The main aim of my research is to elucidate precisely the computational principles underlying higher brain functions and their breakdown in brain diseases. My research allows us to comprehend the mechanisms underlying brain functions by complementing structural and activation based analyses with dynamics. We integrate different levels of experimental investigation in cognitive neuroscience (from the operation of single neurons and neuroanatomy, neurophysiology, neuroimaging and neuropsychology to behaviour) via a unifying theoretical framework that captures the neural dynamics inherent in the computation of cognitive processes.

Selected publications

- **Deco G**, Cruzat J, Cabral J, Tagliazucchi E, Laufs H, Logothetis NK & Kringelbach ML 2019, 'Awakening: Predicting external stimulation to force transitions between different brain states', *Proceedings Of The National Academy Of Sciences Of The United States Of America*, 116, 36, 18088 - 18097.
- **Deco G**, Cruzat J, Kringelbach ML., 2019, 'Brain songs framework used for discovering the relevant timescale of the human brain', *Nature Communications*, 10(1):583.
- Wang P, Kong R, Kong X, Liégeois R, Orban C, **Deco G**, van den Heuvel MP, Thomas Yeo BT 2019, 'Inversion of a large-scale circuit model reveals a cortical hierarchy in the dynamic resting human brain', *Science Advances*, 5(1):eaat7854.
- Hahn G, Skeide MA, Mantini D, Ganzetti M, Destexhe A, Friederici AD, **Deco G** 2019, "A new computational approach to estimate whole-brain effective connectivity from functional and structural MRI, applied to language development", *Science Reports* 11;9(1):8479.
- Donnelly-Kehoe P, Saenger VM, Lisofsky N, Kühn S, Kringelbach ML, Schwarzbach J, Lindenberger U, **Deco G** 2019, "Reliable local dynamics in the brain across sessions are revealed by whole-brain modeling of resting state activity", *Human Brain Mapping*, 40(10):2967-2980.
- Demirtaş M, Ponce-Alvarez A, Gilson M, Hagmann P, Mantini D, Betti V, Romani GL, Friston K, Corbetta M, **Deco G** 2019, 'Distinct modes of functional connectivity induced by movie-watching', *Neuroimage*, 184:335-348.
- Stevner ABA, Vidaurre D, Cabral J, Rapuano K, Nielsen SFV, Tagliazucchi E, Laufs H, Vuust P, **Deco G**, Woolrich MW, Van Someren E & Kringelbach ML 2019, 'Discovery of key whole-brain transitions and dynamics during human wakefulness and non-REM sleep', *Nature Communications*, 10, 1035.
- Grabenhorst F, Báez-Mendoza R, Genest W, **Deco G**, Schultz W. 2019, "Primate Amygdala Neurons Simulate Decision Processes of Social Partners", *Cell*, 177(4):986-998.

ICREA MEMOIR 2019



Hernando A. del Portillo

Institut d'Investigació en Ciències de la Salut Germans Trias i Pujol (IGTP) & Institut de Salut Global Barcelona (ISGlobal)
Life & Medical Sciences

I studied at the University of Georgia where I received my PhD in 1985 followed by two WHO-postdoctoral trainings at the New York University Medical Centre and the Institut Pasteur where I specialized in molecular biology of malaria. Next, I consolidated an interdisciplinary malaria research group at the University of Sao Paulo, Brazil. In 1990, I did a sabbatical year at the Center for Molecular Biology (ZMBH), University of Heidelberg. In 2007, I became an ICREA Research Professor and joined the Barcelona Institute for Global Health, and in 2016 co-joined the Institut d'Investigació Germans Trias i Pujol. Cornerstones of this research activity are the discovery of the largest multigene virulent family of human malaria parasites and the discovery that reticulocyte-derived exosomes from infections act as intercellular communicators and can be used as vaccines and biomarkers.

Research interests

My main research area is the biology of *Plasmodium vivax*, a neglected human malaria parasite responsible for millions of yearly clinical cases. We are presently looking for mechanistic insights of the role of reticulocyte-derived exosomes, nanovesicles of endocytic origin, in signalling the spleen and the bone marrow to unveil molecular basis of anaemia and splenomegaly. To pursue bone marrow and spleen studies, we are implementing the usage of humanized mouse models and organs-on-chip. To use this information in novel control strategies, we are exploring the use of reticulocyte-derived exosomes as a novel vaccine against *P. vivax* as well as novel biomarkers of liver hypnozoite asymptomatic infections. To this end, we are immortalizing cell lines and constructing POC microfluidic devices. Last, to rapidly move this field to translation, we are pursuing the development of exosome-based vaccines against infectious diseases of veterinary importance.

Selected publications

- Montaner-Tarbes S, **del Portillo Hernando A**, Montoya M & Fraile L 2019, 'Key Gaps in the Knowledge of the Porcine Respiratory Reproductive Syndrome Virus (PRRSV)', *Frontiers In Veterinary Science*, 6, 38.
- Tubita V, Segui-Barber J, Lozano J, Banon-Maneus E, Rovira J, Cucchiari D, Moya-Rull D, Oppenheimer F, **Del Portillo H**, Campistol J, Diekmann F, Ramirez-Bajo JM & Revuelta I 2019, 'Effect of immunosuppression in miRNAs from extracellular vesicles of colorectal cancer and their influence on the pre-metastatic niche', *Scientific Reports*, 9, 11177.

Selected research activities

Scientific Organizing Committee: (i) 5th GEIVEX Symposium. Granada, Spain November 5-8. 2019; (ii) International Conference on *Plasmodium vivax* Research (ICPVR) Paris June 26-28. 2019.

Invited Speaker: (i) Malaria Vaccines for the World (MVW), Oxford, UK; (ii) German Society of Extracellular Vesicles (GSEV), Frankfurt Germany.

Ph.D. Thesis Co-Director: Miriam Díaz-Varela, "Exploration of Extracellular Vesicles as a Novel Approach for Antigen Discovery and Vaccine Development against *Plasmodium vivax* Malaria". University of Barcelona.

Industrial Ph.D. Thesis Co-Director: Sergio Montaner-Tarbes, "Assessment of Extracellular vesicles and their applicability in diseases of veterinary importance". University of Lleida and Innovex Therapeutics S.L.

ICREA MEMOIR 2019



Luciano Di Croce

Centre de Regulació Genòmica (CRG)

Life & Medical Sciences

1996 PhD Dept. Cellular and Developmental Biology, University of Rome, Italy. 1996-2000 Postdoctoral work at the University of Marburg, Germany. 2000-2002 Senior Investigator at the European Institute of Oncology, Milan, Italy. 2003 Group Leader at the Centre de Regulació Genòmica (CRG), Barcelona, Spain. Research Professor, Institutació Catalana de Recerca i Estudis Avançats (ICREA). 2013 Elected EMBO Member. Luciano Di Croce is the coordinator of a new Marie Curie ITN project entitled “Chromatin architecture and Design - ChromDesign” (GA 813327) granted by the European Commission’s H2020-MSCA-ITN-2018 program.

Research interests

Epigenetic changes, such as histone modifications and DNA methylation, are common alterations in cancer cells. Our laboratory is addressing the molecular basis of epigenetic alterations during the early phase of the tumorigenesis process. The expression of onco-proteins in hematopoietic precursor cells provides a unique model system to follow the molecular step from a normal to a transformed cell on the level of gene transcription, nuclear structure and chromatin. More recently, Di Croce lab is interested in understanding how variations in the assembly of the Polycomb complexes occur and influence mES cell differentiation and animal development.

Selected publications

- Aranda S, Alcaine-Colet A, Blanco E, Borrás E, Caillot C, Sabido E & **Di Croce L** 2019, ‘Chromatin capture links the metabolic enzyme AHCY to stem cell proliferation’, *Science Advances*, 5, 3, eaav2448.
- Ji Y, Fioravanti J, Zhu W, Wang H, Wu T, Hui J, Lacey NE, Gautam S, Le Gall JB, Yang X, Hocker JD, Escobar TM, He S, Dell’Orso S, Hawk NV, Kapoor V, Telford WG, **Di Croce L**, Muljo SA, Zhang Y, Sartorelli V & Gattinoni L 2019, ‘miR-155 harnesses Phf19 to potentiate cancer immunotherapy through epigenetic reprogramming of CD8(+) T cell fate’, *Nature Communications*, 10, 2157.
- Castaño J, Aranda S, Bueno C, Calero-Nieto FJ, Mejia-Ramirez E, Blanco E, Wang X, Prieto C, Zabaleta L, Rovira M, Göttgens B, **Di Croce L**, **Menendez P**, **Raya A**, Giorgetti A 2019, ‘GATA2 promotes hematopoietic development and represses cardiac differentiation of human mesoderm’. *Stem Cell Reports*, 13, 515-529.
- Aranda, Sergi; **Di Croce, Luciano** 2019, ‘A lid for the marker’, *Nature*, 573, 7772, 38 - 39.
- Di Carlo V, Mocavini I, **Di Croce L**. 2019, ‘Polycomb complexes in normal and malignant hematopoiesis’, *J Cell Biol*, 218 (1): 55.

Selected research activities

Organizer of several international conferences, including for 2019 ChromDesign meeting, Copenhagen, Denmark
 Since 2015: co-organizer of the “The Barcelona Institute of Science and Technology” (BIST) Master school
 Since 2014, co-organizer of the Cold Spring Harbour Laboratories Summer course on ‘Chromatin, Epigenetics and Transcription’
 Since 2012 Chair of the Graduate Programme at CRG
 ERC Panel Member for 2016-2022
 Human Frontier Science Program (HFSP) Panel Member for 2018-2020
 Since 2018 Expert for the Italian Ministry of Health (field of Biomedicine)
 EMBO Member (since 2013)

ICREA MEMOIR 2019



Julian di Giovanni

Universitat Pompeu Fabra (UPF)

Social & Behavioural Sciences

Julian di Giovanni is an ICREA Research Professor at Universitat Pompeu Fabra, the Deputy Director for Research and a Research Professor at the Barcelona GSE, a Research Associate at the CREI, and a Research Fellow of the CEPR. He worked for the Research Department of the IMF from 2004-2013. He has been a Visiting Assistant Professor at the University of Toronto, and a Visiting Scholar at numerous central banks and international organizations. He was awarded an International Incoming Fellowship from the European Research Council Marie Curie Actions (2014), and a European Research Council Consolidator Grant (2016). He has published in the American Economic Review, Econometrica, Journal of Political Economy, Journal of the European Economic Association, and other leading economic journals. He received his PhD in Economics at the University of California, Berkeley in 2004.

Research interests

I work in international economics and macroeconomics broadly defined, with a recent focus on empirical work using big data. The underlying aim in the majority of my work is to provide a better understanding of how different forms of cross-country integration impact domestic economic outcomes. One strand of my current research studies how shocks at the firm transmit across countries via production linkages, and the implications for macroeconomic interdependence. This work builds on past research that studies the importance of micro shocks and large firms in driving macroeconomic fluctuations. I have also worked on the transmission of monetary shocks across borders, and I am currently involved in projects studying (i) the impact of the global financial cycle on local credit markets in emerging markets, and (ii) the impact of government procurement projects on allocative efficiency and aggregate productivity.

ICREA MEMOIR 2019



Margarita Díaz-Andreu

Universitat de Barcelona (UB)

Humanities

ICREA Research Professor, Margarita Díaz-Andreu's career has mainly been developed in the UK and Catalonia. She worked at Durham University from 1996 to 2011, leaving her position as a Reader to move to the University of Barcelona in January 2012. Since then all her efforts have been directed at promoting the internationalisation of Catalan research. Since her arrival she has published ten books and 44 peer-reviewed articles. She is currently leading three projects, R+D+i, Palarq, ERC, the latter sustaining nine PhD and post-doctoral positions. She has also been successful in a JPI grant to start soon. She is also supervising three other students with personal grants, including a Marie Skłodowska-Curie fellowship. Since her arrival in Barcelona eight years ago, four students have completed their PhDs and three of them are now, or will be soon, in research careers.

Research interests

The three main research areas in which Díaz-Andreu has been active and has led research groups in the last few years are still in place: prehistoric art with an emphasis on archaeoacoustics (ERC Artsoundscapes project, Palarq project), the history of archaeology (interarqweb.wordpress.com) and heritage (gapp.cat and upcoming EU-JPI CURBATHERI project). Her work in archaeoacoustics is highly innovative and she leads an interdisciplinary group of archaeologists, acoustic engineers, ethnomusicologists and psychologists. For this project, in addition to working in the Western Mediterranean area, in 2019 she has undertaken fieldwork Altai (Siberia). In the history of archaeology the high point has been the completion of a manuscript on the history of archaeological tourism to be published by Springer. She will soon be leading the Spanish team of a project on heritage conservation. In all these areas she is leading groups of academics and students (GAPP, InterArq, Artsoundscapes).

Selected publications

- **Díaz-Andreu M** 2019. *Arqueologia crítica e humanista*. São Paulo, Fonte Editorial. 211 pages.
- **Díaz-Andreu M** & Mattioli T 2019. 'Rock Art, music and acoustics: a global overview'. In B. David and I. J. McNiven (eds.), *The Oxford Handbook of the Archaeology and Anthropology of Rock Art*: 503-528, Oxford: Oxford University Press.
- **Díaz-Andreu M**, Hameau Ph & Mattioli T 2019, 'Des sites à voir et à entendre: les abris à motifs schématiques de la falaise de Baume Brune (Vaucluse)', *Anthropologie*, 123, 1, 66 - 99.
- **Díaz-Andreu M**, Farina A, Armelloni E, Coltofean L, Picas M & Mattioli T. 2019. 'Acoustic effects at prehistoric landscapes: an archaeoacoustics analysis of rock art sites from Western Mediterranean'. In Vorländer, M. and Fels, J. (eds.), *Proceedings of the 23rd International Congress on Acoustics*, 9 to 13 September 2019 in Aachen, Germany. Berlin, German Acoustical Society: 281-287.
- **Díaz-Andreu M** 2019. Prefacio. In Domínguez, L.S. et al. (eds.), *Arqueología de Contacto en Latinoamérica*. São Luís, Universidade Federal do Maranhão (EDUFMA): 9-15.

Selected research activities

- Membership of scientific committees: EAA Meeting (Bern); ASP VI congress (Alicante)
- Vice-president of the UISPP History of Archaeology Commission
- Advisory panels & evaluation: Caixa, COST, AEI, Ikerbasque.
- Social impact in journals & radio programmes

Conference and talks

- Keynote speaker: heritage conference held at the Museu do Côa (Portugal)
- Garrod Day Talk. University of Cambridge.
- Discussant. Session: From landscape archaeology to soundscape archaeology. EAA (Bern)
- Session organised at the EAA; workshop organised in Barcelona
- Participation in international conferences and workshops: SAA (Albuquerque); Music Archaeology (London), U. de los Andes (Sep), Bologna (Oct); VII IAPP, Torino
- Participation in national conferences and workshops: Residència d'Investigadors; ASP VI; Montblanc; UCM

ICREA MEMOIR 2019



Francisco Javier Doblas-Reyes

Barcelona Supercomputing Center - Centro Nacional de Supercomputación (BSC - CNS)

Experimental Sciences & Mathematics

I started working on climate variability at the Universidad Complutense de Madrid (Spain) in 1992, where I did my PhD. I then worked as a postdoc in MétéoFrance (Toulouse, France), at the Instituto Nacional de Técnica Aeroespacial (Torrejón, Spain) and for ten years at the European Centre for Medium-Range Weather Forecasts (Reading, UK). I led the Climate Forecast Unit at the Institut Català de Ciències del Clima (IC3) from 2010 to 2015. I am currently the head of the Department of Earth Sciences of the Barcelona Supercomputing Center (BSC-CNS). The Department hosts more than 100 engineers, physicists, mathematicians and social scientists who try to bring the latest developments in supercomputing and data analysis to provide the best information and services on climate and air quality. I am author of more than 170 peer-reviewed papers (h index 50, scopus), member of several international scientific committees and supervisor of several postdocs, engineers and PhD students.

Research interests

Global climate is highly variable, which implies that there is much more to understand than just climate change. Climate prediction aims at predicting the variations of climate at different time scales, ranging from one month to several years beyond the start of the forecast. I use an Earth system model based on differential equations to explore the limits of the forecast quality over different parts of the globe, in particular over Africa, South America, the Arctic and Southern Europe. I develop this model to explore the advantages of increasing its resolution to better reproduce the physical processes at the origin of climate variability. I also use statistical techniques to adapt the resulting climate information to specific user needs. Improving the application of this climate information to different socio-economic sectors, with a special focus on energy and disaster risk management, is one of my main targets to try to make a change in both society and the economy.

Selected publications

- Terrado M, Lledo L, Bojovic D, Lera St Clair A, Soret A, **Doblas-Reyes FJ**, Manzanar R, San-Martin D, Jimenez CI 2019, 'The Weather Roulette: A Game to Communicate the Usefulness of Probabilistic Climate Predictions', *Bulletin Of The American Meteorological Society*, 100, 10, 1909 – 1921.
- Smith DM, Eade R, Scaife AA, Caron L-P; Danabasoglu G, DelSole TM, Delworth T, **Doblas-Reyes FJ**, Dunstone NJ, Hermanson L, Kharin V, Kimoto M, Merryfield WJ, Mochizuki T, Mueller WA, Pohlmann H, Yeager S & Yang X 2019, 'Robust skill of decadal climate predictions', *Npj Climate And Atmospheric Science*, 2, UNSP 13.
- Solaraju-Murali B, Caron L; Gonzalez-Reviriego N & **Doblas-Reyes FJ** 2019, 'Multi-year prediction of European summer drought conditions for the agricultural sector', *Environmental Research Letters*, 14, 12, 124014.
- Kushnir Y, Scaife AA, Arritt R, Balsamo G, Boer G, **Doblas-Reyes F**, Hawkins E, Kimoto M, Kolli RK, Kumar A, Matei D, Matthes K, Mueller WA, O'Kane T, Perlwitz J, Power S, Raphael M, Shimpo A, Smith D, Tuma M & Wu B 2019, 'Towards operational predictions of the near-term climate', *Nature Climate Change*, 9, 2, 94 – 101.
- Bellprat O, Guemas V, **Doblas-Reyes F** & Donat MG 2019, 'Towards reliable extreme weather and climate event attribution', *Nature Communications*, 10, 1732.

Selected research activities

- Coordinating lead author of the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC)
- Co-chair of the World Climate Research Programme (WCRP) Modeling Advisory Council.
- Responsible of the Spanish contribution to the WCRP Coupled Model Intercomparison Project (CMIP6)
- Co-author of 22 peer-reviewed publications in 2019.

ICREA MEMOIR 2019



Inés Domingo

Universitat de Barcelona (UB)

Humanities

Inés is ICREA Research professor in the Section of Prehistory and Archaeology (Universitat de Barcelona) since 2010, and Vice-president of the World Archaeological Congress (2017-2020). Through her current and previous positions at the Universities of Valencia (Spain) and Flinders (Australia) she explores the 'Archaeologies' of rock art from a multidisciplinary approach. Her performance in archaeology has earned her a number of academic awards and distinctions: Honorary Associate Researcher at the Dep. of Archaeology, Flinders University (Australia) since 2009; Blaze O'Connor memorial award (WAC, Jordan, 2013); Honorary appointment as guest professor at HeTao University (Inner Mongolia, China) (2010); Honorary Research Fellow of Inner Mongolia Rock Art Protection and Research Association, and Inner Mongolia Rock Art Research Academy (2010) and a PhD University Award (Premio extraordinario de doctorado) (2006).

Research interests

My current research projects aim at bridging the gap between scientific and heritage approaches to one of Europe's most extraordinary bodies of rock art, awarded UNESCO World Heritage Status in 1998: Levantine rock art. This research has been recently awarded an ERC CoG (2018). Her primary aim is to achieve an holistic view of this art by combining a multidisciplinary (Archaeology, Heritage Science, IT and Ethnoarchaeology) and a multiscale approach (from microanalysis to landscape perspectives) to: a. Redefine LRA through new dating techniques and analytical methods to understand the creative process. b. Use this rock art tradition as a proxy to raise new questions of global interest on the evolution of creative thinking and human cognition. c. Define best practices and protocols for open air rock art conservation and management.

Selected publications

- **Domingo Sanz I**, García-Argüelles P, Nadal J, Fullola JM^a, Lerma JL & Cabrelles M 2019, 'Humanizing European Palaeolithic Art: New Visual Evidence of Human/Bird Interactions at L'Hort de la Boquera Site (Margalef de Montsant, Tarragona, Spain)', *L'Anthropologie* vol. 123, no. 1, January-March 2019, pp. 1-18
- **Domingo I** 2019, 'Arte rupestre y tecnologías digitales: una revisión actualizada'. In García G. and Barciela, V. (coords.) *Sociedades prehistóricas y manifestaciones artísticas. Imágenes, nuevas propuestas e interpretaciones*. Colección Petracos, 2. Publicaciones INAPH: 201-208.
- Macarulla A, Román D & **Domingo I** 2019, 'Una nueva mirada al arte Levantino de Racó de Nando (Benassal, Castelló). In García G. and Barciela, V. (coords.) *Sociedades prehistóricas y manifestaciones artísticas. Imágenes, nuevas propuestas e interpretaciones*. Colección Petracos, 2. Publicaciones INAPH: 149-154.
- Brady L, Hampton J & **Domingo I** 2019, 'Recording rock art: Strategies, Challenges, and embracing the Digital Revolution. In David B & McNiven I (eds) *The Oxford Handbook of the Archaeology and Anthropology of Rock Art*. Oxford University Press, pp. 763-786.

ICREA MEMOIR 2019



Ruben Durante

Universitat Pompeu Fabra (UPF)

Social & Behavioural Sciences

I am ICREA Research Professor in the Department of Economics at Universitat Pompeu Fabra (UPF). I am also Affiliated Faculty of the Barcelona GSE and of the Institute of Political Economy and Governance, and Research Affiliate of the Centre for Economic and Policy Research. I hold master degrees from Sorbonne and Brown University and a Ph.D. from Brown University. Prior to joining UPF, I was post-doctoral fellow at Yale University, and assistant and then associate professor of economics at Sciences Po (Paris). My work has been published in some of the world's most renowned reviews in economics including the Journal of Political Economy, the American Economic Review, the American Economic Journal: Applied Economics, the Economic Journal, and the Journal of the European Economic Association. In 2018 I was awarded a five-year 1.5M€ starting grant from the European Research Council for a project on "Independence and Quality of Mass Media in the Internet Age".

Research interests

My fields of research are political economy, media economics, and economic development. My research focuses primarily on the functioning and impact of traditional and new media in both mature and consolidating democracies. Specifically, I examine various aspects of the multifaceted relationship between media, voters, policy-makers and special interests, with particular regard to the ability of an independent press to keep both policy-makers and private interests accountable. Some of the questions tackled in my work include: i) the impact of entertainment television on viewers' socio-political preferences, ii) the strategies used by policy-makers to minimize public scrutiny of their actions, iii) the impact of the Internet on political participation, iv) the influence of corporate interests on the policy-making process, v) the determinants of beliefs about fairness and preferences for redistribution, vi) the design of policies to alleviate inter-ethnic tensions in Sub-Saharan Africa.

Selected publications

- **Durante R**, Pinotti P & Tesei A 2019, "The Political Legacy of Entertainment TV", *American Economic Review*, 109 (7): 2497-2530.

ICREA MEMOIR 2019



Turgut Durduran

Institut de Ciències Fotòniques (ICFO)
Engineering Sciences

November 2015 – ICREA Research Professor; February 2009 – Group Leader – Medical Optics. Dr. Turgut Durduran is a group leader at ICFO. He founded the ICFO-Medical Optics group in 2009 when he joined ICFO and in 2014 he received his tenure and became a professor/group leader. In 2015, he became an ICREA (Catalan Institution for Research and Advanced Studies) Professor at ICFO. Over the years, the group has grown exponentially, currently, with a large number of PhD students, post-docs and engineers collaborating with about a dozen hospitals and biomedical institutes world-wide. He has participated in many advisory boards, grant review boards ranging from the National Institutes of Health to the review of the FP7 projects at the European Commission. He has authored over hundred peer-reviewed papers and delivered over a hundred and fifty invited talks in international conferences and colloquia.

Research interests

Turgut is a physicist who is an expert in biomedical optics. He studies the physics of photon propagation in biological tissues and builds machines that can see through our bodies like never before. His group is highly multi-disciplinary: physicists, engineers and medical doctors, and collaborates closely with hospitals and biomedical centers all around the world. Turgut's current focus is the measurement of hemodynamics and oxygen metabolism. His dream is to see these devices becoming standard clinical equipment for the doctors of the future.

Selected publications

- Gregori-Pla C, Blanco I, Camps-Renom P, Zarak P, Serra I, Cotta G, Maruccia F, Prats-Sanchez L, Martinez-Domeño A, Busch D, Giacalone G, Martí-Fàbregas J, **Durduran T** & Delgado-Mederos R, 'Early microvascular cerebral blood flow response to head-of-bed elevation is related to outcome in acute ischemic stroke', *Journal of Neurology*, 266, 4, 990 – 997.
- Dragojevic T, Vidal-Rosas EE, Hollmann JL, Zappa F, Justicia C & **Durduran T** 2019, 'Functional high-density speckle contrast optical tomography (SCOT) in small animals and in human brain', *Journal Of Cerebral Blood Flow And Metabolism*, 39, 477 – 477.
- Mireles MA, Morales-Dalmau J, Johansson JD, Vidal EE, Vilches C, Martínez-Lozano M del Mar, Sanz V, De Miguel I, Casanovas O, **Quidant R** & **Durduran T** 2019, 'Non-invasive and quantitative *in vivo* monitoring of gold nanoparticle concentration and tissue hemodynamics by diffuse optical spectroscopies', *Journal Nanoscale*, 11, 12, 5595 – 5606.
- Giovannella M, Andresen B, Andersen JB, El-Mahdaoui S, Contini D, Spinelli L, Torricelli A, Greisen G, **Durduran T**, Weigel UM, 2019, 'Validation of diffuse correlation spectroscopy (babylux device) against O-15-water PET for regional cerebral blood flow measurement in neonatal piglets', *Journal Of Cerebral Blood Flow And Metabolism*, 39, 185 – 186.
- Gregori-Pla C, Delgado-Mederos R, Cotta G, Giacalone G, Maruccia F, Avtzi S, Prats-Sánchez I, Martínez-Domeño A, Camps-Renom P, Martí-Fàbregas J, **Durduran T** & Mayos M 2019, 'Microvascular cerebral blood flow fluctuations in association with apneas and hypopneas in acute ischemic stroke', *Neurophotonics*, 6(2), 025004.
- Dragojevic T, Vidal Rosas EE, Hollmann JL, Culver JP, Justicia C & **Durduran T** 2019, 'High-density speckle contrast optical tomography of cerebral blood flow response to functional stimuli in the rodent brain' *Neurophotonics*, 6(4), 045001.

ICREA MEMOIR 2019



Konstantin Dyakonov

Universitat de Barcelona (UB)

Experimental Sciences & Mathematics

Born on 30 May 1964 in Leningrad, USSR (=St. Petersburg, Russia). Graduated from Leningrad State University in 1986. PhD in Mathematics from St. Petersburg State University, 1991. Previous long-term positions: - Institute of Analysing Devices, Leningrad, USSR (1986-1989), researcher; - St. Petersburg University of Electrical Engineering, St. Petersburg, Russia, assistant professor (1989-1992) and then associate professor (1992-1998) in the Department of Mathematics; - Universidad de La Laguna, Tenerife, Spain (1996-1997), visiting professor; - Universitat de Barcelona, Spain (1999-2001), visiting research fellow; - Steklov Institute of Mathematics, St. Petersburg Branch (POMI), St. Petersburg, Russia (1998-2007), senior researcher; - Universitat de Barcelona, Spain (2003-2006), Ramón y Cajal researcher. Prizes: Young Scientist Award in the area of Mathematics from Academia Europaea (for fSU researchers), 1998.

Research interests

Most of my research is devoted to spaces of analytic functions of a complex variable. Typically, the functions live on the unit disk and are well-behaved, in a sense, near/on its boundary, the unit circle. Various specific interpretations of “well-behaved”, such as a natural growth restriction or some kind of boundary smoothness, give rise to important function spaces with nice properties, and I have studied some of these. I am also concerned with certain types of linear operators (e.g., the so-called Toeplitz and Hankel operators) acting on such spaces.

Selected publications

- **Dyakonov KM** 2019, ‘Boundary Gauss–Lucas type theorems on the disk’, *Journal d’Analyse Mathématique*, vol. 138, no. 2, pp. 717-739.
- **Dyakonov KM** 2019, ‘An extremal problem for functions annihilated by a Toeplitz operator’, *Analysis and Mathematical Physics*, vol. 9, no. 3, pp. 1019-1029.
- Dmitrishin D, **Dyakonov K** & Stokolos A 2019, ‘Univalent polynomials and Koebe’s one-quarter theorem’, *Analysis and Mathematical Physics*, vol. 9, no. 3, pp. 991-1004.

Selected research activities

- * Problem solving classes in Complex Analysis, taught at the UB in February-June 2019.
- * Functional Analysis and PDE, a graduate course taught at the UB (as part of *Màster de Matemàtica Avançada*) in September-December 2019.
- * Problem solving classes in Mathematical Analysis, taught at the UB in September-December 2019.
- * Editorial boards: Abstract and Applied Analysis (until November 2019), Journal of Function Spaces, Proceedings of the Institute of Applied Mathematics and Mechanics (NAS of Ukraine).
- * A number of invited talks at various conferences and seminars in Russia, France and Spain.
- * Served as referee for a number of mathematical journals, such as C. R. Math. Acad. Sci. Paris, Studia Math., St. Petersburg Math. J., Anal. Math. Phys.

ICREA MEMOIR 2019



Majid Ebrahim-Zadeh

Institut de Ciències Fotòniques (ICFO)

Engineering Sciences

Majid Ebrahim-Zadeh received his PhD from St Andrews, UK, in 1989. He was a Royal Society Research Fellow from 1993 to 2001, and appointed ICREA Professor at ICFO in 2003. He has over 600 publications, including 205 journal papers, 105 invited talks, 18 invited book chapters and reviews, and has edited 2 books. He has chaired 7 international conferences, served on editorial board of leading journals (*Optica*, *Optics Letters*, *J. Opt. Soc. Am. B*, *IEEE Photonics Journal*), various international scientific councils, advisory boards and steering committees of major international conferences, and on evaluation panels of several funding agencies including ERC Advanced Grants. He is a director and chief scientist of Radiantis, a Fellow of OSA and SPIE, recipient of the Royal Society Merit Award (1995, 1999), Innova Prize, Spain (2004), and Berthold Leibinger Innovation Prize, Germany (2010).

Research interests

His research is focused on the development of new technologies for the generation and manipulation of coherent light in new spectral and temporal domains, which are inaccessible to conventional lasers. The main goal is the exploitation of nonlinear optics, in particular optical parametric processes, to produce laser radiation with unique spectral and temporal flexibility, and applications of this technology to biomedicine, frequency synthesis, spectroscopy, optical microscopy and imaging. Another important focus of his research is commercial enterprise and technology transfer to the industrial sector, where he has successfully transformed research results from his laboratory at ICFO into cutting-edge photonic products through the creation of a spin-off company, Radiantis, in Barcelona, in 2005. Radiantis is a leading manufacturer of state-of-the-art frequency conversion systems, and a certified supplier to one of the largest laser companies in the world.

Selected publications

- O'Donnell, Callum F.; Kumar, S. Chaitanya; **Ebrahim-Zadeh, M.** 2019, *APL Photonics* 4, 5, 050801.
- Ashik, A. S.; O'Donnell, Callum F.; Chaitanya Kumar, S.; **Ebrahim-Zadeh, M.**; Tidemand-Lichtenberg, P.; Pedersen, C. 2019, *Photonics Research* 7, 7, 783-791.
- Sharma, Varun; Kumar, S. Chaitanya; Aadhi, A.; Ye, H.; Samanta, G. K.; **Ebrahim-Zadeh, M.** 2019, *Scientific Reports* 9, 9578.
- O'Donnell, Callum F.; Kumar, S. Chaitanya; Schunemann, P. G.; **Ebrahim-Zadeh, M.** 2019, *Optics Letters* 44, 18, 4570-4573.
- Parsa, S.; Chaitanya Kumar, S.; Nandy, Biplob; **Ebrahim-Zadeh, M.** 2019, *Optics Express* 27, 18, 25436-25444.
- Devi, Kavita; Padhye, A.; Sukeert; **Ebrahim-Zadeh, M.** 2019, *Optics Express* 27, 17, 24093-24104.
- Sharma, Varun; Samanta, G. K.; Kumar, S. Chaitanya; Singh, R. P.; **Ebrahim-Zadeh, M.** 2019, *Optics Letters* 44, 19, 4694-4697.
- Sukeert; Kumar, S. Chaitanya; **Ebrahim-Zadeh, M.** 2019, *Optics Letters* 44, 23, 5796-5799.
- Meng, L.; Padhye, A.; Pedersen, C.; **Ebrahim-Zaden, M.**; Rodrigo, P. J. 2019, *Optics Letters* 44, 7, 1670-1673.
- Junaid, S.; Kumar, S. Chaitanya; Mathez, M.; Hermes, M.; Stone, N.; Shepherd, N.; **Ebrahim-Zadeh, M.**; Tidemand-Lichtenberg, P.; Pedersen, C. 2019, *Optica* 6, 6, 702-708.

Selected research activities

Selected Invited Talks (International Conferences):

- SPIE LASE, *Photonics West*, San Francisco, USA.
- Workshop on Information Optics (WIO), Stockholm, Sweden.
- International Conference on Advanced Materials and Technology (ICMAT), Materials Research Society (MRS), Singapore.
- Nonlinear Optics, Optical Society of America, Hawaii, USA.
- CLEO-Europe, Munich, Germany.

Conference Organisation:

- Committee Chair, *The 32nd Annual IEEE Photonics Conference (IPC)*, San Antonio, Texas, USA.

Other Activities:

- Associate Editor, *Optica*, Optical Society of America, USA.
- Selection Committee: *C. E. K. Mees Medal*, Optical Society of America, USA.
- International Expert Panel: *MSc in Photonics Engineering Program*, Denmark Technical University (DTU), Denmark.

PhD Thesis:

- Hanyu Ye
- Callum Francis O'Donnell

ICREA MEMOIR 2019



Jan Eeckhout

Universitat Pompeu Fabra (UPF)

Social & Behavioural Sciences

Jan Eeckhout is ICREA research professor at UPF, Barcelona. He has teaching and research interests in the labor market and market power. His work has been published in the AER, Econometrica, the REStud, the JPE, and several government grants, including funding from the NSF and the ERC, as well as private grants have supported his research. Jan Eeckhout has been a tenured professor at the University of Pennsylvania, where he was for 9 years. He has also taught at Princeton and NYU Stern and visited MIT. At UPF he has been the chairman of the Department of Economics and Business. He has been editor of the International Economic Review and is currently on the editorial board of the Review of Economic Dynamics and the Journal of Economic Theory, and is past editorial board member of the Journal of the European Economic Association. He is a fellow of the European Economic Association and a member of the Academia Europaea. He received his Ph.D. in Economics from LSE in 1998.

Research interests

Jan Eeckhout has research interests in labor markets and applied economic theory, with a special emphasis on the theory of matching and search. His models develop tools and testable hypotheses for several market applications both in micro and macroeconomics. He studies unemployment, knowledge spillovers, inequality and local labor markets.

Selected publications

- **Eeckhout J**, & Lindenlaub I 2019, 'Unemployment Cycles', *American Economic Journal: Macroeconomics*, 11(4): 175-234

ICREA MEMOIR 2019



Roberto Emparan

Universitat de Barcelona (UB)

Experimental Sciences & Mathematics

I'm originally from Bilbao. I got both my BSc (in June 1990) and my PhD (in November 1995) in Physics from the University of the Basque Country. In January 1996 I went to the University of California, Santa Barbara, for my first postdoc. Two years later, I moved to Durham University, in northern England, for a second postdoc. Near the end of 1999 I took up a junior lecturer position back in Bilbao. I took leave from there in January 2001 to move to a Fellow position at CERN (the European Lab for Particle Physics, outside Geneva). Since January 2003 I am ICREA Research Professor at the Department of Quantum Physics and Astrophysics at Universitat de Barcelona. In 2016 I was awarded an Advanced Grant from the European Research Council.

Research interests

I try to understand the nature of spacetime at its most fundamental level. We know since Einstein that, due to the existence of gravity, spacetime is a dynamical entity. So I study the classical and quantum aspects of gravity and its most basic objects: the black holes. The natural starting point is the theory of General Relativity and the theories that naturally incorporate the ideas of holographic spacetime, namely, String and M-Theory and the AdS/CFT correspondence.

Selected publications

- Andrade T, **Emparan Roberto** & Licht D 2019, 'Charged rotating black holes in higher dimensions', *Journal Of High Energy Physics*, 2, 076.
- Andrade T, **Emparan R**, Licht D & Luna R 2019, 'Cosmic censorship violation in black hole collisions in higher dimensions', *Journal Of High Energy Physics*, 4, 121.
- Raposo G, Pani P & **Emparan R** 2019, 'Exotic compact objects with soft hair', *Physical Review D*, 99, 10, 104050.
- Barack L et al 2019, 'Black holes, gravitational waves and fundamental physics: a roadmap', *Classical And Quantum Gravity*, 36, 14, 143001.
- **Emparan R** & Suzuki R 2019, 'Topology-changing horizons at large D as Ricci flows', *Journal Of High Energy Physics*, , 7, 094.
- Andrade T, **Emparan R**, Licht D & Luna R 2019, 'Black hole collisions, instabilities, and cosmic censorship violation at large D', *Journal Of High Energy Physics*, 9, 99.

Selected research activities

Plenary talks at:

- "The Gravity Initiative Spring Workshop" Princeton;
- "Big Questions series" Arizona;
- "Challenges in Theoretical High-Energy Physics" Nordita Stockholm;
- "Black Holes and Neutron Stars in Modified Gravity" Meudon, France;
- "Southwest Strings Meeting 2019", Arizona

Invited talks and colloquia at Black Hole Initiative, Harvard; MIT, Boston; U of Michigan; ITP Utrecht; GR22 Valencia; King's Coll. London; Imperial Coll. London; London Gravity Seminar

Organizer of workshops

- "Gravity: New perspectives from strings and higher dimensions", Benasque Center for Science, July 2019;
- "Iberian Strings", January 2019, Barcelona;
- "The vacuum of the Universe", June 2019, Barcelona

Dissemination

- 12 interviews (radio, press, tv). 12 public talks (cultural centers, high schools)
- Invited participation in Hay Festival (Querétaro, Mexico)

Committee member of the International Society on General Relativity and Gravitation

Committee member of the Spanish Society of Gravitation and Relativity

Guarantor of ICCUB for María de Maeztu Award

Editorial Board member of Journal of High Energy Physics and International Journal of Modern Physics D

Panel member in ERC-2019 Starting Grants

MSc thesis supervisor of B Nelson, A Argudo, M Berenguer (U. Barcelona)

ICREA MEMOIR 2019



Manel Esteller

Institut de Recerca contra la Leucèmia Josep Carreras (IJC)
Life & Medical Sciences

Manel Esteller (Sant Boi de Llobregat, Barcelona, Catalonia, Spain, 1968) graduated in Medicine with Honours from the Universitat de Barcelona in 1992, where he also obtained his PhD degree in molecular genetics in 1996. He was an Invited Researcher at the School of Biological and Medical Sciences at the University of St. Andrews (Scotland, UK). From 1997 to 2001, He was a researcher at the Johns Hopkins University and School of Medicine (Baltimore, USA) where he established promoter hypermethylation of tumour suppressor genes as a hallmark of all human tumours. From Oct. 2001 to Sept. 2008 he was CNIO Cancer Epigenetics Laboratory's leader. Since Oct. 2008 until May 2019, he has been the Director of the Cancer Epigenetics and Biology Program (PEBC), Bellvitge Institute for Biomedical Research. He is currently Director of the Josep Carreras Leukaemia Research Institute (IJC), Chairman of Genetics in the School of Medicine of the UB.

Research interests

-Definition of the Epigenome of Cancer Cells: Profile of DNA methylation and histone modifications in tumor suppressor genes and repetitive sequences in cancer. Global and gene-specific definition of aberrant epigenetic changes and functional consequences in transcription regulation, DNA repair and chromosome instability. -Study of the Epigenetics Machinery and Mechanisms: Role and function of DNA methyltransferases (enzymes that maintain DNA methylation), specificity of methyl-CpG binding domain proteins (the nuclear factors that recognize DNA methylation), analysis of biological properties of histone deacetylases and methyltransferases (enzymes that modify histones). -Study of Mutations in the Epigenetic Machinery: The mechanisms underlying the disruption of the epigenetic landscape in transformed cells are unknown. -Study of the Epigenetic and Genetic Disruption of Non-Coding RNAs in Human Cancer. -Characterization of the Epitranscriptome in Human Diseases.

Selected publications

- Llinàs-Arias P, Rosselló-Tortella M, López-Serra P, Pérez-Salvia M, Setién F, Marin S, Muñoz JP, Junza A, Capellades J, Calleja-Cervantes ME, Ferreira HJ, Castro de Moura M, Srbic M, Martínez-Cardús A, de la Torre C, Villanueva A, Cascante M, Yanes O, Zorzano A, Moutinho C & **Esteller M** 2019, 'Epigenetic loss of the endoplasmic reticulum-associated degradation inhibitor SVIP induces cancer cell metabolic reprogramming', *JCI Insight*, 4, 8, e125888.
- Piqué L, Martínez de Paz A, Piñeyro D, Martínez-Cardús A, Castro de Moura M, Llinàs-Arias P, Setien F, Gomez-Miragaya J, Gonzalez-Suarez E, Sigurdsson S, Jonasson JG, Villanueva A, Vidal A, Davalos V & **Esteller M** 2019, 'Epigenetic Inactivation of the Splicing RNA Binding Protein CELF2 in Human Breast Cancer'. *Oncogene*, 38, 45, 7106-7112.
- Janin M, Ortiz-Barahona V, Castro de Moura M, Janin M, Ortiz-Barahona V, Castro de Moura M, Martínez-Cardús A, Llinàs-Arias P, Soler M, Nachmani D, Pelletier J, Schumann U, Calleja-Cervantes ME, Moran S, Guil S, Bueno-Costa A, Piñeyro D, Perez-Salvia M, Rosselló-Tortella M, [...], Bech-Serra JJ, Dans PD, Orozco M, Thomas G, Blanco S, Seoane J, Preiss T, Pandolfi PP & **Esteller M** 2019, 'Epigenetic loss of RNA-methyltransferase NSUN5 in glioma targets ribosomes to drive a stress adaptive translational program', *Acta Neuropathologica*, 138, 6, 1053 - 1074.
- Berdasco M & **Esteller M** 2019, 'Clinical Epigenetics: Seizing Opportunities for Translation', *Nature Reviews Genetics*, 20, 109-127.

Selected research activities

Lansdowne Lecture Award, University of Victoria, British Columbia, Canada.
Finalist Dissemination Award, Catalan Society of Biology (SCB).
Best Ideas in Health, Glioblastoma Research, Diario Medico.

ICREA MEMOIR 2019



Eduardo Eyras

Institut Hospital del Mar d'Investigacions Mèdiques (IMIM)

Life & Medical Sciences

E Eyras is ICREA Research Professor since January 2005. After graduating in Physics (U. of Granada, 1995) he did a PhD in Mathematics (U. of Groningen, The Netherlands, 1999) and postdoc (U. of Cambridge, UK) (1999-2001). In 2001, Eyras joined the Sanger Institute, Cambridge, UK (2001-2004), where he worked on methods for alternative splicing prediction and participated in the analyses of the human, mouse and rat genomes. He has also contributed to the analyses of alternative splicing in the chicken and cow genome genomes and since 2007, he has been organizer of the RNA workshop of the ISMB conference. In 2008 he was awarded a Young Investigator Grant of the EURASNET network, and in 2013 he was a visiting professor at the U. of Toronto. E. Eyras leads a research group on Computational RNA Biology and Disease and teaches Machine Learning in genomics in the Masters of Bioinformatics for Health of the UPF.

Research interests

My group works on the development of computational tools to study mechanisms of RNA processing and its role in disease. We develop tools to identify RNA splicing signatures of therapeutic vulnerability in rare diseases and cancer, and develop new algorithms to facilitate the systematic implementation of long-read RNA sequencing in precision medicine.

Selected publications

– Bueno C, Velasco-Hernandez T, Gutierrez-Aguera F, Zanetti SR, Baroni ML, Sanchez-Martinez D, Molina O, Closa A, Agraz-Doblas A, Marin P, **Eyras E**, Varela I & **Menendez P** 2019, 'CD133-directed CAR T-cells for MLL leukemia: on-target, off-tumor myeloablative toxicity', *Leukemia*, 33, 8, 2090 – 2093.

ICREA MEMOIR 2019



Alberto Fernández-Nieves

Universitat de Barcelona (UB)

Experimental Sciences & Mathematics

I was born in Granada (Spain) in 1973. I studied physics and graduated with a PhD from the University in my hometown city in the year 2000. My post-doctoral work was under the supervision of Prof. David A. Weitz in the Department of Physics and DEAS at Harvard University. I subsequently held a lecturer position at the University of Almeria and an INEST Visiting Professor position at Harvard University. In 2008, I became Assistant Professor of Physics at the Georgia Institute of Technology. I obtained tenure and was promoted to Associate Professor in 2014. I have performed research in soft matter, making substantial contributions to the physics of geometrically frustrated liquid crystals, surface-tension-driven instabilities and the thermodynamics of colloidal polymer gels. For my PhD work, I was awarded the prize for young researchers in experimental physics of the Spanish Royal Society of Physics and the doctoral thesis prize from the University of Granada.

Research interests

My research interests are in experimental soft condensed matter. We study a variety of classical many-body systems that have characteristic energy scales accessible at room temperature and that are internally characterized by mesoscopic length scales. As a result, these soft materials are easily deformable by external stresses and fields, or even by thermal fluctuations, and have microscopic dynamics and structural features that can be directly imaged using optical-microscopy techniques and probed using light scattering; this enables addressing many open questions in equilibrium and non-equilibrium physics. Recent research involves partially ordered fluids, colloidal crystals and glasses, and active matter. A recurring theme is the presence of defects in the order and how they sense and respond to the local geometry, the local environment and the system's inherent activity. We are also interested in fluid mechanics and hydrodynamic instabilities.

Selected publications

- Pearce DJG, Ellis PW, **Fernandez-Nieves A** & Giomi L 2019, 'Geometrical Control of Active Turbulence in Curved Topographies', *Physical Review Letters*, 122, 16, 168002.
- Guerrero J, Chang Y-W, Fragkopoulou AA & **Fernandez-Nieves A** 2019, 'Capillary-Based Microfluidics-Coflow, Flow-Focusing, Electro-Coflow, Drops, Jets, and Instabilities', *Small*, 1904344.
- Dimitriyev MS, Chang Y-W, Goldbart PM & **Fernandez-Nieves A** 2019, 'Swelling thermodynamics and phase transitions of polymer gels', *Nano Futures* 3, 042001.

Selected research activities

Invited talks at conferences/workshops:

- 81st New England Complex Fluids Workshop, Harvard University.
- DIEP workshop on "hydrodynamics at all length scales: from high energy to hard and soft matter", Leiden (The Netherlands).
- Thermodynamics 2019 Conference (Huelva, Spain).
- 10th International Conference Engineering of Chemical Complexity (Potsdam, Germany).
- XXVI Sitges Conference on Statistical Mechanics: "New Trends in Statistical Physics" (Sitges, Spain).
- Micro and Nanofluidics: from Technology to Science, (Benasque, Spain). (vii) German Physical Society, University of Regensburg (Germany)

Invited colloquia/seminars:

- Universidad Carlos III de Madrid,
- Universidad Complutense de Madrid,
- Universidad de Tarragona,
- Oak Ridge National Laboratory (USA),
- Aachen University (Germany),
- UMASS at Amherst (USA),
- Exxon Mobile (USA)

Thesis advised: Michael Tennenbaum, Georgia Tech

Thesis committees: John Nicosia, Georgia Tech; Josep Maria Pages Casas, U Barcelona

Conferences organized: MRS Fall Meeting – Symposium on Droplets, Bubbles and Emulsions (Boston, USA)

Panel review of neutron scattering proposals, Oak Ridge National Lab (USA)

Refereeing: Phys Rev Lett, Phys Rev E, Phys Rev X, Phys Rev Fluids, Phys Rev Applied, Proc Nat Acad Sci, Nature, Nature Materials, Nature Comm, J Fluid Mech, Soft Matter

Grants: MINECO, 147.015€ (PI); La Caixa, 118.500€ (PI); MINECO – FECYT, 12.000€ (participant).

ICREA MEMOIR 2019



Alexander Fidora

Universitat Autònoma de Barcelona (UAB)
Humanities

Alexander Fidora, born 1975 in Offenbach (Germany), studied philosophy at the University of Frankfurt and the Universitat Autònoma de Barcelona. He obtained his PhD in 2003 at Frankfurt University, where he has been co-director of a DFG-research project. In 2006 he accepted a position at ICREA in the Department of Ancient and Medieval Studies of the Universitat Autònoma de Barcelona, where he has been Executive Director of the Institute of Medieval Studies (until fall 2018). He has been a Visiting Professor at Saint Louis University, Universidad Panamericana in Mexico, University of Erlangen-Nuremberg and University of Pennsylvania. His work has been distinguished with the “Premi Internacional Catalònia” (2011) and the “Samuel Toledano Prize” (2012). Co-editor of the “Revista Española de Filosofía Medieval”; Secretary of “Arxiu de Textos Catalans Antics”. Vice-president of SIEPM and of SOFIME. Member of the Academia Europaea (AE).

Research interests

Alexander Fidora is working on the interreligious dimensions of medieval Hispanic philosophy. In particular, he studies cultural contacts between Judaism, Christianity and Islam, such as: reception, interpretation and transformation of philosophical and theological translations from Arabic by Jewish and Christian authors; Latin philosophy into Hebrew; Polemics, controversial theology and interreligious dialogue in the Middle Ages; and Consequences of the confrontation between the three religions of the Book for the formation of European culture (ERC-Research Projects “Latin Philosophy into Hebrew” (2008-2012) and “The Latin Talmud” (2014-2019)).

Selected publications

- **Fidora A** & Hasselhoff G K 2019 (eds.), *The Talmud in Dispute during the High Middle Ages*, Bellaterra.
- **Fidora A** 2018 (2019) (ed.), *Polemic Translations of Jewish Texts During the Middle Ages* (= Theme Section of the journal *Henoch* 40/2).
- **Fidora A** 2019, ‘The Influence of the *Extractiones de Talmud* on Anti-Jewish Sermons’, in Fidora & Hasselhoff (eds.), *The Talmud in Dispute during the High Middle Ages*, Bellaterra, 235-47.
- Dal Bo F & **Fidora A** 2018 (2019), ‘Inicium Creationis Iesu Nazareni’, *Toledot Yesu* in the Thematic Version of the *Extractiones de Talmud*, *Henoch* 40/2, pp. 206-22.
- Carpentieri N, **Fidora A** & Lampurlanés I 2018 (2019), ‘Avicena y Gerardo de Cremona sobre la frenitis: Una comparación entre *al-Qānūn fī at-Ṭibb* y su traducción latina’, *Al-Qantara* 39/2, 292-320.
- Ed. de la Cruz Ó with **Fidora A**, Mora G and Soler A 2019, *Raimundo Lullo e il nuovo dialogo tra Cristianesimo, Ebraismo e Islam*, Barcelona.
- de la Cruz Ó, **Fidora A**, Mora G & Soler A 2019, ‘Raimondo Lullo, un nuovo modo di dialogare’, in de la Cruz (ed.), *Raimundo Lullo e il nuovo dialogo*, Barcelona, pp. 32-40.
- **Fidora A** 2019, ‘Raimondo Lullo rispetto alla critica attuale al dialogo interreligioso’, in de la Cruz (ed.), *Raimundo Lullo e il nuovo dialogo*, Barcelona, 229-55.
- **Fidora A** 2005 (2019), ‘Ética y Política en el *De divisione philosophiae* de Domingo Gundisalvo’, *Mediaevalia. Textos e Estudos*, 24, 37-54.
- **Fidora A** 2018 (2019), ‘Foreword’, in: U. Cecini and Ó. de la Cruz (eds.), *Extractiones de Talmud* (CCCM 291), Turnhout, pp. v-vi.

Selected research activities

Invited lectures in Fribourg, Dortmund, Hamburg and Oxford; co-organizer with M. Tischler of a panel at the SMM-conference in Barcelona (Jul 8-11).

As a member of the Barcelona Knowledge Hub (BKH), he coordinated the Annual Meeting of the AE (Oct 23-5) and convened the Disputatio of Barcelona (Nov 14), organised by the BKH and the AE.

He was the 2019 lecturer of the honorary lecture series of the Albertus-Magnus-Institute in Bonn, founded in 1931.

ICREA MEMOIR 2019



Toni Gabaldón

Institut de Recerca Biomèdica de Barcelona (IRB Barcelona) &
Barcelona Supercomputing Center - Centro Nacional de
Supercomputación (BSC - CNS)
Life & Medical Sciences

I'm a biochemist and molecular biologist by training (Universities of Valencia and Mainz). After several years working on a molecular biology lab, and attracted by the emerging fields of genomics and bioinformatics, in 2001 I moved to the comparative genomics group of Martijn Huynen in the NCMLS, The Netherlands. In 2005, I obtained a PhD in Medical Sciences (Radboud University Nijmegen), and then moved, thanks to an EMBO fellowship, to the bioinformatics department at CIPF (Valencia). In September 2008 I started my own group in the Bioinformatics and Genomics department at CRG. In 2013 I was awarded an ERC starting grant and an ICREA research professorship. In 2017 I was awarded the ERC consolidator Grant and the Margaret Dayhoff Award. I have always used an evolutionary perspective to address different biological questions. I am not only interested in understanding how complex biological systems work, but also how they have come to be as they are.

Research interests

My main research interest is to understand the complex relationships between genome sequences and phenotypes and how these two features evolve within and across species. I generally use large-scale phylogenetics and molecular evolution approaches that allow looking at the evolution of genomes from the perspective of all of their genes, and apply these analyses to a variety of biological questions related to the evolution and function of biological communities, organisms, organelles, pathways, and families of protein-coding and non-coding genes. I have a special interest in understanding processes related to human pathogenesis. Through collaborations with experimental groups, I apply comparative genomics to discover new mechanisms and genes involved in interesting processes, especially those of clinical relevance. Given our exposure to new types and scales of data, my group has had the need to develop novel bioinformatics tools to fill in existing gaps.

Selected publications

- Saus E, Iraola-Guzman S, Willis JR, Brunet-Vega A & **Gabaldon T** 2019, 'Microbiome and colorectal cancer: Roles in carcinogenesis and clinical potential', *Molecular Aspects Of Medicine*, 69, 93 - 106.
- Naranjo-Ortiz MA & **Gabaldon T** 2019, 'Fungal evolution: diversity, taxonomy and phylogeny of the Fungi', *Biological Reviews*, 94, 6, 2101 - 2137.
- **Gabaldon T** et al. 2019, 'Recent trends in molecular diagnostics of yeast infections: from PCR to NGS', *Fems Microbiology Reviews*, 43, 5, 517 - 547.
- Zhao et al. (including; **Gabaldon T**) 2019, 'A comprehensive genome variation map of melon identifies multiple domestication events and loci influencing agronomic traits', *Nature Genetics*, 51, 11, 1607 - +.
- **Gabaldon T** & Fairhead C 2019, 'Genomes shed light on the secret life of *Candida glabrata*: not so asexual, not so commensal', *Current Genetics*, 65, 1, 93 - 98.
- Marcet-Houben M & **Gabaldon T** 2019, 'Evolutionary and functional patterns of shared gene neighbourhood in fungi', *Nature Microbiology*, 4, 12, 2383 - 2392.
- Pegueroles C, Iraola-Guzman S, Chorostecki U, Ksiezopolska E, Saus Ester & **Gabaldon T** 2019, 'Transcriptomic analyses reveal groups of co-expressed, syntenic lncRNAs in four species of the genus *Caenorhabditis*', *Rna Biology*, 16, 3, 320 - 329.
- Naranjo-Ortiz MA & **Gabaldon T** 2019, 'Fungal evolution: major ecological adaptations and evolutionary transitions.', *Biological Reviews Of The Cambridge Philosophical Society*, 94, 4, 1443 - 1476.
- Gonzalez-Torres P, Rodriguez-Mateos F, Anton J & **Gabaldon T** 2019, 'Impact of Homologous Recombination on the Evolution of Prokaryotic Core Genomes', *Mbio*, 10, 1, e02494-18.
- Mariotti M, Salinas G, **Gabaldon T** & Gladyshev V 2019, 'Utilization of selenocysteine in early-branching fungal phyla', *Nature Microbiology*, 4, 5, 759 - 765.

ICREA MEMOIR 2019



José Ramón Galán-Mascarós

Institut Català d'Investigació Química (ICIQ)

Experimental Sciences & Mathematics

J.R. Galán-Mascarós received his PhD from University of Valencia under the supervision of Prof. E. Coronado (1999). Between 1999 and 2002 he was post-doctoral researcher at Texas A&M University working with Prof. Kim R. Dunbar. In 2002 he joined ICMOL (U. de Valencia) as Ramón y Cajal Fellow. In 2009 he took a position at ICIQ, where he currently leads a research group focused on future applications of coordination chemistry for Renewable Energies and Materials Sciences. In september 2010 he became ICREA Research Professor. Galán-Mascarós has received several awards, including the Excellence in Research Award by the RSEQ (2019), the Olivier Kahn International Award (2008) and an ERC Starting Grant (2012-2016). He is the coordinator of the collaborative project H2020-FETPROACT A-LEAF (2017-2020): a major European public investment for the realization of a viable artificial photosynthesis platform.

Research interests

Our research team is devoted to the development of novel materials with the desired chemical and physical properties for applications in the fields of Materials Sciences and Renewable energies. In Renewable Energies, we are working in the development of stable, efficient and low-cost new catalysts and platforms for the production of solar fuels. In Materials Sciences, we are designing multifunctional smart materials able to exhibit novel phenomena from unusual combination of physical properties (redox, magnetic, electrical and/or optical, etc...).

Selected publications

- Moss B, Hegner FS, Corby S, Selim S, Francas L, Lopez N, Gimenez S, **Galan-Mascaros JR** & Durrant JR 2019, 'Unraveling Charge Transfer in CoFe Prussian Blue Modified BiVO₄ Photoanodes', *ACS Energy Lett.* vol. 4, pp 337-342.
- Garces-Pineda FA, Blasco-Ahicart M, Nieto-Castro D, Lopez N & **Galan-Mascaros JR** 2019 'Direct magnetic enhancement of electrocatalytic water oxidation in alkaline media', *Nat. Energy*, vol. 4, pp 519-525.
- Garces-Pineda FA, Gonzalez-Cobos J, Torrens M & **Galan-Mascaros JR** 2019, 'Fluorine-Doped Tin Oxide/Alumina as Long-Term Robust Conducting Support for Earth-Abundant Water Oxidation Electrocatalysts', *ChemElectroChem*, vol. 6, 2282-2289.
- Haider A, Bassil BS, Soriano-Lopez J, Qasim HM, Saenz de Pipaon C, Ibrahim M, Dutta D, Koo YS, Carbo JJ, Poblet JM, **Galan-Mascaros JR** & Kortz U 2019, '9-Cobalt(II)-Containing 27-Tungsto-3-germanate(IV): Synthesis, Structure, Computational Modeling, and Heterogeneous Water Oxidation Catalysis', *Inorg. Chem.*, vol. 58, 11308-11316.
- Corella-Ochoa MN, Tapia JB, Rubin HN, Lillo V, González-Cobos J, Núñez-Rico JL, Balestra SRG, Almora-Barrios N, Lledós M, Güell-Bara A, Cabezas-Giménez J, Escudero-Adán EC, **Vidal-Ferran A**, Calero S, Reynolds M, Martí-Gastaldo C & **Galan-Mascaros JR** 2019, 'Homochiral metal-organic frameworks for enantioselective separation in liquid chromatography', *J. Am. Chem. Soc.*, vol. 141, pp 14306-14316.

Selected research activities

Galan-Mascaros JR 2019, 'Z = 55, cesio, Cs el elemento que define el tiempo (y el espacio) en la era atómica', *An. Quim.*, vol. 115, pp 117.

ICREA MEMOIR 2019



Eric Galbraith

Universitat Autònoma de Barcelona (UAB)

Experimental Sciences & Mathematics

A native of Halifax, Canada, Galbraith completed an undergraduate degree in Earth and Planetary Science at McGill University in 1997, then worked as an exploration geologist in Peru and a tour guide on polar expedition cruises before undertaking a PhD at the University of British Columbia, completed in 2006. This was followed by three years of postdoctoral research at Princeton University, developing and using Earth System models, with a focus on ocean biogeochemistry and long-term climate variability. Galbraith returned to McGill University as a professor, where he worked until joining ICREA in 2015.

Research interests

Over the past century, humans have emerged as a dominant component of the Earth system. For decades, it has been clear that we are on an increasingly unsustainable trajectory due to rapid alteration of climate, biogeochemical cycles and ecosystems at the global scale. Despite this clarity, we have not yet made the large changes in trajectory that are required to ensure sustainability. Part of this lack of action can be attributed to an incomplete understanding of the emergent properties of the human-Earth system, including the behavioural motivations of humans and outcomes for human experience and well-being. I am interested in using statistical analyses, simple theory and numerical models to improve our predictive understanding of the coupled human-Earth system. Most of my past work has addressed uncertainty in the natural science side of the system, including the study of past, natural climate changes, and the controls on the chemical composition and large-scale ecology of the global ocean. My focus is now on developing integrated, quantitative descriptions of the two-way coupling between natural and human elements by bridging Earth system modeling methods with social science. Most of my current work is developing these approaches for the global marine fishery, through the ERC-funded BIGSEA project.

Selected publications

- Lotze HK et al. 2019, 'Global ensemble projections reveal trophic amplification of ocean biomass declines with climate change', *Proceedings Of The National Academy Of Sciences Of The United States Of America*, 116, 26, 12907 – 12912.
- **Galbraith ED**, Le Mezo P, Hernandez GS, Bianchi D & Kroodsma D 2019, 'Growth Limitation of Marine Fish by Low Iron Availability in the Open Ocean', *Frontiers In Marine Science*, 6, UNSP 509.
- Heneghan RF, Hatton IA & **Galbraith ED** 2019, 'Climate change impacts on marine ecosystems through the lens of the size spectrum', *Emerging Topics In Life Sciences*, 3, 2, 233 – 243.
- Barrington-Leigh C & **Galbraith E** 2019, 'Feasible future global scenarios for human life evaluations', *Nature Communications*, 10, 161.
- Guiet J, **Galbraith E**, Kroodsma D & Worm B 2019, 'Seasonal variability in global industrial fishing effort', *Plos One*, 14, 5, e0216819.
- Toggweiler JR, Druffel Ellen RM, Key RM & **Galbraith ED** 2019, 'Upwelling in the Ocean Basins North of the ACC: 1. On the Upwelling Exposed by the Surface Distribution of C-14', *Journal Of Geophysical Research-oceans*, 124, 4, 2591 – 2608.
- Carozza DA, Bianchi D & **Galbraith ED** 2019. Metabolic impacts of climate change on marine ecosystems: implications for fish communities and fisheries, *Global Ecology and Biogeography*. 28, 2, 158-169.
- **Galbraith E** & de Lavergne C 2019, 'Response of a comprehensive climate model to a broad range of external forcings: relevance for deep ocean ventilation and the development of late Cenozoic ice ages'. *Climate Dynamics*, 52, 1-2, 653 – 679.

ICREA MEMOIR 2019



Elena Galea

Universitat Autònoma de Barcelona (UAB)

Life & Medical Sciences

1985: BS Biology, Universidad Autónoma de Madrid. 1990: PhD Biology, Department of Physiology, School of Medicine, Universidad Autónoma de Madrid. 1991-1994: Postdoc/Research Associate, Department of Neuroscience, Cornell University Medical College, New York. 1995-1997: Instructor, Department of Neuroscience, Cornell University Medical College, New York. 1998-2003: Assistant Professor, Department of Anesthesiology, University of Illinois, Chicago. 2004-present: ICREA Research Professor, Institute of Neurosciences, Universitat Autònoma de Barcelona. 2008-2010: Vice Director, Institute of Neurosciences, Universitat Autònoma de Barcelona. 2012-2013: Visiting scholar, Massachusetts General Institute for Neurodegenerative disease, Harvard Medical School, Boston.

Research interests

I seek to unravel the mechanisms whereby a brain cell called ‘astrocyte’ contributes to higher-brain functions —cognition, memory, emotion— and to establish the pathological consequences of astrocyte dysfunction. Three core ideas guide my research. First, astrocytes not only carry out homeostatic functions in support of neurons, but they also compute, i.e., they process information intelligently, plausibly by way of calcium transients. Second, astrocytes are superior therapeutic targets: increasing their resilience or restoring their malfunction in acute or chronic neurological diseases will have a beneficial impact on multiple pathological processes at once. Three, mathematics and systems biology —which has lately included artificial intelligence— are indispensable tools to clarify astrocyte (dys)function, identify astrocyte-based molecular signatures in human fluids, and develop astrocyte-targeted therapies. .

Selected publications

- Eraso Pichot A, Menacho C, Parra-Damas A, Pardo L, Servitja JM, Saura CA, **Galea E** & Masgrau R 2019, ‘Astrocytic CREB controls the expression of monocarboxylate transporter 4’, *Glia*, 67, E275 - E275.

Selected research activities

Therapeutical applications of Systems Neuroscience in CNS diseases RED2018-102491-T. Coordinator.

ICREA MEMOIR 2019



Patrick Gámez

Universitat de Barcelona (UB)

Experimental Sciences & Mathematics

Patrick Gamez received his PhD at the University of Lyon and was awarded the French Chemical Society Prize for his PhD research. After postdoctoral stays at the MPI für Kohlenforschung and at the University of Strasbourg, he became research associate at Leiden University. Since October 2010, he is ICREA Research Professor in bioinorganic chemistry at the Universitat de Barcelona. His research group is financed by the MICINN and is recognized by the Catalan Government. He is the (co-)author of over 242 publications (h-index: 54; >12000 citations). He is a member of the Spanish Bioinorganic Chemical Society (AEBIN), the Society of Biological Inorganic Chemistry (SBIC), the RSC, the RSEQ and the Advisory Board of Inorganic Chemistry Frontiers (IF = 5.934). He has been Associate Editor of RSC Advances (2015-2017). Since June 2016, he is Fellow of the RSC.

Research interests

Cancer and Alzheimer's disease (AD) represent two major chronic diseases that are in the top ten leading causes of mortality worldwide and their incidence will increase exponentially in the coming decades, as the result of population ageing. My current research interests are aimed at developing novel Nanotechnology strategies for the development of efficient diagnostic and therapeutic tools (theranostics; drug delivery and detection) against these two important public health issues (www.nanobic.eu).

Selected publications

- Vázquez G, Caballero AB, Kokinda J, Hijano A, Sabaté R & **Gamez P** 2019, 'Copper, dityrosine cross-links and amyloid- β aggregation', *Journal of Biological Inorganic Chemistry*, vol. 24, pp 1217-1229.
- Caballero AB, Espargaró A, Pont C, Busquets MA, Estelrich J, Muñoz-Torrero D, **Gamez P** & Sabate R 2019, 'Bacterial Inclusion Bodies for Anti-Amyloid Drug Discovery: Current and Future Screening Methods', *Current Protein & Peptide Science*, 20, 6, 563 - 576.
- Espargaró A, Pont C, **Gamez P**, Muñoz-Torrero D & Sabate R 2019, 'Amyloid Pan-inhibitors: One Family of Compounds To Cope with All Conformational Diseases', *Acs Chemical Neuroscience*, 10, 3, 1311 - 1317.
- Censi V, Caballero AB, Pérez-Hernández M, Soto-Cerrato V, Korrodi-Gregório L, Pérez-Tomás R, Dell'Anna MM, Mastrorilli P & **Gamez P** 2019, 'DNA-binding and in vitro cytotoxic activity of platinum(II) complexes of curcumin and caffeine', *Journal of Inorganic Biochemistry*, vol. 198, pp 110749.

Selected research activities

- Visiting professor at Sofia University (Bulgaria)
- Member of the Scientific Committee of the network HC3A between Occitanie and Catalonia ([website](http://www.hc3a.eu))
- Organizer at BioLugo ([website](http://www.biolugo.org))
- President of the Association Science Squared (www.sci2.org)
- Editor-in-chief of Chemistry Squared (www.chem2.org)
- Founder of Physics Squared (www.phys2.org)
- Vice-president of the Spanish Bioinorganic Chemical Society (www.aebin.es)
- Evaluator for various national and international research agencies, namely the AEI (Spain), Hcéres (France), RSC-FLAIR (UK), and the Alzheimer's Society (UK)
- Member of two PhD defense committees
- Three invited talks and two invited seminars

ICREA MEMOIR 2019



F. Javier García de Abajo
 Institut de Ciències Fotòniques (ICFO)
 Engineering Sciences

Javier García de Abajo obtained his PhD in condensed matter theory from the University of the Basque Country (Spain) in 1993. After spending three years in Berkeley National Lab., he became staff scientist at CSIC (Spain) and he was promoted to Research Professor in 2008. He is currently leading the Nanophotonics Theory group at ICFO. He has worked in atomic collisions, surface science, electron microscope spectroscopies, plasmonics, and theoretical nanophotonics. He has coauthored 350+ papers that have accumulated 28,000+ citations and a h index of 81 (WoK, Jan. 2020). He is a Fellow of both the American Physical Society and the Optical Society of America.

Research interests

Javier García de Abajo's research program on the theory nanoscale photonics ranges from optical characterization with electron-microscope spectroscopies to studies of ultrasensitive single-molecule detection, quantum aspects of light-matter interaction, excitation and characterization of plasmons by electron beams, plasmonic metamaterials, quantum friction, radiative transfer and coherent control, and graphene plasmonics. These topics cover a broad spectrum of research in nanophotonics. This theoretical effort encompasses classical and quantum methods, both analytical and numerical, which are the basis to understand and propose new phenomena with application to biosensing and quantum plasmonics.

Selected publications

- Abd El-Fattah ZM, Mkhitarian V, Brede J, Fernández L, Li C, Guo Q, Ghosh A, Rodríguez Echarri A, Naveh D, Xia F, Ortega JE & **García de Abajo FJ** 2019, 'Plasmonics in atomically thin crystalline silver films'. *ACS Nano* 13, 7771-7779.
- Dias EJC & **García de Abajo FJ** 2019, 'Fundamental Limits to the Coupling between Light and 2D Polaritons by Small Scatterers', *ACS Nano*, 13, 5, 5184 - 5197.
- Di Giulio V, Kociak M & **García de Abajo FJ** 2019, 'Probing quantum optical excitations with fast electrons', *Optica*, 6, 12, 1524 - 1534.
- Rodríguez Echarri A, Cox JD & **García de Abajo FJ** 2019, 'Quantum effects in the acoustic plasmons of atomically thin heterostructures', *Optica*, 6, 5, 630 - 641.
- Cox JD & **García de Abajo FJ** 2019, 'Nonlinear Graphene Nanoplasmonics', *Accounts of Chemical Research*, 52, 9, 2536 - 2547.
- Pan D, Xu H & **García de Abajo FJ** 2019, 'Circular Dichroism in Rotating Particles', *Physical Review Letters*, 123, 6, 066803.
- Cox JD & **García de Abajo FJ** 2019, 'Single-Plasmon Thermo-Optical Switching in Graphene', *Nano Letters*, 19, 6, 3743 - 3750.
- Saavedra JRM & **García de Abajo FJ** 2019 'Visible optical resonances in electrically doped DNA', *ACS Photonics* 6, 932-938.
- Vanacore GM, Berruto G, Madan I, Pomarico E, Biagioni P, Lamb RJ, McGrouther D, Reinhardt O, Kaminer I, Barwick B, Larocque H, Grillo V, Karimi E, **García de Abajo FJ** & Carbone F 2019, 'Ultrafast generation and control of an electron vortex beam via chiral plasmonic near fields', *Nature Materials*, 18, 6, 573 - 379.
- Polman A, Kociak M & **García de Abajo FJ** 2019, 'Electron-beam spectroscopy for nanophotonics', *Nature Materials*, 18, 11, 1158 - 1171.
- Maniyara RA, Rodrigo D, Yu R, Canet-Ferrer J, Ghosh DSR, Yongsunthorn R, Baker DE, Rezikyan A, **García de Abajo FJ** & **Pruneri V** 2019, 'Tunable plasmons in ultrathin metal films', *Nature Photonics*, 13, 5, 328 - 333.

ICREA MEMOIR 2019



Maria F. García-Parajo

Institut de Ciències Fotòniques (ICFO)

Engineering Sciences

Maria F. García-Parajo obtained her PhD in Physical Electronics in 1993 at Imperial College, London, UK, working on the fabrication and photoluminescence spectroscopy of quantum structures based on GaAs/AlGaAs. After acquiring extensive expertise in scanning probe microscopy (STM, NSOM, AFM) at the L2M-CNRS, Bagneux, France (1993-1995) and University of Barcelona, Spain (1995-1996) she moved in 1996 to the Applied Optics group of the University of Twente, the Netherlands. Her main research topics have been single molecule detection and spectroscopy using near- and far-field optical techniques with focus in photophysics of organic and autofluorescent proteins, molecular photonics and biophysics. Since 2005 she is ICREA Research Professor, first hosted at the IBEC – Institute for Bioengineering of Catalonia and since July 2011 at ICFO – The Institute of Photonic Sciences, leading the Single Molecule Biophotonics group.

Research interests

Our research focuses on the development of advanced optical techniques to the study of biological processes at the single molecular level on living cells. We focus on the development and application of different forms of super-resolution microscopy (STED, STORM, NSOM) as well as photonic antennas to reach spatial resolutions around 10nm on intact cells. Fluorescence correlation spectroscopy in ultraconfined volumes, and multi-color single particle tracking are exploited to gain access to dynamic processes down to the microsecond time resolution. Using these combined approaches, we aim at understanding how spatiotemporal compartmentalization of biomolecules inside cells regulates and control cell function. This fundamental question has important implications for health and disease, touching the fields of cell biology and immunology.

Selected publications

– Balcerek M, Loch-Olszewska H, Torreno-Pina JA, **Garcia-Parajo MF**, Weron A, Manzo C & Burnecki K 2019, 'Inhomogeneous membrane receptor diffusion explained by a fractional heteroscedastic time series model', *Physical Chemistry Chemical Physics*, 21, 6, 3114 – 3121.

Selected research activities

Recipient of the ERC-Advanced grant NANO-MEMEC, 2018.

Member of Evaluation Panel ERC- Life Sciences, Advanced Grants, European Research Council.

President of the jury for the annual award "Premis de la Ciutat de Barcelona", Experimental Sciences and Technology.

Member of the international organizing committee of the 12th European Biophysical Meeting (EBSA), Madrid. July 2019. *Co-chair* of the Session New & Notable.

Member of the international scientific committee of the 2020 European Physical Society (EPS), Condensed Matter Division.

Coordinator of the Advanced Optical Microscopy Program at BIST-Barcelona Institute of Science & Technology, Barcelona, Spain.

Member of WISE International Review Panel: talented female tenure track positions at NWO, NL.

17 invited lectures at international conferences and workshops.

Participation in general talks, debates and dissemination activities to promote the active participation of Women in Science

ICREA MEMOIR 2019



Jose A. Garrido

Institut Català de Nanociència i Nanotecnologia (ICN2)

Engineering Sciences

Jose A. Garrido is an ICREA Research Professor at the Catalan Institute of Nanosciences and Nanotechnology-ICN2 in Barcelona, and head of the Advanced Electronic Materials and Devices group. He received a Master and PhD degree in Telecommunication Engineering from the Technical University of Madrid, in 1996 and 2000, respectively. From 2001 to 2004, he worked as a postdoc at the Walter Schottky Institute, Technische Universität München, where he obtained his habilitation in experimental physics in 2010. From 2011 to 2015, Jose A. Garrido held a lecturer (privatdozent) position at the department of physics of the Technische Universität München. In September 2015, Jose A. Garrido joined ICN2 as ICREA Professor. Currently, Jose A. Garrido is vicedirector and head of the Strategy Development Office at ICN2.

Research interests

Jose A. Garrido leads the Advanced Electronic Materials and Devices group at ICN2. The activities of the team focus on technology and material science of novel electronic materials, with a strong emphasis on graphene and other 2D materials. In addition, the team works towards the development of technological applications of these materials in electronics, bioelectronics, and biosensing. The activities cut across different scientific aspects, from fundamentals (physics of devices and semiconductors) to materials (growth of graphene and 2D materials, surface functionalization, advanced characterization), through devices (fabrication technology, nanofabrication), and to applications (biosensors, neural implants and biomedical technologies, energy storage and conversion).

Selected publications

– Masvidal-Codina E, Illa X, Dasilva M, Bonaccini Calia A, Dragojević T, Vidal-Rosas EE, Prats-Alfonso E, Martínez-Aguilar J, De la Cruz JM, Garcia-Cortadella R, Godignon P, Rius G, Camassa A, Del Corro E, Bousquet J, Hébert C, **Durduran T**, Villa R, **Sanchez-Vives MV**, **Garrido JA** & Guimerà-Brunet A 2019, 'High-resolution mapping of infraslow cortical brain activity enabled by graphene microtransistors', *Nature Materials*, 18, pages 280-288.

ICREA MEMOIR 2019



Hector Geffner

Universitat Pompeu Fabra (UPF)

Engineering Sciences

Hector was born in Buenos Aires in 1959, did his BS in Caracas, Venezuela, and got his PhD in Computer Science at UCLA. He is a fellow of the American and European Associations for Artificial Intelligence (AAAI, ECCAI), former associate editor of the Journal of Artificial Intelligence Research (JAIR) and the Artificial Intelligence Journal (AIJ), and member of the European AI Board (EurAI). He taught at the Universidad Simón Bolívar in Caracas, Aachen University of Technology, Linköping University, Stanford University, Université Paul Sabatier, and King's College, among other places. He joined ICREA and the UPF in 2001, where he is a Professor in the Department of Information and Communication Technologies (DTIC). He teaches courses on logic, artificial intelligence, and more recently, on social and technological change.

Research interests

Hector works on planning in intelligent systems, developing methods for generating and recognizing autonomous behavior automatically using model-based methods. In these methods, agents are not programmed by hand but derive their behavior automatically by solving a model of the interaction between the agent, their goals, and the environment. The challenge is mainly computational as the formulation of methods for deriving the right behavior effectively when the models are large is computationally intractable in the worst case. The work involves theory based on logic, probabilities, heuristics, and algorithms, and computational experiments. The research is relevant to both artificial intelligence and cognitive science, as it aims to uncover general principles of intelligent behavior that take into account the computational constraints that are present in both natural and artificial systems.

Selected publications

- Bonet B, Frances G & **Geffner H** 2019, 'Learning Features and Abstract Actions for Computing Generalized Plans', *Thirty-third Aaai Conference On Artificial Intelligence / Thirty-first Innovative Applications Of Artificial Intelligence Conference / Ninth Aaai Symposium On Educational Advances In Artificial Intelligence*, 2703 - 2710.

ICREA MEMOIR 2019



Wolfgang Gernjak

Institut Català de Recerca de l'Aigua (ICRA)

Engineering Sciences

2002 MSc in Analytical and Physical Chemistry from Vienna University of Technology, Austria.

2006 PhD in Land and Water Management from BOKU Vienna, Austria.

2000-2008 External Research Staff & post-doc, Plataforma Solar de Almería, Spain – Solar advanced oxidation & desalination.

2008-2014 Senior research fellow, The University of Queensland, Australia – Group leader: Drinking and recycled water.

2014-2015 Ramon & Cajal research fellow, Catalan Institute for Water Research (ICRA) – Group leader: Water Supply and Advanced Treatment.

2015- ICREA Research Professor at Catalan Institute for Water Research (ICRA) – Group leader: Water Supply and Advanced Treatment.

Research interests

I aim to innovate the ways we treat water applied to water reuse, desalination, and drinking water to realize a vision for smart and water sensitive cities and societies. Specifically, I am an expert on numerous novel advanced oxidation processes or membrane filtration such as reverse osmosis but have also broad knowledge on many other processes. The focus of my research is on technology innovation. For example, I research novel membrane processes such as forward osmosis or innovative lighting solutions for UV driven advanced oxidation processes (utilizing vacuum UV or LEDs). A key aspect is that those technologies are then assessed in the context of complete treatment trains or more holistically, as buliding block of solutions for cities. My research on water treatment technology is typically strongly connected to controlling water quality hazards to end-users, including trace organic contaminants, disinfection byproducts, and also pathogens.

Selected publications

– Velo-Gala I, Farre MJ, **Radjenovic J & Gernjak W** 2019, 'N-Nitrosodimethylamine (NDMA) Degradation by the Ultraviolet/Peroxodisulfate Process', *Environmental Science & Technology Letters*, 6, 2, 106 – 111.

– Sbardella L, Velo-Gala I, Comas J, Rodriguez-Roda Layret I, Fenu A & **Gernjak W** 2019, 'The impact of wastewater matrix on the degradation of pharmaceutically active compounds by oxidation processes including ultraviolet radiation and sulfate radicals', *Journal Of Hazardous Materials*, 380, UNSP 120869.

– Rizzo L, Malato S, Antakyali D, Beretsou VG, Đolić MB, **Gernjak W**, Heath E, Ivancev-Tumbas I, Karaolia P, Lado Ribeiro AR, Mascolo G, McArdell CS, Schaar H, Silva AMT & Fatta-Kassinos D 2019, 'Consolidated vs new advanced treatment methods for the removal of contaminants of emerging concern from urban wastewater', *Science of the Total Environment*, 655, pp. 986-1008.

Selected research activities

Organized and chaired workshop: International experiences in potable reuse – what and how can we best learn? October 4th, 2019, Girona.

Relevant talks:

06/2019: Gernjak, W. Lamp driven advanced oxidation processes. At: 6th European Conference on Environmental Applications of Advanced Oxidation Processes. **Invited plenary presentation.** Portoroz, Slovenia.

Supervision of PhD theses:

- M. Sauchelli Toran (completed in 2019). Mass Transport and Fouling of Novel Forward Osmosis Thin-Film Composite Membranes.
- M. Plá-Castellana (since 2017). Chemometric tools for water quality assessment with online UV-Vis spectrometers.
- N. Kovoorge (2018-). A novel advanced oxidation process based on a dual wavelength (185nm/254nm) approach.
- N. Tsiarta (2019-). Hybrid ozone-ceramic membrane process: increasing hydroxyl radical yield and OMP reduction while reducing membrane fouling.
- A. Kumar (2019-). Design, development and characterization of atmospheric plasma system for wastewater treatment.

ICREA MEMOIR 2019



Mario Giampietro

Universitat Autònoma de Barcelona (UAB)

Engineering Sciences

Mario Giampietro was born in Italy in 1953. He graduated in Chemical Engineering (1978) and Biological Sciences (1981) at Università La Sapienza, Rome. He has a MS degree in Food System Economics (CEFAS/Università La Tuscia) and a PhD in Social Sciences (Wageningen University, NL). Mario was a researcher at Istituto Nazionale di Ricerca per gli Alimenti e la Nutrizione (INRAN) from 1985 to 2007, but pursued most of his research as visiting scientist at leading universities, such as Cornell University (1987-1989 and 1992-1995), Wageningen University (1997), Universitat Autònoma de Barcelona (1998-2000), University of Wisconsin, Madison (2002), Penn State University (2005-2006), and Arizona State University (2006-2007). He joined ICREA and UAB in 2007. He has more than 150 scientific publications and is author of several books. He is the coordinator of the 7.4 M€ Horizon2020 project “Moving Towards Adaptive Governance in Complexity: Informing Nexus Security” (MAGIC).

Research interests

Mario works on integrated assessment of sustainability issues. Using concepts from complex systems theory, he has developed an innovative scientific approach: Multi-Scale Integrated Analysis of Societal and Ecosystem Metabolism (MuSIASEM). MuSIASEM integrates biophysical and socioeconomic variables across multiple hierarchical scales, thus establishing a link between the metabolism of socio-economic systems and potential constraints of the natural environment. MuSIASEM allows the use of integrated sets of indicators that can be chosen “à la carte” by social actors in relation to multiple criteria of performance. Recent research has focused on the analysis of energy systems and energy scenarios and directives (projects EUFORIE, NETEP, PARTICIPIA), food systems (GLAMUR), and the nexus between energy, food, and water in relation to sustainable development goals (MAGIC).

Selected publications

- **Giampietro M** 2019, ‘On the circular bioeconomy and decoupling: Implications for sustainable growth’, *Ecological Economics*, 162: 143-156.
- Pérez-Sánchez L, **Giampietro M**, Velasco-Fernández R & Ripa M 2019, ‘Characterizing the metabolic pattern of urban systems using MuSIASEM: The case of Barcelona’, *Energy Policy*, 124: 13-22.
- Di Felice LJ, Ripa M & **Giampietro M** 2019, ‘An alternative to market-oriented energy models: Nexus patterns across hierarchical levels’, *Energy Policy*, 126: 431-443.
- Cabello V, Renner A & **Giampietro M** 2019, ‘Relational analysis of the resource nexus in arid land crop production’, *Advances in Water Resources*, 130: 258-269.
- Serrano-Tovar T, Peñate Suárez B, Musicki A, de la Fuente Bencomo JA, Cabello V & **Giampietro M** 2019, ‘Structuring an integrated water-energy-food nexus assessment of a local wind energy desalination system for irrigation’, *Science of the Total Environment*, 689: 945-957.
- Vivien F-D, Nieddu M, Befort N, Debref R & **Giampietro M** 2019, ‘The hijacking of the bioeconomy’, *Ecological Economics*, 159: 189-197.
- Fierro A, Forte A, Zucaro A, Micera R & **Giampietro M** 2019, ‘Multi-scale integrated assessment of second generation bioethanol for transport sector in the Campania Region’, *Journal of Cleaner Production*, 217: 409-422.

Selected research activities

“Modelling the effects of structural changes and terms of trade”, plenary presentation at the Energy Modelling Platform for Europe Conference (EMP-E 2019): Modelling the implementation of A Clean Planet For All Strategy, European Commission DG RTD, Brussels, 8 Oct 2019.

“Wicked tensions of transition”, keynote presentation at the 12th Biennial Conference of the Canadian Society for Ecological Economics (CANSEE 2019): Engaging Economies of Change, Waterloo, Canada, 24 May 2019.

Invited expert, EU-China Joint Experts’ Seminar on identifying potential joint priorities for research and innovation in food, agriculture and biotechnology, European Commission DG AGRI, Brussels 25 March 2019.

ICREA MEMOIR 2019



Mark Gieles

Universitat de Barcelona (UB)

Experimental Sciences & Mathematics

Mark Gieles obtained his PhD in 2006 from Utrecht University in the Netherlands under the supervision of Prof Henny Lamers and Prof Simon Portegies Zwart. He then moved to the European Southern Observatory (ESO) in Chile as a research fellow and support astronomer on the Very Large Telescope (VLT) at Cerro Paranal in the Atacama desert. In 2009 he won a Royal Society University Research Fellowship (URF) which he took up at the Institute of Astronomy of the University of Cambridge and in 2013 he moved it to the University of Surrey, where he started a new astrophysics research group. From 2013 to 2019 he was PI of a Starting Grant of the European Research Council (ERC) and since 2017 he is a member of the editorial board of Monthly Notices of the Royal Astronomical Society (MNRAS), one of the leading peer-reviewed journals in astronomy and astrophysics.

Research interests

I am interested in the formation and dynamical evolution of globular clusters to shed light on the stellar initial mass function, black holes, gravitational waves and the dark matter distribution in galaxies. The Milky Way contains 150 globular clusters, for which we have exquisite observations, including kinematics and chemistry. To understand these, I use both star-by-star N-body simulations and dynamical mass models. I developed a new family of mass models (limepy) to search for black holes in star clusters and to probe dark matter in the Milky Way using data from the ESA-Gaia satellite and related surveys. I am also interested in the abundance problem of globular clusters. I proposed a globular cluster formation model in which a supermassive star forms via stellar collisions and pollutes the cluster with hot hydrogen-burning products in the first few million years.

Selected publications

- Antonini F, **Gieles M** & Gualandris A 2019, 'Black hole growth through hierarchical black hole mergers in dense star clusters: implications for gravitational wave detections', *Monthly Notices Of The Royal Astronomical Society*, 486, 4, 5008 – 5021.
- de Boer TJL, **Gieles M**, Balbinot E, Henault-Brunet V, Sollima A, Watkins LL & Claydon I 2019, 'Globular cluster number density profiles using Gaia DR2', *Monthly Notices Of The Royal Astronomical Society*, 485, 4, 4906 – 4935.
- Hénault-Brunet V, **Gieles M**, Sollima A, Watkins LL, Zocchi A, Claydon I, Pancino E, & Baumgardt H 2019, 'Mass modelling globular clusters in the Gaia era: a method comparison using mock data from an N-body simulation of M4', *MNRAS*, vol. 483, pp 1400-1425

Selected research activities

In 2019 my ERC starting grant CLUSTERS came to an end. CLUSTERS developed new dynamical models for globular clusters (GCs) (limepy) and compared them to state-of-the art observations. The CLUSTERS team found that several GCs contain a large population of stellar-mass BHs and that these give rise to similar observational signatures as the sought-after intermediate-mass BH. To understand the evolution of BH populations in GCs, a fast model for the evolution of GCs with BHs was developed (clusterbh). This new model was used to make predictions for dynamically produced BH binary mergers that can now be observed with gravitational wave observatories. The team also proposed a new formation mechanism for GCs, in which a supermassive star forms together with the cluster to explain the anomalous abundances that are ubiquitous in GCs today.

The most important **conclusions of CLUSTERS** are that:

- 1. stellar-mass BHs are common in GCs;
- 2. supermassive stars may have existed in all GCs;
- 3. there is no convincing evidence for intermediate-mass BHs in GCs;
- 4. the reported signatures of dark matter in GCs can be explained by Galactic tides.

ICREA MEMOIR 2019



Roger Gomis

Institut de Recerca Biomèdica de Barcelona (IRB Barcelona)

Life & Medical Sciences

Dr. Roger Gomis is an ICREA Research Professor and a member of the Oncology Program at the Institute for Research in Biomedicine, Barcelona. He received his PhD in biochemistry from the University of Barcelona in 2002, and was a postdoctoral fellow at Memorial Sloan-Kettering Cancer Center in Prof. Joan Massagué's laboratory. In 2007, he assumed his current position. Since 2018 he is an associate professor at the University of Barcelona. Dr. Roger Gomis is interested in how growth factors, signaling pathways, and gene expression programs control normal cell behavior and cancer cell metastasis. Driven by the problem of metastasis, which is the cause of 90% of cancer deaths, his laboratory is pursuing the molecular and genetic mechanisms of metastasis. In particular, identifying genes that enable cancer to metastasize clinically relevant sites. In 2012 Roger founded Inbiomotion as an ICREA and IRB Barcelona spin-off company from his research.

Research interests

Intricate signalling networks control cell division, differentiation, movement, organization and death. Cancer cells disobey these signals during tumour progression and metastasis, which is the final step in 90% of all fatal solid tumours. Metastasis is therefore a grave public health problem and consequently a field of considerable pharmaceutical interest. A major research focus of our group is to identify and understand the genes and functions that allow tumor cells to achieve metastatic colonization of vital organs. As we understand more about the biology of BC cells, we can begin to address how best to treat this form of disease. Key to determining whether dormant solitary cells or micrometastases represent valid targets is knowledge of the underlying biology of dormancy and the probability of cells progressing to active metastatic growth. This progression is poorly understood in preclinical models and even less so clinically and has become of our interest.

Selected publications

- Ivanova S, Polajnar M, Hernandez-Alvarez MI, Slobodnyuk K, Plana N, **Nebreda AR**, Palacin M, **Gomis RR**, Behrends C & Zorzano A 2019, 'Regulation of death receptor signaling by the autophagy protein TP53INP2', *EMBO Journal*, 38, 10, e99300.
- Salvador F, Llorente A & **Gomis RR** 2019 "From latency to overt bone metastasis in breast cancer: Potential for treatment and prevention". *J. Pathol.* 249, 1, 6 - 18.
- Coleman R, Gregory W, Jean-Mairet J, Tercero JC, Torres-Martin J & **Gomis R** 2019, 'Long term survival benefits of adjuvant zoledronic acid associated with maf status of primary tumor', *Cancer Research*, 79, 4.
- **Gomis RR** 2019, 'Survival Skills Ensure that Cancer Spreads', *Nature*, 573, 353-354.

Selected research activities

Young Investigator Award, awarded by the Spanish Association for Research in Cancer (ASEICA), Spain.

ICREA MEMOIR 2019



Alejandro R. Goñi

Institut de Ciència de Materials de Barcelona (CSIC - ICMAB)
Engineering Sciences

I was born in Córdoba, Argentina, and graduated in physics in 1985 from Balseiro Institute, Argentina. In 1986 I moved to Germany for my PhD at the Max-Planck Institute FKF in Stuttgart with Prof. M. Cardona, which I finished in 1989. It followed a two-years postdoc at AT&T Bell Labs in Murray Hill, USA, and back to the MPI Stuttgart for three years. In 1996 I switched to the Technical University of Berlin for an appointment as Research & Teaching Associate. In 1999 I was awarded the Karl-Scheel Prize of the Physical Society of Berlin for my contributions to the field of high-pressure semiconductor physics. I joined the Optoelectronic Properties of Nanostructured Materials group at ICMAB-CSIC in November 2003 as ICREA. I created a facility for optical spectroscopy with micro and nanometer-scale resolution and set up a laboratory for high-pressure physics. I am leading group activities on high pressure, hybrid perovskites and plasmon-assisted thermionic emitters.

Research interests

I am an experimental physicist with broad interests and expertise in solid-state physics, optical spectroscopy (Raman scattering, photoluminescence, etc.), nano-science and technology, energy materials, the physics of low-dimensional materials (superlattices, quantum wires and dots), highly correlated electron systems, and high-pressure techniques. Essentially, I use light as a probe of the physical properties of all kinds of organic and/or inorganic molecular and nano-materials, searching for new behaviors or phenomena that emerge as a direct consequence of the reduced dimensionality and/or size of the material system under study. Although I am pursuing basic research, almost all my lines of investigation have a clear application in mind, such as to improve the performance of optoelectronic devices based on nano-materials, enhance thermoelectric and/or photovoltaic properties, boost solar energy conversion efficiency, develop ultra-sensitive spectroscopic techniques, etc.

Selected publications

- Gómez A, Wang Q, **Goñi AR**, Campoy-Quiles M & Abate A 2019, 'Ferroelectricity-free lead halide perovskites', *Energy Environ. Sci.* **12**, 2537-2547.
- Francisco-López A, Charles B, Weber OJ, Alonso MI, Garriga M, Campoy-Quiles M, Weller MT & **Goñi AR** 2019, 'Equal Footing of Thermal Expansion and Electron-Phonon Interaction in the Temperature Dependence of Lead Halide Perovskite Band Gaps', *J. Phys. Chem. Lett.* **10**, 2971-2977.
- Alonso MI, Charles B, Francisco-López A, Garriga M, Weller MT & **Goñi AR** 2019, 'Spectroscopic ellipsometry study of $\text{FA}_x\text{MA}_{1-x}\text{PbI}_3$ Hybrid Perovskite Single Crystals', *J. Vac. Sci. Technol. B.* **37**, 062901/1-7.
- Francisco-López A, Han B, Lagarde D, Marie X, Urbaszek B, Robert C & **Goñi AR** 2019, 'On the Impact of the Stress Situation on the Optical Properties of WSe_2 Monolayers under High Pressure', *Pap. Phys.* **11**, 110005/1-10.

Selected research activities

- Principal Investigator of the research project *Plasmon-resonance driven thermionic emitters for improved solar energy harvesting* (PLASMIONICO), a Marie Skłodowska-Curie Individual Fellowship (Dr. Luis. A. Pérez), Grant No. H2020-MSCA-IF-2018-839402, September 2019 - August 2021.
- Co-Principal Investigator of project Ref. PGC2018-095411-B-I00, *Efficient harvesting of visible and infrared solar energy through rainbow architectures* (RAINBOW), from the Ministerio de Ciencia, Innovación y Universidades of Spain, January 2019 - December 2021.
- Since April 2019, Coordinator of the strategic Research Line RL1: *Sustainable Energy Conversion & Storage Systems* of the Institute of Materials Science of Barcelona (ICMAB-CSIC) and member of ICMAB's Scientific Executive Board.

ICREA MEMOIR 2019



Miguel A. González Ballester

Universitat Pompeu Fabra (UPF)

Engineering Sciences

Degree in Computer Science from Universitat Jaume I (1996), and doctorate from the University of Oxford (2000). I was a senior researcher at Toshiba Medical Systems (Japan), INRIA (France), and the University of Bern (Switzerland), where I was leading the Surgical Technology Division at the Faculty of Medicine. From 2008 until September 2013 I was in charge of the Research Department of the company Alma IT Systems in Barcelona. In October 2013 I was appointed ICREA Research Professor, and joined the Department of Information and Communication Technologies at Universitat Pompeu Fabra in Barcelona, where I lead the Barcelona Centre for New Medical Technologies (BCN Medtech). I have approx. 300 publications in peer-reviewed scientific journals and conferences, and have supervised 20 PhD theses. I was awarded Fellowships from Toshiba and the Japan Society for the Promotion of Science.

Research interests

My research focus is on computerised medical image analysis and computer-assisted surgery, including: image processing and computer vision, image-based diagnosis through machine learning, medical imaging physics, computational modelling and simulation of virtual organs and surgical interventions, navigation in computer-assisted surgery, surgical devices and implants, and applied clinical research. In addition to basic research with solid mathematical foundations (notably my work on statistical biomechanical models), all my projects have a marked translational character, focusing on concrete clinical and industrial applications.

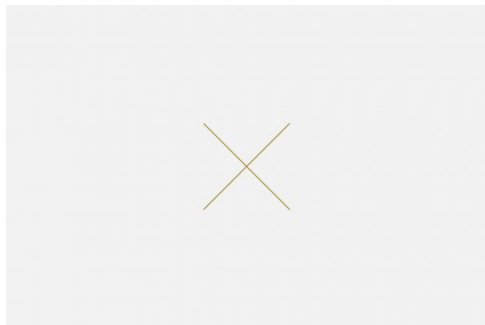
Selected publications

- López-Linares K, García I, García A, Cortes C, Piella G, Macía I, Noailly J & **González Ballester MA** 2019, 'Image-based 3D characterization of abdominal aortic aneurysm deformation after endovascular aneurysm repair', *Frontiers in Bioengineering and Biotechnology*, vol. 7, no. 267, pp 1-17.
- Zimmer V, **González Ballester MA** & Piella G 2019, 'Multimodal image registration using Laplacian commutators', *Information Fusion*, vol. 49, pp 130-145.
- Ruiz Wills C, Olivares AL, Tassani S, Ceresa M, Zimmer V, **González Ballester MA**, del Río LM, Humbert L & Noailly J 2019, '3D patient-specific finite element models of the proximal femur based on DXA towards the classification of fracture and non-fracture cases', *Bone*, vol. 121, pp 89-99.
- Torrents-Barrena J, Piella G, Masoller N, Gratacós E, Eixarch E, Ceresa M & **González Ballester MA** 2019, 'Fully automatic segmentation of the placenta and its peripheral vasculature in intrauterine fetal MRI', *Medical Image Analysis*, vol. 54, pp 263-279.
- Rampun A, López-Linares K, Morrow PJ, Scotney BW, Wang H, Garcia Ocaña I, Maclair G, Zwigelaar R, **González Ballester MA** & Macía I 2019, 'Breast pectoral muscle segmentation in mammograms using a modified holistically-nested edge detection network', *Medical Image Analysis*, vol. 57, pp 1-17.
- Xia J, Wang F, Benkarim OM, Sanroma G, Piella G, **González Ballester MA**, Hahner N, Eixarch E, Zhang C, Shen D & Li G 2019, 'Fetal cortical surface atlas parcellation based on growth patterns', *Human Brain Mapping*, vol. 40, pp 3881-3899.
- Torrents-Barrena J, López-Velazco R, Piella G, Masoller N, Valenzuela-Alcaraz B, Gratacós E, Eixarch E, Ceresa M & **González Ballester MA** 2019, 'TTTS-GPS: Patient specific preoperative planning and simulation platform for twin-to-twin transfusion syndrome fetal surgery', *Computer Methods and Programs in Biomedicine*, vol. 179, no. 104993, pp 1-23.

Selected research activities

- New spin-off company: MiWendo Solutions
- Program Chair IEEE ISBI 2019

ICREA MEMOIR 2019



María Concepción González-García

Universitat de Barcelona (UB)

Experimental Sciences & Mathematics

Prof M.C. Gonzalez-Garcia got her PhD in Theoretical Particle Physics at the University of Valencia in 1991. She held postdoctoral positions at University of Wisconsin-Madison and as a fellow of the CERN Theory Division. As early as 1993 she obtained a tenured scientist position at the CSIC of which she took residency in 1996 at IFIC (a joint CSIC-University of Valencia institute) where eventually she was promoted to full Research Professor. In 2003 she joined the Yang Institute for Theoretical Physics at Stony Brook University as Associate Professor. She joined ICREA in the fall of 2006. She has written over 100 research papers on particle physics phenomenology, as well as some review articles. She is regularly invited to international meetings and conferences and she has given plenary talks at the most important conferences in her area.

Research interests

I am a theoretical particle physicist. I study the fundamental laws that govern the behaviour of the smallest components of Nature: the elementary particles. I do it by comparing the predictions from different theories with measurements performed at accelerators, where high energy beams of matter are made to collide, as well as in experiments which detect the elementary particles arriving to us from outer space, and which were produced in the burning of the stars or during the reactions occurring in the early Universe. The ultimate goal is two-fold: understand the physical laws of the microcosms as well as how they determine the Universe we live in.

Selected publications

- Almeida E, Alves A, Rosa-Agostinho N, Eboli OJP & **Gonzalez-Garcia MC** 2019, 'Electroweak sector under scrutiny: A combined analysis of LHC and electroweak precision data', *Physical Review D*, 99, 3, 033001.
- Esteban I, **Gonzalez-Garcia MC**, Hernandez-Cabezudo A, Maltoni M & Schwetz T 2019, 'Global analysis of three-flavour neutrino oscillations: synergies and tensions in the determination of (θ_{13}) , (CP), and the mass ordering', *Journal Of High Energy Physics*, , 1, 106.
- Esteban I, **Gonzalez-Garcia MC** & Maltoni M 2019, 'On the determination of leptonic CP violation and neutrino mass ordering in presence of non-standard interactions: present status', *Journal Of High Energy Physics*, , 6, 055.
- Almeida E, Rosa-Agostinho N, Eboli OJP & **Gonzalez-Garcia MC** 2019, 'Light-quark dipole operators at the LHC', *Physical Review D*, 100, 1, 013003.

ICREA MEMOIR 2019



Cayetano González

Institut de Recerca Biomèdica de Barcelona (IRB Barcelona)

Life & Medical Sciences

After completing a PhD on fly genetics in the laboratory of Pedro Ripoll at the Centre for Molecular Biology (CBM, Madrid, Spain), Cayetano González moved to David Glover's lab in the UK, first at Imperial College and later as a CRC Joint Principal Investigator at Dundee. In 1994, he took his first independent position, as a Group Leader at EMBL (Heidelberg, Germany). After the customary nine-year period at EMBL, he moved to the Centro Nacional de Investigaciones Oncológicas (CNIO, Madrid, Spain). In 2004 he moved to his present post at the Institute for Research in Biomedicine (IRB Barcelona) where he leads the Cell Division Group. In 2007 he was elected to full membership of the European Molecular Biology Organisation (EMBO).

Research interests

We model cancer in flies to understand the cellular and molecular changes that drive malignant growth. We focus on the mechanisms of malignant transformation in larval brains where we have found abnormal self-renewing asymmetric division often results in malignant growth. Some of our experimental tumor models are driven by the ectopic expression of germline proteins. We are interested in the mechanisms that bring about genome instability in these tumors and try establishing the actual extent to which such lesions contribute to tumor progression. We develop and make extensive use of microscopy techniques. We demonstrated that the microtubule cytoskeleton of *Drosophila* neuroblasts is governed by the distinct behaviour displayed by centrosomes in these cells. We maintain an active line of research to identify new centrosomal proteins and found some with human orthologs that are linked to human pathologies.

Selected publications

- Molnar C, Peter Heinen J, Reina J, Llamazares S, Palumbo E, Breschi A, Gay M, Villarreal L, Vilaseca M, Pollarolo G & **Gonzalez C** 2019, 'The histone code reader PHD finger protein 7 controls sex-linked disparities in gene expression and malignancy in *Drosophila*', *Science Advances*, 5, 8, eaaw7965.

Selected research activities

Selected Conferences and Meetings

January 2019: 2nd Asian Pacific *Drosophila* Neuroscience Conference "Using *Drosophila* larval brain tumours to understand malignant and normal growth during development". Taipei. Taiwan.

Professional Services

January 2019: HFSP fellowship review committee meeting 2019. Strasbourg. France.

March 2019: PhD thesis defense member (External Examiner). Instituto Gulbenkian de Ciência. Oeiras. Portugal.

March 2019: PhD thesis defense member (External Examiner). The Gurdon Institute. Cambridge. UK.

May 2019: Open Biology Editorial Board meeting. London. UK.

November 2019: Member of Evaluation Committee for Professorship promotion at University of Cyprus.

2019- : Member of EMBO Global Investigator Network Committee.

2018-2021: Member of European Science Foundation (ESF) College of Expert Reviewers.

Member of Editorial Boards: G3, Genes, Genomes, Genetics; Royal Society Open Biology; EMBO Reports; Life Sciences Encyclopaedia.

Conference organization: Barcelona BioMed Conference "*Drosophila* as a cancer model". Barcelona. Spain.

ICREA MEMOIR 2019



Pau Gorostiza

Institut de Bioenginyeria de Catalunya (IBEC)

Life & Medical Sciences

Pau Gorostiza graduated in physics at the University of Barcelona (UB), where he obtained his PhD (European Doctorate) in the field of semiconductor electrochemistry. He worked at the UB microscopy facility in AFM and STM of biological samples, and in nanotechnology for materials science. He visited the CNRS – Université Pierre et Marie Curie (France), and the University of California at Berkeley (USA). He is currently ICREA Research Professor at the Institute for Bioengineering of Catalonia, where he develops photoswitchable ligands of neuronal proteins and studies charge transport in redox proteins and photosynthetic complexes using EC-STM/AFM. He obtained a Human Frontier Science Program (HFSP) Career Development Award and two European Research Council (ERC) grants. He published more than 100 articles (3500 citations, h-index 31) and holds 7 patents (5 licensed). He has supervised 8 postdoctoral fellows and 9 PhDs.

Research interests

Research in the group is focused on developing nanoscale tools to study biological systems. These tools include instrumentation based on proximity probes, like Electrochemical Tunneling Microscopy and Spectroscopy, that we are applying to study metal oxides and redox proteins. Another set of nanotools that we are developing is based on molecular actuators that can be switched with light, like azobenzene, which can be chemically attached to biomolecules in order to optically control their activity.

Selected publications

- López-Martínez M, López-Ortiz M, Antinori ME, Wientjes E, Nin-Hill A, **Rovira C**, Croce R, Díez-Pérez I & **Gorostiza P** 2019, 'Electrochemically Gated Long-Distance Charge Transport in Photosystem I', *Angewandte Chemie-international Edition*, 58, 38, 13280-13284
- Riefole F, Matera C, Garrido-Charles A, Gomila AMJ, Sortino R, Agnetta L, Claro E, Masgrau R, Holzgrabe U, Batlle M, Decker M, Guasch E & **Gorostiza P** 2019, 'Optical Control of Cardiac Function with a Photoswitchable Muscarinic Agonist', *Journal Of The American Chemical Society*, 141, 18, 7628 - 7636.
- Cabré G, Garrido-Charles A, Moreno M, Bosch M, Porta-de-la-Riva M, Krieg M, Gascon-Moya M, Camarero N, Gelabert R, Lluch JM, Busqué F, Hernando J, **Gorostiza P** & Alibés R 2019, 'Rationally designed azobenzene photoswitches for efficient two-photon neuronal excitation', *Nature Communications*, 10, 907.
- Pittolo S, Lee H, Lladó A, Tosi S, Bosch M, Bardia L, Gómez-Santacana X, Llebaria A, Soriano E, Colombelli J, Poskanzer KE, Perea G & **Gorostiza P** 2019, 'Reversible silencing of endogenous receptors in intact brain tissue using 2-photon pharmacology', *Proceedings Of The National Academy Of Sciences Of The United States Of America*, 116, 27, 13680 - 13689.
- Cabré G, Garrido-Charles A, González-Lafont A, Moormann W, Langbehn D, Egea D, Lluch JM, Herges R, Alibés R, Busqué F, **Gorostiza P** & Hernando J 2019, 'Synthetic Photoswitchable Neurotransmitters Based on Bridged Azobenzenes', *Organic Letters*, 21, 10, 3780 - 3784.
- Maleeva G, Wutz D, Rustler K, Nin-Hill A, Alfonso-Prieto M, Petukhova E, Bautista-Barrufet A, Gomila-Juaneda A, Scholze P, Peiretti F, **Rovira C**, König B, **Gorostiza P** & Bregestovski P 2019, 'A photoswitchable GABA receptor channel blocker', *British Journal Of Pharmacology*, 176, 15, 2661 - 2677.

ICREA MEMOIR 2019



Sebastian Grinstein

Institut de Física d'Altes Energies (IFAE)

Experimental Sciences & Mathematics

I completed my MSc at the University of Buenos Aires in 1998 working on the measurement of the production cross section of direct photons at the D0 experiment (Fermilab, USA). Afterwards, I worked in Sweden as a member of the Astroparticle Group of the Royal Institute of Technology studying cosmic rays. I did my PhD (2003, University of Buenos Aires) measuring the properties of quarks and gluons in high energy collisions at D0. In 2003 I became a postdoctoral Fellow at Harvard University where I worked mainly at the CDF experiment (Fermilab) on top-quark physics and detector operations. In 2008 I joined the IFAE (Institut de Física d'Altes Energies) LHC-ATLAS experiment group as an ICREA Researcher. I am currently leading the ATLAS Detector upgrade effort at IFAE. In 2012 I became an ICREA Research Professor.

Research interests

My research has been focused on high-energy experimental particle physics: understanding which are the fundamental constituents of nature and how they interact. At the Fermilab Tevatron accelerator I have performed studies of QCD and the properties of the heaviest quark, the top quark. At the LHC accelerator at CERN I conducted searches for new physics in the top sector. I have always been drawn to instrumentation R&D. Currently I lead a coordinated project to develop semiconductor pixel detectors for the ATLAS experiment. As a result of this project, 3D pixel silicon sensors designed and produced at Barcelona are included in the innermost detector layer of ATLAS and in the tracking system of the ATLAS Forward Proton detector. My recent work aims to develop radiation hard silicon sensors for tracking and timing detectors of the coming high luminosity LHC era. I am also co-leading a project to produce a new generation of real time breast biopsy machines based on CdTe sensors.

Selected publications

- Terzo S, Benoit M, Cavallaro E, Casanova R, Di Bello FA, Foerster F, **Grinstein S**, Iacobucci G, Peric I, Puigdengoles C, Vicente Barrero Pinto M & Vilella Figuerase E 2019, 'Characterisation of AMS H35 HV-CMOS monolithic active pixel sensor prototypes for HEP applications', *Journal Of Instrumentation*, 14, P02016.
- Terzo S, Chmeissani M, Giannini G, **Grinstein S**, Manna M, Pellegrini G, Quirion D & Vazquez Furelos D 2019, 'Performance of Irradiated RD53A 3D Pixel Sensors', *Journal Of Instrumentation*, 14, P06005.

Selected research activities

- * Principal investigator of the ATLAS-Upgrade group at IFAE (FPA, MINECO).
- * Principal investigator of the Instrumentation group at IFAE (SGR, AGAUR).
- * Co-principal investigator of the 3D Biopsy on Tomosynthesis project (RIS3CAT, ACCIO).
- * Co-principal investigator of the BIOSPAD BIST Ignite project (BIST).
- * Coordinator of AIDA-2020 activities at IFAE and WP6 co-coordinator (H2020, EU).
- * One PhD thesis completed in 2019 (D. Vazquez Furelos). Three PhD theses currently underway.
- * Member of the ATLAS High Granularity Timing Detector management group.

ICREA MEMOIR 2019



Víctor Guallar

Barcelona Supercomputing Center - Centro Nacional de Supercomputación (BSC - CNS)

Life & Medical Sciences

Professor Guallar performed his undergraduate at the Autonomous University of Barcelona (Spain), with a major in Chemistry, followed by a joined PhD in physical chemistry at UC Berkeley and Autonomous University of Barcelona, with Professors Josep M. Lluch, Miquel Moreno and William H Miller (November 1999 thesis defense). Afterwards, he moved for a postdoctoral research position (2000-2003) to Columbia University in New York City, under the supervision of Prof. Richard Friesner. In 2003 he got a tenured position as an assistant Professor at the Biochemistry and Molecular Biophysics department at the School of Medicine in Washington University in St. Louis. In 2006 he was appointed ICREA Research Professor in the Life Science Department at the Barcelona Supercomputing Center (BSC), where he has been developing his research group. In 2016 he co-founded Nostrum Biodiscovery, the first spin-off from the BSC.

Research interests

In the EAPM lab at BSC we are devoted to the development and application of computational algorithms in molecular modeling. Using techniques such as Monte Carlo simulations, bioinformatics, machine learning and mixed quantum mechanics/molecular mechanics methods, we face different biophysical and biochemical challenges, including characterization and engineering of enzymes for industrial and biomedical applications, software development for more efficient early stages of drug design, and neoantigen presentation prediction.

Along 2019, particular interest has focused on: i) developing the first PluriZyme with two activities, providing complex cascade reactions in a single enzyme, ii) enhancing our software PELE with a fragment builder and a Markov State Model modules, and iii) the development of NOAH (Neoantigen Optimization AlgoritHm), the first bioinformatics procedure for neoantigen selection that correlates with an immunogenic response.

Selected publications

- Gilabert JF et al. 2019, 'Monte Carlo Techniques for Drug Design: The Success Case of PELE', *Biomolecular Simulations In Structure-based Drug Discovery*, 87-103.
- de Salas F et al. 2019, 'Engineering of a fungal laccase to develop a robust, versatile and highly-expressed biocatalyst for sustainable chemistry', *Green Chemistry*, **21**: 5374-5385.
- Saen-Oon S et al. 2019, 'Atomistic simulations shed new light on the activation mechanisms of ROR gamma and classify it as Type III nuclear hormone receptor regarding ligand-binding paths', *Scientific Reports*, **9**:17249.
- Gilabert JF et al., **Guallar V** 2019, 'PELE-MSM: A Monte Carlo Based Protocol for the Estimation of Absolute Binding Free Energies', *J Chem Theory Comput*, **15**: 6243-6253.
- Aranda C et al. 2019, 'Selective synthesis of 4-hydroxyisophorone and 4-ketoisophorone by fungal peroxygenases', *Catalysis Science & Technology*, **9**: 1398-1405.
- Serrano A et al. 2019, 'Switching the substrate preference of fungal aryl-alcohol oxidase: towards stereoselective oxidation of secondary benzyl alcohols', *Catalysis Science & Technology*, **9**: 833-841.
- Mateljlik I et al. 2019, 'Increasing Redox Potential, Redox Mediator Activity, and Stability in a Fungal Laccase by Computer-Guided Mutagenesis and Directed Evolution', *Acs Catalysis*, **9**: 4561-4572.
- Vina-Gonzalez J et al. 2019, 'Structure-Guided Evolution of AAO from *Pleurotus eryngii* for the Selective Oxidation of Secondary Benzyl Alcohols', *Advanced Synthesis & Catalysis*, **361**: 2514-2525
- Carro J et al. 2019, 'Modulating Fatty Acid Epoxidation vs Hydroxylation in a Fungal Peroxygenase', *Acs Catalysis*, **9**: 6234-6242.

Selected research activities

We are actively involved in science dissemination, organizing a module of the Barcelona International Youth Science Challenge and participating in "Dia de la Ciència a les Escoles".

As for transfer of technology, we filed our first molecule patent at NBD and reached an agreement for a second spin-off for neoantigen prediction with IrsiCaixa.

ICREA MEMOIR 2019



Albert Guillén i Fàbregas

Universitat Pompeu Fabra (UPF)

Engineering Sciences

Albert Guillén i Fàbregas is an ICREA Research Professor at Universitat Pompeu Fabra. He is also an Adjunct Researcher at the University of Cambridge. In 1999 he received both the Telecommunication Engineering Degree and the Electronics Engineering Degree from Universitat Politècnica de Catalunya and the Politecnico di Torino respectively, and the PhD in Communication Systems from École Polytechnique Fédérale de Lausanne in 2004. He has held appointments at the New Jersey Institute of Technology, Telecom Italia, European Space Agency, Institut Eurécom, University of South Australia and the University of Cambridge. He is a recipient of both Consolidator and Starting Grants of the European Research Council. He is a member of the Young Academy of Europe and a Senior Member of the IEEE. He is an Editor of the IEEE Transactions on Information Theory and the Foundations and Trends on Communications and Information Theory.

Research interests

The broad theme of his research is the mathematical foundations of communications, spanning the fields of Information Theory, Coding Theory, Communications Theory and Signal Processing. Its aim is to study the fundamental limits of reliable communication, along with schemes and processing algorithms that allow one to achieve them.

Selected publications

- Somekh-Baruch A, Scarlett J & **Guillen i Fabregas A** 2019, 'Generalized Random Gilbert-Varshamov Codes', *IEEE Transactions on Inf Theory*, vol 65, no 6, pp 3452 - 3469, Jun 2019.
- Vazquez-Vilar G, **Guillen i Fabregas A** & Verdu S 2019, 'The Error Probability of Generalized Perfect Codes via the Meta-Converse', *IEEE Transactions on Inf Theory*, vol 65, no 9, pp. 5705 - 5717, Sept 2019.
- Somekh-Baruch A, Scarlett J & **Guillen i Fabregas A** 2019, 'A Recursive Cost-Constrained Construction that Attains the Expurgated Exponent', *IEEE International Symposium On Inf Theory (isit)*, , 2938 - 2942.
- Font-Segura J, Martinez A & **Guillen i Fabregas A** 2019, 'Asymptotics of the Random Coding Error Probability for Constant-Composition Codes', *IEEE International Symposium on Inf Theory*, Paris, France, Jul 2019.
- Abroshan M, Venkataramanan R, Dolecek L & **Guillen i Fabregas A** 2019, 'Coding for Deletion Channels with Multiple Traces', *IEEE International Symposium on Inf Theory*, Paris, France, Jul 2019.
- Rezazadeh A, Font-Segura J, Martinez A & **Guillen i Fabregas A** 2019, 'Joint Source-Channel Coding for the Multiple-Access Channel with Correlated Sources', *IEEE International Symposium on Inf Theory*, Paris, France, Jul 2019.
- Averbuch R, Merhav N & **Guillen i Fabregas A** 2019, 'Large Deviations of Typical Random Codes', *IEEE International Symposium on Inf Theory*, Paris, France, Jul 2019.

Selected research activities

- ERC Consolidator Grant (2017-2022)
- Invitations: ITA 2019 San Diego, MMSE 2019 Napoli, MDS 2019 Durshtein, Imperial College London, Huawei Mathematics Research Centre Paris
- Technical Program Committee (TPC) Co-Chair: 2023 IEEE International Symposium on Information Theory
- TPC Member: 2020 International Zurich Seminar on Communications, 2019 IEEE International Symposium on Information Theory
- Associate Editor IEEE Transactions on Information Theory and Foundations and Trends on Communications and Information Theory
- Member Young Academy of Europe

ICREA MEMOIR 2019



Roger Guimerà

Universitat Rovira i Virgili (URV)

Experimental Sciences & Mathematics

Roger Guimerà (Barcelona, 1976) graduated in Physics at Universitat de Barcelona in 1998, and obtained a PhD in Chemical Engineering from Universitat Rovira i Virgili in 2003. He then moved to Northwestern University where he worked as a postdoctoral fellow and, later, as a Fulbright Scholar. In 2008 he became a Research Assistant Professor at Northwestern's Department of Chemical and Biological Engineering, before accepting his current position at ICREA in 2010. He has been awarded the Premi Nacional de Recerca al Talent Jove (2010), the Erdős-Rényi Prize in Network Science (2012), and the Young Scientist Award for Socio- and Econophysics (2014).

Research interests

Cells, ecosystems and economies are examples of complex systems. In complex systems, individual components interact with each other, usually in nonlinear ways, giving rise to complex networks of interactions that are neither totally regular nor totally random. Partly because of the interactions themselves and partly because of the interaction's topology, complex systems cannot be properly understood by just analyzing their constituent parts. This feature of complex systems poses important challenges from both a fundamental perspective and an engineering perspective. Roger's research is devoted to the study of complex systems and, particularly, of the structure of complex networks and the interplay between network structure and dynamics. During his career, he has: (i) made methodological contributions to the study of complex networks, and (ii) used complex network analysis to gain understanding on a number of systems.

Selected publications

- Tarres-Deulofeu M, Godoy-Lorite A, **Guimera R** & Sales-Pardo M 2019, 'Tensorial and bipartite block models for link prediction in layered networks and temporal networks', *Physical Review E*, 99, 3, 032307.
- Menden MP et al. 2019, 'Community assessment to advance computational prediction of cancer drug combinations in a pharmacogenomic screen', *Nat. Comm.* 10, 2674
- Senan O, Aguilar-Mogas A, Navarro M, Capellades J, Noon L, Burks D, Yanes O, **Guimera R**, Sales-Pardo M 2019, 'CliqueMS: a computational tool for annotating in-source metabolite ions from LC-MS untargeted metabolomics data based on a coelution similarity network', *Bioinformatics*, 35, 20, 4089 - 4097
- Godoy-Lorite A **Guimerà R** & Sales-Pardo M 2019, 'Network-Based Models for Social Recommender Systems'. In: Moscato P, de Vries N (eds) *Business and Consumer Analytics: New Ideas*. Springer, Cham

Selected research activities

Principal investigator:

- "Mecánica Estadística para el Modelado y la Predicción del Comportamiento Humano", (MINECO), 1 Jan 2017 - 30 Jun 2020

Invited talks at international conferences:

- 10th International Conference on Complex Networks, COMPLENET'19, Tarragona, Catalonia
- Workshop on Higher-order Interaction Networks, Oxford, UK
- Critical and Collective Effects in Graphs and Networks 2019, Les Houches, France

Editorship:

- PLoS ONE

ICREA MEMOIR 2019



Karen Hardy

Universitat Autònoma de Barcelona (UAB)

Humanities

I joined ICREA in 2008. Following a PhD in the Institute of Archaeology, University College London, I worked on projects based in Hungary, Scotland and Papua New Guinea. From 1997-2005 I co-directed the Scotland's First Settlers project which explored the early post glacial environment and human population of North West Scotland. In 2005 I was awarded a Marie Curie OIF to visit the University of Sydney where I set up an international project to recover information of the role of plants in human evolutionary and pre-agrarian diets. My return phase took place at the University of York, UK. I am an Honorary Research Fellow at the University of Edinburgh.

Research interests

My interest lies in early prehistoric periods before the adoption of farming. Specifically, I study pioneer populations, human adaptations, use of land and sea-scapes and exploitation of wild plants as food, medicine and raw materials. The analysis of chemical compounds and microfossils extracted from samples of ancient dental calculus provides direct access to biographical details and paleoenvironmental information; this is particularly useful for earlier Palaeolithic periods where the evidence is very limited. Much of my research is also focused on the human use of the Atlantic coastline, specifically in West Africa and North west Europe. In the early postglacial periods, until the mid-Holocene around 8000 years ago, Britain was still physically attached to Europe and the coastline of North West Scotland was part of Europe's continental limit.

Selected publications

– **Hardy K** 2019, 'Paleomedicine and the use of plant secondary compounds in the Paleolithic and Early Neolithic', *Evolutionary Anthropology*, 28, 2, 60 – 71.

Selected research activities

Keynote speaker, 12th Brazilian Symposium of Pharmacognosy and the 17th Latin American Symposium of Pharmacobotany, Petrópolis city, Rio de Janeiro State, Brazil. *Paleomedicine and the use of plant secondary compounds in human evolution*

ICREA MEMOIR 2019



Stuart Hardy

Universitat de Barcelona (UB)

Experimental Sciences & Mathematics

I completed a BSc in Geology (Hons 1st Class) at Glasgow University in 1984 and then a Masters in Computer Science at Bradford University in 1987. Thereafter, I worked on satellite rainfall prediction and hydrological modelling at Reading University for 2 years, before undertaking a PhD at the University of London (1989-1994) in Mathematical Modelling of Tectonics and Sedimentation. Two Postdoc fellowships then followed: A 2-year Royal Society European Science Exchange Fellowship at CSIC (Jaume Almera) in Barcelona, and 1-year post-doc working with John Suppe at Princeton University. I was subsequently a lecturer in the Earth Science Department at the University of Manchester for 5 years. I have been an ICREA Research Professor in the Faculty of Geology at the Universitat de Barcelona since 2003.

Research interests

My research interest lies in the mathematical, numerical, modelling of geological processes (tectonics, sedimentation, volcanology, etc.) on both Earth and other Planetary bodies. To this end, I use a variety of different approaches to try to better understand (through both modelling and validation) the various relationships preserved in the physical geological record on Earth, or recorded by remote sensing techniques on distant Planetary bodies. I am interested in both continuum (e.g. finite difference, finite element) and discontinuum techniques (e.g. discrete element, SPH) both from a theoretical standpoint and in using them in practical applications. I am also very much interested in using high performance computing (HPC) to run high resolution, parallelized numerical models and visualize the results of such models. Recent research has focused on computational determinism in parallelized HPC codes, Martian tectonics, viscous deformation, salt tectonics and discrete element modelling of deltaic sedimentation.

Selected publications

- **Hardy S** 2019, "Novel discrete element modelling of Gilbert-type delta formation in an active tectonic setting - first results.", *Basin Research*, 31, 1, 77-91.
- **Hardy S** 2019, 'Discrete element modelling of extensional, growth, fault-propagation folds', *Basin Research*, 31, 3, 584 - 599.
- **Hardy S** 2019, "The Internal Structural Evolution of Calderas: Results from 3D Discrete Element Simulations", *Geosciences* 2019, 9, 419;

ICREA MEMOIR 2019



Wolfram Hinzen

Universitat Pompeu Fabra (UPF) & FIDMAG Hermanas Hospitalarias (FIDMAG)
Humanities

I obtained a Magister (Freiburg, 1993), an MA (King's College London, 1994), and a PhD (philosophy, Bern, 1996), prior to becoming a Swiss-government funded postdoctoral researcher in Stuttgart (1996-7) and New York (1997-9). I was first employed in an academic position as Assistant Professor in Regensburg (1999), then at the Universitat van Amsterdam (2003-2006), before becoming a full professor in Durham (2006-) and an ICREA Research Professor in Barcelona in April 2013. I also was a guest professor at Hong Kong University (2010) and at Universitat Autònoma de Barcelona (2011).

Research interests

I study the role of language in human cognition by studying disorders of language in the context of cognitive disorders. I have inaugurated the 'Un-Cartesian hypothesis', which suggests that the evolution of language is also the evolution of a particular cognitive type. The theoretical basis of this research program is set out in my monographs 'Mind Design' (2006), 'An Essay on Names and Truth' (2007), and 'The Philosophy of Universal Grammar' (2013, with M. Sheehan), all from Oxford UP, but my group now pursues it largely empirically. I have directed three international projects (NWO, 2006-2011; AHRC/DFG, 2009-2012; AHRC, 2014-2017), the last of these dedicated to the comparative study of language disorder in schizophrenia and aphasia. In Barcelona I have founded the Grammar & Cognition lab (www.grammar.cat), which pursues the project of a typology of linguistic diversity across clinical populations.

Selected publications

- Tovar A, Fuentes-Claramonte P, Soler-Vidal J, Ramiro-Sousa N, Rodriguez-Martinez A, Sarri-Closa C, Sarró S, Larrubia J, Andrés-Bergareche H, Miguel Cesma MC, Pablo Padilla P, Salvador R, Pomarol-Clotet E & **Hinzen W** 2019, 'The linguistic signature of hallucinated voice talk in schizophrenia', *Schizophrenia Research*, 206, 111 - 117.
- Cokal D, Zimmerer V, Varley R, Watson S, Turkington D, Ferrier N & **Hinzen W** 2019, 'Comprehension of factive and non-factive clausal complements in schizophrenia with and without formal thought disorder', *Journal of Nervous and Mental Disease*, 207:5, 384-392.
- Tovar A, Schmeisser S, Morey C, Gari A & **Hinzen W** 2019, 'Language disintegration under conditions of severe formal thought disorder', *Glossa-a Journal Of General Linguistics*, 4, 1, 134.
- Cokal D, Zimmerer V, Turkington D, Ferrier N, Varley R, Watson S & **Hinzen W** 2019, 'Disturbing the rhythm of thought: speech pausing patterns in schizophrenia, with and without formal thought disorder', *PLOS ONE*, 14, 5, e0217404.
- Little B, Gallagher P, Zimmerer V, Varley R, Douglas M, Spencer H, Cokal D, Deamer F, Turkington D, Ferrier IN, **Hinzen W** & Watson S 2019, 'Language in Schizophrenia and Aphasia: the Relationship with Non-verbal Cognition and Thought Disorder', *Cognitive Neuropsychiatry*, 24:6, 389-405.
- **Hinzen W**, Slusna D, Schroeder K, Sevilla G, Vila Borrellas E 2019, 'Mind-Language = ? The significance of non-verbal autism', *Mind & Language*, 1-25.
- Fuentes-Claramonte P, Soler J, **Hinzen W** et al. 2019, 'The interfering effects of frequent auditory verbal hallucinations on shadowing performance in schizophrenia', *Schizophrenia Research*, 208, 488 - 489.

ICREA MEMOIR 2019



Carl Hoefer

Universitat de Barcelona (UB)

Humanities

I did my PhD in Philosophy at Stanford University with Peter Galison and Nancy Cartwright. My first academic position was at the University of California, Riverside. In 1998 I moved to the London School of Economics to join the department of Philosophy, Logic and Scientific Method. From 2002-2013 I was an ICREA at the UAB philosophy department. From 2005-2013 I was coordinator of the research group GRECC at the UAB. From 2009 - 2017 I was the founding Editor in Chief of the *European Journal for Philosophy of Science*, published by Springer. After a two-year sojourn in Canada (2013-2015) I returned to ICREA and joined the University of Barcelona and the LOGOS research group in July 2015. I am currently Director of the Barcelona Institute of Analytic Philosophy (BIAP), and in 2019 my long-awaited book *Chance in the World* was published by Oxford University Press.

Research interests

My research has mostly addressed age-old metaphysical questions by examining the metaphysics of nature that flows from our best scientific theories. In particular, I work on the nature of space, time and motion as revealed by physics (especially, Einstein's theories of relativity); and on the nature of objective probability as revealed by its uses in many branches of science and other human activities. At present my active research interests include three traditional big issues in the philosophy of science: scientific realism (i.e., should we take our best scientific theories to be giving us the truth about the world?); the nature of the (physical) laws of nature; and the tension between the manifest notion of time from daily experience and time as portrayed in our best theories of physics. In addition, I am working on the arguments for the physical non-locality of nature based on quantum entanglement phenomena.

Selected publications

- **Hoefer C & Martí G** 2019, 'Water has a microstructural essence after all', *European Journal For Philosophy Of Science*, 9:12.
- **Hoefer C** 2019, *Chance in the World: A Humean Guide to Objective Chance*, Oxford University Press, New York & London.
- **Hoefer C**, Viger C & Viger D 2019, 'The Philosopher's Paradox: How to Make a Coherent Decision in the Newcomb Problem', *Theoria: An International Journal for Theory, History and Foundations of Science*, 34(3), pp. 407-421.
- Solé A & **Hoefer C** 2019, 'The Nomological Interpretation of the Wave Function', in *Philosophers Look at Quantum Mechanics*, ed. Alberto Cordero, Springer.

Selected research activities

- Co-Principal Investigator, *Laws, Explanation and Realism in Physical and Biological Sciences*. Spanish MICINN funded research project FFI2016-76799-P
- Director, Barcelona Institute of Analytic Philosophy (BIAP)
- Co-organizer, *POND IV* (annual conference of the research network Philosophy of Science Around the Mediterranean)
- Member of Board of Governors, John Bell Institute
- Invited speaker at international conferences in L'Aquila (Italy), Jerusalem (Israel), Belgrade (Serbia), Rutgers University (New Jersey, USA), Lausanne (Switzerland) and Venice (Italy).

ICREA MEMOIR 2019



Sergio R. Idelsohn

Centre Internacional de Mètodes Numèrics a Enginyeria (CIMNE)
Engineering Sciences

Date and place of birth: November 15, 1947, Paraná (Argentina). Marital status: Married. Three children. Education: Degree: Mechanical Engineer, Universidad Nacional de Rosario (Argentina) 1970. Postgraduate Studies: PhD in Applied Sciences, University of Liege (Belgium) 1974. Adviser: Prof. Fraeijns de Veubeke. Languages: Spanish, French and English. Research Interests: Computational Mechanics, Finite Element Methods in Structural Dynamics, Fluid Mechanics and Heat Transfer. Present Positions: ICREA Research Professor and Senior Researcher at the International Center for Numerical Methods in Engineering, Universitat Politècnica de Catalunya, Barcelona, Spain. Previously : Full-time Professor, National University of Litoral, Santa Fe, Argentina and “Investigador Superior” of CONICET, Argentina.

Research interests

He is a specialist in the numerical simulations of mechanical engineering problems, in particular, Computational Fluid Dynamics (CFD). In the last ten years he developed a new method called the Particle Finite Element Method (PFEM) to solve fluid mechanics problems including free-surface flow, breaking waves and fragmentation. This method becomes very popular to solve problems like ship and harbour designs, melting of metals, erosion, and polymer combustion or magma analysis. Currently he works on solving CFD problems in Real Time using approximation techniques based on particles and solution of turbulent fluid flows via multi-scale approximations.

Selected publications

- **Idelsohn SR**, Gimenez JM & Nigro NM 2019, ‘Multifluid flows with weak and strong discontinuous interfaces using an elemental enriched space’, *Int. J. For Num. Meth. In Fluids*, 86, 12, 750 – 769.
- Reyes R, Codina R, Baiges J & **Idelsohn S** 2019, “Reduced Order Models for thermally coupled low Mach flows”, *Advanced Modeling and Simulation in Engineering Sciences*; 5.1, p. 28. issn: 2213-7467.
- Gimenez JM, Aguerre HJ, **Idelsohn SR** & Nigro NM 2019, ‘A second-order in time and space particle-based method to solve flow problems on arbitrary meshes’, *Journal Of Computational Physics*, 380, 295 – 310.
- **Idelsohn SR**, Oñate E & Becker P 2019, “Particle Methods in Computational Fluid Dynamics”, ‘*Encyclopedia of Computational Mechanics Second Edition*’, edited by Stein E, de Borst R & Hughes TJR. John Wiley & Sons.

Selected research activities

Plenary Lecturer at the Congress on Advanced in Numerical Methods for Simulation, Optimization and Uncertainty Quantification of Coupled Physical Problems. Boulder, Colorado, USA.

Keynote Lecturer at the 6th European conference on computational mechanics (ECCM 6)and 7th European conference on computational fluid dynamics (ECFD 7), Glasgow, UK.

Plenary Lecturer at the USACM Thematic Conference on Meshfree and Particle Methods: Applications and Theory. Santa Fe, New Mexico, USA.

Keynote Lecturer at the 15th US National Congress on Computational Mechanics, Austin, Texas, USA.

Member of the Executive Council of the International Association of Computational Mechanics (1998-2020).

Panel Member of the Evaluation Committee for the Advanced Grants 2018 of the European Research Council (ERC), 2017-2019.

Honorary Chairman of the XXIV Congreso sobre Métodos Numéricos y sus Aplicaciones – ENIEF 2019. Santa Fe, Argentina, 5-7 November 2019.

Selected Semi-Plenary Lecturer to the next 14th World Congress on Computational Mechanics, Paris, France (2020).

ICREA MEMOIR 2019



Manuel Irimia

Centre de Regulació Genòmica (CRG)

Life & Medical Sciences

Manuel Irimia obtained his PhD in 2010 at University of Barcelona investigating the origin of vertebrates at a genomic level. After two postdocs at Stanford University and University of Toronto, he joined the Centre for Genomic Regulation (CRG) in June 2014. He has been elected EMBO Young Investigator (2018) and obtained an ERC Starting Grant in 2014.

Research interests

Manuel Irimia's research is centered on two major questions: How does a single genome sequence encode the information to build the enormous complexity of cell types and structures of an adult organism? How are changes in this sequence translated into morphological novelties during evolution? To address these questions, his lab combines computational and experimental approaches using in vitro and in vivo systems (zebrafish, mouse and fruitfly) to investigate the roles of transcriptomic diversification and specialization in embryonic development and evolution.

Selected publications

- Torres-Méndez A, Bonnal S, Marquez Y, Roth J, Iglesias M, Permanyer J, Almudí I, O'Hanlon D, Guitart T, Soller M, Gingras AC, Gebauer F, Rentzsch F, Blencowe BJB, **Valcárcel J & Irimia M** 2019, 'A novel protein domain in an ancestral splicing factor drove the evolution of neural microexons', *Nature Ecol Evol*, 3, 4, 691 – 701.
- Skvortsova K, Tarbashevich K, Stehling M, Lister R, **Irimia M**, Raze E & Bogdanovic O 2019, 'Retention of paternal DNA methylome in the developing zebrafish germline', *Nature Communications*, 10, 3054.
- Ustaoglu P, Haussmann IU, Liao H, Torres-Mendez A, Arnold R, **Irimia M** & Soller M 2019, 'Srrm234, but not canonical SR and hnRNP proteins, drive inclusion of Dscam exon 9 variable exons', *Rna*, 25, 10, 1353 – 1365.
- **Irimia M** & Maeso M 2019, Boosting Macroevolution: Genomic Changes Triggering Qualitative Expansions of Regulatory Potential, in *Old Questions and Young Approaches to Animal Evolution*, pp 175-207, Springer Nature Switzerland AG.

Selected research activities

- 10 invited scientific seminars.
- 7 oral communications in international scientific meetings (6 as invited speaker).
- 1 supervised PhD thesis defended, and 4 as evaluation panel member.

ICREA MEMOIR 2019



David Irving

Institució Milà i Fontanals (CSIC - IMF)
Humanities

David R. M. Irving studied at Griffith University, the University of Queensland, and the University of Cambridge. He held post-doctoral positions at Christ's College, Cambridge, and King's College London; he then taught at the University of Nottingham, the Australian National University, and the University of Melbourne. He became an ICREA Research Professor in 2019 and is based at the Institució Milà i Fontanals-CSIC. His research interests include the role of music in early modern intercultural exchange, the global history of music, and historical performance practice. He is co-general editor of the forthcoming *Cultural History of Music* series from Bloomsbury, and co-editor of the Cambridge University Press journal *Eighteenth-Century Music*. His awards include the Jerome Roche Prize from the Royal Musical Association and the McCredie Musicological Award from the Australian Academy of the Humanities.

Research interests

My research stands at the nexus of historical musicology, ethnomusicology, and global history, examining the role of music in intercultural exchanges during the early modern period. I have worked on musical and cultural repercussions of Spanish, Portuguese, French, Dutch, and British colonialism in early modern Southeast Asia; I have also studied the role of music in Catholic missions (especially the Jesuits) in the early modern world. I aim to develop new conceptual frameworks and theoretical models for global histories of music, and to explore the impact of global colonialism on musical thought and practice in early modern Europe. I am currently tracing the rise of "European music" as a conceptual, aesthetic, and philosophical category, and am critiquing the emergence of cultural essentialism and exceptionalism in music historiography. I am also a violinist, have deep interests in organology, and am active in the field of historical performance practice.

Selected publications

– **Irving DRM** 2019, "Music in Global Jesuit Missions, 1540–1773." In *The Oxford Handbook of the Jesuits*, edited by Ines G. Županov, 598–634. New York: Oxford University Press.

Selected research activities

Since joining ICREA in March 2019, I have completed a number of projects as well as designing and creating new ones.

Prior to my arrival I had directed an Australian Research Council Discovery Project on Cocos Malay music and dance in the Cocos (Keeling) Islands; in April the ethnographic documentary arising from this project was premiered in Aberdeen. I undertook further archival research on this topic in the UK and have since submitted several publications.

In July I co-organised and ran with a Canadian collaborator the international workshop *Rethinking Enlightenment Music History* at Dalhousie University, with the support of a Connection Grant awarded by the SSHRC (Canada). We are currently co-editing a book in this field.

This year I delivered a keynote address in Lisbon and presented colloquia at UPF, Brown University, and Bristol University; I also gave conference papers in Cambridge, Oxford, Boston, Prague, Vienna, and Barcelona. Many of these relate to the manuscript-in-progress of my next monograph, *How the World Made European Music: A Global History of Early Modern Convergence*.

Within the International Musicological Society I initiated the "Global History of Music" Study Group; as its chair, I founded a seminar series. In March I was appointed co-editor of the Cambridge University Press journal *Eighteenth-Century Music*, and have worked on several issues so far.

I was invited to teach graduate seminars at Harvard University, Brown University, and ESMUC, and I examined PhD theses in the USA, UK, and Spain. In December, three of my PhD students graduated from the University of Melbourne.

I keep active as a baroque violinist; in December I played in a complete recording of Arcangelo Corelli's twelve *Concerti Grossi* Op.6 (1714), for which I have also contributed the liner notes.

ICREA MEMOIR 2019



Kazushi Iwasawa

Universitat de Barcelona (UB)

Experimental Sciences & Mathematics

Born and educated in Japan. After obtaining PhD in astrophysics at Nagoya University, Nagoya, Japan, in 1995, I moved to Europe, working at the Institute of Astronomy, Cambridge in UK (1995-2005), at the Max Planck Institut für Extraterrestrische Physik in Germany (2005-2008), and at INAF-Osservatorio Astronomico di Bologna in Italy (2008-2009). In 2010, I joined ICREA, to work as an ICREA Research Professor at the Institut de Ciències del Cosmos of Universitat de Barcelona (ICCUB). My main research area is X-ray astronomy on active galaxies and cosmic black holes.

Research interests

I work in the field of observational astronomy, using X-ray observatories in space. My primary interest is in the formation and evolution of supermassive black holes powering active galaxies. These active galaxies are strong X-ray emitters, which makes X-ray observations a powerful probe of black hole activity even at great cosmological distances. I am involved in a few multi-wavelength survey projects which attempt to establish cosmic evolution of the black hole activity and its relation to the galaxy formation. Currently most active collaborations include Great Observatories All-sky LIRG Survey, for investigating properties of star formation and active black holes in luminous infrared galaxies, the XMM-Newton deep survey in the Chandra Deep Field South for the evolution of active galactic nuclei, and the SHELLQs project with the Subaru HyperSuprime Cam survey to search for the most distant quasars.

Selected publications

- Matt G & **Iwasawa K** 2019, 'A receding torus model for the Iwasawa-Taniguchi effect for Compton-thick AGN', *Monthly Notices Of The Royal Astronomical Society*, 482, 1, 151 - 153.
- Matsuoka Y, Onoue M, Kashikawa N, Strauss M, **Iwasawa K**, Lee CH, Imanishi M, Nagao T et al. 2019, 'Discovery of the First Low-luminosity Quasar at $z > 7$ ', *Astrophysical Journal Letters*, 872, 1, L2.
- Liu W, Veilleux S, **Iwasawa K**, Rupke DSN, Teng S, Vivian U, Tombesi F, Sanders D, Max CE & Melendez M 2019, 'Elliptical Galaxy in the Making: The Dual Active Galactic Nuclei and Metal-enriched Halo of Mrk 273', *Astrophysical Journal*, 872, 1, 39.
- Matsuoka Y, **Iwasawa K**, Onoue M, Kashikawa N, Strauss M, Lee CH, Imanishi M, Nagao T et al. 2019, 'Subaru High-z Exploration of Low-luminosity Quasars (SHELLQs). X. Discovery of 35 Quasars and Luminous Galaxies at $5.7 \leq z \leq 7.0$ ', *Astrophysical Journal*, 883, 2, 183.

Selected research activities

Supervision of thesis work: Núria Torres i Albà (PhD) and Óscar Jiménez Arranz (master)

Invited talks in the 5th meeting of AGN research in Spain and two Sesto Workshops 2019

Press release on the SHELLQs high-redshift quasar search with the Subaru HSC survey, "Astronomers discover 83 super massive black holes in the early Universe". Links: <https://subarutelescope.org/Pressrelease/2019/03/13/index.html>, <http://icc.ub.edu/news/524>

ICREA MEMOIR 2019



Matthias Jamin

Institut de Física d'Altes Energies (IFAE)

Experimental Sciences & Mathematics

After defending my PhD thesis in July 1988 at the University of Heidelberg under the supervision of Prof. H.G. Dosch, I had several positions including scientific associate at TU Munich, a fellowship at CERN (Geneva) and research assistant again at Heidelberg Univ. In February 1996, I completed my Habilitation at the University of Heidelberg. In April 1998, I was awarded a Heisenberg fellowship by the DFG, which I occupied until October 2004. During this period I replaced two professors one at Heidelberg Univ. and the other one at LMU Munich, I spent some time as a visiting researcher at Fermilab (USA), and in July 2003 I was awarded an Apl. professorship by Heidelberg Univ. I am employed with ICREA since April 2005. My scientific work until today includes more than ninety publications which so far received more than 7,400 citations.

Research interests

The “Standard Model” of particle physics until now describes all observed phenomena in its realm to an astonishing precision. Still, theoretical prejudice exists demanding physics which goes beyond it. “Beyond Standard Model” physics might be – so far unsuccessfully – uncovered directly by its observation, or through unveiling mismatches within the present theory. For the latter approach high precision predictions are required which necessitate a sound knowledge of the Standard Model input parameters. My main work concerns precision determinations of those parameters in the strong-interaction sector of the “Standard Model”, most notably the strong coupling and the masses of “quarks”, entities which are the sub-constituents of the protons and neutrons in ordinary atomic nuclei.

ICREA MEMOIR 2019



Gerardo Jiménez

Institut de Biologia Molecular de Barcelona (CSIC - IBMB)
Life & Medical Sciences

Gerardo Jiménez graduated in biology from Universitat de Barcelona in 1988. He performed his doctoral studies at the Leukaemia Research Fund in London and at the Department of Biochemistry of Universitat de Barcelona, working on the structure and regulation of mammalian globin gene loci. After receiving his PhD degree in 1993, he worked as a postdoctoral fellow at Cancer Research UK, both in Oxford and in London. Since then, his research interests have focused on the transcriptional and cell signaling mechanisms controlling gene expression during animal development, mainly using *Drosophila* as a model system. After his postdoctoral training, he moved to the Institut de Biologia Molecular de Barcelona-CSIC, where he is head of the Gene Expression and Signaling laboratory since 2002. He joined ICREA in 2003.

Research interests

During animal development, the differentiation of cells, tissues and organs is tightly regulated through specific gene expression programs. Our research addresses the transcriptional and cell signaling mechanisms responsible for this control. Most of our work uses the fruit fly, *Drosophila*, which allows us to combine classical genetic, cell biological and biochemical approaches with recently developed genome-editing technologies such as CRISPR-Cas9. One main line of research focuses on Ras-Erk signaling and its downstream effector Capicua (Cic), an evolutionarily conserved transcriptional repressor with key roles in normal development and human diseases. We discovered this factor in *Drosophila* and are studying its function from different perspectives, including the analysis of its basic mechanism of repression and its interaction with Erk signaling and other signal transduction pathways. In addition, we have a long-term interest in transcriptional corepressors such as the conserved Groucho/TLE and Atrophin proteins, which we are analyzing from a functional and mechanistic point of view. In the long term, our studies are designed to characterize basic cell biological mechanisms that are relevant to human disorders.

Selected research activities

- * Principal investigator of research project “Transcriptional interpretation of RTK signaling” funded by MICINN (2018-2020).
- * Co-investigator in research project “Chromatin and Gene Expression” funded by AGAUR (2017-2020).
- * Invited speaker at Centro Andaluz de Biología del Desarrollo (CABD, Seville).
- * Director of Master thesis by Clàudia Lagares Martín (Universitat de Barcelona, July 2019).
- * Ad-hoc grant reviewer for Natural Sciences and Engineering Research Council of Canada and peer reviewer for international scientific journals (e.g. *Current Biology*, *Genetics*, *iScience*).

ICREA MEMOIR 2019



Raúl Jiménez

Universitat de Barcelona (UB)

Experimental Sciences & Mathematics

Prof. Raúl Jiménez (Madrid, 1967) obtained his PhD at the Niels Bohr Institute in 1995; he then moved to the Royal Observatory in Edinburgh where he held a PPARC Advanced Fellowship. He then went to the US where he joined the faculty, as a professor, of the Physics & Astronomy departments of Rutgers University and, later, the University of Pennsylvania. He joined ICREA in Sept 2007 as Professor at the ICC. He was a Radcliffe fellow at Harvard in 2015-2016. He has made several contributions to our understanding of the Universe: the first evidence of dark energy from the ages of high redshift galaxies and globular clusters, the origin of dark galaxies, the first clue of how galaxies are assembled as a function of time, the first determination of the expansion history of the Universe, the role of cosmic explosions in the survival of exolife, the role of symmetries in the universe and a lower bound to the cosmological constant.

Research interests

Prof. Raúl Jiménez is a theoretical physicist interested in a number of problems in astrophysics and cosmology. The main drive of my research is to connect ideas in theoretical physics to observable phenomena and in turn explain new observations. The main objective of my research is to understand the fundamental laws of nature using cosmological and astronomical observations. His fields of research include: the formation and evolution of galaxies, stellar evolution, the cosmic microwave background, dark energy and the origin of the universe.

Selected publications

- **Jimenez R**, Maartens R, Khalifeh AR, Caldwell RR, Heavens AF & **Verde L** 2019, 'Measuring the homogeneity of the universe using polarization drift', *Journal Of Cosmology And Astroparticle Physics*, 5, 048.
- **Jimenez R**, Cimatti A, **Verde L**, Moresco M & Wandelt B 2019, '**The local and distant Universe: stellar ages and H_0** ', *Journal of Cosmology and Astroparticle Physics*, Issue 03, article id. 043.

ICREA MEMOIR 2019



Aurelio Juste

Institut de Física d'Altes Energies (IFAE)

Experimental Sciences & Mathematics

Born in 1970 in Terrassa (Barcelona). Graduated in physics in 1993 at the Univ. Autònoma de Barcelona (UAB). Obtained PhD in experimental particle physics in 1998 at the Institut de Física d'Altes Energies (IFAE) at the UAB, studying electron-positron collisions in the ALEPH experiment at the LEP Collider at CERN. Moved to Chicago (USA) in 1998, to study proton-antiproton collisions at the energy frontier in the D0 experiment at the Fermilab Tevatron Collider, first as a Research Associate (1998-2002), then as a Wilson Fellow (tenure-track position, 2002-2006) and eventually as staff scientist (2006-2009). At D0 held a number of leadership positions in physics (convener of Top and Higgs groups), algorithms (convener of Jet Energy Scale and Jet Energy Resolution groups) and upper management (physics coordinator). Since November 2009, ICREA Research Professor at IFAE, studying proton-proton collisions with the ATLAS experiment at CERN's Large Hadron Collider (LHC).

Research interests

My research is focused on accelerator-based experimental particle physics, aiming at achieving an understanding on how Nature operates at the most fundamental level. In particular, unraveling the mechanism of electroweak symmetry breaking and mass generation, as well as searching for new physics phenomena, are the main goals of my research. At the LHC I am carrying out studies on the heaviest known elementary particle, the top quark, as well as on the recently-discovered Higgs boson, seeking connections in the dynamics that govern both particles. I am also searching for beyond the Standard Model (SM) physics, such as supersymmetric partners of SM particles, exotic heavy quarks appearing in composite Higgs models or models with extra spatial dimensions, and additional Higgs bosons revealing an extended Higgs sector. Since 2016, I lead a team of over 20 scientists from IFAE-Barcelona that analyzes the data from the ATLAS experiment.

Selected publications

- Alvarez E, **Juste A** & Sandá RM 2019, 'Four-top as probe of light top-philic New Physics', *JHEP*, 12, 080.
- ATLAS Collab. 2019, 'Search for heavy particles decaying into a top-quark pair in the fully hadronic final state in pp collisions at $\sqrt{s}=13$ TeV with the ATLAS detector', *Phys. Rev. D*, 99, 092004.
- ATLAS Collab. 2019, 'Search for top-quark decays $t \rightarrow Hq$ with 36/fb of pp collision data at $\sqrt{s}=13$ TeV with the ATLAS detector', *JHEP*, 05, 123.

Selected research activities

- * Principal investigator of the ATLAS group at IFAE (21 members).
 - * 2019 High Energy and Particle Physics Prize of the European Physical Society: awarded to the CDF and D0 Collaborations for the discovery of the top quark and the detailed measurement of its properties. Played a leading role in this program at D0 (Convener of the Top and JES groups, Physics Coordinator).
 - * Member of the ATLAS Speakers Committee (Deputy Chair: Apr-Sep 2019, Chair: Oct 2019-Mar 2020).
 - * Referee for the Research Grants Council of Hong Kong.
 - * Editor of *Advances in High Energy Physics* and *Journal of Particle Physics*.
 - * Supervisor of four PhD theses and one Master thesis (all ongoing).
 - * Lectures on Standard Model phenomenology at IFAE/UAB Master.
 - * Seminars at UC-UIMP Master, IFCA, Santander, May 2, 2019, and BIST-UPF Master, UPF, Barcelona, Oct 15, 2019.
 - * Colloquia at DESY, Hamburg and DESY, Zeuthen, Germany, Jun 25-26, 2019.
- Plenary addresses at:
- * *ATLAS HTop Workshop*, DESY, Hamburg, Germany, Apr 15-17, 2019.
 - * *4th NPKI Workshop: Searching for New Physics on the Horizon*, Seoul, Republic of Korea, May 12-17, 2019.
 - * *ATLAS Exotics and HDBS Joint Workshop*, Naples, Italy, Jun 11-14, 2019.
- Workshop organization:
- * Chair: *Light scalars: origin, cosmology, astrophysics and experimental probes*, CCBPP, Benasque, Spain, Apr 7-13, 2019.
 - * Program Committee: *15th Rencontres du Vietnam: Behind and Beyond the Standard Model at the LHC, Future Colliders and Elsewhere*, Quy Nhon, Vietnam, Sep 15-21, 2019.

ICREA MEMOIR 2019



Giorgos Kallis

Institut de Ciència i Tecnologia Ambientals - UAB ()
Social & Behavioural Sciences

Giorgos Kallis is an ecological economist and political ecologist working on environmental justice and limits to growth. He has a Bachelors degree in chemistry and a Masters in environmental engineering from Imperial College, a PhD in environmental policy from the University of the Aegean, and a second Masters in economics from the Barcelona Graduate School of Economics. He is an ICREA professor since 2010. Before coming to Barcelona, Giorgos was a Marie Curie International Fellow at the Energy and Resources group at the University of California-Berkeley.

Research interests

My research is 'un-disciplinary'. I have worked over the years on very diverse topics; from water policy in Europe or California, participatory science, and evolution in societies, to climate change, limits to growth and conflicts over resource use. What connects my various pieces of work is a quest to understand why and how societies misuse their environments, and why behavioural, institutional and technological changes that could make a difference are not taken up. I am most known for my recent publications on 'degrowth', the hypothesis that societies can live better with less. My degrowth research combines institutional, ecological economic and historical analysis to explain how the idea of economic growth came to be hegemonic, why it is limited, and what alternatives there are to growth-based development. My latest book 'Limits: why Malthus was wrong and why environmentalists should care' was published by Stanford University Press in 2019.

Selected publications

- **Kallis G** 2019, '*Limits. Why Malthus was wrong and why environmentalists should care*', Palo Alto: Stanford University Press.
- Kotsila P & **Kallis G** 2019, 'Biopolitics of public health and immigration in times of crisis: The malaria epidemic in Greece (2009-2014)', *Geoforum*, 106: 223-233.
- Goddard JJ, **Kallis G** & Norgaard RB 2019, 'Keeping multiple antennae up: Coevolutionary foundations for methodological pluralism', *Ecological Economics*, 165: 106420.
- Demaria F, **Kallis G** & Bakker K 2019, 'Geographies of degrowth: Nowtopias, resurgences and the decolonization of imaginaries and places', *Environment and Planning E: Nature and Space*, 2(3): 431-450
- Scott E, **Kallis G** & Zografos C 2019, 'Why environmentalists eat meat', *PloS One*, 14(7): p.e0219607.
- **Kallis G** 2019, 'Socialism without growth', *Capitalism Nature Socialism*, 30(2): 189-206.
- **Kallis G** 2019, 'Capitalism, socialism, degrowth. A rejoinder', *Capitalism Nature Socialism*, 30: 267-273
- Turhan E, **Kallis G** & Zografos C 2019, 'Power Asymmetries, Migrant Agricultural Labour, and Adaptation Governance in Turkey: A Political Ecology of Double Exposures', In La Jeunesse I and Larrue C (eds), *Facing Hydrometeorological Extreme Events: A Governance Issue*, pp.261-281.

ICREA MEMOIR 2019



Arjan W. Kleij

Institut Català d'Investigació Química (ICIQ)

Experimental Sciences & Mathematics

MSc (with honors) and PhD (Cum Laude) from the University of Utrecht (Netherlands). In 2002 he moved to Spain as a NWO TALENT fellow with Javier de Mendoza, followed by another postdoc appointment at the University of Amsterdam (The Netherlands) working with Joost Reek. He also held various scientific positions in the industry working as a project leader (Avantium) and senior research scientist (Hexion). In 2006, he returned to Spain as an ICREA Researcher and ICIQ Group Leader, and was promoted to ICREA Research Professor in 2011. He is member of several advisory boards (Current Organic Chemistry, Journal of CO₂ Utilization) and editorial boards (ChemSusChem, Molecules). Guest editorships for Catal. Sci. & Technol., ChemSusChem and Adv. Synth. Catal.; chairman of the CDCC conference in Portugal in 2016 & 2020, chair of the EUGSC-4 conference in 2019; Associate Editor for Organic Chemistry Frontiers. Citations >9900, h-index of around 56.

Research interests

The research of my group focuses on the valorization of small molecules (including CO₂) into value-added chemicals and materials. We design new and more sustainable catalytic methods for their conversion and use in organic synthesis. We use homogeneous catalysis approaches based on metal complexes and/or organocatalysts, and investigate important process features such as catalyst recycling, energy/material efficiencies and overall selectivity/reactivity profiles. In all these endeavors, we wish to solve challenging stereoselective and enantioselective transformations including those focusing on the preparation of compounds featuring challenging quaternary stereocenters.

Selected publications

- Enrique Gomez J, Cristofol A & **Kleij AW** 2019, 'Copper-Catalyzed Enantioselective Construction of Tertiary Propargylic Sulfones', *Angewandte Chemie-international Edition*, Vol. 58, 12, 3903 - 3907.
- Hu L, Cai A, Wu Z, **Kleij AW** & Huang G 2019, 'A Mechanistic Analysis of the Palladium-Catalyzed Formation of Branched Allylic Amines Reveals the Origin of the Regio- and Enantioselectivity through a Unique Inner-Sphere Pathway', *Angewandte Chemie-international Edition*, Vol. 58, 41, pp. 14694-14702.
- Cai A & **Kleij AW** 2019, 'Regio- and Enantioselective Preparation of Chiral Allylic Sulfones Featuring Elusive Quaternary Stereocenters', *Angewandte Chemie-international Edition*, Vol 58, 42, pp. 14944-14949.
- Huang R, Rintjema J, González-Fabra J, Martín E, Escudero-Adán EC, Bo C, Urakawa A & **Kleij AW** 2019, 'Deciphering key intermediates in the transformation of carbon dioxide into heterocyclic products', *Nat. Catal.*, **2**, pages62-70.

Selected research activities

- Chair of the 4th EUGSC Conference on Green & Sustainable Chemistry (Tarragona, Spain); Associate Editor for *Organic Chemistry Frontiers* (RSC); Invited guest editor for *Advanced Synthesis & Catalysis*, for an issue on CO₂ catalysis; Invited editorial board member for *ChemSusChem* (Wiley); chair of the 2019 ICIQ Summer School on New CO₂ Transformation Technologies; co-organizer of the symposium "Catalytic Small Molecule Activation and CO₂ valorization at the 2019 BIENAL (RSEQ) in San Sebastián
- Invited Keynotes: 2019 International Green and Sustainable Chemistry Conference (Beijing, China); 2019 ICCDU (Aachen, Germany)
- Invited Lectures: at various companies - Lubrizol, MercaChem, Syncom; at various universities - Amsterdam (NL), Groningen (NL), UB Barcelona (ES), Chengdu (China), Xi'an (China), Salerno (Italy).
- Board member of evaluation panels for promotion of international scientists in the UK (2) and Taiwan (1), member of 6 PhD thesis tribunals.

ICREA MEMOIR 2019



Tess Knighton

Institució Milà i Fontanals (CSIC - IMF)

Humanities

Tess Knighton holds MA and PhD degrees from the University of Cambridge and is an Emeritus Fellow of Clare College, Cambridge. From May 2011 she has been an ICREA Research Professor at the Institució Milà i Fontanals (CSIC) in Barcelona. In July 2012 she was awarded a Marie Curie Foundation Integration Grant for a research project on the urban musics of early modern Barcelona. Her research interests embrace music and culture in the Iberian world from the 15th to the early 17th centuries, and she has published widely in this field. She was Editor of the OUP journal *Early Music* from 1993 to 2009 and since 2003 is Series Editor of the *Studies in Medieval and Renaissance Music* series for The Boydell Press. She forms part of editorial and advisory committees of *Monumentos de la Música Española*, *Revista de Musicología*, *Anuario Musical*, *Schola Cantorum Basiliensis*, and 'Connected Cities' on the 'Historical Soundscapes' digital platform.

Research interests

My research focuses on various interrelated aspects of music in the Iberian world in the long 16th century: music and ceremony; music in the urban context, including perspectives of sensory and emotional history; the impact of music printing on the diffusion of musical repertory; and music historiography. Analysis of music and ceremony focuses on public display as well as private devotions; placing music in the context of court ceremonial reveals patterns of self-identity and image-making. Study of the urban musical experience of different social groups highlights the relationship between music and the institutional complex and urban societal interaction. The impact of music printing on the diffusion and accessibility of music is studied through extant inventories to reveal how European editions were transmitted to the centres of the book trade and the extent of musical literacy. Received ideas of Renaissance Iberian music are challenged and historiographical filters analyzed.

Selected publications

- **Knighton T** & Kreitner K 2019, 'The music of Juan de Anchieta', Routledge, London.
<https://www.routledge.com/The-Music-of-Juan-de-Anchieta-1st-Edition/Knighton-Kreitner/p/book/9781315555379>
- **Knighton T** 2019, 'Approaches to Text-Setting in Castilian-Texted Devotional Songs', in (ed.) Colin M-A, *French Renaissance Music and Beyond. Studies in Memoriam of Frank Dobbins*, Epitome Musicale, Brépols, Turnhout, 2018, pp. 427-454.
- **Knighton T** 2019, 'The Written Transmission of Polyphonic Song in Spain c.1500: The Case of the Segovia Manuscript', in Furhmann W & Urchueguía C, *The Segovia Manuscript: A European Musical Repertory in Spain, c.1500* *Studies in Medieval and Renaissance Music*, 20 (Woodbridge: The Boydell Press), pp. 231-263.
- **Knighton T** 2019, 'The Polyphonic Songs Attributed to Pedro de Escobar', *Revista Portuguesa de Musicología / Portuguese Journal of Musicology*, 6/1, pp. 183-210.

Selected research activities

2019 has been an intense year for research, publication, conferences and seminars. Research has focused on new investigation in Barcelona archives – diocesan, city and parish church – relating to the musical activity of a collegiate church, the contribution of confraternities and guilds to the urban soundscape, and the sonosphere of a parish church. This new research is feeding into a monograph on daily musical life in early modern Barcelona and other publications. It has been especially interesting to develop perspectives drawn from the history of the senses and emotions to open up wider discourses and methodologies. I explored these ideas in the ICREA Colloquium 'Beyond Musicology', and developed them further in other papers and seminars. The curious phenomenon of waiting hours for a bus and then four turning up at once, has occurred with my publications this year: these all relate to Iberian music and culture around 1500.

ICREA MEMOIR 2019



Meike Köhler

Institut Català de Paleontologia (ICP)

Life & Medical Sciences

EDUCATION: 1982 – MSc of Sciences (Diplom), Univ Hamburg, Germany. 1988 – PhD Vertebrate Paleontology, Univ Hamburg, Germany. Positions: 2000-2006 – Researcher Inst Paleont Miquel Crusafont; 2006-current – ICREA Research Professor at Inst Cat Paleontologia; 2013-current – Ass.Prof Dep. BABVE UAB; 2006-2014 – Ass.Prof Dep. Ecology, Univ. Barcelona;

AWARDS: 2010 “Premi Bartomeu Darder” Soc Nat Hist Balear; 2010; “Premio Paleontología10” Int Award; 2010 “Research Excellence Prize 2010” Univ.Aut.Barcelona; 1999 “Premi Ciutat de Barcelona” Award of Barcelona City.

PUBLICATIONS: Science; Nature; Trends Ecol Evol; Proc Natl Acad Sci USA; Current Biol; Proc R.Soc B; Scientific Reports; PLoS ONE; Peer J; C Biochem Physiol A; Brain Behav Evol; J. AnatOmy; Mam Biol; Geobios; Palaeogeogr., Palaeoclimat., Palaeoecol.; J. Vert. Paleont; Biol.J.Linn Soc.; Lethaia; CR Palevol.; J Zool.; Integr. Zool.; Swiss J. Pal.; Zitteliana; J Human Evol; Am J Anthr; Folia Prim. etc.

Research interests

– Life History Evolution and Evolution of Ageing and Longevity – Evolution of Body Size – Insularity and Evolution in Resource-limited Environments – Evolution of Brain and Nervous system

Selected publications

- Orlandi-Oliveras G, Nacarino-Meneses C & **Köhler M** 2019, ‘Dental histology of late Miocene hipparionins compared with extant Equus, and its implications for Equidae life history’, *Palaeogeography Palaeoclimatology Palaeoecology*, 528, 133 – 146.
- Calderon T, DeMiguel D, Arnold W, Stalder G & **Köhler M** 2019, ‘Calibration of life history traits with epiphyseal closure, dental eruption and bone histology in captive and wild red deer’, *Journal Of Anatomy*, 235, 2, 205 – 216.
- Calderón T 1*, Arnold W2, Stalder G2, Painer J2 & **Köhler M** 1,3 2019, ‘**The impact of weaning on bone tissue**’ [Abstract] Program and abstracts 5th International Symposium on Palaeohistology July 31st– August 4th, 2019 – Cape Town, South Africa (p.28).
- Orlandi-Oliveras G, Nacarino-Meneses C & **Köhler M** 2019, ‘Were hipparionins running faster through life than Equus? Insights from dental and bone histology’ [Abstract] Program and abstracts 5th International Symposium on Palaeohistology July 31st–August 4th, 2019 – Cape Town, South Africa (p. 53).

Selected research activities

I am Associate professor at the Department of Animal Biology, Plant Biology and Ecology (BABVE) Autonomous University Barcelona (UAB) since 2007. As such, I am teaching the official Master of Paleobiology and Fossil Record and the official Master of Biological Anthropology.

ICREA MEMOIR 2019



Gerasimos Konstantatos

Institut de Ciències Fotòniques (ICFO)
Engineering Sciences

Nov. 2015 – Present: ICREA/Group Leader at the Institute of Photonic Sciences (ICFO), Mediterranean Technology Park, Barcelona, Spain.
April 2015 – Oct. 2015: Group Leader – Professor at the Institute of Photonic Sciences (ICFO)
Sep. 2009 – March 2015: Group Leader – Assistant Professor at the Institute of Photonic Sciences (ICFO)
Sep. 2008 – July 2009: Postdoctoral fellow in the department of Electrical and Computer Engineering at the University of Toronto, Canada.
Ed/ Oct. 2004 – July 2008: PhD in the department of Electrical and Computer Engineering at the University of Toronto, Canada.
Connaught Fellow. Sep. 2002 – Sep. 2004: MA Sc in the department of Electrical and Computer Engineering at the University of Toronto, Canada.
Sep. 1996 – Sep. 2001: Diploma in Electrical and Computer Engineering from the University of Patras, Greece.

Research interests

We employ advances in nanoscience and we transform them into nanotechnology in solving real-world problems that current technology cannot address or do so at an affordable cost for the benefit of the society. We are doing so by assembling a group of physicists, chemists and engineers to tackle complex, interdisciplinary problems. We focus on novel functional nanomaterials, nanostructures and devices for optoelectronics and renewable energy applications. Our main scope is on the development of low-cost, high-efficiency solar cells employing nanostructured materials of low toxicity and high abundance to address the TW challenge and on the development of hybrid 2-dimensional / 0-dimensional optoelectronic platforms for highly sensitive, low cost photodetectors in the visible and infrared part of spectrum covering a broad range of applications including night vision, remote sensing, environmental monitoring and biomedical and health monitoring. We also develop low cost infrared light emitting diodes and lasers for on-chip spectrometry, structured illumination and silicon-photonics applications.

Selected publications

- Pradhan S, Di Stasio F, Bi Y, Gupta S, Christodoulou S, Stavrinadis A & **Konstantatos G** 2019, 'High-efficiency colloidal quantum dot infrared light-emitting diodes via engineering at the supra-nanocrystalline level', *Nature Nanotechnol*, 14, 1, 72
- Huo N, Figueroba A, Yang Y, Christodoulou S, Stavrinadis A, Magen C & **Konstantatos G** 2019, 'Engineering Vacancies in Bi₂S₃ yielding Sub-Bandgap Photoresponse and Highly Sensitive Short-Wave Infrared Photodetectors', *Advanced Optical Materials*, 7, 11, 1900258.
- Pradhan S, Dalmases M & **Konstantatos G** 2019, 'Origin of the Below-Bandgap Turn-On Voltage in Light-Emitting Diodes and the High V-OC in Solar Cells Comprising Colloidal Quantum Dots with an Engineered Density of States', *Journal Of Physical Chemistry Letters*, 10, 11, 3029 – 3034.
- Wang Y, Liu Z, Huo N, Li F, Gu M, Ling X, Zhang Y, Lu K, Han L, Fang H, Shulga AG, Xue Y, Zhou S, Yang F, Tang X, Zheng J, Loi MA, **Konstantatos G** & Ma W 2019, 'Room-temperature direct synthesis of semi-conductive PbS nanocrystal inks for optoelectronic applications', *Nature Communications*, 10, 5136.
- Özdemir O, Ramiro I, Gupta S & **Konstantatos G** 2019, 'High sensitivity hybrid PbS CQD-TMDC photodetectors up to 2 μm' *ACS Photonics* 6, 2381-2386
- Polat EO, Mercier G, Nikitskiy I, Puma E, Galan T, Gupta S, Montagut M, Piqueras JJ, Bouwens M, **Durduran T**, **Konstantatos G**, Goossens S & **Koppens F** 2019, 'Flexible graphene photodetectors for wearable fitness monitoring' *Sci. Adv.* 5, eaaw7846

ICREA MEMOIR 2019



Frank Koppens

Institut de Ciències Fotòniques (ICFO)

Experimental Sciences & Mathematics

Prof. Frank Koppens obtained his PhD in physics at Delft University, The Netherlands. After a postdoctoral fellowship at Harvard University, since 2010, Koppens is group leader at the Institute of Photonic Sciences. Koppens has received five ERC awards: the ERC starting grant, the ERC consolidator grant, and three ERC proof-of-concept grants. Other awards include the Christiaan Huygensprijs, the national award for research in Spain, the IUPAP young scientist prize in optics and the ACS young investigator award. In total, Koppens has published more than 80 refereed papers (H-index above 52), with more than 40 in Science and Nature family journals. Total citations >20.000 (google scholar). Koppens is workpackage leader and vice-chairman of the executive board of the graphene flagship program, a 1000 MillionEuro project for 10 years. He is on the Clarivate list of highly cited researchers (ranked in top 1% by citations)

Research interests

The quantum nano-optoelectronics group, led by Prof. Koppens, studies interactions between light and matter at extreme limits. Several unique and novel techniques are exploited to confine light to nano-meter lengths scales and study physical processes at ultra-fast timescales. For example, we use unique low-temperature near-field imaging techniques to probe the electronic response to infrared and THz light with nanometer-scale spatial resolution.

Central in these studies are the rich variety of novel materials that are only one atom thick: graphene and 2d materials. These materials exhibit fascinating properties and in particular, by building heterostructures of these layered materials, completely new material systems can be created atom-by-atom: atomic lego!

One of the more recent objectives is to marry the topological properties of 2d-material heterostructures with nano-photonics. For example, we aim to generate non-reciprocal nanoscale optical fields (plasmons) and implement topologically protected plasmons such that they move around defects and corners. At the same time, visualizing and controlling electromagnetic excitations with nearfield imaging will be used as a tool to unravel extraordinary phenomena in exotic quantum materials. Topological nano-photonics is a new paradigm for novel quantum materials and will enable novel future applications in miniaturized photonic isolators, diodes and logic circuits and could lead to completely new concepts for communication systems, optical transistors and optical information processing

In addition to the new science and physics, the group develops new concepts for photo-detection, imaging systems, optical modulation, nano-scale light processing and switching, as well as flexible and wearable health and fitness devices. We aim to build prototypes of these disruptive technologies, in collaboration with industry. The group works closely with the Graphene Flagship program and large industries worldwide.

Selected publications

- Castilla S, Terres B, Autore M, Viti L, Li J, Nikitin AY, Vangelidis I, Watanabe K, Taniguchi T, Lidorikis E, Vitiello MS, Hillenbrand R, Tielrooij KJ, **Koppens FHL** 2019, 'Fast and Sensitive Terahertz Detection Using an Antenna-Integrated Graphene pn Junction', *Nano Letters*, 19, 5, 2765 - 2773.
- Vialla F, Danovich M, Ruiz Tijerina DA, Massicotte M, Schmidt P, Taniguchi T, Watanabe K, Hunt RJ, Szyniszewski M, Drummond ND, Pedersen TG, Falko VI & **Koppens FHL** 2019, 'Tuning of impurity-bound interlayer complexes in a van der Waals heterobilayer', *2d Materials*, 6, 3, 035032.
- Schädler KG, Ciancico C, Pazzagli S, Lombardi P, Bachtold A, Toninelli C, Reserbat-Plantey A & **Koppens FHL** 2019, 'Electrical Control of Lifetime-Limited Quantum Emitters Using 2D Materials', *Nano Letters*, 19, 6, 3789 - 3795.
- Scarafagio M, Tallaire A, Tielrooij KJ, Cano D, Grishin A, Chavanne MH, **Koppens FHL**, Ringuède A, Cassir M, Serrano D, Goldner P & Ferrier A, 2019, 'Ultrathin Eu- and Er-Doped Y2O3 Films with Optimized Optical Properties for Quantum Technologies', *Journal Of Physical Chemistry C*, 123, 21, 13354 - 13364.
- Akinwande D, Huyghebaert C, Wang CH, Serna MI, Goossens S, Li L, Wong HP & **Koppens FHL** 2019, 'Graphene and two-dimensional materials for silicon technology', *Nature*, 573, 7775, 507 - 518.
- Ciancico C, Schädler KG, Pazzagli S, Colautti M, Lombardi P, Osmond J, Dore C, Mihi A, Ovvy AP, Pernice WHP, Berretti E, Lavacchi A, Toninelli C, **Koppens FHL**, Reserbat-Plantey A, 2019, 'Narrow Line Width Quantum Emitters in an Electron-Beam-Shaped Polymer', *ACS Photonics*, 6, 12, 3120 - 3125.
- Polat EO, Mercier G, Nikitskiy I, Puma E, Galan T, Gupta S, Montagut M, Piqueras JJ, Bouwens M, **Durduran T**, **Konstantatos G**, Goossens S & **Koppens FHL** 2019, 'Flexible graphene photodetectors for wearable fitness monitoring', *Sci. Adv.* 5, eaaw7846

Selected research activities

We organized the graphene pavillion at the mobile world congress and event with more than 110.000 visitors.

ICREA MEMOIR 2019



Ai Koyanagi

Fundació per la Recerca i la Docència Sant Joan de Déu (FSJD)
Life & Medical Sciences

I am a medical doctor and an epidemiologist. I obtained my PhD (International Health) at Johns Hopkins University, Baltimore, USA. My main research interest concerns health determinants and how they vary by geography or country income level. In particular, mental disorders and their comorbidity with physical disorders are her primary interest. I conduct multi-country epidemiological studies examining the modifiable risk factors for a wide range of mental and physical disorders with high burden at the population level.

Research interests

I am interested in learning about health determinants and how they vary by geography. In particular, mental disorders and their comorbidity with physical disorders are my primary interest given my clinical experience as a physician and psychiatrist. Most of my research has focused on multi-country epidemiological studies examining the modifiable risk factors of a range of mental and physical disorders with high burden at the population level using large nationally representative datasets predominantly from low- and middle-income countries (LMICs).

Selected publications

- Ashdown-Franks G, Vancampfort D, Firth J, Smith L, Sabiston CM, Stubbs B & **Koyanagi A** 2019, 'Association of leisure-time sedentary behavior with fast food and carbonated soft drink consumption among 133,555 adolescents aged 12-15 years in 44 low- and middle-income countries', *International Journal Of Behavioral Nutrition And Physical Activity*, 16, 35.
- Solmi M, Firth J, Miola A, Fornaro M, Frison E, Fusar-Poli P, Dragioti E, Shin JI, Veronese N, Stubbs B, **Koyanagi A**, Kisley S & Correll CU 2019, 'Disparities in cancer screening in people with mental illness across the world: prevalence and comparative meta-analysis versus the general population including 4,717,839 people'. *Lancet Psychiatry*, 7, 1, 52 - 63.
- **Koyanagi A**, Veronese N, Vancampfort D, Stickley A, Jackson SE, Oh H, Shin JI, Haro JM, Stubbs B, Smith L 2019, 'Association of bullying victimization with overweight and obesity among adolescents aged 12-15 years from 41 low- and middle-income countries' *Pediatric Obesity*, UNSP e12571.
- Firth J, Siddiqi N, **Koyanagi A**, Siskind D, Rosenbaum S, Galletly C, Allan S, Canejo C, Carney R, Carvalho AF, Chatterton ML, Correll CU, Curtis J, Gaughran F, Heald A, Hoare E, Jackson SE, Kisely S, Lovell K, Maj M, McGorry PD, Mihalopoulos C, Myles H, O'Donoghue B, Pillinger T, Sarris J, Schuch FB, Shiers D, Smith L, Solmi M, Suetani S, Taylor J, Teasdale SB, Thornicroft G, Torous J, Usherwood T, Vancampfort D, Veronese N, Ward PB, Yung AR, Killackey E, Stubbs B 2019 'The Lancet Psychiatry Commission: a blueprint for protecting physical health in people with mental illness'. *Lancet Psychiatry*, 6, 8, 675 - 712.

ICREA MEMOIR 2019



Ben Lehner

Centre de Regulació Genòmica (CRG)
Life & Medical Sciences

- * 2018 – Coordinator of CRG Systems Biology Program
- * 2017 – EMBO Member
- * 2014 – Senior Group Leader, CRG
- * 2014-17 – AXA Chair in risk prediction in age-related diseases, CRG
- * 2010 – EMBO Young Investigator
- * 2009 – ICREA Research Professor
- * 2007 – ICREA Junior Researcher
- * 2006 – Group Leader, EMBL-CRG Systems Biology Unit, Centre for Genomic Regulation, Barcelona
- * 2004-06 – Postdoctoral Fellow, Fraser Lab, The Wellcome Trust Sanger Institute
- * 2004 – PhD University of Cambridge
- * 2000 – BA Natural Sciences, University of Cambridge

Research interests

Many mutations, for example disease causing mutations in humans, are not harmful in all of the individuals who carry them. When do genetic changes result in phenotypic change? When do they not? How do mutations combine together to alter phenotypes? Why is this and how can this be predicted? How and why do mutation rates vary across the genome? How does the physiology and environment of one generation influence subsequent generations? How do chance events influence the characteristics of individuals? These are the main questions that drive our research, and we use both experimental and computational approaches to address them. Most of our work is hypothesis driven and we choose model systems and approaches to best answer the question at hand, particularly model organisms where we can perform large-scale and highly quantitative genetic analysis. In short, we aim to identify, understand and predict how genetic variation occurs and when it results in phenotypic variation, both at the level of the typical outcome in a population and also in each particular individual.

Selected publications

- Schmiedel JM & **Lehner B** 2019, ‘Determining protein structures using deep mutagenesis’, *Nature Genetics*, 51, 7, 1177 – +.
- Schmiedel JM, Carey LB & **Lehner B** 2019, ‘Empirical mean-noise fitness landscapes reveal the fitness impact of gene expression noise’, *Nature Communications*, 10, 3180.
- Li X, Lalic J, Baeza-Centurion P, Dhar R & **Lehner B** 2019, ‘Changes in gene expression predictably shift and switch genetic interactions (vol 10, 3886, 2019)’, *Nature Communications*, 10, 4319.
- Domingo J, Baeza-Centurion P & **Lehner B** 2019, ‘The Causes and Consequences of Genetic Interactions (Epistasis)’, *Annual Review Of Genomics And Human Genetics*, Vol 20, 2019, 20, 433 – 460.
- Bolognesi B, Faure AJ, Seuma M, Schmiedel JM, **Tartaglia GG & Lehner B** 2019, ‘The mutational landscape of a prion-like domain’, *Nature Communications*, 10, 4162.
- Lindeboom RGH, Vermeulen M, **Lehner B & Supek F** 2019, ‘The impact of nonsense-mediated mRNA decay on genetic disease, gene editing and cancer immunotherapy’, *Nature Genetics*, 51, 11, 1645 – +.
- Baeza-Centurion P, Minana B, Schmiedel JM, **Valcarcel J & Lehner B** 2019, ‘Combinatorial Genetics Reveals a Scaling Law for the Effects of Mutations on Splicing’, *Cell*, 176, 3, 549 – +.
- Dhar R, Missarova AM, **Lehner B & Carey LB** 2019, ‘Single cell functional genomics reveals the importance of mitochondria in cell-to-cell phenotypic variation’, *Elife*, 8, e38904.
- Francesconi M, Di Stefano B, Berenguer C, de Andres-Aguayo L, Plana-Carmona M, Mendez-Lago M, Guillaumet-Adkins A, Rodriguez-Esteban G, Gut M, Gut I, Heyn H, **Lehner B & Graf T** 2019, ‘Single cell RNA-seq identifies the origins of heterogeneity in efficient cell transdifferentiation and reprogramming’, *Elife*, 8, e41627.

ICREA MEMOIR 2019



Maciej Lewenstein

Institut de Ciències Fotòniques (ICFO)

Experimental Sciences & Mathematics

Maciej Lewenstein (Warsaw 1955) joined the Centre for Theoretical Physics of the Polish Academy of Sciences in Warsaw in 1980, did Ph.D. in Essen in 1983 with Fritz Haake and habilitated in 1986 in Warsaw. Postdocs at Universität Essen and at Harvard University with Roy J. Glauber (Nobel 2005), a faculty member of CEA in Saclay (1995-1998), and of the Leibniz University Hannover (1998-2005). In 2005 he moved to Catalonia as ICREA Research Professor to lead the quantum optics theory at the Institut de Ciències Fotòniques in Castelldefels. His interests include quantum optics, quantum physics, quantum information, many-body theory, attosecond science, and statistical physics. His other passion is jazz and avant-garde music – he is an acclaimed jazz writer and critic. At ICFO Maciej Lewenstein leads a 25 people team working on the mentioned subjects.

Research interests

Maciej Lewenstein is a theoretical physicist per se. His research interests are extremely diverse. He works on and contributes successfully to different branches of physics and other sciences. On one side he deals with purely mathematical questions related to foundations of physics, such as the nature of correlations in quantum systems. On the other extreme, Lewenstein has worked on models of human cognition and human voting behavior. Recently his interests mainly focus on quantum many body physics, quantum information theory, quantum optics, atomic physics, atto-nanophysics, quantum simulators, quantum open systems, statistical physics, Brownian motion theory and its applications to quantum physics, nano- and bio-photonics, or applications of theoretical quantum chemistry to quantum many body physics. In his research he uses extensively methods of the contemporary theoretical physics. At ICFO Maciej Lewenstein leads a 25 people team working on the mentioned subjects.

Selected publications

- Rego L, Dorney KM, Pisanty E, **Lewenstein M**, Plaja L, Kapteyn HC, Murnane MM & Hernandez-Garcia C 2019, ‘Generation of extreme-ultraviolet beams with time-varying orbital angular momentum’, *Science*, 364, 6447, 1253 – +, eaaw9486.
- Pisanty E, Machado GJ, Vicuna-Hernandez V, Picon A, Celi A, Torres JP & **Lewenstein M** 2019, ‘Knotting fractional-order knots with the polarization state of light’, *Nature Photonics*, 13, 8, 569-574.
- Mehboudi M, Lampo A, Charalambous C, Correa LA, Garcia-March MA & **Lewenstein M** 2019, ‘Using Polarons for sub-nK Quantum Nondemolition Thermometry in a Bose-Einstein Condensate’, *Physical Review Letters*, 122, 3, 030403.
- Aloy A, Tura J, Baccari F, **Acin A**, **Lewenstein M** & Augusiak R, 2019, ‘Device-Independent Witnesses of Entanglement Depth from Two-Body Correlators’, *Physical Review Letters*, 123, 10, 100507.
- Piga A, Aloy A, **Lewenstein M** & Frerot I 2019, ‘Bell Correlations at Ising Quantum Critical Points’, *Physical Review Letters*, 123, 17, 170604.
- Amini K, **Biegert J**, Calegari F, Chacon A, Ciappina MF, Dauphin A, Efimov DK, De Morisson F, Figueira C, Krzysztof G, Piotr G, Pisanty E, Prauzner-Bechcicki J, Krzysztof S, Suarez N, Zair A, Zakrzewski J & **Lewenstein M** 2019, ‘Symphony on strong-field approximation’, *Reports On Progress In Physics*, 82, 11, 116001.
- Pisanty E, Rego L, San Roman J, Picon A, Dorney KM, Kapteyn HC, Murnane MM, Plaja L, **Lewenstein M** & Hernandez-Garcia C, 2019, ‘Conservation of Torus-knot Angular Momentum in High-order Harmonic Generation’, *Physical Review Letters*, 122, 20, 203201.
- Gonzalez-Cuadra D, Bermudez A, Grzybowski PR, **Lewenstein M** & Dauphin A 2019, ‘Intertwined topological phases induced by emergent symmetry protection’, *Nature Communications*, 10, 2694.

Selected research activities

CCCB, Quantum Debate „What do we mean when we speak of quantum physics?”
Academia Europea, “A New Humanism for the 21st century?”

ICREA MEMOIR 2019



Julio Lloret-Fillol

Institut Català d'Investigació Química (ICIQ)

Experimental Sciences & Mathematics

Dr. Julio Lloret-Fillol graduated in Chemistry from the Universidad de Valencia in 2001 where he also obtained his PhD in 2006, working under the supervision of Prof. P. Lahuerta and Prof. J. Pérez-Prieto. After his PhD he moved to the University of Heidelberg to the group of Prof. L. H. Gade as a postdoctoral MEyC fellow and postdoctoral Marie Curie fellow. Since 2010 he has been working as independent research leader at Universitat de Girona (Ramón y Cajal programme). In 2014 he obtained a position as Young Research Group Leader at the Institut de Química Computacional i Catàlisi (UdG). In November 2014 he move to his actual position of group leader at the Institute of Chemical Research of Catalonia (ICIQ).

Research interests

My research is mainly focused on designing new catalysts for more sustainable chemistry through the use of artificial photosynthetic schemes (APS) (ERC Consolidator Grant). Although artificial photosynthetic schemes are a potential solution for a future sustainable society, basic science still needs to be done in order to achieve this objective. Accordingly, my research dream is to address the production of fine chemicals using solely CO₂, water and light as driving force. To this end, we are working on developing new methodologies to employ light as a driving force to produce reductive organic transformation and in the understanding of one of the most important reactions in earth, the water oxidation, identified as one of the bottlenecks for the production of solar fuels. Mechanistic investigations will aid to understand multi-proton multi-electron transformations. These areas of research can open up new avenues for newer and greener synthetic methods.

Selected publications

- Claros M, Ungeheuer F, Franco F, Martin-Diaconescu V, Casitas A & **Lloret-Fillol J** 2019, 'Reductive Cyclization of Unactivated Alkyl Chlorides with Tethered Alkenes under Visible-Light Photoredox Catalysis', *Ang. Chem. Int. Ed.*, **15**, 4869 – 4874.
- Codolà Z, Gamba I, Acuña-Parés F, Casadevall C, Clémancey M, Latour J-M, Luis J M, **Lloret-Fillol J** & Costas M 2019, 'Design of Iron Coordination Complexes as Highly Active Homogenous Water Oxidation Catalysts by Deuteration of Oxidation-Sensitive Sites', *J. Am. Chem. Soc.*, **141**, 323 – 333.
- Call A, Casadevall C, Romero-Rivera A, Martin-Diaconescu V, Sommer D J, Osuna S, Ghirlanda G & **Lloret-Fillol J** 2019, 'Improved Electro- and Photocatalytic Water Reduction by Confined Cobalt Catalysts in Streptavidin', *ACS Cat.*, **9**, 5837 – 5846.
- Franco F, Fernandez S & **Lloret-Fillol J** 2019, 'Advances in the electrochemical catalytic reduction of CO₂ with metal complexes', *Curr. Opin. Electrochem.*, **15**, 109 – 117.
- Sabenya G, Gamba I, Gomez L, Clémancey M, Frisch J R, Klinker E J, Blondin G, Torelli S, Que L Jr, Martin-Diaconescu V, Latour J-M, **Lloret-Fillol J** & Costas M 2019, 'Octahedral iron(IV)-tosylimido complexes exhibiting single electron-oxidation reactivity', *Chem. Sci.*, **10**, 9513 – 9529.
- Bucci A, Mondal S S, Martin-Diaconescu V, Shafir A. & **Lloret-Fillol J** 2019, 'Cobalt Amide Imidate Imidazolate Frameworks as Highly Active Oxygen Evolution Model Materials', *ACS Appl. Energy Mater.*, **2**, 8930 – 8938.

Selected research activities

- Member of the Young Academy of Europe
- Professor at the Master's in Advanced Catalysis and Molecular Modelling (UdG)
- Co-organizer of the ICIQ-INTECAT School

Selected Conferences & Talks

- Advancing Chemistry in Spain: ERC Researchers (Spain) **Invited**
- ICC2018 – Sendai (Japan) **Invited**
- ACS-Spring-Orlando (US) **Invited**
- AMN9, Wellington, (New Zealand) **Invited**
- Otago Future Fuels (OFF), Dunedin, (New Zealand) **Plenary Lecture**
- CaixaForum Química i energia, les fronteres del segle XXI Tarragona & Girona **Outreach Lectures**

ICREA MEMOIR 2019



Josep M. Llovet

Institut d'Investigacions Biomèdiques August Pi i Sunyer (IDIBAPS)
Life & Medical Sciences

Josep M. Llovet, MD is ICREA Research Prof, Liver Cancer Translational Oncology Lab, Liver Unit, IDIBAPS, Hospital Clinic, Univ. Barcelona, Prof. of Medicine and Director of the Liver Cancer Program at Icahn Mount Sinai School of Medicine, NY. He has published 287 manuscripts in Liver Cancer, including NEJM, Lancet, Nature, Nat.Genet., Cancer Cell and Gastroenterology (IF:4052; citations:66339; h-index:105). Top 1% most cited researcher globally, Clarivate Analytics (2014-19), Educational Councilor (2013-15), President of ILCA (2011-13), Senior Editor of CCR, he has lectured in more than 604 international meetings and has been the PI of European grants FP7-HEPTROMIC, HEP-CAR, Accelerator Award, NIH-NIDDK R01-award, I+D and competitive private grants. His achievements are: 1. Establish a clinical and molecular classification for HCC. 2. Establish efficacy of chemoembolization and sorafenib for HCC. 3. Identification of novel drivers and oncogenic pathways in HCC and ICC.

Research interests

Prof Josep M. Llovet has been working in clinical and translational research in hepatocellular carcinoma (HCC) and cholangiocarcinoma (ICC) for the last 25 years. He is leading international randomized trials in HCC on novel targeted therapies and developing a molecular classification of the disease, understanding the genetic aberrations and signaling pathways involved and in the identification of new molecular targeted therapies. He has organized the HCC Genomic Consortium and the HEPTROMIC Consortium that includes several international HCC research centers: IDIBAPS-Hospital Clínic, Icahn School of Medicine at Mount Sinai, INSERM, Univ. Tuebingen, Dana-Farber-MIT-Broad Institute and NCI. The main future areas of interest are a) identify biomarkers predicting response to sorafenib and checkpoint inhibitors (nivolumab) or mechanisms of resistance b) translate oncogenic drivers discoveries as targeted therapies in HCC and ICC, c) unraveling the molecular traits of NASH-HCC.

Selected publications

- Pinyol R, Montal R, Bassaganyas L et al. 2019, 'Molecular predictors of prevention of recurrence in HCC with sorafenib as adjuvant treatment and prognostic factors in the phase 3 STORM trial', *Gut*. 68:1065-1075
- Malehmir M, Pfister D, Gallage S et al. 2019, 'Platelet GPIIb/IIIa is a mediator and potential interventional target for NASH and subsequent liver cancer', *Nature Medicine*, 25:641-655.
- Moeini A, Torrecilla S, Tovar V et al. 2019, 'An Immune Gene Expression Signature Associated With Development of Human Hepatocellular Carcinoma Identifies Mice That Respond to Chemopreventive Agents', *Gastroenterology*, 57:1383-1397
- Montal R, Andreu-Oller C, Bassaganyas L et al. 2019, 'Molecular Portrait of High Alpha-Fetoprotein in Hepatocellular Carcinoma; Implications for Biomarker-Driven Clinical Trials', *British Journal of Cancer*, 121:340-343
- Ruiz de Galarreta M, Bresnahan E, Molina-Sanchez P et al. 2019, 'beta-Catenin Activation Promotes Immune Escape and Resistance to Anti-PD-1 Therapy in Hepatocellular Carcinoma', *Cancer Discovery*, 9:1124-1141
- Teufel M, Seidel H, Koechert K et al. 2019, 'Biomarkers Associated With Response to Regorafenib in Patients With Hepatocellular Carcinoma', *Gastroenterology*, 56:1731-1741
- Pinyol R, Sia D & **Llovet JM** 2019, 'Immune Exclusion-Wnt/CTNNB1 Class Predicts Resistance to Immunotherapies in HCC', *Clinical Cancer Research*. 25:2021-2023
- **Llovet JM**, Montal R & Villanueva A 2019, 'Randomized trials and endpoints in advanced HCC: Role of PFS as a surrogate of survival', *Journal Of Hepatology*, 70:1262-1277

Selected research activities

- Senior Editor. Clinical Cancer Research
- Director. Master in Translational Medicine. Universitat de Barcelona
- Executive Committee. IDIBAPS
- Director Liver Cancer Program. ICAHN School of Medicine at Mount Sinai
- Fellow Award. American Association for the Study of the Liver Diseases (AASLD)
- Tisch Cancer Institute Award. NCI designated Cancer Center Recognition ISMMS
- President, AASLD-SIG Liver Tumors

ICREA MEMOIR 2019



Núria López-Bigas

Institut de Recerca Biomèdica de Barcelona (IRB Barcelona)
Life & Medical Sciences

Núria López-Bigas has a PhD in Biology from the University of Barcelona and has expertise in Medical Genetics and in Computational Biology and Bioinformatics. During her PhD work, she studied the molecular causes of hereditary deafness at the group of Xavier Estivill. Next she moved to the European Bioinformatics Institute in Hinxton (Cambridge, UK) to work on Computational Genomics at the group of Christos A. Ouzounis and then at the Center for Regulatory Genomics (Barcelona) at the group of Roderic Guigó. Núria joined the Pompeu Fabra University in April 2006 with a Ramón y Cajal Position, was appointed ICREA Research Professor in October 2011 and her lab moved to Institute for Research in Biomedicine in November 2016. She leads the Biomedical Genomics Research Group (<http://bbglab.irbbarcelona.org>). In 2015 she was awarded an ERC Consolidator Grant.

Research interests

Núria López-Bigas research is focused on the study of cancer from a genomics perspective. She is particularly interested in the identification of cancer driver mutations, genes and pathways across tumor types and in understanding the mutational processes leading to accumulation of mutations in tumors. Among the most important achievements obtained by Lopez-Bigas' lab are the development of pioneer methods to identify driver genes (Oncodrive methods), the creation of IntOGen (<http://www.intogen.org>), a discovery tool for cancer research, the discovery that protein-bound DNA impairs nucleotide excision repair (Radhakrishnan et al., 2016), the finding that exons have reduced mutation rate due to differential mismatch repair (Frigola et al., 2017), the discovery that nucleosome covered DNA shows a 10 bp periodicity on the rate of somatic and germline mutations (Pich et al., 2018), and the identification of the mutational footprints of cancer therapies (Pich et al., 2019).

Selected publications

- Hernández-Sánchez M, Kotaskova J, Rodríguez AE, Radova L, Tamborero D, Abáigar M, Plevova K, Benito R, Tom N, Quijada-Álamo M, Bikos V, Martín AA, Pal K, García de Coca A, Doubek M, **López-Bigas N**, Hernández-Rivas JM & Pospisilova S 2019, 'CLL cells cumulate genetic aberrations prior to the first therapy even in outwardly inactive disease phase Comprehensive Characterization of Cancer Driver Genes and Mutations', *Leukemia*, 33, 2, 518 - 522.
- Pich O, Muiños F, Lolkema MP, Steeghs N, Gonzalez-Perez A & **Lopez-Bigas N** 2019, 'The mutational footprints of cancer therapies', *Nature Genetics*, 51, 12, 1732-1740
- Martínez-Jiménez F, Muiños F, López-Arribillaga E, **López-Bigas N** & González-Pérez A 2019, 'Systematic analysis of alterations in the ubiquitin proteolysis system reveals its contribution to driver mutations in cancer', *Nature Cancer*, s43018-019-0001-2
- Gonzalez-Perez A, Sabarinathan R & **Lopez-Bigas N** 2019, 'Local Determinants of the Mutational Landscape of the Human Genome', *Cell*, 177 (1):101-114.
- Arnedo-Pac C, Mularoni L, Muinos F, Gonzalez-Perez A & **Lopez-Bigas N** 2019, 'OncodriveCLUSTL: a sequence-based clustering method to identify cancer divers', *Bioinformatics*, 35, 22, 4788-4790.

Selected research activities

Chair for Advances in Computational Biology Conference 2019. Fostering collaboration among women scientists. Barcelona, Nov 28 - 29, 2019.

Co-organizer of EMBL Cancer Genomics Conference 2019, 4-6 November. Heidelberg, Germany

Invited speaker at: - EACR conference. Defence is the Best Attack: Immuno-Oncology Breakthroughs. Barcelona - Heterogeneity and Evolution in Cancer Conference at CNIO, Madrid - Medical Genetics Session, New Horizons in Genomics, QMUL London - and others

Keynote Speaker at First Zürich Precision Oncology Symposium, Comprehensive Cancer Center Zürich (Switzerland)

Chair of the Research Integrity Committee at the Institute for Research in Biomedicine

Board member of the Spanish Society Against Cancer (AECC)

National "Doctores Diz Pintado" Cancer Research Prize

ICREA MEMOIR 2019



Dan López de Sa

Universitat de Barcelona (UB)

Humanities

I am ICREA Research Professor at the Departament de Filosofia of the Universitat de Barcelona. I did my PhD in Barcelona (visiting ANU for a short while). I was Arché Postdoc in St Andrews (2004-06), Fullbright-GenCat Postdoc at NYU (2006-07), ICREA Researcher (2007-12) and then RyC (2012-13). I have published papers in *Analysis*, *Erkenntnis*, *Mind*, *Noûs*, *Philosophers' Imprint*, *Philosophical Studies*, *Proceedings of the Aristotelian Society*, and *Synthèse*, among others.

Research interests

I work on matters issuing from words -vagueness, contextualism/relativism, rigidity- and issues where words don't really matter (much) -truthmaking, grounding, time, disagreement, values-. In between, I have an increasing interest in topics around gender, race, and sexuality.

Selected research activities

- Principal investigator of Spanish Government Research Project "SM—Social Metaphysics" (PGC2018-094563-B-I00, 2019-21)
- Associate Editor of *Teorema* for "Metaphysics"
- Member of the "network of excellence" (Consolider) "*Facts and Thoughts in Perspective: New Issues*" (FFI2016-81858-REDC, 2017-19), research group "Law & Philosophy" (AGAUR 2017 SGR 823), and the interuniversity *BIAP-Barcelona Institute of Analytic Philosophy* (UB, UPF, UdG)
- Member of the *Societat Catalana de Filosofia* (IEC), the *Sociedad Española de Filosofía Analítica*, the *European Society of Analytic Philosophy* and the *American Philosophical Association*.
- In 2019, I convened the weekly SM-Seminar In Metaphysics and co-convened the weekly reading group on social institutions with JJ Moreso (UPF).
- Organizer of the international workshops: "Sexual Metaphysics—SM1": Barcelona, 27-28 June 2019, BIAP Workshop on Gender: Barcelona 17-18 December 2019
- Invited Talks:
 - 'Terminological Ethics: BDSM, Polyamory, and other Sexual Orientations' *SWIP panel at the Joint Sessions 2019*; Durham; July 2019
 - 'Grounding vs Anchoring in the Law' *Grounding in Law*; Barcelona; June 2019
 - 'The Phenomenon of Claimed Slurs' *Stanford/CSLI Philosophy of Language & Linguistics Workshop*; May 2019
- I supervised or co-supervised three PhD students and one MA thesis.

ICREA MEMOIR 2019



Gábor Lugosi

Universitat Pompeu Fabra (UPF)

Social & Behavioural Sciences

Gábor Lugosi received his PhD from the Hungarian Academy of Sciences in 1991 in electrical engineering. Since September 1996, he has been at the Department of Economics, Pompeu Fabra University. He became ICREA Research Professor in 2006.

Research interests

Gábor Lugosi has mostly worked on the mathematics of machine learning, probability, mathematical statistics, information theory, and game theory. His research has been motivated by applications in telecommunications and computer science and also by game-theoretic learning. Recently he has mostly worked on high-dimensional problems in statistics, random graphs, “on-line” learning and sequential optimization, and inequalities in probability theory.

Selected publications

- **Lugosi G** & Mendelson S 2019, ‘Sub-Gaussian estimators of the mean of a random vector’, *Annals of Statistics*, Vol. 47, No. 2, 783-794.
- **Lugosi G** & Pereira SA 2019, ‘Finding the seed uniform attachment trees’, *Electronic Journal of Probability*, Vol. 24, paper no. 18, 1-15.
- **Lugosi G** & Mendelson S 2019, ‘Near-optimal mean estimators with respect to general norms’, *Probability Theory and Related Fields*, 175, 3-4, 957 – 973.
- Addario-Berry L, Devroye L, **Lugosi G** & Imbuzeiro Oliveira R 2019, ‘Local optima of the Sherrington-Kirkpatrick Hamiltonian’, *Journal of Mathematical Physics*, 60, 4, 043301.
- **Lugosi G** & Mendelson S 2019, ‘Mean estimation and regression under heavy-tailed distributions—a survey’, *Foundations of Computational Mathematics*, 19(5), 1145-1190.
- **Lugosi G** & Mendelson S 2019, ‘Regularization, sparse recovery, and median-of-means tournaments’, *Bernoulli*, Vol. 25, No. 3, 2075-2106.

Selected research activities

Gábor Lugosi was a visiting researcher at the School of Computer Science of McGill University between September and December, 2019. He was also an invited visiting researcher at IMPA, Rio de Janeiro, for the month of May, 2019.

He is the funding co-editor of the journal *Mathematical Statistics and Learning*, published by the European Mathematical Society.

He is associate editor of the journals *Probability Theory and Related Fields*, *Annals of Applied Probability*, *Journal of Machine Learning Research*, *Machine Learning Journal*, *TEST*, and *ESAIM: Probability and Statistics*.

He was a panel member of the 2019 ERC Synergy Grants.

He is the Principal Investigator of a Google Focused Award, a Fundación BBVA grant to Research groups on Big Data, a research group project funded by the Spanish Ministry of Science, Innovation, and Universities, and another one funded by the Catalan governmental agency AGAUR.

ICREA MEMOIR 2019



María J. Macías

Institut de Recerca Biomèdica de Barcelona (IRB Barcelona)

Life & Medical Sciences

Since 2002 at the IRB Barcelona working in the Structural and Computational Biology Programme as GL of the Structural Characterization of Macromolecular Assemblies group. Past positions: 1998- 2002, Staff Scientist at the EMBL (Structural Biology) Heidelberg, Germany 1993-1998 Post Doctoral position at the EMBL (Structural Biology) Heidelberg, Germany in the group of Prof. Dr. H. Oschkinat 1993-PhD Degree: PhD in Organic Chemistry, Salamanca University (Spain), supervised by Prof. M. Grande Research Fields: Structural Biology, NMR, X-ray crystallography, Computational Biology, Signaling Current Research: Structural determination of protein domains and complexes involved in splicing, transcription and signaling Protein folding and stability Analysis of tumor mutations

Research interests

Our research interest is focused on deciphering the mechanisms that correlate cell signaling with gene expression using high resolution structural biology. We also aim at discovering how these mechanisms are regulated, and their consequent implications in human diseases from the structural point of view. Recently our work has been focused on the family of transcription factors Smads, where we have discovered a mechanism that labels these key components of the TGF-beta pathway first for activation and then for degradation. Using NMR and X-ray crystallography we are currently characterizing the interactions of Smad proteins and cofactors with DNA promoters, to provide a first understanding of how these molecular machines work and to pave the basis for the design of small molecular inhibitors specifically targeted towards tumor-derived SMAD forms.

Selected publications

- Aragon E, Wang Q, Zou Y, Morgani SM, Ruiz L, Kaczmarska Z, Su J, Torner C, Tian L, Hu J, Shu W, Agrawal S, Gomes T, Marquez JA, Hadjantonakis A-K, **Macias MJ** & Massagué J2019, 'Structural basis for distinct roles of SMAD2 and SMAD3 in FOXH1 pioneer-directed TGF-beta signaling', *Genes & Development*, 33, 21-22, 1506 - 1524.
- Iglesias-Bexiga M, Palencia A, Corbi-Verge C, Martin-Malpartida P, Blanco FJ, **Macias MJ**, Cobos ES & Luque I 2019, 'Binding site plasticity in viral PPxY Late domain recognition by the third WW domain of human NEDD4', *Sci Rep.* 9(1):15076.
- Pluta R, Aragon E, Cordero J, Martin-Malpartida P, Ruiz L & **Macias MJ** 2019, 'Structural basis for DNA recognition by FoxH1 pioneer transcription factor', *Febs Open Bio*, 9, 276 - 276.

Selected research activities

One PhD thesis defended (Tiago Gomes), November 2019

ICREA MEMOIR 2019



Marco Madella

Universitat Pompeu Fabra (UPF)
Humanities

After graduating at the University of Milan (Italy) in Natural Sciences (Botany), I worked as a contract scientist at the Archaeological Museum of Como and left the team in 1993 to start a PhD at the University of Cambridge. After finishing my PhD I took up a position as research fellow at the McDonald Institute for Archaeological Research, also teaching archaeology and human evolution at the Institute for Continuing Education (Madingly Hall) of the University of Cambridge. In 2004 I became affiliated lecturer in the Department of Archaeology and in 2005 director of studies in archaeology and anthropology at St. Edmund's College in the University of Cambridge. Since July 2005 I am ICREA research professor first at the IMF-CSIC and from 2014 at Universitat Pompeu Fabra. I currently coordinate the Culture and Socio-Ecological Dynamics (CaSEs) research group and I teach in the UPF Master in World History.

Research interests

My background is in archaeobotany and environmental archaeology, and I am interested in understanding the socio-ecological dynamics of past human populations in arid and semi-arid environments, from the Mediterranean to the tropics. My interests span from past vegetation histories, the modelling and simulation of processes in human behavioural change, people-plants co-evolutionary dynamics, long term trajectories of biodiversity and sustainability in prehistoric societies, and the origin and resilience of agriculture. Agriculture had an immense impact on humans and non-humans, and the future of our world is linked to making agriculture sustainable by maintaining biodiversity, re-evaluating traditional knowledge and mitigating environmental impact. Archaeology can play a key role in all these lines of investigation. Key areas for my work are South and West Asia, and South America.

Selected publications

- Lancelotti C, Biagetti S, Zerboni A, Usai D & **Madella M** 2019, 'The archaeology and ethnoarchaeology of rain-fed cultivation in arid and hyper-arid North Africa', *Antiquity*, 93, 370, 1026 - 1039.
- Ahedo V, Caro J, Bortolini E, Zurro D, **Madella M** & Galan JM 2019, 'Quantifying the relationship between food sharing practices and socio-ecological variables in small-scale societies: A cross-cultural multi-methodological approach', *Plos One*, 14, 5, e0216302.
- Kay AU, Fuller DQ, Neumann K, Eichhorn B, Hoehn A, Morin-Rivat J, Champion L, Linseele V, Huysecom E, Ozainne S, Lespez L, Biagetti S, **Madella M**, Salzmann U & Kaplan JO 2019, 'Diversification, Intensification and Specialization: Changing Land Use in Western Africa from 1800 BC to AD 1500', *Journal Of World Prehistory*, 32, 2, 179 - 228.
- Bortolini E, Biagetti S, Frinchillucci G, Abukhar H, Warsame AA & **Madella M** 2019, 'Newly found stone cairns in Mudug region, Puntland: a preliminary report', *Azania - Archaeological Research in Africa*, 54, 1, 94 - 106.
- Lombardo U, Ruiz-Perez J, Rodrigues L, Mestrot A, Mayle F, **Madella M**, Szidat S & Veit H 2019, 'Holocene land cover change in south-western Amazonia inferred from paleoflood archives', *Global And Planetary Change*, 174, 105 - 114.
- Gur-Arieh S, **Madella M**, Lavi N & Friesem D 2019, 'Potentials and limitations for the identification of outdoor dung plasters in humid tropical environment: a geo-ethnoarchaeological case study from South India', *Archaeological and Anthropological Sciences*, 11, 6, 2683 - 2698.

Selected research activities

- Honorary Professor at the School of Geography, Archaeology and Environmental Studies of the University of the Witwatersrand (South Africa)
- Co-Global Coordinator of LandUse6k - PAGES
- Advisory Board, INQUA Commission for Humans and the Biosphere

ICREA MEMOIR 2019



Vivek Malhotra

Centre de Regulació Genòmica (CRG)

Life & Medical Sciences

Vivek Malhotra is one of world's leaders on protein secretion and cellular compartmentation. His work is focused on how cellular compartments are made and communicate with each other, and how cells duplicate their compartments during cell division. He has been studying these processes since the late 80s and is acknowledge world wide for his creativity and novel findings. He obtained his Ph.D from Oxford and was a postdoc at Stanford University. He was a professor at University of California San Diego for 18 years. He joined the Centre for Genomic Regulation, Barcelona as a coordinator of the Cell and Developmental Biology Programme and ICREA Research Professor.

Research interests

We want to understand the mechanism by which eukaryotic cells model membranes to generate transport carriers based on their needs. For example, how bulky molecules such as the collagens are secreted, how mucins are secreted in a regulated manner, and how transport carriers form at the Golgi. Protein such as TANGO's, PIMS and PKD are helping us resolve this issue. We have uncovered a new pathway by which cells secrete proteins that cannot enter the ER-Golgi pathway of secretion. We hope this will help us understand the mechanism by which cells release various cytokines, growth and angiogenic factors in a signal dependent manner. Finally we are interested in the mechanism by which Golgi complex is built during repeated cycles of cell-division.

Selected publications

- Cantero-Recasens G, Butnaru CM, Brouwers N, Mitrovic S, Valverde MA & **Malhotra V** 2019, 'Sodium channel TRPM4 and sodium/calcium exchangers (NCX) cooperate in the control of Ca²⁺-induced mucin secretion from goblet cells', *J Biol Chem.* 294, 816-826.
- Raote I & **Malhotra V** 2019, 'Protein transport by vesicles and tunnels'. *J Cell Biol.* 218(3):737-739
- Chiritoiu M, Brouwers N, Turacchio G, Pirozzi M & **Malhotra V** 2019, 'GRASP55 and UPR Control Interleukin-1 β Aggregation and Secretion', *Dev Cell.* 49, 1, 145.

ICREA MEMOIR 2019



Mervi Mantsinen

Barcelona Supercomputing Center - Centro Nacional de Supercomputación (BSC - CNS)
Engineering Sciences

I graduated in Technical Physics at Helsinki University of Technology (HUT), now Aalto University, Finland in 1992. I carried out my research in the Plasma Physics and Fusion Group of HUT until 1995 when I moved to the JET Joint European Torus, the largest tokamak in the world, located in the UK. At JET, I worked as Ion Cyclotron Resonance Frequency (ICRF) Physics Expert, Scientific Coordinator, Responsible Officer for several large modelling codes and Physicist in Charge as well as trained as Session Leader of JET experiments. My thesis for the degree of Doctor of Science in Technology at HUT in 1999 was based on my research at JET. In 2003 I became Deputy Leader of Task Force Heating and Current Drive at JET, with approx. 80 members at several research institutions across Europe. In 2006 I joined the ICRF group of the Asdex Upgrade tokamak, Max-Planck-Institute for Plasma Physics, Germany and in October 2013 I was appointed ICREA Research Professor at BSC.

Research interests

My research is directed towards contributing to the development of nuclear fusion as a source of energy and, in particular, to the ITER project. ITER is an international nuclear fusion R&D project, which is building the world's largest experimental tokamak nuclear fusion reactor in France. ITER aims to demonstrate that fusion energy is scientifically and technologically feasible. My research is focused in the numerical modelling of experiments in magnetically confined fusion devices in preparation for ITER operation, working towards the objectives of the European fusion research programme EUROfusion for Horizon 2020 in close collaboration with ITER, International Tokamak Physics Activity, EUROfusion and the Spanish national fusion laboratory CIEMAT. My overall objective is to enhance the modelling capabilities by code validation and optimization, with the ultimate goal of helping improve the performance of ITER and future fusion reactors.

Selected publications

- Rakha A, **Mantsinen MJ** et al. 2019, 'Modelling of beam-driven Alfvén modes in TJ-II plasmas', *Nucl. Fusion*, 59, 5, 056002.
- Rakha A, Lauber Ph, **Mantsinen MJ** & Spong DA 2019, 'Shear Alfvén wave continuum spectrum with bifurcated helical core equilibria', *Nucl. Fusion*, 59, 10, 106042.
- Garzotti L et al. 2019, 'Scenario development for D-T operation at JET', *Nucl. Fusion*, 59, 7, 076037.
- Garcia J et al. 2019, 'First principles and integrated modelling achievements towards trustful fusion power predictions for JET and ITER', *Nucl. Fusion*, 59, 8, 086047.
- Kirov K et al. 2019, 'Fast ion synergistic effects in JET high performance pulses', *Nucl. Fusion*, 59, 5, 056005.
- Garcia-Munoz M et al. 2019 'Active Control of Alfvén Eigenmodes in Magnetically Confined Toroidal Plasmas', *Plasma Phys. Control. Fusion*, 61, 5, 054007.
- Eriksson J et al. 2019, 'Measuring fast ions in fusion plasmas with neutron diagnostics at JET', *Plasma Phys. Control. Fusion*, 61, 014027
- Nabais F et al. 2019, 'Energetic ion losses 'channeling' mechanism and strategy for mitigation', *Plasma Phys. Control. Fusion*, 61, 8, 084008
- Czarnecka A et al. 2019, 'Analysis of metallic impurity content by means of VUV and SXR diagnostics in hybrid discharges with hot-spots on the JET-ILW poloidal limiter', *Plasma Phys. Control. Fusion*, 61, 085004

Selected research activities

Fusion Group Leader at BSC (fusion.bsc.es)
Coordinator of the RIS3CAT Emerging Sector Fusion proposal involving 7 centers and budget of 4 M€
Chair of Local Organizing Committee for 47th EPS Conference on Plasma Physics
Scientific Coordinator of EUROfusion experiment 'ICRF scenario support for D and T plasmas' at the JET tokamak, UK
Supervisor of 3 PhD and MSc students (UPC)
Member of a PhD thesis evaluation panel (Eindhoven University of Technology, The Netherlands)
Reviewer for Spanish National Agency of Evaluation, EUROfusion, ICREA and journals Physics of Plasmas, Plasma & Fluids

ICREA MEMOIR 2019



Tomàs Marquès-Bonet

Universitat Pompeu Fabra (UPF) & Centre de Regulació Genòmica (CRG)

Life & Medical Sciences

Dr. Marquès-Bonet is the Principal Investigator of the group “Comparative Genomics” and director of the Institute of Evolutionary Biology (IBE; UPF/CSIC) and at the CRG-CNAG. He started his own lab in 2010 with an ERC Starting Grant and was selected as ICREA in 2011. In 2013 he was selected for the EMBO young Investigator award. Starting on 2017 he is an HHMI International young investigator. He has been part of many genome consortia, leading the section of duplications and structural variation in most of them. His group aims to characterize human specific genomics features, including the evolution of epigenetics in humans or the impact of CNVs in phenotypic traits. With a total of more than 120 peer-reviewed publications, he has published as a senior authorship in *Science* (2016), *Nature* (2013;2019), *Genome Research* (2015), *Plos Genetics* (2013,2015) among others. He was awarded with an ERC Consolidator 2019.

Research interests

What makes us human? This is a fundamental question in many disciplines. Our team analyzes a wide range of genome variants to determine processes, variants and molecular features that are intrinsic to our species. To do so, we study full genome, epigenomes and transcriptomic sequences of humans and great apes for a better understanding of human specific features.

Selected publications

- Fontserè C, de Manuel M, **Marques-Bonet T**, Kuhlwiilm M 2019, ‘Admixture in Mammals and How to Understand Its Functional Implications On the Abundance of Gene Flow in Mammalian Species, Its Impact on the Genome, and Roads into a Functional Understanding’, *Bioessays*, 41, 12, 1900123.
- Kuderna LFK, Lizano E, Julia E, Gomez-Garrido J, Serres-Armero A, Kuhlwiilm M, Antoni Alandes, Alvarez-Estape M, Juan D, Simon H, Alioto T, Gut M, Gut I, Schierup MH, Fornas O & **Marques-Bonet T** 2019, ‘Selective single molecule sequencing and assembly of a human Y chromosome of African origin’, *Nature Communications*, 10, 4.
- Welker F, Ramos-Madriral J, Kuhlwiilm M *et al* 2019, ‘Enamel proteome shows that *Gigantopithecus* was an early diverging pongine’, *Nature* 576, 262-265.
- van der Valk T, Diez-del-Molino D, **Marques-Bonet T**, Guschanski K & Dalen L 2019, ‘Historical Genomes Reveal the Genomic Consequences of Recent Population Decline in Eastern Gorillas’, *Current Biology*, 29, 1, 165 - +.
- Gokhman D, Mishol N, de Manuel M, de Juan D, Shugrun J, Meshorer E, **Marques-Bonet T**, Rak Y & Carmel L 2019, “Reconstructing Denisovan Anatomy Using DNA Methylation Maps”, *Cell* 179 (1), 180-192. e10
- Fages A et al. 2019, ‘Tracking Five Millennia of Horse Management with Extensive Ancient Genome Time Series.’, *Cell*, 177, 6, 1419+.
- Kuhlwiilm M, Han S, Sousa VC, Excoffier L & **Marques-Bonet T** 2019, ‘Ancient admixture from an extinct ape lineage into bonobos’, *Nature Ecology & Evolution*, 3, 6, 957 - 965.
- Han S, Andres AM, **Marques-Bonet T** & Kuhlwiilm M 2019, ‘Genetic Variation in Pan Species Is Shaped by Demographic History and Harbors Lineage-Specific Functions’, *Genome Biology And Evolution*, 11, 4, 1178 - 1191.

ICREA MEMOIR 2019



Genoveva Martí

Universitat de Barcelona (UB)

Humanities

I was born in Barcelona and I obtained my BA at the University of Barcelona. In 1982 I joined the PhD program at Stanford University, where my PhD was awarded in January 1989. I have been Assistant Professor at the University of Washington, Seattle, Assistant and Associate Professor at the University of California, Riverside, and Reader at the London School of Economics. In 2014-15 I was Professor of Philosophy at Western University, Ontario (Canada). I have been coordinator of the research group LOGOS (http://www.ub.es/grc_logos). I was awarded the Narcís Monturiol Medal by the Generalitat de Catalunya in 2012. I am an elected member of the Academia Europaea since 2009. In 2017 I was elected Chair of the Philosophy, Theology and Religious Studies Section of the Academia Europaea. In November 2018 I was elected Vice-President of the Academia Europaea.

Research interests

My research focuses on the exploration of reference, the relation between words and pieces of the world that makes it possible to talk about things. Traditionally, reference has been conceived as mediated by our cognitive perspective on things. On this view, which objects we talk about is determined by the concepts we associate with the expressions we use. Against this view I defend an approach to the semantics of singular terms and natural-kind terms according to which reference is not determined just by our mental states nor by the concepts we entertain; it rather depends on causal and social factors that are external to our mind. My research topics are connected to research areas in Linguistics and Psychology. I also have worked on the explanation of legal disputes from the point of view of different theories of reference, and on the impact of experimental data on semantics.

Selected publications

- **Hoefer C & Martí G** 2019, 'Water has a microstructural essence after all', *European Journal For Philosophy Of Science*, 9, 1, UNSP 12.
- **Martí G & Martínez-Fernández J** 2019, 'On 'actually' and 'dthat': truth-conditional differences in possible worlds semantics'. *Organon F*, Volume 26 (3): 491-504

Selected research activities

Presentations

'Experimental Semantics. A re-assessment of the debate'. *Fourth Graduate Conference in Philosophy*. University of Belgrade.

'Referring to Kinds of Things'. Conference: *The multi-level structure of reality*. Hebrew University of Jerusalem.

'Referencia y datos empíricos. Una evaluación del debate'. *V Congreso Ibero-Americano de Filosofía. Symposium In Memoriam of Maite Ezcurdia*. UNAM, México.

Discussion panels on Intuitions (with Janet Levin) and on Essentialism (with Carl Hoefer). *Stirring the Possum with Michael Devitt*. Hudson, New York.

'On Whales and Fish. Two models of interpretation'. *Primer Encuentro U. Torcuato di Tella - UPF - UdG*. Buenos Aires, Argentina. *World Congress in Philosophy*, Luzerne, Switzerland and *Legal Theory Festival*, Edinburgh, UK (presented by co-author Lorena Ramírez-Ludeña).

ICREA MEMOIR 2019



Marc Martí-Renom

Centre de Regulació Genòmica (CRG)

Life & Medical Sciences

I obtained a Ph.D. in Biophysics from the UAB where I worked on protein folding under the supervision of Professors B. Oliva, F.X. Avilés and M. Karplus (Nobel Laureate in 2013). After that, I went to the US for a postdoctoral training on protein structure modeling at the Sali Lab (Rockefeller University) as the recipient of the Burroughs Wellcome Fund fellowship. Later on, I was appointed Assistant Adjunct Professor at UCSF. Between 2006 and 2011, I headed the Structural Genomics Group at the CIPF in Valencia (Spain). Since October 2013, I am ICREA Research Professor and lead the Structural Genomics Group at the CNAG-CRG. Our group is broadly interested on how RNA, proteins and genomes organize and regulate cell fate. I have published over 100 articles in international peer-reviewed journals with over 10000 citations (Google Scholar indexed).

Research interests

How biomolecules fold and function in a three-dimensional space is one of the most challenging questions in biology. For example, we have limited knowledge on how the 2-meter-long DNA molecule folds in the micro-sized nucleus or how RNA, proteins and small chemical compounds fold and interact to perform their most basic functions of the cell. Our research group employ the laws of physics and the rules of evolution to develop and apply experimental and computational methods for predicting the 3D structures of macromolecules and their complexes.

Selected publications

- Spill YG, Castillo D, Vidal E & **Marti-Renom MA** 2019, 'Binless normalization of Hi-C data provides significant interaction and difference detection independent of resolution.', *Nature Communications*, 10, 1, 1938 - 1938.
- Cuadrado A, Gimenez-Llorente D, Kojic A, Rodriguez-Corsino M, Cuartero Y, Martin-Serrano G, Gomez-Lopez G, **Marti-Renom MA** & Losada A, 2019, 'Specific Contributions of Cohesin-SA1 and Cohesin-SA2 to TADs and Polycomb Domains in Embryonic Stem Cells', *Cell Reports*, 27, 12, 3500 - +.
- Miguel-Escalada I, et al., **Marti-Renom MA**, Fraser P, Ferrer J 2019, 'Human pancreatic islet three-dimensional chromatin architecture provides insights into the genetics of type 2 diabetes', *Nature Genetics*, 51, 7, 1137 - +.
- Morf J, Wingett SW, Farabella I, Cairns J, Furlan-Magaril M, Jimenez-Garcia LF, Liu X, Craig FF, Walker S, Segonds-Pichon A, Andrews S, **Marti-Renom MA** & Fraser P 2019, 'RNA proximity sequencing reveals the spatial organization of the transcriptome in the nucleus', *Nature Biotechnology*, 37, 7, 793 - +.
- Vara C, Paytuy-Gallart A, Cuartero Y, Le Dily F, Garcia F, Salva-Castro J, Gomez-H L, Julia E, Moutinho C, Aiese Cigliano R, Sanseverino W, Fornas O, Pendas AM, Heyn H, Waters PD, **Marti-Renom MA** & Ruiz-Herrera A 2019, 'Three-Dimensional Genomic Structure and Cohesin Occupancy Correlate with Transcriptional Activity during Spermatogenesis', *Cell Reports*, 28, 2, 352 - +.

Selected research activities

- Chair of the International Nucleome Consortium COST Action.
- Steering Committee of LifeTime (<https://lifetime-fetflagship.eu>)
- Coordinator of 4DNucleome in Europe (<https://4dnucleome.eu>)
- Vicepresident of the Societat Catalana de Biologia.

ICREA MEMOIR 2019



Ruben Martin

Institut Català d'Investigació Química (ICIQ)

Experimental Sciences & Mathematics

Ruben Martin was born in Barcelona in 1976. He received his PhD in 2003 at the Universitat de Barcelona with Prof. A. Riera. In January 2004 he moved to the Max-Planck-Institut für Kohlenforschung as a Humboldt postdoctoral fellow with Prof. A. Fürstner and in May 2005 he undertook further postdoctoral studies at MIT with Prof. Stephen L. Buchwald. In September 2008 he joined the ICIQ as a group leader. His current research interests concern the discovery and development of synthetically useful organometallic protocols. Ruben Martin was promoted to Associate Professor in July 2013 and to ICREA Research Professor in October 2013. During his time as group leader he has been awarded with 3 ERC projects by the European Research Council and with the 2020 Arthur Cope Scholar Award, 2019 Novartis Chemistry Award, 2018 Banc Sabadell Award to Sciences and Engineering, 2018 Hirata Award, 2018 OMCOS Award or 2019 ChemSocRev Pioneering Investigator Award, among the most recent.

Research interests

Our research is focused on the development of new catalytic protocols for producing synthetically relevant molecules from ubiquitous and simple precursors by activating inert, abundant and ubiquitous C-H, C-C and C-O bonds, probably the most fundamental linkages in nature. Additionally, my research has also been focused on the design of new catalytic protocols that utilize biomass-derived feedstocks such as carbon dioxide (CO₂) for preparing valuable carboxylic acid derivatives under mild reaction conditions. During the last years, my research at ICIQ has provided solutions to relevant and challenging synthetic problems from both scientific and industrial standpoint, thus providing a new opportunities to build up molecular complexity from simple and abundant precursors

Selected publications

- Tortajada A, Duan Y, Sahoo B, Cong F, Toupalas G, Sallustrau A, Loreaiu O, Audisio D & **Martin R** 2019, 'Catalytic Decarboxylation/Carboxylation Platform for Accessing Isotopically Labeled Carboxylic Acids', *ACS Catal*, 9, 5897-5901,
- Sun S Z, Romano C & **Martin R** 2019, 'Site-selective catalytic deaminative alkylation of unactivated olefins', *Journal of The American Chemical Society*, 141, 41, 16197 - 16201.
- Gu Y, Shen Y, Zarate C & **Martin R** 2019, 'A Mild and Direct Site-Selective sp(2) C-H Silylation of (Poly)Azines', *Journal Of The American Chemical Society*, 141, 1, 127 - 132.
- Börjesson M, Tortajada A & **Martin R** 2019, 'N-Containing Heterocycles on Demand by Merging Ni Catalysis and Photoredox PCET', *Chem*, 5, 254-256.
- Martin-Montero R, Reddy Yathamam V, Yin H, Davies J & **Martin R** 2019, 'Ni-catalyzed Reductive Deaminative arylation at sp³ Carbon Centers', *Organic Letters*, 21, 8, 2947 - 2951.
- Liu X-W, Zarate C & **Martin R** 2019, 'Base-Mediated Defluorosilylation of C(sp²)-F and C(sp³)-F Bonds', *Angew Chem Int Edit Engl* 58, 7, 2064 - 2068.
- **Martin R**, Sahoo B, Belloti P, Julià-Hernández F, Meng Q Y, Crespi S & König B 2019, 'Site-Selective, Remote sp³ C-H Carboxylation Enabled by the Merger of Photoredox and Nickel Catalysis', *Chemistry a European Journal*, 25, 38, 9001 - 9005.

Selected research activities

Selected conferences & lectures:

1. Novartis
2. Université de Montréal
3. McGill University
4. University of Bologna
5. Massachusetts Institute of Technology (MIT)
6. Wolf Symposium in Chemistry
7. Markovnikov Congress on Organic Chemistry
8. The Future of C-H Functionalization
9. Syngenta
10. Boehringer Ingelheim
11. Firmenich
12. University of Lyon
13. Yale University

ICREA MEMOIR 2019



Iñaki Martin-Subero

Institut d'Investigacions Biomèdiques August Pi i Sunyer (IDIBAPS)
Life & Medical Sciences

In 2001, I obtained my PhD in Biochemistry from the University of Navarra on genetics of lymphoid neoplasms under the supervision of Prof. Maria J Calasanz and co-supervision of Prof. Reiner Siebert from the Christian-Albrechts University of Kiel. After that, I continued my studies on lymphoma genetics as postdoctoral fellow with Prof. Siebert. In 2005, I became interested in the field of epigenomics and in 2009 I came back to Spain. After a short stay at the IDIBELL, I went to the UB/IDIBAPS to start my career as independent researcher embedded in the group of Prof. Elias Campo. In 2016, I was appointed Junior Leader of the Biomedical Epigenomics group at the IDIBAPS and from November 2018 I am ICREA Research Professor at the IDIBAPS. I also have an appointment as associate professor at the UB. Our group is interested in the role of epigenetics in the origin, evolution and clinical manifestations of lymphoid tumors.

Research interests

Understanding the molecular mechanisms underlying cancer initiation and evolution is an academically exiting question and has important translational implications for affected patients. In this global context, our group uses epigenomics to study the causes and consequences of corrupted transcriptional programs in a variety of lymphoid tumors. In the last years, we have performed detailed multi-omics characterization of normal and neoplastic B cells. In the next phase of our research program, we are mostly focusing on i) the role of enhancers and transcription factors as major modulators of the transcriptional landscape, ii) describing the cellular architecture of normal B cell differentiation and in the evolution of B cell tumors using single cell technologies, and iii) translating epigenomic information to better diagnose B cell tumors according to their biological basis and clinical risk as well as to generate novel therapeutic targets.

Selected publications

- Roisman A, Castellano G, Navarro A, Gonzalez-Farre B, Pérez-Galan P, Esteve-Codina A, Dabad M, Heath S, Gut M, Bosio M, Bellot P, Salembier P, Oliveras A, Slavutsky I, Magnano L, Horn H, Rosenwald A, Ott G, Aymerich M, López-Guillermo A, Jares P, **Martín-Subero JI**, Campo E, Hernández L. Differential expression of long non-coding RNAs are related to proliferation and histological diversity in follicular lymphomas. *Br J Haematol.* 2019 Feb;184(3):373-383.
- Bergmann AK, Fataccioli V, Castellano G, Martin-Garcia N, Pelletier L, Ammerpohl O, Bergmann J, Bhat J, Pau ECS, **Martín-Subero JI**, Moffitt AB, Valencia A, Oberg HH, Wesch D, Jayne S, Dyer MJS, Kabelitz D, Gaulard P, Siebert R. DNA methylation profiling of hepatosplenic T-cell lymphoma. *Haematologica.* 2019 Mar;104(3):e104-e107.
- Speedy HE, Beekman R, Chapaprieta V, Orlando G, Law PJ, Martín-García D, Gutiérrez-Abril J, Catovsky D, Beà S, Clot G, Puiggròs M, Torrents D, Puente XS, Allan JM, López-Otín C, Campo E, Houlston RS, **Martín-Subero JI**. Insight into genetic predisposition to chronic lymphocytic leukemia from integrative epigenomics. *Nat Commun.* 2019 Aug 9;10(1):3615.
- Tsagiopoulou M, Papakonstantinou N, Moysiadis T, Mansouri L, Ljungström V, Duran-Ferrer M, Malousi A, Queirós AC, Plevova K, Bhoi S, Kolia P, Oscier D, Anagnostopoulos A, Trentin L, Ritgen M, Pospisilova S, Stavroyianni N, Ghia P, **Martín-Subero JI**, Pott C, Rosenquist R & Stamatopoulos K. DNA methylation profiles in chronic lymphocytic leukemia patients treated with chemoimmunotherapy. *Clin Epigenetics.* 2019 Dec 2;11(1):177.

ICREA MEMOIR 2019



Jaime F. Martínez-García

Centre de Recerca en Agrigenòmica (CRAG)

Life & Medical Sciences

After graduating in Biology, I've got my PhD (January 1993, Universitat de València) working on how plants regulate their growth in response to environmental light conditions. After three consecutive postdocs working on plant transcription factors (John Innes Center, Norwich, UK - Cathie Martin's group; 1993 - 1995), on phytochrome signaling in the model plant *Arabidopsis thaliana* (Plant Gene Expression Center, UC-Berkeley, USA - Peter Quail's team; 1996 - 2000) and on photoperiod-regulated potato tuberization (Instituto de Biología Molecular de Barcelona, CSIC, Barcelona, Spain - Salomé Prat laboratory; 2000 - 2001), I've got a permanent position as an ICREA Research Professor in November 2001 and established my own research group. Currently, my group is interested in understanding how plants see and respond to the proximity of other plants.

Research interests

From the different light-regulated plant development responses, my laboratory works to understand how plants respond to vegetation proximity, a type of plant-plant communication. In *Arabidopsis thaliana*, a sun-loving plant that avoids vegetation proximity and shade, perception of neighboring vegetation results in the activation of a set of responses known as the *shade avoidance syndrome* (SAS). The most obvious SAS response is the induction of the elongation of seedlings. After identifying several SAS regulatory components, we established that they are organized in complex transcriptional regulatory networks in which the levels of several components are rapidly altered after plant proximity perception. This network is formed by a broad range of transcription factors and cofactors, as well as specific components of the nuclear pore complex.

We have expanded our research to other plant species closely related to *A. thaliana* that tolerate (instead of avoid) plant shade, as is the case of *Cardamine hirsuta*, a species susceptible to be used in genetic approaches. Our comparative genetic analyses between both kinds of species has helped us to unravel how nature implements adaptation to plant shade and high planting density. Ultimately, our work will help to better understand how plants communicate to each other, a knowledge that will contribute to make agricultural systems more complex, and hence to transition towards a more sustainable agriculture.

Selected publications

- Ortiz-Alcaide M, Llamas E, Gómez-Cadenas A, Nagatani A, **Martínez-García JF** & Rodríguez-Concepción M© 2019, 'Chloroplasts modulate elongation responses to canopy shade by retrograde pathways involving HY5 and ABA'. *Plant Cell* 31, 384-398.
- Molina-Contreras MJ*, Paulisic S*, Then C*, Moreno-Romero J, Pastor-Andreu P, Morelli L., Roig-Villanova I, Jenkins H, Hallab A, Gan X, Gómez-Cadenas A, Tsiantis M, Rodríguez-Concepción M & **Martínez-García JF**© 2019, 'Photoreceptor activity contributes to contrasting response to shade in Cardamine and Arabidopsis seedlings'. *Plant Cell* 31, 2649-2663.

Selected research activities

- Invited lectures and seminars. "Being tolerant in shaded times: what weeds can teach us". Macquarie University, Sydney, Australia. Invited by Ian Wright (25 October); "Divergent plant responses to vegetation proximity: the contribution of photoreceptors". University of Utrecht, The Netherlands. Invited by Ronald Pierik (24 June); "How to be tolerant in shaded times: lessons from weeds". UMR, CIRAD, Montpellier. Invited by Tanguy Lafarge (23 May) and "How to be tolerant in shaded times: lessons from weeds". Programa Seminario Interdepartamental, Máster "Biotecnología" y Máster "Producción, protección y mejora vegetal", Universidad de Córdoba. Invited by Prof. Enriqueta Moyano (5 April).
- Member of the Organizing Committee of the International Symposium on Plant Photobiology 2019 (ISPP 2019). 3-8 June 2019, Barcelona (Spain). <https://www.ispphotobiology2019.com>.
- Four-month sabbatical stay in the Macquarie University (Sydney, Australia) in the laboratory of Prof. Ian Wright. During this time I was appointed the honorary academic title of Visiting Professor with Macquarie University.
- Fellowship from the Spanish Ministry of Science, Innovation and Universities for the four-month sabbatical stay at the Macquarie University (September to December).

ICREA MEMOIR 2019



Bienvenido Martínez-Navarro

Institut Català de Paleoecologia Humana i Evolució Social (IPHES)
Humanities

Degree in Geology (1987) and PhD in Paleontology (1991). I work on Quaternary mammals, and participate at different Plio-Pleistocene projects around the World, been the co-leader of the Baza and Incarcal projects in Spain, the Oued Sarrat project in Tunisia, and the Engel Ela-Ramud project in Eritrea. I also participate in the study of the sites of Buia in Eritrea, Melka Wakena in Ethiopia, and Dmanisi in Georgia, and have worked in the past studying the sites of the Atbara River in Sudan, `Ubeidiya, Gesher Benot Ya'aqov, and Bizat Ruhama in Israel, Argentario and Pirro Nord in Italy, and Vallonnet in France.

Research interests

I am a paleontologist working on Quaternary mammals from Europe, Asia and Africa. My main interest is to describe the ecological scenario where our ancestors, the earlier members of the genus *Homo*, evolving and dispersing from Africa, were able to colonize the middle latitudes of Eurasia, and survive in seasonal climates during the Pleistocene times. I have developed an intense research travelling around the world to study the African origin mammals dispersing into Eurasia, and the Eurasian origin mammals dispersing into Africa, in order to describe their systematics, phylogeny, biochronology, paleobiogeography, autoecology, and their potential ecological relationships among them and with hominins. I work on fossil hyenas, sabertoothed tigers, hunting dogs, bears, elephants and mastodons, hippos, pigs, buffaloes, antelopes, deers, giraffes, camels, monkeys and other groups.

Selected publications

- Cappellini E, Welker F, Pandolfi L, Ramos-Madrigal J, Samodova D et al. (48 authors) 2019, 'Early Pleistocene enamel proteome from Dmanisi resolves Stephanorhinus phylogeny', *Nature* 574, pages103-107.
- Espigares MP, Palmqvist P, Guerra-Merchán A, Ros-Montoya S, García-Aguilar JM, Rodríguez-Gómez G, Serrano FJ, **Martínez-Navarro B** 2019, 'The earliest cut marks of Europe: a discussion on hominin subsistence patterns in the Orce sites (Baza basin, SE Spain)'. *Scientific Reports*, 9, 15408.
- Medin T, Medin T, **Martínez-Navarro B**, Madurell-Malapeira J, Figueirido B, Kopalani G, **Rivals F**, Kiladze G, Palmqvist P & Lordkipanidze D 2019. 'The bears from Dmanisi and the first dispersal of early Homo out of Africa'. *Scientific Reports* 9:17752.
- **Martínez-Navarro B**, Palmqvist P, Espigares MP & Ros-Montoya S (Eds) (2019). *Libro de Resúmenes de las XXXV Jornadas de Paleontología*, Soc. Esp. Paleont., Baza 2-5 Octubre de 2019. ISBN: 978-84-09-14609-3. Dep. Leg.: GR-1191-2019. 380 p.

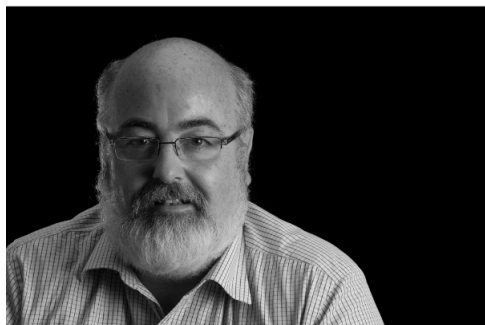
Selected research activities

During year 2019 I have conducted field research at the Engel Ela-Ramud basin (Eritrea), the Oued Sarrat basin (Tunisia), and at the Spanish sites of Baza 1 (Baza-Guadix basin, Andalusia) and Incarcal (Banyles-Besalú basin, Catalonia).

I have done lab work too at the National Museum of Ethiopia in Addis Ababa, studying the Early Pleistocene faunal collection from the site of Melka Wakena; the Faculty of Sciences of Bizerte in Tunisia, studying the Middle Pleistocene fauna from the site of Oued Sarrat; the National Museum of Georgia in Tbilisi, studying the fossil collection from the Early Pleistocene site of Dmanisi; and at the Archaeological Museum of Baza (Granada, Spain), studying the Pliocene fossil collection of Baza 1.

I have been Chairman of the XXXV Jornadas de Paleontología organizing committee (the Spanish Annual Congress of Paleontology), held in Baza (Granada) on 2nd-5th October.

ICREA MEMOIR 2019



Mario Martínez

Institut de Física d'Altes Energies (IFAE)

Experimental Sciences & Mathematics

Born in Madrid, he studied Theoretical Physics at the Universidad Autónoma de Madrid. He spent many years at DESY in Hamburg (Germany) studying deeply inelastic electron-proton scattering in the ZEUS experiment, where he obtained his PhD and then worked as DESY researcher. In 2001, he moved to USA to work in Fermilab. He participated in the CDF experiment at the Tevatron proton-antiproton collider, with emphasis on searches for new physics. In 2007 he moved back to Europe and started working also in the ATLAS experiment at the Large Hadron Collider at CERN, initiating operations in 2009. Since then he was acting as project leader of the IFAE-Barcelona group in ATLAS. In 2015 he was appointed Head of IFAE Experimental Division, Scientific Manager of the Spanish High Energy Physics, and Scientific Delegate in CERN's Council. Starting in 2018, he initiated a new activity related to Gravitational Waves Physics with the LIGO-Virgo interferometers.

Research interests

I originally focused on QCD studies and searches for new physics beyond the Standard Model (Higgs boson, supersymmetry, dark matter, extra-dimensions, WIMPs, etc) at particle physics collider experiments in Europe and USA. This translates into hundreds of publications, tens of conference talks, and 13 PhD theses that I supervised to date. Since 2009, I focused on the LHC physics program at CERN. In 2012 the LHC experiments (ATLAS and CMS) discovered the Higgs boson. The LHC resumed operations in 2015 with a center-of-mass energy increased from 7-8 TeV to 13 TeV. In the period 2009-2015, I led a group of almost 30 scientists from IFAE-Barcelona that analyzes the data from the ATLAS experiment. In 2015 I took responsibilities as Head of IFAE Experimental Division, Scientific Manager of the Spanish High Energy Physics Program (until 2018), and Scientific Delegate to CERN Council (until 2018). Recently, I have started at IFAE a new involvement in Gravitational Wave Physics in the Virgo interferometer with emphasis on those aspects related to fundamental physics and cosmology. I am currently deeply involved in both ATLAS and LIGO-Virgo activities, searching for the nature of the dark matter in the cosmos.

Selected publications

- Cirone A et al. 2019, "Investigation of magnetic noise in Advanced Virgo", *Class. Quant. Grav.* 36, no.22, 225004
- ATLAS Collaboration 2019, "Combination of searches for invisible Higgs boson decays with the ATLAS experiment", *Phys. Rev. Lett.* 122,231801
- ATLAS Collaboration 2019, "Constraints on mediator-based dark matter and scalar dark energy models using $\sqrt{s}=13$ TeV pp collision data collected by the ATLAS detector", *JHEP* 05 142
- ATLAS Collaboration 2019, "Measurement of VH , $H \rightarrow b\bar{b}$ production as a function of the vector-boson transverse momentum in 13 TeV pp collisions with the ATLAS detector", *JHEP* 05,141

Selected research activities

- Member of CMS Phase 2 Upgrade Group at CERN.
- Head of IFAE Experimental Division.
- PI of Gravitational Waves group at IFAE.
- Member of the Virgo Steering Committee.
- Member of the Steering Committee for the Einstein Telescope Project.
- Member of the LIGO-Virgo-KAGRA Committee for Climate Change.
- Five PhD students under my direct supervision in ATLAS and Virgo experiments.
- One Master Thesis concluded in 2019 and three additional ones under my supervision.
- Lecturer in the CERN High-School Students Internship Programme in 2019.
- Reviewer for Physical Review and JHEP Journals.
- Several Talks in Conferences and Workshops.

ICREA MEMOIR 2019



Javier Martínez-Picado

Institut de Recerca de la Sida - IrsiCaixa (IrsiCaixa)
Life & Medical Sciences

Javier Martínez-Picado is ICREA Research Professor at the AIDS Research Institute IrsiCaixa in Barcelona, an institution that works to advance clinical research and translate results into patients care. He is also associate professor at the University of Vic (UVic-UCC). He received his PhD from the University of Barcelona where he subsequently became associate professor lecturing on different microbiology-related subjects. In 1996, he joined the Massachusetts General Hospital as postdoctoral fellow of the Harvard Medical School, where he engaged in AIDS research. In 2000, he obtained a position as biomedical researcher of the Spanish Health Department appointed to the Hospital "Germans Trias i Pujol" in Badalona (Barcelona). Dr. Martínez-Picado serves on different government, academic and industry advisory boards and has published extensively on HIV treatment strategies and HIV pathogenesis in international journals.

Research interests

The main subject of our biomedical research is the Human Immunodeficiency Virus (HIV), a retrovirus that can lead to Acquired ImmunoDeficiency Syndrome (AIDS), a condition in humans in which the immune system begins to fail, leading to life-threatening opportunistic infections. Since the beginning of the epidemic, 76 million people have been infected with HIV, of which 35 million have died from AIDS. In 2016, 1 million people died from AIDS-related causes and 1.8 million became newly infected worldwide. Our research programs are focused on understanding how HIV causes disease at the molecular and cellular level, tackling cellular and anatomical viral reservoirs, exploring new strategies to cure HIV/AIDS and collaborating on global HIV/AIDS vaccine development projects.

Selected publications

- Gupta RK *et al.* 2019, 'HIV-1 remission following CCR5Δ32/Δ32 haematopoietic stem-cell transplantation', *Nature*, 568, 7751, 244
- Perez-Zsolt D *et al.* 2019, 'Anti-Siglec-1 antibodies block Ebola viral uptake and decrease cytoplasmic viral entry', *Nat Microbiol* 4(9):1558-70.
- Julg B *et al.* 2019, 'Recommendations for analytical antiretroviral treatment interruptions in HIV research trials', *Lancet HIV* 6(4):e259-68.
- Moron-Lopez S *et al.* 2019, 'Switching from a protease inhibitor-based regimen to a dolutegravir-based regimen', *Clin Infect Dis* 69(8):1320-8.
- Muncunill J *et al.* 2019, 'Plasma Epstein-Barr virus load as an early biomarker and prognostic factor of HIV-1-related lymphomas', *Clin Infect Dis* 68(5):834-43.
- Jong W *et al.* 2019, 'Therapeutic vaccine in chronically HIV-1-infected patients', *Vaccines* 7(4). pii: E209.
- Perez-Zsolt D *et al.* 2019, 'Dendritic cells from the cervical mucosa capture and transfer HIV-1 via Siglec-1', *Front Immunol* 10, 825.
- Ruiz A *et al.* 2018, 'Antigen production after latency reversal and expression of inhibitory receptors in CD8+ T cells limit the killing of HIV-1 reactivated cells', *Front Immunol* 9, 3162.
- Blanch-Lombarte O *et al.* 2019, 'Enhancement of antiviral CD8+ T-cell responses and complete remission of metastatic melanoma in an HIV-1-infected subject treated with pembrolizumab', *J Clin Med* 8(12). pii:E2089
- Gonzalez-Cao M, *et al.* 2019. 'Cancer immunotherapy of patients with HIV infection', *Clin Transl Oncol* 21(6): 713-20.
- Millar JR, *et al.* 2019. 'Increasing diagnostic uncertainties in children with in-utero HIV infection'. *Pediatr Infect Dis J* 38(8):e166-8.
- Mothe B, *et al.* 2019. 'Therapeutic vaccination refocuses T-cell responses towards conserved regions of HIV-1 in early treated individuals'. *EClinicalMedicine* 11:65-80.

ICREA MEMOIR 2019



Pedro Martínez

Universitat de Barcelona (UB)

Life & Medical Sciences

I graduated in Chemistry (Biochemistry and Molecular Biology) in 1982 from the Universitat Autònoma de Barcelona, where I also obtained my PhD (in 1990). My training was completed in several places, but mainly at the California Institute of Technology (Pasadena, USA) and at the Centro Nacional de Biotecnología (Madrid, Spain). Before my ICREA appointment I was Associate Professor in the Faculty of Medicine at the University of Bergen (Norway). Currently I am an ICREA Research Professor at the Universitat de Barcelona, Departament de Genètica, a position that I hold since the year 2003. The area of my research is the Evolution of Developmental Mechanisms.

Research interests

In our group we are interested in understanding how animals have evolved over time. We assume that the morphological changes have occurred as a consequence of modifications in the use of different genes during development. In this context, the main aim of our research is to study the origin of the bilateral animals, from radial ancestors. We compare the expression of genes in bilateral and radial animals, hoping to find what changes may have occurred when that transition happened (more than 500 million years ago). Recently we have extended the analysis using genome comparisons. We have sequenced the genomes of several basal bilaterian animals (members of the phylum Xenacoelomorpha) and are in the process of analyzing, and comparing, all types of genomic features. They should give us key insights into the mechanisms that underlie the origin and diversification of animals. The origin of the centralized nervous system is, at present, the major focus of our research efforts.

Selected publications

- Philippe H, Poustka AJ, Chiodin M, Hoff KJ, Dessimoz C, Tomiczek B, Schiffer PH, Müller S, Domman D, Horn M, Kuhl H, Timmermann B, Satoh N, Hikosaka-Katayama T, Nakano H, Rowe ML, Elphick MR, Thomas-Chollier M, Hankeln T, Mertes F, Wallberg A, Copley RR, **Martínez P** & Telford MJ 2019, 'Mitigating anticipated effects of systematic errors supports sister-group relationship between Xenacoelomorpha and Ambulacraria', *Current Biology*, 29, 1818-1826.
- Hartenstein V & **Martínez P** 2019, 'Structure, development and evolution of the digestive system', *Cell Tissue Res* 377: 289.
- Hartenstein V & **Martínez P** 2019, 'Phagocytosis in cellular defense and nutrition: a food-centered approach to the evolution of macrophages', *Cell Tissue Res*, 377: 527.
- Jondelius U, Raikova OI & **Martínez P** 2019, 'Xenacoelomorpha, a Key Group to Understand Bilaterian Evolution: Morphological and Molecular Perspectives'. In: Pontarotti P. (eds) *Evolution, Origin of Life, Concepts and Methods*. Springer, Cham.
- Arnone MI, Oliveri P & **Martínez P** 2019, 'A conceptual history of the "regulatory genome": From Theodor Boveri to Eric Davidson', *Marine Genomics*. 44, 24-31.
- Gavilán B, Sprecher SG, Hartenstein V & **Martínez P** 2019 'The digestive system of xenacoelomorphs', *Cell Tissue Res*, 377: 369.

Selected research activities

Member of the COST Action (spanish representative) CA16203, "MARISTEM"
Board Member International Society of Invertebrate Biology (ISIM)

ICREA MEMOIR 2019



Daniel Maspoch

Institut Català de Nanociència i Nanotecnologia (ICN2)
Engineering Sciences

Born in L'Escala (Girona) in 1976. He graduated in chemistry at the Universitat de Girona and obtained his PhD in materials science at the Universitat Autònoma de Barcelona & Institut de Ciència de Materials de Barcelona. He then moved to Northwestern University, where he worked as a postdoctoral fellow in the group of professor Chad A. Mirkin. He moved back to the Institut Català de Nanotecnologia (ICN) thanks to a Ramón y Cajal contract, where he founded the Supramolecular NanoChemistry & Materials Group. Since September 2011 he is ICREA Research Professor and Group Leader at the Institut Català de Nanociència i Nanotecnologia (ICN2). He is a recipient of European Research Council (ERC) Consolidator and PoC Grants.

Research interests

My research interests are focused on controlling the assembly -Supramolecular Chemistry- of molecules, metal ions and nanoparticles for the creation of functional nanostructured materials -Nanotechnology- with empty spaces; and use them to encapsulate, store, separate, react and deliver molecules of interest. My main contributions are in the fields of nanoporous Metal-Organic Frameworks (MOFs), Covalent-Organic Frameworks (COFs), Metal-Organic Polyhedra (MOPs) and Delivery Systems for applications in myriad areas, including Energy (e.g. gas storage), Catalysis, the Environment (e.g. pollutant removal, CO₂ storage), Encapsulation (e.g. long-lasting fragrances), and Life Science -Medicine and animals health- (e.g. drug-delivery systems and contrast agents).

Selected publications

- Carné-Sánchez A, Craig GA, Larpent P, Guillerm V, Urayama K, **Maspoch D** & Furukawa S 2019, 'A coordinative solubilizer method to fabricate soft porous materials from insoluble metal-organic polyhedra', *Angewandte Chemie-international Edition*, vol. 58, no. 19, pp 6347 - 6350.
- Garzon-Tovar L, Perez-Carvajal J, Yazdi A, Hernandez-Munoz J, Tarazona P, Imaz I, Zamora F & **Maspoch D** 2019, 'A MOF@COF composite with enhanced uptake through interfacial pore generation', *Angewandte Chemie-international Edition*, vol. 58, no. 28, pp 9512 - 9516.
- Troyano J, Carné-Sánchez A & **Maspoch D** 2019, 'Programmable self-assembling 3D architectures generated by patterning of swellable MOF-based composite films', *Advanced Materials*, vol. 31, no. 21, pp 1808235.
- Pérez-Carvajal J, Boix G, Imaz I & **Maspoch D** 2019, 'The imine-based COF TpPa-1 as an efficient cooling adsorbent that can be regenerated by heat or light', *Advanced Energy Materials*, 9, pp 1901535.
- Guillerm V & **Maspoch D** 2019, 'Geometry mismatch and reticular chemistry: strategies to assemble metal-organic frameworks with non-default topologies', *Journal of the American Chemical Society*, vol. 141, no. 42, pp 16517 - 16538.
- Grancha T, Carne-Sanchez A, Hernandez-Lopez L, Albalad J, Imaz I, Juanhuix J & **Maspoch D** 2019, 'Phase transfer of rhodium(II)-based metal-organic polyhedra bearing coordinatively bound cargo enables molecular separation', *Journal of the American Chemical Society*, vol. 141, no. 45, pp 18349 - 18355.
- Carné-Sánchez A, Albalad J, Grancha T, Imaz I, Juanhuix J, Larpent P, Furukawa S & **Maspoch D** 2019, 'Postsynthetic covalent and coordination functionalization of rhodium(II)-based metal-organic polyhedra', *Journal of the American Chemical Society*, vol. 141, no. 9, pp 4094 - 4102.

Selected research activities

ERC Proof-of-Concept Grant

ICREA MEMOIR 2019



David Mateos

Universitat de Barcelona (UB)

Experimental Sciences & Mathematics

I was born in 1974 in Barcelona. I obtained my PhD in Theoretical Physics from the University of Barcelona in 2000. After that I enjoyed many years of wonderful postdoctoral life at Cambridge University, UK (2 years), Perimeter Institute, Canada (3 years) and University of California at Santa Barbara, USA (3 years). I am an ICREA Research Professor at the Department of Quantum Physics and Astrophysics at the University of Barcelona since July 2008. In 2012 I was awarded a Starting Grant from the European Research Council (1.4 M€).

Research interests

My main goal is to understand the physics of the Universe at the most fundamental level. Our present understanding is based on two theories. General relativity is a classical theory that provides a good description of gravitational interactions at large, macroscopic scales. The other three interactions, the electromagnetic, the strong and the weak interactions, are unified in a quantum theory, the so-called Standard Model of elementary particles. The answers to many important questions in fundamental physics require a unified, quantum theory of all interactions; these questions include the quantum properties of black holes, cosmology and the origin of the Universe, particle physics beyond the Standard Model, etc. For this reason I work on string theory, a quantum theory that has the potential to describe all forces and particles in Nature in a single, unified framework.

Selected publications

- Faedo AF, **Mateos D**, Pantelidou C & Tarrío J 2019, 'A supersymmetric color superconductor from holography', *Journal Of High Energy Physics*, 5, 106.
- Faedo AF, **Mateos D**, Pantelidou C & Tarrío J 2019, 'Spectrum of a supersymmetric color superconductor', *Journal Of High Energy Physics*, 11, 020.
- Elander D, Faedo AF, **Mateos D**, Pravos D & Subils JG 2019, 'Mass spectrum of gapped, non-confining theories with multi-scale dynamics', *Journal Of High Energy Physics*, 5, 175.
- Faedo AF, **Mateos D**, Pantelidou C & Tarrío J 2019, 'Erratum to: Towards a holographic quark matter crystal (vol 10, 139, 2017)', *Journal Of High Energy Physics*, 7, 058.

Selected research activities

Invited Talks

- Hydrodynamics near a critical point, "Theoret. Foundations of Relativistic Hydrodynamics", Banff, Canada.
- Extreme Holography: From Heavy Ion Collisions to Neutron Star Mergers, "Gravity - New perspectives from strings and higher dimensions", Benasque Centre for Science, Spain.
- Holography at High Density, "Rencontres Theoriciens", Inst. Henri Poincare, Paris, France.
- Extreme Holography, "Belgian Holography Meeting", Leuven, Belgium.
- Holographic Complex CFTs, U Autònoma Barcelona, Spain.
- Holographic Dynamics across a Phase Transition, Ecole Polytechnique and Saclay, Paris, France.

Supervised Theses

- D. Pravos, PhD, U Barcelona.
- M. Frias, Master, U Barcelona.

Conference Organization

- Iberian Strings 2019, U Barcelona.

Teaching

- Frontiers of Theoretical Physics, Master Course at U Barcelona.

Managerial

- Member of the advisory board of the Institute for Cosmos Sciences, U Barcelona.
- Guarantor of the Maria de Maeztu project of the Institut. for Cosmos Sciences, U Barcelona.

Outreach and Media

- ¿De qué hablamos cuando hablamos de cuántica?, debate at the CCCB, Barcelona, Spain.
- Quarks, Gluones y Agujeros Negros, public lecture, Benasque Centre for Science, Spain.
- The Quark-Gluon Plasma, radio interview on "SER Catalunya", Barcelona, Spain.

ICREA MEMOIR 2019



Paolo Melchiorre

Institut Català d'Investigació Química (ICIQ)

Experimental Sciences & Mathematics

Paolo Melchiorre is an ICREA Research Professor at the Institute of Chemical Research of Catalonia (ICIQ) in Tarragona. Paolo studied Chemistry at the University of Bologna (Italy) where he graduated in 1999. He began his doctoral studies in Chemistry working in the area of enantioselective catalysis. Before obtaining his PhD in 2003, he spent a research period in Denmark working with Prof. Karl Anker Jørgensen, Århus University, where his studies centered on asymmetric organocatalysis. Afterwards, he worked as a postdoctoral associate at the Industrial Chemistry Faculty of the Bologna University. There, he began his independent studies on the development of novel organocatalytic asymmetric transformations. In October 2007, he took a permanent position as an Assistant Professor at Bologna University. In September 2009, Paolo moved to Catalonia as ICREA Research Professor and ICIQ Senior Group Leader.

Research interests

My main interest is on the discovery and mechanistic elucidation of new enantioselective organocatalytic and photochemical processes that address unsolved problems in synthetic methodology. My research on light-driven stereocontrolled processes aims at increasing process efficiency using a mechanistically-guided approach, controlling reaction selectivity, and reducing the environmental impact of chemical synthesis. My approach is based on the combination of two powerful fields of molecule activation, visible light photocatalysis and metal-free organocatalysis, to develop fundamentally new and ground-breaking strategies to asymmetric catalysis via the intermediacy of light-mediated open-shell redox processes and excited-state reactivity patterns. The motivation is that the use of light excitation to bring a molecule from its ground state to an electronically excited state can unlock previously inaccessible reaction pathways, thereby creating new synthetic opportunities.

Selected publications

- van Leeuwen T, Buzzetti L, Perego LA & **Melchiorre P** 2019, 'A Redox-Active Nickel Complex that Acts as an Electron Mediator in Photochemical Giese Reactions', *Angewandte Chemie-international Edition*, 58, 15, 4953 - 4957.
- Cuadros S, Horwitz MA, Schweitzer-Chaput B & **Melchiorre P** 2019, 'A visible-light mediated three-component radical process using dithiocarbamate anion catalysis', *Chemical Science*, 10, 21, 5484 - 5488.
- Gandolfo E, Tang X, Roy SR & **Melchiorre P** 2019, 'Photochemical Asymmetric Nickel-Catalyzed Acyl Cross-Coupling', *Angewandte Chemie-international Edition*, .
- Bieszcza B, Perego LA & **Melchiorre P** 2019, 'Photochemical C-H Hydroxyalkylation of Quinolines and Isoquinolines', *Angewandte Chemie-international Edition*, 58, 47, 16878 - 16883.
- Goti G, Bieszcza B, Vega-Penalzo A & **Melchiorre P** 2019, 'Stereocontrolled Synthesis of 1,4-Dicarbonyl Compounds by Photochemical Organocatalytic Acyl Radical Addition to Enals', *Angewandte Chemie-international Edition*, 58, 4, 1213 - 1217.
- Schweitzer-Chaput B, Horwitz MA, de Pedro Beato E & **Melchiorre P** 2019, 'Photochemical generation of radicals from alkyl electrophiles using a nucleophilic organic catalyst', *Nature Chemistry*, 11, 2, 129 - 135.
- Buzzetti L, Crisenza GEM & **Melchiorre P** 2019, 'Mechanistic Studies in Photocatalysis', *Angewandte Chemie-international Edition*, 58, 12, 3730 - 3747.

Selected research activities

- * January 2019, PM becomes an Associate Editor of *Chemical Science* (RSC)
- * "Giorgio Modena" medal from Italian Chemical Society
- * PM has delivered lectures at 12 International congresses (e.g. European Symposium of Organic Chemistry, ESOC, Vienna; Bürgenstock Conference, Brunnen) and 15 scientific talks at universities and chemical industries.

ICREA MEMOIR 2019



Maurizio Mencuccini

Centre de Recerca Ecològica i Aplicacions Forestals (CREAF)

Experimental Sciences & Mathematics

BSc degree in Forest Science at University of Firenze (Italy, 1992). Research Associate at Istituto Sperimentale per la Selvicoltura (Italy, 1992). PhD in plant environmental biology at the University of Firenze (Italy, 1993-1995). Postdoc at Boyce Thompson at Cornell University (USA, 1995-1997). Lecturer, senior lecturer, reader, then Professor of Forest Science at Edinburgh University (UK, 1997-2016). Since 2018, ranked as a Highly Cited Researcher (top 1% by citations) in the field of Plant & Animal Science by Clarivate Analytics. Ranked among the top Italian Scientists in the area of Natural & Environmental Science by Via-Academy (http://www.topitalianscientists.org/top_italian_scientists.aspx).

Research interests

I work at the frontier between biological and environmental sciences, interfacing with global change. My major contributions to science are in the study of forest dynamics, particularly carbon and water cycles, in Boreal, temperate, tropical and Mediterranean forests in Europe, the Americas, Australia and Africa. I have authored >200 peer-reviewed papers. I am very involved in debates concerning how longer and more intense droughts, as a consequence of climate change, can accelerate tree mortality. I also work closely with the forestry sector on themes including forest growth and carbon sequestration, using models and remote sensing. I have supervised >40 scientists, of whom >20 are still active in senior academic positions or universities. I have spoken at several high-profile conferences. Since 2018, I have been ranked as a Highly Cited Researcher (top 1% by citations) in the field of Plant & Animal Science by Clarivate Analytics.

Selected publications

- **Mencuccini M**, Rosa T, Rowland L, Choat B, Cornelissen H, Jansen S, Kramer K, Lapenis A, Manzoni S, Niinemets U, Reich P, Schrod F, Soudzilovskaia N, Wright IJ & Martinez-Vilalta J 2019, 'Leaf economics and plant hydraulics drive leaf : wood area ratios', *New Phytologist*, 224: 1544-1556.
- Binks O, **Mencuccini M**, Rowland L, da Costa ACL, de Carvalho CJR, Bittencourt P, Eller C, Sales T, Carvalho G, Maklouf EJ, Soza A, Ferreira L, Steel Silva V, Oliveira R & Meir P 2019, 'Foliar water uptake in Amazonian trees: evidence and consequences', *Global Change Biology*, 25, 8, 2678 - 2690.
- **Mencuccini M**, Manzoni S & Christoffersen B 2019, 'Modelling water fluxes in plants: from tissues to biosphere', *New Phytologist*, 222, 3, 1207 - 1222.
- Rosas T, **Mencuccini M**, Barba J, Cochard H, Saura-Mas S & Martinez-Vilalta J 2019, 'Adjustments and coordination of hydraulic, leaf and stem traits along a water availability gradient', *New Phytologist*, 223, 2, 632 - 646.

Selected research activities

Invited participant. Key hydraulic traits and their representation at the global scale. NASA-sponsored Workshop *Sensing Forest Water Dynamics from Space*, Keck Institute for Space Studies - California Institute of Technology, Pasadena, CA, USA, Oct 14-18, **2019**.

ICREA MEMOIR 2019



Raúl Méndez

Institut de Recerca Biomèdica de Barcelona (IRB Barcelona)
Life & Medical Sciences

Raúl Méndez studied biology (biochemistry) in the Universidad Autónoma de Madrid. He obtained his PhD in 1993 for work carried out at the Centro de Biología Molecular Severo Ochoa under the supervision of César de Haro. He did postdoctoral work in the laboratory of Robert E. Rhoads at the Louisiana State University Medical Center (1994-1997) and then in the laboratory of Joel D. Richter (1997-2001) at the University of Massachusetts and in 2001 he joined the Centre de Regulació Genòmica of Barcelona as a group leader. In 2010 his group moved to the Institut de Recerca Biomèdica of Barcelona, where he is a senior scientist and ICREA Research Professor. Since the time of his PhD work, his research has focused on how mRNAs are translated into proteins and how this process is regulated during cell division and differentiation. EMBO member since 2012.

Research interests

The primary interest of our group is to understand the molecular mechanisms that dictate alternative 3' UTR formation and the temporal and spatial translational control of specific mRNAs during cell cycle progression and chromosome segregation, senescence and related pathologies. Cell cycle progression is programmed, at least in part, by stored silent mRNAs whose translation is specifically regulated by sequences located at their 3'-untranslated regions (3'-UTRs) and their binding proteins. Our work in the past years has focused on three main questions: 1, to elucidate the mechanisms underlying the translational control by cytoplasmic polyadenylation cis-acting elements and trans-acting factors. 2, to define how this translational control circuit regulates cell cycle progression by establishing a molecular circuit, stabilized by positive and negative feed-back loops. 3, to explore the contribution of these mechanisms in the reprogramming of gene expression in cancer.

Selected research activities

- 29/Oct/2019 · "The CPEB-family of RNA-binding proteins, mechanisms of action and new functions in cell cycle and cancer" · Lady Davis Institute for Medical Research Montreal, Canada · (Canada)
- 01/Oct/2019 · "The CPEB-family of RNA-binding proteins, mechanisms of action and new functions in cell cycle and cancer" · EMBO Workshop 'RNP network dynamics in development and disease' Ljubljana Slovenia · (Slovenia)
- 21/May/2019 · "CPEBs in squamous cell carcinoma" · Montpellier Translation machinery and Cancer · (France)

ICREA MEMOIR 2019



Pablo Menéndez

Institut de Recerca contra la Leucèmia Josep Carreras (IJC)
Life & Medical Sciences

Born in Avilés, Asturias, in 1974. Biochemist by University of Salamanca (1997) and PhD in Medicine (Hematology) by the same University in 2002, under the supervision of Prof. Alberto Orfao and Prof. Jesus San Miguel. Postdoctoral training in stem cell biology (Mick Bhatia Laboratory, London, ON, Canada; 2002-2005) and in childhood leukemia (Mel Greaves Laboratory, London, UK; 2005-2007). In 2007, I was appointed Director of the Andalusian Stem Cell Bank, and was leading my own lab at CIBM (Granada, Spain) until July 2011 when I moved to GENyO (Granada, Spain) as Principal Investigator. In June 2013 I was appointed ICREA Research Professor and Research Director of The Josep Carreras Leukemia Research Institute-Campus Clínic, Barcelona, Spain.

Research interests

1.-Understanding the pathogenesis and cellular origin of MLL-rearranged and MLL-germline Acute Lymphoblastic Leukemia in children. 2.- Leukemic cell-niche environment interactions and targeted therapies in Acute Myeloid Leukemia. A role for BM-stroma in therapy resistance 3.-Deciphering the intrinsic determinants and signaling pathways underlying hematopoietic from human pluripotent stem cells. 4.- Adoptive T-cell-based CAR immunotherapy for B-cell, T-cell ALL and AML.

Selected publications

- Recasens-Zorzo C et al. 2019, *Haematologica*, 104(4):778-788.
- Bueno C et al. 2019, 'Natural history and cell-of-origin of TCF3-ZNF384 & PTPN11 mutations in twins with concordant B-ALL', *Blood*, 134(11):900-905
- Castaño J et al. 2019, 'GATA2 promotes hematopoietic development and represses cardiac differentiation of human mesoderm', *Stem Cell Rep*, 13:515-529.
- O'Byrne S, Elliott N, Buck G, Rice S, Knapp D,..., **Menendez P**, Milne TA, Roberts I & Roy A 2019, 'Reordering B-lymphopoiesis in the human fetus identifies ontogeny-related developmental programmes in common with infant leukaemia', *Blood*, 134:1059-1071.
- Urduño R, **Menéndez P**,..., Deutzmann R, Fernandez AF, Fraga MF 2019, 'Chromatin regulation by Histone H4 acetylation at Lysine 16 during cell death and differentiation in the myeloid compartment', *NAR*, 47, 10, 5016 - 5037.
- Bueno C et al... **Menendez P*** 2019, *Haematologica*, 104(6):1189-1201.
- Sánchez-Martínez D et al. 2019, *BLOOD*, 133:2291-2304.
- Diaz de la Guardia, **Menendez P** 2019, *Haematologica*, 104(2):E54-E58.
- Agraz-Doblás A et al. 2019, *Haematologica*, 104(6):1176-1188.
- Lopez-Millán MB et al. 2019, *Leukemia*, 33(7):1557-1569.
- Bueno C et al. 2019, *Leukemia*, 33(8):2090-2125.

ICREA MEMOIR 2019



Arben Merkoçi

Institut Català de Nanociència i Nanotecnologia (ICN2)
Engineering Sciences

ICREA Research Professor and head of Nanobioelectronics & Biosensors Group at ICN2 (Institut Català de Nanociència i Nanotecnologia). He obtained his PhD at University of Tirana working on ion selective electrodes. Since 1992 he has been doing research as postdoctoral fellow and research professor at Polytechnic Univ. of Budapest, Univ. of Ioanina, Univ. degli Studi di Padua, Univ. Politècnica de Catalunya, Univ. Autònoma de Barcelona and New Mexico State Univ. His research is focused on the integration of biological molecules and other species with micro- and nanostructures with interest for the design of novel (bio)sensors. He has published more than 290 articles and supervised 38 PhD thesis. He is co-founder of two spin-off companies, PaperDrop dedicated to nanodiagnostics and GraphenicaLab to electronic printing.

Research interests

- Catalytic/carrier nanomaterials: nanoparticles as electrocatalysts, nanoparticles as biomolecule carriers, and nanowires/nanotubes for non-enzymatic and enzyme mimic sensors
- Nanomicrofluidics and lab-on-a-chip technologies
- Paper- or nanopaper-based nanobiosensors
- Nanochannels: nanoporous membranes as electrical sensing platforms
- Graphene: biosensors based on graphene-related materials
- Nanomotors: self-propelled micro/nanomotors for biosensing and other Applications

Selected publications

- Morales-Narvaez E & **Merkoci A** 2019, 'Graphene Oxide as an Optical Biosensing Platform: A Progress Report', *Advanced Materials*, 31, 6, 1805043.
- Khater M, de la Escosura-Muniz A, Altet L & **Merkoci A** 2019, 'In Situ Plant Virus Nucleic Acid Isothermal Amplification Detection on Gold Nanoparticle-Modified Electrodes', *Analytical Chemistry*, 91, (7), 4790 - 4796.
- Dincer C, Bruch R, Costa-Rama E, Fernandez-Abedu MT, **Merkoci A**, Manz A, Urban GA & Gueder F 2019, 'Disposable Sensors in Diagnostics, Food, and Environmental Monitoring', *Advanced Materials*, 31, 30, 1806739.
- Ranjbar S, Farahmand Nejad MA, Parolo C, Shahrokhian S & **Merkoci A** 2019, 'Smart Chip for Visual Detection of Bacteria Using the Electrochromic Properties of Polyaniline', *Analytical Chemistry*, 91, (23), 14960 - 14966.
- Nagar B, Balsells M, de la Escosura-Muniz A, Gomez-Romero P & **Merkoci A** 2019, 'Fully printed one-step biosensing device using graphene/AuNPs composite', *Biosensors & Bioelectronics*, 129, 238 - 244.
- Quesada-Gonzalez D, Baiocco A, Martos AA, de la Escosura-Muniz A, Palleschi G & **Merkoci A** 2019, 'Iridium oxide (IV) nanoparticle-based electrocatalytic detection of PBDE', *Biosensors & Bioelectronics*, 127, 150 - 154.
- Quesada-Gonzalez D, Sena-Torralba A, Prio Wicaksono W, de la Escosura-Muniz A, Ivandini TA, **Merkoci A** 2019, 'Iridium oxide (IV) nanoparticle-based lateral flow immunoassay', *Biosensors & Bioelectronics*, 132, 132 - 135.
- Sari E, Uzek R & **Merkoci A** 2019, 'Paper Based Photoluminescent Sensing Platform with Recognition Sites for Tributyltin', *Acs Sensors*, 4, 3, 645 - 653.

ICREA MEMOIR 2019



Andreas Meyerhans

Universitat Pompeu Fabra (UPF)

Life & Medical Sciences

University Education – 1987 PhD in Chemistry, University of Hamburg, Germany. – 1982 Diploma in Chemistry, University of Hamburg, Germany. Professional Positions – Since 2010 ICREA Research Professor at Pompeu Fabra University, Barcelona. – 1998-2009 Full Professor, Saarland University, Germany. – 1990-1998 Assistant Professor, University of Freiburg, Germany. – 1988-1990 Postdoctoral Fellow, Institute Pasteur, Paris, France. – 1987-1988 Postdoctoral Fellow, Institute Biotechnological Research, Braunschweig, Germany.

Research interests

Infections with non-cytopathic viruses usually have 2 different outcomes. They may be eliminated by host immune responses (acute infections) or they may persist lifelong (persistent infections). Medically important examples are the Hepatitis B virus (HBV), the Human Immunodeficiency virus (HIV) and the Hepatitis C virus (HCV) that in adults usually follow an acute (HBV), a persistent (HIV) or an either acute or persistent (HCV) infection course. My laboratory is interested (i) to understand the factors that regulate the decision between an acute versus a persistent infection course, (ii) to define the factors that control the dynamic balance of virus expansion and immune control in persistent infections, and (iii) to generate quantitative descriptions of the virus/immune system dynamics by mathematical modeling.

Selected publications

- Grebennikov D, Bouchnita A, Volpert V, Bessonov N, **Meyerhans A** & Bocharov G 2019, ‘Spatial Lymphocyte Dynamics in Lymph Nodes Predicts the Cytotoxic T Cell Frequency Needed for HIV Infection Control’, *Frontiers In Immunology*, 10, 1213.
- Argilagué J, Pedragosa M, Esteve-Codina A, Riera G, Vidal E, Peligero-Cruz C, Casella V, Andreu D, Kaisho T, Bocharov G, Ludewig B, Heath S & **Meyerhans A** 2019, ‘Systems analysis reveals complex biological processes during virus infection fate decisions’, *Genome Research*, 29, 6, 907 – 919.
- Zheltkova V, Argilagué J, Peligero C, Bocharov G & **Meyerhans A** 2019, ‘Prediction of PD-L1 inhibition effects for HIV-infected individuals’, *Plos Computational Biology*, 15, 11, e1007401.
- Gonzalez-Cao M, **Martinez-Picado J**, Karachaliou N, Rosell R & **Meyerhans A** 2019, ‘Cancer immunotherapy of patients with HIV infection’, *Clin Transl Oncol*. 21, 6, 713 – 720.
- Gomara MJ, Perez Y, Martinez JP, Barnadas-Rodriguez R, Schultz A, von Briesen H, Peralvarez-Marin A, **Meyerhans A** & Haro I 2019, ‘Peptide Assembly on the Membrane Determines the HIV-1 Inhibitory Activity of Dual-Targeting Fusion Inhibitor Peptides’, *Scientific Reports*, 9, 3257.
- Pedragosa M, Riera G, Casella B, Esteve-Codina A, Steuerman Y, Seth C, Bocharov G, Heath S, Gat-Viks I, Argilagué J & **Meyerhans A** 2019, ‘Linking Cell Dynamics With Gene Coexpression Networks to Characterize Key Events in Chronic Virus Infections’, *Frontiers In Immunology*, 10, 1002.

Selected research activities

Co-editor for *Frontiers in Immunology* on a special issue on “Mathematical Modeling of the Immune System in Homeostasis, Infection and Disease”

ICREA MEMOIR 2019



Marco Milán

Institut de Recerca Biomèdica de Barcelona (IRB Barcelona)
Life & Medical Sciences

I graduated in Biology at the Universidad Complutense (Madrid, 1991) and obtained my PhD in the laboratory of Antonio García-Bellido at the CBM-Severo Ochoa (Madrid, 1995). A couple of years later, I joined the laboratory of Stephen M. Cohen at the EMBL-Heidelberg, where I got a position as Staff Scientist. In 2003, I got my present position as ICREA Research Professor at the Institute for Research in Biomedicine (IRB Barcelona) leading the Development and Growth Control Laboratory. Since 2007, I was also the Head of the Cell and Developmental Biology Programme at the IRB. In 2018, I was appointed Head of the Mechanisms of Disease Programme at the IRB. In 2007, I was elected EMBO Young Investigator. I was Visiting Professor at the National University of Singapore in 2010. I am a member of the EMBO Journal, and Disease, Models and Mechanisms editorial boards. I have directed 9 PhD theses and published, as first or lead author, more than 70 papers.

Research interests

Research in my lab is centered around the two following topics:

- 1. Cell and tissue biology of Chromosomal Instability (CIN):** CIN, defined as an increased rate of changes in chromosome structure and number, is a feature of most, if not all, solid tumors. Our lab has recently developed an epithelial model of CIN in *Drosophila* where the relevant cell populations and pertinent cell interactions involved in the response of an epithelial tissue to CIN have been identified. We are currently characterizing at the genetic and molecular level CIN-induced cellular behaviours such as epithelial to mesenchymal (EMT)-like cell fate transition, tissue invasiveness and senescence.
- 2. Regulation of tissue size:** We use the epithelial primordium of the *Drosophila* wing to address how the size and fate of a developing organ is regulated by the activity of morphogens and their gradients.

Selected publications

- Santabarbara-Ruiz P, Esteban-Collado J, Perez L, Viola G, Abril JF, **Milán M**, Corominas M & Serras F 2019, 'Ask1 and Akt act synergistically to promote ROS-dependent regeneration in *Drosophila*', *Plos Genetics*, 15, 1, e1007926.
- Murcia L, Clemente-Ruiz M, Pierre-Elies P, Royou A & **Milán M** 2019, 'Selective Killing of RAS-Malignant Tissues by Exploiting Oncogene-Induced DNA Damage', *Cell Reports*, 28, 1, 119 -131.
- Sanchez JA, Mesquita D, Ingaramo MC, Ariel F, **Milán M** & Dekanty A 2019, 'Eiger/TNF alpha-mediated Dilp8 and ROS production coordinate intra-organ growth in *Drosophila*', *Plos Genetics*, 15, 8, e1008133.

Selected research activities

Co-organizer of the EMBL in SPAIN Alumni Meeting Barcelona (Spain), 2019

ICREA MEMOIR 2019



Ramon Miquel

Institut de Física d'Altes Energies (IFAE)

Experimental Sciences & Mathematics

Born in 1962 in Gelida (Barcelona). Graduated in physics in 1985 at Universitat de Barcelona (UB). PhD in experimental high-energy physics in 1989 at Universitat Autònoma de Barcelona. Postdoctoral stay at CERN, Geneva (Switzerland) from 1991 to 1996, mostly working on the ALEPH experiment at the LEP accelerator. “Professor Titular” at UB, 1997-2000. Moved to Lawrence Berkeley National Laboratory, Berkeley (USA) as a Career Staff Scientist in 2001, where started a transition towards observational cosmology. Since 2006, ICREA Research Professor at Institut de Física d'Altes Energies (IFAE). Associate Director of IFAE from 2008 to 2014. Director since 2015. Working mostly on the “Dark Energy Survey” (DES), “Dark Energy Spectroscopic Instrument” (DESI), and IFAE-led “Physics of the Accelerating Universe” (PAU) projects. All of them try to shed light into the nature of the “dark energy” that is causing the current acceleration of the expansion of the Universe.

Research interests

I am an experimental particle physicist trying to understand the ultimate building blocks of the Universe and their interactions, through both experiments involving particle accelerators and astronomical observations. Recently, my work has been mostly devoted to planning instruments and performing observations to try to unveil the nature of the so-called “dark-energy” component of the Universe, which accounts for about 70% of the matter-energy of the Universe, counters the attractive effect of gravity on all other forms of matter and energy, and drives the current accelerated expansion of the Universe.

Selected publications

- Abbott TMC et al. 2019 (DES Collaboration), ‘Dark Energy Survey year 1 results: Constraints on extended cosmological models from galaxy clustering and weak lensing’, *PRD*, 99, 123505.
- Abbott TMC et al. 2019 (DES Collaboration), ‘Dark Energy Survey year 1 results: Joint analysis of galaxy clustering, galaxy lensing, and CMB lensing two-point functions’, *PRD* 100, 023541.
- Abbott TMC et al. 2019 (DES Collaboration), ‘Cosmological Constraints from Multiple Probes in the Dark Energy Survey’, *PRL* 122, 171301.
- Prat J et al. 2019 (DES Collaboration), ‘Cosmological lensing ratios with DES Y1, SPT, and Planck’, *MNRAS* 487, 1363
- Kovács A et al. 2019 (DES Collaboration), ‘More out of less: an excess integrated Sachs-Wolfe signal from supervoids mapped out by the Dark Energy Survey’, *MNRAS* 484, 5267.
- Eriksen M et al. 2019, ‘The PAU Survey: early demonstration of photometric redshift performance in the COSMOS field’, *MNRAS* 484, 4200.
- Padilla C et al. 2019, ‘The Physics of the Accelerating Universe Camera’, *AJ* 157, 246.

Selected research activities

- Adviser of the PhD thesis “Cosmology and the galaxy-matter connection using weak gravitational lensing cross-correlations in the Dark Energy Survey,” by Judit Prat (UAB, 27/09/2019). Grade: Excellent cum laude.
- Member of the Scientific Advisory Committee of APPEC, the Astroparticle Physics European Consortium of funding agencies.
- Spanish representative in the Management Committee of the “Dark Energy Survey” (DES) Collaboration.
- Chair of the DES Builders’ Committee.
- Member of the DES Publication Board and the Advisory Board to the DES Director.
- Member of the Speakers Board of the “Dark Energy Spectroscopic Instrument” (DESI) Collaboration.

ICREA MEMOIR 2019



Jordi Miralda-Escudé

Universitat de Barcelona (UB)

Experimental Sciences & Mathematics

I learned physics at the Autonomous University of Barcelona, and astronomy on my own and through some amateur associations in Catalonia. I did my PhD in astrophysics at Princeton University, graduating in 1991 with a thesis on gravitational lensing by clusters of galaxies and large-scale structure. I was a postdoc at the Institute of Astronomy in Cambridge, and a Long-Term Member at the Institute for Advanced Study. I joined the University of Pennsylvania as a professor of astrophysics in 1996, and then moved to The Ohio State University in 2000. I have been back to Catalonia with an ICREA position since 2005, and I am at present doing research on astrophysics and cosmology at the Institut de Ciències del Cosmos at the University of Barcelona.

Research interests

I enjoy searching for physical explanations of what we observe in the Universe. My interests range over the formation of galaxies and their large-scale distribution in space, dark matter and dark energy in the Universe, the intergalactic medium, the formation of massive black holes and the dynamics of nuclear regions of galaxies, and gravitational lensing as a probe to the nature of dark matter. Over the last few years I have focused on the large-scale distribution of intergalactic gas probed by spectroscopic surveys of quasars in which hydrogen and heavy elements are observed in absorption. This is revealing crucial clues on both the initial conditions of the Universe and the formation of galaxies. At present I am also looking at various techniques to inquire on the nature of dark matter, among them the observation of extremely magnified high-redshift stars close to the critical curves of clusters of galaxies acting as gravitational lenses, and the study of tidal streams of stars left by stellar systems orbiting the Milky Way galaxy.

Selected publications

- Kaurov AA, Dai L, Venumadhav T, **Miralda-Escudé J** & Frye B 2019, 'Highly Magnified Stars in Lensing Clusters: New Evidence in a Galaxy Lensed by MACS J0416.1-2403', *Astrophysical Journal*, 880, 1, 58.
- Palau CG & **Miralda-Escudé J** 2019, 'Statistical detection of a tidal stream associated with the globular cluster M68 using Gaia data', *Monthly Notices Of The Royal Astronomical Society*, 488, 2, 1535 - 1557.
- Armengaud E et al. 2019, 'Physics potential of the International Axion Observatory (IAXO)', *Journal Of Cosmology And Astroparticle Physics*, 6, 047.
- Mendes de Oliveira C et al., 2019, 'The Southern Photometric Local Universe Survey (S-PLUS): Improved SEDs, morphologies and redshifts with 12 optical filters', *MNRAS*, vol. 481, no. 1, pp 241-267.
- Cenarro AJ et al 2019, 'J-PLUS: The Javalambre Photometric Local Universe Survey', *Astronomy & Astrophysics*, 622, A176.

ICREA MEMOIR 2019



Morgan W. Mitchell

Institut de Ciències Fotòniques (ICFO)

Experimental Sciences & Mathematics

Born in 1968 in Palo Alto, California, USA, Prof. Mitchell earned his Ph.D. in Physics from the University of California at Berkeley in 1999 with a thesis on the quantum optics of photon-photon interactions. In the group of Serge Haroche at the Ecole Normale Supérieure he advanced cavity quantum electrodynamics with cold atoms and microfabricated optical resonators. At Reed College he built the first diode-laser based entangled photon sources, and in the group of Aephraim Steingberg in Toronto he demonstrated the first multi-photon NooN states and quantum process tomography. He joined ICFO in 2004 and ICREA in 2011. He leads the research group Atomic Quantum Optics at ICFO and coordinates the Quantum Technologies Emergent Community in Catalonia (QuantumCAT). He was awarded an ERC Starting Grant in 2011, an ERC Proof-of-Concept Grant in 2016, and has been recognized with a Vanguardia de la Ciencia award in 2012, Ehrenfest Prize and Kavli Publication Prize in 2016.

Research interests

Prof. Mitchell leads the Atomic Quantum Optics group at ICFO, which uses experimental quantum optics and atomic physics for quantum technology and quantum foundations. The group works with single neutral atoms as single quantum systems, spinor Bose-Einstein condensates and high-density atomic vapors as extreme sensors, and has invented several sources of atom-resonant squeezed and entangled light. Major projects include chip-scale atomic magnetometers for magnetic brain imaging (Quantum Technologies Flagship project macQsimal), quantum enhancement protocols for state of the art optical lattice atomic clocks, quantum random number generators for loophole-free Bell tests and device-independent quantum technologies, and coordination of The BIG Bell Test, a world-wide collaboration in foundations of physics. In 2017 Prof. Mitchell co-founded the Qside Technologies to deliver state of the art quantum random number generation for communications and data security applications.

Selected publications

- Prakash V, Bianchet LC, Cuairan MT, Gomez P, Bruno N & **Mitchell MW** 2019, 'Narrowband photon pairs with independent frequency tuning for quantum light-matter interactions', *Optics Express*, vol. **27**, no. 26, pp. 38463.
- Bruno N, Bianchet LC, Prakash V, Li N, Alves N, **Mitchell MW** 2019, 'Maltese cross coupling to individual cold atoms in free space', *Optics Express*, vol. **27**, no. 21, p. 31042.
- Gomez P, Mazzeinghi C, Martin F, Coop S, Palacios S & **Mitchell MW** 2019, 'Interferometric measurement of interhyperfine scattering lengths in Rb-87', *Physical Review A*, 100, 3, 032704.
- Liu Y *et al.* 2019, 'Experimental measurement-dependent local Bell test with human free will', *Physical Review A*, 99, 2, 022115.

ICREA MEMOIR 2019



Sandra Montón-Subías

Universitat Pompeu Fabra (UPF)

Humanities

1988: BSc Geography and History (Universitat de Barcelona, Spain). 1993: PhD History (Universitat Autònoma de Barcelona). I began my research at Universitat Autònoma de Barcelona, studying processes of emerging complexity in Mediterranean Bronze Age societies. Since then, I have worked at the University of Athens, at the McDonald Institute for Archaeological Research, at the University of Cambridge, at the Universitat Autònoma de Barcelona, at Universitat Pompeu Fabra, at the University of California Santa Cruz, at the Northwestern University, at the National Taiwan University, at the University of Guam, at German Archaeological Institute/Roman-Germanic Commission in Frankfurt and at the University of Oslo. I was co-chair of the EAA working party AGE <http://www.upf.edu/materials/fhuma/age/> for the period 2009-2015.

Research interests

I am an archaeologist with broad interests in social and theoretical archaeology. My current fields of research are the Archaeology of Modern Iberian Colonialism, the Archeology of Globalization, and Gender Archaeology. Most specifically, I am analysing the consequences that Spanish colonialism and Jesuit missionization had on the native Chamorro populations of Guam and the Mariana Islands (western Pacific), with a specific focus on the effects that such domination had on power relationships, gender systems and maintenance activities. As a historical archaeologist, I converge historical written documents and material culture in my research. Although I focus on the study of modern colonial processes, I investigate much broader cultural sequences that include previous developments of local oral populations, thus bridging the long-debated prehistory/history divide.

Selected publications

- **Montón-Subías S** 2019. 'Gender, Missions, and Maintenance Activities in the Early Modern Globalization: Guam 1668-98'. *International Journal of Historical Archaeology*, 23(2), 404-429.
- **Montón-Subías S** & Bayman, J 2019, "Arqueología del contacto cultural y colonialismo ibérico en Guam. Excavaciones en Casa Real (Refugio de la Vida Salvaje, Ritidian)", *Informes y Trabajos*, vol 17, pp. 243-252.

Selected research activities

Grants and Research Groups:

- Scientist in Charge in 840992 - ARCARIB. *Archaeology of Informal Maritime Commerce in the Colonial Caribbean*. (MSCA-IF), H2020.
- Principal Coordinator in *Cultura Material, Colonialismo y Género. Una perspectiva arqueológica*. MINECO (2017-2019).
- Principal Investigator in HAR2016-77564-C2-1-P, *Cultura Material, Colonialismo y Género en el Pacífico. Una Aproximación desde la Arqueología Histórica*. MINECO (2017-2019).
- Principal Investigator in ABERIGUA. *Arqueología del Colonialismo Ibérico en Guam, Pacífico occidental*, Fundación Palarq & MECD.
- Coordinator of the UPF Research Group "Colonialism, Gender and Materialities" (CGyM).

Invited talks, conferences and workshops:

- Workshop Archaeologies of Tradition, Continuity and Resistance, Australian National University Canberra, Australia.
- Gender and Material Culture in Early Modern Colonial Globalization. Joint Pacific Institute / CAR / Pacific and Asian History Seminar, Australian National University, Canberra, Australia.
- Going Colonial, Going Global. Gender, Maintenance Activities and Material Culture in Early Modern Globalization. Archaeology and Material Culture Seminar Series, University of Sydney, Australia.
- Archaeologies of Cultural Contact and Colonialism in Micronesia. The ABERIGUA project. Centre for Classical and Near Eastern Studies of Australia, Sydney, Australia.

Other:

- Co-director of the 2019 San Dionisio's excavations, Guam.
- Co-coordinator of the Master in Global Archaeology (UPF).
- Section Editor Encyclopedia of Global Archaeology.

ICREA MEMOIR 2019



Núria Montserrat Pulido

Institut de Bioenginyeria de Catalunya (IBEC)

Life & Medical Sciences

My expertise in understanding the molecular mechanisms leading to organ regeneration was recognized with the prestigious ERC-Starting grant in 2014. After receiving a Ramon y Cajal Fellowship (first ranked candidate, 100/100 points, 2015) and became Junior Group Leader (2015) at IBEC. I received 5.2 M€ in funded projects. I have published > 58 papers (mostly belonging to the first decile of their respective fields), including journals as Cell, Cell Stem Cell, Materials Today, among others, and 6 book chapters receiving about 2800 citations (Scopus). My h-index is 28. I gave >100 invited talks and participated in more than 200 outreach activities. I am also devoted to translating my findings into the clinics relaying on collaborations with world-recognized clinicians and basic collaborators.

Research interests

Dr. Montserrat research is focused in understanding the molecular mechanisms leading to organ regeneration together with the development of basic knowledge in the field of pluripotent stem cells (PSCs) for human disease modeling. Fascinated with the possibility to combine emerging technologies from the field of pluripotent stem cells (i.e., somatic reprogramming, organoids, among others) together with innovative methodologies from the bioengineering field (i.e., 3D bioprinting, organ-on-chip, among others) Montserrat team explores new scenarios of human disease modeling, with a special focus in kidney and heart related fields.

Selected publications

- Sample M, Boulicault M, Allen C, Bashir R, Hyun I, Levis MM, Lowenthal C, Mertz D, **Montserrat N**, Palmer MJ, Saha K & Kartman J 2019, 'Multi-cellular engineered living systems: building a community around responsible research on emergence', *Biofabrication*, 11, 4, 043001.
- Garreta E, Prado P, Tarantino C, Oria R, Fanlo L, Marti E, Zalvidea D, **Trepas X**, Roca-Cusachs P, Gavalda-Navarro A, Cozzuto L, Campistol JM, Izpisua Belmonte JC, Hurtado del Pozo C & **Montserrat N** 2019, 'Fine tuning the extracellular environment accelerates the derivation of kidney organoids from human pluripotent stem cells', *Nature Materials*, 18, 4, 397 - +.

Selected research activities

I have been always committed to science dissemination and communication and dedicate my efforts to encourage and explain science to scholars and other social groups (including elder people, and specially girls and woman). In this regard, I have performed more than 15 science communication activities to general public (including media and newspapers). I was selected as Co-Commissioner for the organization of the first City and Science Biennial that was held in Barcelona (February 7th-11th, 2019) receiving more than 11.000 visitors. I have co-organized different international meetings in the fields of bioengineering and regenerative medicine.

ICREA MEMOIR 2019



Massimo Motta

Universitat Pompeu Fabra (UPF)

Social & Behavioural Sciences

Massimo Motta (BSc Bocconi, Milan, 1987; PhD Louvain, 1991) is Research Professor at ICREA, Universitat Pompeu Fabra (UPF) and Barcelona GSE. He was Chief Economist at the European Commission in 2013-2016, where he coordinated the EC's economic analysis and advised the Competition Commissioner on antitrust, merger and state aid. He was previously professor at Univ. Bologna (2007-2010), European University Institute, Florence (1998-2008) and UPF (1992-1998). He is Research Fellow of CEPR, of CESifo, and a Fellow of the European Economic Association. His research is on industrial organization and has been published in the top international journals. Massimo's book on *Competition Policy: Theory and Practice* (Cambridge, 2004) is the standard reference on antitrust. His new (co-authored) book on *Exclusionary Practices* (Cambridge) was published in January 2018.

Research interests

Massimo has been working on a number of issues related to the welfare effects of business practices. In particular, he has been studying exclusionary practices – such as predation, rebates, exclusive contracts, tying, refusal to deal – that dominant firms may adopt to exclude rivals from the market; and the effects of mergers and acquisitions. Both sets of issues are very important in today's digital economies, and his current research focuses on the conduct of the big digital platforms: with C Fumagalli and C Tarantino (respectively at Bocconi Univ. and at LUISS, Rome) he studies the acquisition of start-ups by big firms, with M Peitz (Mannheim) the policy aspects of “big tech mergers” in general, and with S Shelegia (UPF) large firms' decisions not to allow access to their platforms, or to imitate products and applications of complementors, to prevent the possibility of being challenged by them.

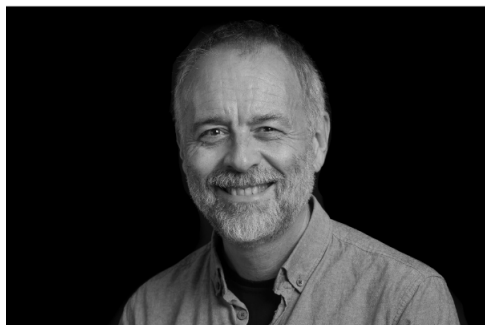
Selected publications

- **Motta M** 2019, “Challenges for EU Merger Control”, *Concurrences*, 2: 44-49.
- Hansen S & **Motta M** 2019 ‘Vertical Exclusion with Downstream Risk Aversion or Limited Liability’, *Journal of Industrial Economics*, vol 67, Issue 3-4, pp. 409-447.

Selected research activities

Massimo Motta was elected President of the European Association of Researchers in Industrial Economics (EARIE) in September 2019. He received the XI “Premi Societat Catalana d'Economia” for the book “Exclusionary Practices. The Economics of Monopolisation and Abuse of Dominance” in October 2019.

ICREA MEMOIR 2019



Salvador Moya-Solà

Institut Català de Paleontologia (ICP)

Life & Medical Sciences

PhD in Geological Sciences (UAB, 1983). He was researcher of the Institute of Paleontology of Sabadell. Currently, he is ICREA research professor at the Institut Català de Paleontologia M. Crusafont (CERCA program). He was the founder and first director of this institute (2006-2017). Science, Pnas, Tree, Proc. Royal Soc., between others. He has received several national and international awards. He participates in several national and international projects, among them the RHOI Project (Revealing Hominid Origin Initiative, NSF USA) and international projects (Leakey Foundation, Wenner-Gren foundation) as well as national projects (Mineco, Agaur). He and his team are responsible for the discovery and study of key fossil hominoid specimens such as the partial skeletons of *Hispanopithecus laietanus*, *Pierolapithecus catalaunicus* and *Pliobates cataloniae*, the best preserved of the whole Eurasian continent.

Research interests

The main aim of my research is the study of the origin and evolution of hominoids (Primates) from a paleontological perspective. It forms part of a wider research scope, embracing the evolutionary history of primates including Paleogene and Pleistocene primates. A major goal is the study of the paradox existing between the ancestral crown-hominoid (and hominid) morphotypes reconstructed on the basis of derived features shared by extant taxa and the more primitive morphotype found in the fossil record. This suggests that homoplasy plays a role in hominoid evolution, suggesting that orthograde adaptations could be convergent in the three hominoid lineages, gibbons, orangutans and African Apes. Morphofunctional analysis of complex structures or the application of proteomics to fossil hominoids, would help to identify homoplastic characters. Field work on the Vallès-Penedès Neogene basin with the objective to increase the current hominoid fossil record, is a priority action of my research.

Selected publications

- Urciuoli A, Zanolli C, Begun D, Almecija S, Dumoncel J, **Moya-Solà S**, Alba DM 2019, 'A deformation-based geometric morphometric analysis of the vestibular apparatus in the Miocene apes *Hispanopithecus laietanus* and *Rudapithecus hungaricus*', *American Journal Of Physical Anthropology*, 168, 253 - 253.
- Alba DM, Garcés M, Casanovas-Vilar I, Robles JM, Pina M, **Moya-Solà S**, Almecija S 2019, 'Bio- and magnetostratigraphic correlation of the Miocene primate-bearing site of Castell de Barbera to the earliest Vallesian', *Journal Of Human Evolution*, 132, 32 - 46.
- Sanchez IM, Demiguel D, Almecija S, **Moya-Solà S**, Morales J & Alba DM 2019, 'New *Hispanomeryx* (Mammalia, Ruminantia, Moschidae) from Spain and a reassessment of the systematics and paleobiology of the genus *Hispanomeryx* Morales, Moya-Solà & Soria, 1981', *Journal Of Vertebrate Paleontology*, 39, 2, e1602536.
- Strani F, DeMiguel D, Alba DM, **Moya-Solà S**, Bellucci L, Sardella R & Madurell-Malapeira J 2019, 'The effects of the "0.9 Ma event" on the Mediterranean ecosystems during the Early-Middle Pleistocene Transition as revealed by dental wear patterns of fossil ungulates', *Quaternary Science Reviews*, 210, 80-89.
- Pina M, Alba DM, **Moya-Solà S** & Almécija S 2019, 'Femoral neck cortical bone distribution of dryopithecine apes and the evolution of hominid locomotion', *Journal of Human Evolution*, 136, 102651.

Selected research activities

Associate professor of the Biological Anthropology unit, BADVE departament, UAB; Professor of the official Master of Paleobiology and Fossil Record of the Universitat Autònoma de Barcelona/Universitat de Barcelona; Professor of the official Master of Biological anthropology of the Universitat Autònoma de Barcelona/ Universitat de Barcelona.

ICREA MEMOIR 2019



Aitor Mugarza

Institut Català de Nanociència i Nanotecnologia (ICN2)

Engineering Sciences

Aitor Mugarza graduated and obtained his PhD in Physics both at the University of the Basque Country. After his doctoral studies, he was awarded a Marie Curie fellowship to work as a postdoctoral scientist at the Lawrence Berkeley National Laboratory, USA, and at the Materials Science Institute of Barcelona (ICMAB). He later joined the Catalan Institute of Nanoscience and Nanotechnology-ICN2 (formerly ICN) starting as a Ramon y Cajal Fellow in 2007, and as Tenure Track Group Leader of the Atomic Manipulation and Spectroscopy Group since 2013. He is author of 65+ articles, and of 45+ invited talks at international conferences, universities and schools. His research activity is based on the investigation of quantum properties of matter at the nanoscale, and developing strategies to manipulate them with atomic precision.

Research interests

The research interests of Aitor Mugarza focus on the atomic-scale engineering of the quantum properties of novel nanomaterials. At the nanoscale, the properties of materials are dominated by quantum effects and interfacial phenomena, which impose strong limitations on the control and reproducibility of device performances, but also open up avenues for engineering new physical properties. The aim of Aitor Mugarza and his group is to understand and control quantum phenomena with atomic precision by chemical and structural manipulation, nanostructuring and interfacing materials that are identified as strategic in the roadmap for new technologies (hybrid metal-organic heterostructures, graphene-based 2D materials, topological insulators...).

Selected publications

- Moreno C, Garcia-Lekue A & **Mugarza A** 2019, 'Nanoarquitecturas de grafeno con precisión atómica', *Revista Española de Física*, Vol. 33, Num. 4.
- Hieulle J, Wang X, Stecker C, Son D-Y, Qiu L, Ohmann R, Ono L K, **Mugarza A** & Qi Y 2019, 'Unraveling the Impact of Halide Mixing on Perovskite Stability', *J. Am. Chem. Soc.* 141, 3515-3523
- Moreno C, Panighel M, Vilas-Varela M, Sauthier G, Tenorio M,†Ceballos G, Peña D & **Mugarza A** 2019, 'Critical role of phenyl substitution and catalytic substrate on the surface-assisted polymerization of dibromobianthracene derivatives', *Chem. Mater.*, 31 (2), pp 331-341.

Selected research activities

Selected Talks

Plenary

International Workshop on Nanomaterials and Nanodevices (IWNN), Beijing, China, July 1-7, 2019.

Invited

Symposium on Two Dimensional Materials (Carbonhagen), Copenhagen, Denmark, August 21-22, 2019.

European Conference on Chemistry For Two-Dimensional Materials (Chem2DMat), Dresden, Germany, September 3-6, 2019.

International Winterschool on Electronic Properties of Novel Materials, Kirchberg, Austria, March 9-16, 2019.

International Workshop on Nanomaterials and Nanodevices (IWNN), Changsha, China, July 1-7, 2019.

Graphene Industry Challenges & Opportunities (GraphIn), Madrid, Spain, February 21-22, 2019.

Other Activities

Chairman of the Organizing Committee of the I2 Workshop on Innovation and Technology Transfer.

Member of the Scientific Committee of the Spanish Vacuum Society (ASEVA).

Lecturer in Master in Multidisciplinary Research in Experimental Sciences (UPF-BIST).

Lecturer in Master in Advanced Nanoscience and Nanotechnology (UAB).

ICREA MEMOIR 2019



Kilian Muñiz

Institut Català d'Investigació Química (ICIQ)

Experimental Sciences & Mathematics

Kilian Muñiz is an ICREA Research Professor at the Institute of Chemical Research of Catalonia (ICIQ), in Tarragona. He was born in 1970 in Hildesheim, Germany. From 1990 to 1996 he studied Chemistry at the Universities of Hannover (Germany), Oviedo (Spain) and Imperial College London (UK), and in 1996 he graduated with a Diploma in Chemistry from Hannover University. From 1996 to 1998 he worked in the group of Prof. Carsten Bolm at the RWTH Aachen (Germany) to obtain his PhD in Organic Chemistry. In 1999/2000 he carried out research as a postdoctoral associate with Prof. Ryoji Noyori at Nagoya University (Japan). He started his independent research in 2001 at Bonn University (Germany) as a Liebig fellow and defended his Habilitation Thesis in 2005. The same year he moved to the University of Strasbourg as an Associate Professor. He was promoted to Full Professor in 2006. In November 2009 he moved to Spain and joined ICIQ as Group Leader. He has been with ICREA since 2010.

Research interests

Our research deals with the discovery of novel chemical transformations to provide direct access to nitrogenated molecules, which are key players in a variety of compounds of biological, medicinal and pharmaceutical interest. The group continues devising entirely new oxidative amination reactions based on transformations that do not require any metal promoters. To this end, defined monomeric iodine reagents and catalysts in the oxidation states of +I and +III have been developed. These serve as versatile tools in a variety of novel enantioselective amination reactions. This chemistry is continuously expanded to iodine catalyses and related bromine catalyses for aliphatic C-H amination in order to pioneer effective conceptual tools for advanced oxidation at different stages of chemical synthesis, including building block generation and late-stage diversification. Recently, this amination catalysis has been applied to the synthesis of complex biologically relevant natural products.

Selected publications

- Flores A, Cots E, Berges J & **Muniz K** 2019, 'Enantioselective Iodine(I/III) Catalysis in Organic Synthesis', *Advanced Synthesis & Catalysis*, 361, 1, 2 - 25.
- Duhamel T & **Muniz K** 2019, 'Cooperative iodine and photoredox catalysis for direct oxidative lactonization of carboxylic acids', *Chemical Communications*, 55, 7, 933 - 936.
- Del Castillo E & **Muniz K** 2019, 'Enantioselective Synthesis of Nicotine via an Iodine-Mediated Hofmann-Löffler Reaction', *Organic Letters*, 21, 3, 705 - 708.
- Cots E, Flores A, Martin Romero R & **Muniz K** 2019, 'A Practical Aryliodine(I/III) Catalysis for the Vicinal Diamination of Styrenes', *ChemSuschem*, 12, 13, 3028 - 3031.
- Bafaluy D, Munoz-Molina MJ, Funes-Ardoiz I, Herold S, de Aguirre AJ, Zhang H, Maseras F, Belderrain TR, Perez PJ & **Muniz K** 2019, 'Copper-Catalyzed N-F Bond Activation for Uniform Intramolecular C-H Amination Yielding Pyrrolidines and Piperidines', *Angewandte Chemie-International Edition*, 58, 26, 8912 - 8916.
- Bosnidou AE & **Muniz K** 2019, 'Intermolecular Radical C(sp³)-H Amination under Iodine Catalysis', *Angewandte Chemie-International Edition*, 58, 22, 7485 - 7489.
- Duhamel T, Martinez MD, Sideri IK & **Muniz K** 2019, '1,3-Diamine Formation from an Interrupted Hofmann-Löffler Reaction: Iodine Catalyst Turnover through Ritter-Type Amination', *ACS Catalysis*, 9, 9, 7741 - 7745.

Selected research activities

Vice-President of the Organic Chemistry Section of the RSEQ

Member of the Appeal Commission for the ANECA State Accretion

Organic Chemistry Symposium at the Biannual Meeting of the RSEQ 2019, Organizer, San Sebastian, May 27-30, 2019

6th Barluenga Lectureship, Main Organizer, Oviedo/Spain, November 7-8, 2019

Advisory Board Member for Advanced Synthesis & Catalysis, Journal of Organic Chemistry and The Chemical Record

ICREA MEMOIR 2019



Pura Muñoz-Cánoves
 Universitat Pompeu Fabra (UPF)
 Life & Medical Sciences

Pura Muñoz-Cánoves studied Pharmacology in the University of Valencia. She obtained her PhD in 1990 in the Autonomous University of Madrid for work carried out at The Scripps Research Institute (La Jolla, USA). She did postdoctoral work at the University of California-San Diego and The Scripps Research Institute, and in 1994 she joined the Cancer Research Institute in Barcelona as a postdoc, becoming an independent group leader in 1997. In 2002 her group moved to the Center for Genomic Regulation (CRG) in Barcelona, and she became a senior scientist in 2007 in that Institution. Late 2008 she moved to the Pompeu Fabra University (UPF) after becoming an ICREA Research Professor. Through the UPF, she holds a collaborative agreement with the Spanish National Center on Cardiovascular Research. Her research focuses on deciphering the mechanisms regulating skeletal muscle regeneration and growth, in physiology and disease.

Research interests

Our main objective is to understand the mechanisms regulating stem cell homeostasis and regenerative functions: how stem cells maintain quiescence, are activated, transit to proliferative expansion and differentiation, and finally self-renew, and how they interact with the external inflammatory environment. Research is specially focused on stem cells of skeletal muscle. Recent studies from the laboratory have shed light on 1) age-associated muscle decline and wasting (sarcopenia) and loss of stem-cell regenerative functions with aging; and 2) the physiopathology of muscular dystrophies, with a specific interest in the contribution of inflammation and fibrosis to dystrophy progression. These findings are relevant for regenerative medicine.

Selected publications

- Perdigueró E, Moiseeva V, **Muñoz-Cánoves P** 2019, 'Simultaneous Isolation of Stem and Niche Cells of Skeletal Muscle: Applicability for Aging Studies', *Methods Mol Biol.* 2045:13-23

Selected research activities

Conferences, Invited Speaker:

- International Symposium of "Living in Space". Japan Aerospace Exploration Agency (JAXA). Kyoto, Japan. March 2019 (invited by Dr. Atsuko Sehara)
- Riken Institute. Kobe, Japan. March 2019 (invited by Dr. Fumio Matsuzaki)
- Osaka University. Osaka, Japan. March 2019 (invited by Dr. So-ichiro Fukada)
- International Conference on Aging Biology. Beijing, China. April 2019 (invited by Dr. Guanghui Liu)
- Gordon Research Seminar Conference on Myogenesis. Il Ciocco, Italy. June 2019 (invited by Dr. Benedicte Chazaud)
- Marabou's Foundation. Meeting on Nutrition and Stem Cell Integrity in Ageing. Stockholm, Sweden. June 2019 (invited by Dr. Bo Angelin)
- International Society of Stem Cell Research (ISSCR). Los Angeles, USA. June 2019 (invited by Dr. Douglas Melton)
- **Keynote Lecture*: EMBO Conference. 10th International Fission Yeast Meeting. Barcelona, Spain. July 2019 (invited by Dr. Jose Ayté)
- FEBS Workshop Aging and Regeneration. Innsbruck, Austria. September 2019 (invited by Dr. Pidder Jansen)
- **Keynote Lecture*: Frontiers Conference on "Skeletal muscle: development, regeneration and disease". American Association of Cell Biology. Costa Rica. September 2019 (invited by Drs. Alessandra Sacco, Peter Zammit and Fabio Rossi)
- 3RD International stem cell meeting. Crete, Greece. October 2019 (invited by Drs. Kursad Turksen and Jeff Dilworth)
- Des Treilles Foundation Conference on Stem cells and stress response mechanisms. Les Arcs-Dranguignan, France. October 2019 (invited by Dr. Emmanuelle Passegué)

ICREA MEMOIR 2019



Silvia Muro

Institut de Bioenginyeria de Catalunya (IBEC)

Life & Medical Sciences

Dr. Muro obtained her PhD in Sciences from Universidad Autónoma de Madrid and then moved to University of Pennsylvania as a Postdoctoral Associate and Research Assistant Professor in Pharmacology. In 2008 she joined the Bioengineering Department and the Institute for Bioscience and Biotechnology Research at the University of Maryland, where she was a tenured Associate Professor since 2012. Since November 2017, she is an ICREA Professor in the Institute for Bioengineering of Catalonia. Dr. Muro has published 80+ articles and chapters in drug delivery and has received awards from the Controlled Release Society, the American Society for Nanomedicine, the UMD Outstanding Life Sciences Invention in 2011, the Junior Faculty Outstanding Engineering Research award, and is a member of the NIH Nanomedicine Study Section.

Research interests

Dr. Muro's research sits at the interface between molecular-cellular biology and nanotechnology-drug delivery. Her lab studies the biological mechanisms ruling how our cells and tissues transport cargoes to precise destinations within our bodies, and then applies this knowledge toward the design of "biologically-controlled" nanodevices for improved delivery of therapeutic agents to specific disease sites. Focusing on genetic conditions that cause metabolic, neurodegenerative and cardiovascular syndromes, as well as on a new transport pathway she helped discover, her goal is to gain non-invasive, efficient, and specific access within the body and its cells, to enable effective treatment of these life-threatening disorders and other maladies characterized by similar pathological traits.

Selected publications

- Manthe RL, Rappaport JA, Long Y, Solomon M, Veluvolu V, Hildreth M, Gugutkov D, Marugan J, Zheng W & **Muro S** 2019, 'δ-Tocopherol Effect on Endocytosis and Its Combination with Enzyme Replacement Therapy for Lysosomal Disorders: A New Type of Drug Interaction?', *J Pharmacol Exp Ther.* 370(3):823-833.
- Roki N, Tsinas Z, Solomon M, Bowers J, Getts RC & **Muro S** 2019, 'Unprecedentedly high targeting specificity toward lung ICAM-1 using 3DNA nanocarrier', *J Control Release.* 305:41-49.

Selected research activities

-Talks & presentations.

- Mid-Atlantic DNA Nanotechnology Symposium, National Institute of Standards and Technology, Gaithersburg, USA (Nov. 2019).
- European Symposium on Lysosomal Storage Disorders, Madrid, Spain (Nov. 2019).
- Department of Pharmaceutical Sciences. University at Buffalo, USA (Oct. 2019).
- Annual Meeting of the Controlled Release Society. Valencia, Spain (Jul. 2019).
- Advances on Lysosomal Diseases. Vall d'Hebron Hospital, Barcelona, Spain (May 2019).
- Advances in Basic Discoveries and Therapeutic Approaches in Lysosomal Diseases, Galveston, USA (Mar. 2019).
- Mid-Atlantic Soft Matter Workshop. Shady Grove, USA (Feb. 2019).
- Department of Pharmaceutical Sciences, University of Michigan, Ann Arbor, USA (Feb. 2019).

-Grants.

- IBEC Faster Future Crowdfunding Program, Spain, Principal Investigator, 01/10/2019-30/09/2020.
- BBR MPower Program, USA, Principal Investigator, 01/09/2019-30/06/2020.
- MINECO RETOS Program, Spain, Principal Investigator, 10/01/2019-22/09/2022.

-Panels & boards.

- Scientific Review Group NANO, National Institutes of Health, USA. (Feb. 2019, Jun. 2019, Oct. 2019)
- Agencia Estatal de Investigación - MINECO RETOS (Dec. 2019).
- Czech Science Foundation. (Jul. 2019).
- Co-Chair, "Global health & neglected diseases", Annual Meeting of the Controlled Release Society, Valencia, Spain. (Jul. 2019).
- Editorial board, WIREs Nanomedicine & Nanobiotechnology". (01/01/2019-)

ICREA MEMOIR 2019



Toni Naco del Hoyo

Universitat de Girona (UdG)

Humanities

Prof. Toni Naco del Hoyo (PhD 1996, UAB) is a Roman Historian. A former Fulbrighter (UC Berkeley, 2004), before joining ICREA in 2009 he held Catalan and Spanish funded postdoctoral positions at Oxford University for 3 years till 2002. In 2004-9 he held a Ramón y Cajal Fellowship at UAB. Research awards as PI: H.F. Guggenheim Foundation (2007), RICIP (2010; 2012-3), 3 Spanish R+D Grants, Icrea Conference Award (2012), Tytus Visiting Fellowship at Cincinnati (2014); 4-year grant of archaeological research (2018-21). Since 2011 he has been yearly Visiting Scholar at Classics (Oxford). He has sponsored 3 postdocs (2012-4; 2018-20). In 2015 he moved to Universitat de Girona, where he is the PI of a funded SGR Consolidated Group (2017-20) leading 25 researchers. He has successfully supervised 4 PhD dissertations and he is currently supervising 5 further theses. He is also sponsoring 1 PhD Research Assistant (IF-UdG, 2019-2022).

Research interests

Prof. Naco del Hoyo's research and interests lie predominantly with the history and archaeology of the Roman Republic. Thanks to Spanish funding (2015-8, 2019-21) he leads a team on the Roman intervention in the West, alongside Dr J. Principal (Museu d'Arqueologia de Catalunya). They will organize an international conference on the North-Western Mediterranean (c. 150-70 BCE) in Girona in 2020. Also, he has conducted research on Republican taxation (recently revisited), collateral damage, garrisoning strategies, asymmetrical warfare, military intelligence and logistics, crisis management, international relations and peacebuilding studies in the Classical World. Recently, he has co-edited a book on Rome's military intervention in pre-Sertorian Hispania (Barcelona 2017). Likewise, in 2018 he co-edited a volume on War, Warlords and Interstate relations in the Ancient Mediterranean (Leiden-Boston 2018), with a high profile line-up of multidisciplinary contributors.

Selected publications

- **Naco del Hoyo T** 2019 'Rethinking *stipendiarius* as tax terminology of the Roman Republic. Political and military dimensions' *Museum Helveticum*. Schweizerische Zeitschrift für klassische Altertumswissenschaft, 76.1, 70-87.
- **Naco del Hoyo T** 2019, 'Invited Review of James Tan, Power and Public Finance at Rome, 264-49 BCE. 2017 Oxford University Press Oxford, 9780190639570, £ 64', *Historische Zeitschrift* 308, Issue 2, 2019, 453-456,

Selected research activities

- **PI (together with Dr Jordi Principal, Museu d'Arqueologia de Catalunya) of the funded project (Ministry of Science): PGC2018-098991-B-I00:** Spaces of integration in Republican Rome (II). NE of Hispania Citerior and its connectivity (133-72 BCE). 2019-21 + 1 PhD Research Assistantship (4 years).
- **Responsible for a 3-year PhD Research Assistant IFUdG** (funded by Universitat de Girona): Mr. Gerard R.Ventós (October 2019 - September 2022).
- **Responsible for a 2-year Postdoctoral 'Juan de la Cierva' Fellowship (funded by Ministry of Science):** FJC-2018-038166-I (fellowship granted, but candidate withdrawn for personal reasons before signing his job contract).
- **Conference lectures** presented at Naples (Università Federico II) and Mallorca (III Llibera Res Publica Forum of Roman Republican Historians).
- **2 Seminars of 'Group of Research of Mid-Republican Rome' (GERRM) organized in Girona (12 and 20 September).** Guest speakers: Dr. F.J. Vervaeke (Melbourne) and J. Muñoz Coello (Huelva).
- **3 research stays** as a *Visiting Scholar (Classics, Oxford University)* in February, May, November.
- **Evaluation reports** for Agencia Estatal de Investigación (research project grant applications), scholarly journals (Erebea, Onoba, Indice Histórico Español) and academic publishers (Routledge Editions, London-New York).

ICREA MEMOIR 2019



Rosemarie Nagel

Universitat Pompeu Fabra (UPF)

Social & Behavioural Sciences

Rosemarie Nagel received her Ph.D. in economics in 1994 from the University of Bonn with Reinhard Selten as her advisor. In 1994-1995 she was a postdoc with Al Roth, University Pittsburgh. Since 1995 she has been working in the Department of Economics and Business in Universitat Pompeu Fabra; in 2006, she was promoted to full professor, and in 2007 she joined ICREA as a research professor. Her primary research is in experimental and behavioral economics, especially in macroeconomic experiments and in neuroeconomics. She has published in the American Economic Review, Econometrica, Review of Economic Studies, Strategic Management Journal, Proceedings of the National Academy of Sciences (PNAS), Nature Human Behavior, Financial Times, Spektrum der Wissenschaft, etc.

Research interests

I work in experimental economics, focusing on simplified economic situations of risk, coordination, and competition. I develop descriptive models introducing knowledge from psychology and neurosciences related to the theory of mind. I link behavioral data with brain activity gained through functional magnetic resonance imaging (fMRI) or eye-tracking data co-working with cognitive scientists, neuroscientists, biologists, and psychologists. Furthermore, with experimental economists and macro theorists, and recently also, separately, with computational economists, I organize summer schools, workshops, and research using experimental tools to tackle macro and computational questions. In the next years, I am planning to “leave the lab” with my work on “De-Anchoring Beliefs” through interactions with philosophy and political science collaborations, also using fieldwork.

Selected publications

- Pedersini R, **Nagel R** & LeMenestrel M 2019, “The Power of Requests in a Re-distribution Game: An Experimental Study” *Games*, 10, 27. (special issue of on social norms and games)
- Attanasi G, Battigalli P, Manzoni E & **Nagel R** 2019, “Belief-dependent preferences and reputation: Experimental analysis of a repeated trust game”, *Journal of Economic Behavior & Organization*, 167, 341-360. (special issue on Psychological Game theory)

Selected research activities

Organization of Workshop on Computational and Experimental Economics (within Summerforum BGSE) with Jasmina Arifovic (SFU), John Ledyard (Caltech), and Deli Gatti Domenico (Uni. Catholica, Milan).

Organization of BESLAB International Conference on Theoretical and Experimental Macroeconomics in Bank of Canada with John Duffy (Uni Irvine C), Frank Heinemann (TU Berlin), Luba Peterson (SFU), Shyam Sunder (Yale), and Janet Jiang (Bank of Canada).

Speaker in a workshop on Complexity: On the Way to Mathematical Foundations of Organization Science in Max Planck Institute (MPI) Mathematics in the Natural Sciences.

European Central Bank (ECB): Invited Speaker macroeconomics seminar: Bounded Rationality in Keynesian Beauty Contests: A Lesson for Central Bankers?

Lecture in NYU-Shanghai Neuro Economics Summer School (organizers: Daw, Glimcher, Kable, Plassmann, and Tymula).

ICREA MEMOIR 2019



Arcadi Navarro

Universitat Pompeu Fabra (UPF) & Centre de Regulació Genòmica (CRG)

Life & Medical Sciences

Arcadi got a PhD in Biology at the UAB. After quitting academia for a few years, he went back to research as a postdoc at the University of Edinburgh. He entered the UPF in 2002 and joined ICREA in 2006. Between 2008-13 he was vice-director of the Institute for Evolutionary Biology (IBE), a joint UPF-CSIC initiative. Since 2010 he is Professor of Genetics at the UPF and leads a group on Evolutionary Genomics within the Department of Experimental and Health Sciences. He directed that Department between 2013 and 2016, a time during which he started a collaboration with the CRG, the EMBL-EBI and the BSC to co-direct the European Genome-Phenome Archive.

In 2016 he left academy again to become Secretary for Universities and Research at the Generalitat de Catalunya. He left government in 2018 and, after a short sabbatical, he returned to all his previous appointments in January 2019. He is happy to be back!!!

Research interests

Life as we see it in our planet today has been shaped by many different biological processes during billions of years. These processes leave complex and fascinating signatures in our genomes in the form of differences between species, or between individuals of the same species. By interrogating these patterns of genome diversity we can infer what are the forces that affect living organisms, how and when they act and how do they affect such various things as biodiversity, ageing or the differential susceptibility of different persons to certain diseases. All this knowledge empowers us to control our future but, above all, it is fun to obtain.

Selected publications

- Rodriguez JA, Farre X, Muntane G, Marigorta UM, Hughes DA, Spataro N, Bosch E & **Navarro A** 2019, 'Reply to: Retesting the influences of mutation accumulation and antagonistic pleiotropy on human senescence and disease', *Nature Ecology & Evolution*, 3(7): 994 - 995.
- Saunders G et al. 2019, 'Leveraging European infrastructures to access 1 million human genomes by 2022', *Nat Rev Genet.* 20(11):693-701.
- Karlsson Linnér R et al. 2019, 'Genome-wide association analyses of risk tolerance and risky behaviors in over 1 million individuals identify hundreds of loci and shared genetic influences', *Nature Genetics* 51:245-257.

ICREA MEMOIR 2019



László Neumann

Universitat de Girona (UdG)

Engineering Sciences

I was born in 1955 in Budapest, Hungary. MSc. in Engineering and Mathematics, 1978 TU Budapest, Mechanical Engineering: computer tomography. PhD 1982, Applied Mathematics: economical modeling. Publications: conference proceedings 53, journals 32, 3 books, chapters in books 20, others 55. As a head of industrial departments and projects, I led research and software development in architectural CAD, cartography, medical imaging, 3D face modeling, color harmony design, and numerical methods. Between 1995-2007: visiting lecturer at TU Vienna. Since 2002 ICREA Research Professor. My strengths are the interdisciplinary approach, mathematical modeling and motivating people. I am member of over a dozen IPC and other committees.

Research interests

My research has an interdisciplinary character in the common focus of computer imagery and applied mathematics. This wide field covers image processing, color science, computer graphics, computational photography and numerical methods. My profile in VICOROB at Universitat de Girona encompasses underwater and medical color image enhancement and visualization, efficient gradient domain solvers, illumination fusion, de-hazing and HDRI techniques. My most important results have been achieved here in the field of high quality large-area undersea image mosaicing. In this challenging field we computed the largest ever seamless deep-water gigamosaic images. After twelve years of thorough research, I am going to accomplish development of the Coloroid Renotation system and their applications, based on a huge amount of observations. On the other hand, in color research I am currently focusing on high-precision color calibration techniques of digital cameras with noise analysis.

ICREA MEMOIR 2019



Konstantin M. Neyman

Universitat de Barcelona (UB)

Experimental Sciences & Mathematics

Konstantin Neyman is ICREA Professor at the Department de Ciència de Materials i Química Física and the Institut de Química Teòrica i Computacional, Universitat de Barcelona, leading the group Reactivity of Nanostructures. He obtained his PhD in Chemistry from the Inst. of Inorganic Chemistry in Novosibirsk and completed his Habilitation (*Venia Legendi*) in Theoretical Chemistry at the TU München. He published a book, 9 book chapters, 190+ articles in referred journals and made 350 presentations at conferences and in universities, 135 of which as keynote and invited lectures. His publications were cited 8000+ times in WoS, H-index = 50 and 10000 times in GoogleScholar, H = 56. Before joining ICREA, Dr. Neyman held senior research associate positions in Germany: at the TU München, Ludwig-Maximilian Universität München and Fritz-Haber-Institut (Berlin) of the Max-Planck Society. He has contributed to the attraction of funds for more than 40 research projects.

Research interests

My research group deals with modelling of advanced, in particular, nanostructured inorganic materials important for catalysis, hydrogen technology, energy storage and related applications. A general aim is to understand at the atomic level, by carrying out large-scale quantum mechanical computer calculations, how the structure and composition of a material are related with its function in a given chemical process. It is often hardly possible to obtain this information experimentally. Yet, its absence drastically hinders creation of materials with desired improved properties.

Selected publications

- Bruix A & **Neyman KM**. 'How to design models for ceria nanoparticles: challenges and strategies for describing nanostructured reducible oxides', In: *Computational Modelling of Nanoparticles*, Eds. Bromley ST, Woodley SM, Series: Vol. 12: Frontiers of Nanoscience, Elsevier, Oxford, 2019, pp 55-99.
- Mamatkulov M, Yudanov IV, Bukhtiyarov AV, Prosvirin IP, Bukhtiyarov VI & **Neyman KM** 2019 'Pd segregation on the surface of bimetallic PdAu nanoparticles induced by low coverage of adsorbed CO', *Journal of Physical Chemistry C*, vol. 123, pp 8037-8046.
- Kardash TYu, Derevyannikova EA, Slavinskaya EM, Stadnichenko AI, Mal'tsev VA, Zaikovskii AV, Novopashin SA, Boronin AI, **Neyman KM** 2019, 'Pt/CeO₂ and Pt/CeSnO_x catalysts for low-temperature CO oxidation prepared by plasma-arc technique', *Frontiers in Chemistry*, vol. 7, 114 (1-17)
- Vega L, Aleksandrov HA & **Neyman KM** 2019, 'Using density functional calculations to elucidate atomic ordering of Pd-Rh nanoparticles at sizes relevant for catalytic applications', *Chin. J. Catal.*, vol. 40, no. 11, pp 1749-1757
- Liu S, Zhao Z-J, Yang C, Zha S, **Neyman KM**, Studt F & Gong J 2019 'Adsorption preference determines segregation direction: A shortcut to more realistic surface models of alloy catalysts', *ACS Catalysis*, vol. 9, pp 5011-5018.
- Olobardi S, Vega L, Fortunelli A, Stener M, Viñes F & **Neyman KM** 2019, 'Optical properties and chemical ordering of Ag-Pt nanoalloys: a computational study', *Journal of Physical Chemistry C*, vol. 123, pp 25482-25491.

Selected research activities

8 invited talks at conferences & universities: Madrid & Barcelona, ES; San Diego, USA; Cancun, MX; Moscow, RU; Sofia, BG. 9 contributed conference presentations.

ICREA MEMOIR 2019



Josep Nogués Sanmiquel

Institut Català de Nanociència i Nanotecnologia (ICN2)

Engineering Sciences

ICREA Research Professor and Group Leader of the Magnetic Nanostructures group at the Institut Català de Nanociència i Nanotecnologia. Graduated in Physics from the Universitat Autònoma de Barcelona in 1986, earned his PhD in Condensed Matter Physics from the Royal Institute of Technology (Stockholm, Sweden) in 1993. He was post-doc fellow at the University of California San Diego from 1993 to 1997. From 1997-2001 research associate at the Universitat Autònoma de Barcelona and since 2001 ICREA Research Professor at the same university. In 2007 he moved to the ICN2 - Institut Català de Nanociència i Nanotecnologia. His research interest is in the magnetic properties of diverse materials and the exchange coupling between dissimilar magnetic materials. In recent he has expanded his research interest into magnetoplasmonic materials for biomedical applications, novel structures for environmental remediation and advanced characterization of nanomaterials.

Research interests

We study the magnetic properties of different types of exchange coupled nanostructures, e.g., lithographically patterned structures and core-shell type nanoparticles. The idea is to use magnetic interactions that arise between different magnetic materials to improve the overall magnetic properties of the materials. We correlate the different structural, morphological or magnetic parameters with the enhanced magnetic properties.

Another core topic of the group is magnetoplasmonic nanostructures for biomedical applications (e.g., hyperthermia). In recent years, we have started to work on new topics like novel structures for environmental remediation or advanced characterization of nanomaterials (using TEM, synchrotron techniques or neutrons).

Selected publications

- Serra A et al. 2019, 'Highly active ZnO-based biomimetic fern-like microleaves for photocatalytic water decontamination using sunlight', *Applied Catalysis B-environmental*, 248, 129 - 146.
- Muro-Cruces J et al. 2019, 'Precise Size Control of the Growth of Fe₃O₄ Nanocubes over a Wide Size Range Using a Rationally Designed One-Pot Synthesis', *Acs Nano*, 13, 7, 7716 - 7728.
- Golosovsky IV et al. 2019, 'Zinc blende and wurtzite CoO polymorph nanoparticles: Rational synthesis and commensurate and incommensurate magnetic order', *Applied Materials Today*, 16, 322 - 331.

Selected research activities

Selected Talks

Plenary

'Magnetoplasmonic nanodomes as a novel structure for biomedical Applications'

Joint European Magnetic Symposia (JEMS), Sweden

'Magnetoplasmonic nanodomes as a novel structure for biomedical Applications'

International Baltic Conference on Magnetism, Russia

Keynote

'Multifunctional magneto-plasmonic nanodomes for combined magnetic manipulation multi-modal imaging and photo-thermal therapies'

International Symposium On Metastable, Amorphous And Nanostructured Materials (ISMANAM), India

'Inversion parameter in spinel Fe₃O₄/Mn₃O₄ core/shell nanoparticles at atomic resolution'

Nanotech France, France

Invited

'Surface-driven Magnetism of Fe-oxide nanocrystals'

American Chemical Society National Meeting and Exhibition, USA

'Magnetic behavior of binary assemblies of nanoparticles'

International Conference on Nanoscience Nanotechnology and Nanobiotechnology (3NANO), Brazil

'Determination of the inversion parameter in spinel oxides core-shell nanoparticles at atomic resolution by STEM-EELS techniques'

Global Conference on Magnetism and Magnetic Materials, Italy

ICREA MEMOIR 2019



Sergei Odintsov

Institut de Ciències de l'Espai (CSIC - ICE)

Experimental Sciences & Mathematics

ICREA Research Professor at ICE (CSIC-IEEC) since 2003. Author of about 600 journal articles, with about 40000 citations. Two ms were cited more than 2000 times, while two more ms and two books - more than 1000 times. Foreign Member of the Royal Norwegian Academy, member of Eur. Phys. Soc., Italian Grav. Soc. Awarded by Amaldi Gold Medal: European Prize for Gravitational Physics 2014. Editorial Board Member of six journals and referee of about 20 journals (with excellence certificates from PLB, EPL, PRD, PRL and EPJC). Hirsh index $h=100$ (Google Sch.), $h=81$ (WoS) and $h=92$ (inspirehep). Supervisor of 12 PhDs. Speaker/lecturer of about 120 conf. and organizer of about 40 int. workshops. Top Cited Thomson-Reuters/Clarivate Analytics Researcher in 2014, 2015, 2016, 2017, 2018. Web of Science 2017 Award. Silver Medal (2017) and Honorary Professorship (2019) of TSPU, Tomsk.

Research interests

I develop the theory which should describe our universe history. My main purpose is to formulate the consistent alternative to Einstein gravity in order to resolve the fundamental puzzle of modern cosmology: why and how the universe accelerates? In fact, I proposed the first modified gravity which may describe the unification of the early-time inflation (including singular one) and late-time acceleration, i.e. consistent universe history evolution. We also proposed a bouncing universe in modified gravity as scenario that is alternative to the inflation. The alternative gravity we develop should describe the whole sequence of the universe eras: inflation, radiation-matter dominance and dark energy era with consistent transitions from one era to other era. The study of current universe clarifies its future: if it will expand eternally or if its evolution will be finished in the future singularity.

Selected publications

- **Odintsov SD**, Saez-Chillon Gomez D & Sharov SG 2019, 'Testing logarithmic corrections to R^2 -exponential gravity by observational data', *Phys.Rev. D* 99, p.024003
- **Odintsov SD** & Oikonomou VK 2019, 'Inflationary phenomenology of Einstein Gauss-Bonnet gravity compatible with GW170817', *Physics Letters B* 797, p.134874
- Elizalde E, **Odintsov SD**, Oikonomou VK & Paul T 2019, 'Logarithmic-corrected R^2 gravity inflation in the presence of Kalb-Ramond fields', *JCAP* 1902, 017
- Nojiri S, **Odintsov SD** & Saridakis EM 2019, 'Holographic inflation', *Physics Letters B*, 797, UNSP 134829.
- Nojiri S, **Odintsov SD** & Oikonomou VK 2019, 'Ghost-free Gauss-Bonnet theories of gravity', *Physical Review D* 99, p.044050
- Nojiri S, **Odintsov SD** & Saridakis E 2019, 'Modified cosmology from extended entropy with varying exponent', *Eur.Phys.J. C* 79, p.242
- **Odintsov SD** & Oikonomou VK 2019, 'Effects of spatial curvature on the $f(R)$ gravity phase space: no inflationary attractor?', *Classical And Quantum Gravity*, 36, 6, 065008
- **Odintsov SD** & Oikonomou VK 2019, ' $f(R)$ gravity inflation with string-corrected axion dark matter', *Physical Review D*, 99, 6, 064049.
- **Odintsov SD** & Oikonomou VK 2019, 'Finite-time singularities in swampland-related dark energy models', *EPL* 126, p.20002
- **Odintsov SD** & Oikonomou VK 2019, 'Unification of inflation with dark energy in $F(R)$ gravity and axion dark matter', *Physical Review D* 99, p.104070

Selected research activities

- Chairman/Keynote Speaker at Workshop Siberian String Cosmology (March, Tomsk)
- Int Conf Symmetry 2019 (Sept., Benasque)
- Organizer/Keynote Speaker at 10th Math. Phys. Conf. (Sept., Belgrade)
- Workshop Modified Grav & Cosm. (May, Barcelona)
- Keynote Speaker at Int. Meeting on Fund. Physics (April, Aranjuez)
- 10th Friedmann Seminar (July, Saint-Petersburg)
- Int Conf Modern Physics of Compact Stars (Sept., Erevan)

ICREA MEMOIR 2019



Serena Olsaretti

Universitat Pompeu Fabra (UPF)

Humanities

I have been an ICREA Research Professor at UPF since 2010. Prior to that, I was Senior Lecturer at the Faculty of Philosophy, University of Cambridge, and Fellow of St. John's College, which I joined in 2001. I had first arrived at Cambridge in 1999, as a Research Fellow at Emmanuel College, after studying at the University of Oxford, where I obtained a B.A., an M.Phil. and a DPhil.degree.

Research interests

My work is in moral and political philosophy. I have worked on the ethics of markets, egalitarianism, and theories of well-being. Since September 2015, I have been the PI of an ERC Consolidator project on "Justice and the Family. An Analysis of the Normative Significance of Procreation and Parenthood in a Just Society". The project examines what liberal egalitarian theorists of justice should think about how the costs and benefits of children should be distributed, both among contemporaries and across generations. I hold we need to address these relatively neglected questions to develop a complete and defensible theory of justice.

Selected research activities

- *Parental Justice. The Role of the Family in a Just Society and in the Theory of Justice*, monograph under contract with Oxford University Press
- Olsaretti, S., "Reproducirse es inmoral?" Interview in *Valors* 176 (December 2019)
- Elected member, *Academia Europaea* (since July 2019)
- Associate Editor of *Ethics. An International Journal of Social, Political and Legal Philosophy*
- PI of ERC Consolidator Grant on *Justice and the Family: An Analysis of the Normative Significance of Procreation and Parenthood in a Just Society*
- Organiser (with A-A Cormier and R Spotorno) of international conference on *What Are Children Owed?* (June 2019)
- Reviewer for Oxford University Press, and for *Economics&Philosophy* and *Utilitas*
- *Society for Applied Philosophy*, Executive Committee Member

ICREA MEMOIR 2019



Ciara O'Sullivan

Universitat Rovira i Virgili (URV)
Engineering Sciences

Ciara O' Sullivan received a BSc in Analytical Chemistry from Dublin City University in 1992, a PhD in Biotechnology from Cranfield University in 1996 and then went on to lead the sensors group at University College Cork from 1996-99. She then took up a Marie Curie Fellowship at the Universitat Rovira i Virgili (1999-2001) and was then awarded a Ramón y Cajal Fellowship which she pursued for 1 year prior to taking up her current position as ICREA Research Professor and establishing the Nanobiotechnology and Bioanalysis Group at the Universitat Rovira i Virgili. She is group leader of the GENCAT funded Consolidated Group INTERFIBIO. Her group details can be found at www.interfibio.com.

Research interests

Her research interests lie in the development of electrochemical and optical biosensors exploiting advances in tailored biocomponents. Presently, her work focuses on reducing to practise cost-effective molecular diagnostics for screening and monitoring of disease, as well as on the development of aptamers for application in optical and electrochemical molecular aptamer beacons. The approaches for molecular diagnostics being developed include parallelised real-time electrochemical next generation sequencing, electrochemical array based primer extension and elongation for multiplexed SNP detection, multiplexed electrochemical miRNA detection and quantitative paper diagnostics as companion tools for the future paradigm of pharmacogenomics and personalised medicine.

Selected publications

- Magrina I, Toldra A, Campas M, Ortiz M, Simonova A, Katakis I, Hocek M & **O'Sullivan CK** 2019, 'Electrochemical genosensor for the direct detection of tailed PCR amplicons incorporating ferrocene labelled dATP', *Biosensors & Bioelectronics*, 134, 76 - 82.
- Mairal Lerga T, Jauset-Rubio M, Skouridou V, Bashammakh AS, El-Shahawi MS, Alyoubi AO & **O'Sullivan CK** 2019, 'High Affinity Aptamer for the Detection of the Biogenic Amine Histamine', *Analytical Chemistry*, 91, 11, 7104 - 7111.
- Toldra A, Alcaraz C, Diogene J, **O'Sullivan CK** & Campas M 2019, 'Detection of *Ostreopsis cf. ovata* in environmental samples using an electrochemical DNA-based biosensor', *Science Of The Total Environment*, 689, 655 - 661.
- Toldra A, **O'Sullivan CK** & Campas M 2019, 'Detecting Harmful Algal Blooms with Isothermal Molecular Strategies', *Trends In Biotechnology*, 37, 12, 1278 - 1281.

Selected research activities

- Executive Editor Analytical Biochemistry (Elsevier, to end 2019)
- Associate Editor Analytical Chemistry /ACS)
- International Advisory Board Microchimica Acta (Springer), Analytical Bioanalytical Chemistry (Springer, to end 2019)
- Participating in H2020 ICT and H2020 HEALTH Integrated Projects
- Participating in Human Frontiers Science Project
- Participating in Plan Nacional (MINECO)
- 4 PhD students defended in 2019
- Director of international training course on selection of aptamers (AptaSel)
- Reviewer of H2020 FET, ICT; ANR (France)
- International Advisory Board Member of i-SENSE (UK)
- Participating in Masters in Nanoscience at University of Western Cape (South Africa)
- Co-direction of PhD students from University of the Philippines at Diliman and University of the Western Cape
- Co-direction of MSc students from Ulm University
- Teaching activities: 7,5 ECTS in Masters in Nanoscience (Nanobiotechnology)

ICREA MEMOIR 2019



Sílvia Osuna

Universitat de Girona (UdG)

Experimental Sciences & Mathematics

Sílvia Osuna received her PhD in 2010 from the University of Girona (UdG) at the Institut de Química Computacional (IQC). In 2010, she moved to the group of Prof. Houk at the University of California, Los Angeles (UCLA). Since then, Sílvia has worked in computational design of enzymes of medical and pharmaceutical interest. Sílvia has more than 70 research publications, and been awarded the Young Researcher award by the Royal Spanish Society of Chemistry (RSEQ 2016), the Research award by the Fundació Princesa de Girona (FPdG 2016- Science category), the 2017 Young Researcher Award of EuCheMS Organic Division, and 2019 Young Researcher award by Lilly and RSEQ. Her group is funded by the European Research Council project – Starting Grant (ERC-2015- STG-679001, NetMoDEzyme), the I+D MINECO project (EnzExplora, PGC2018-102192-B-I00), and the Catalan government project for emergent research teams (2017-SGR-1701).

Research interests

Sílvia's research lies at the interface between computational chemistry and biology. Her research focuses on the study of biochemical processes mainly related to enzyme catalysis. Her lab is developing new computational tools for predicting which amino acid changes are required to the enzyme structure for allowing novel function, enhancing a promiscuous side reaction, or expanding its substrate scope. Her goal is to enable the routine computational design of proficient enzymes to boost their use in industry for the synthesis of pharmaceutically relevant targets. She also applies the developed methodologies to the study of the recognition and assembly process of biomolecules with carbon-based materials.

Selected publications

- Curado-Carballada C, Feixas F, Iglesias-Fernandez J & **Osuna S** 2019, 'Hidden Conformations in Aspergillus niger Monoamine Oxidase are Key for Catalytic Efficiency', *Angewandte Chemie-international Edition*, 58, 10, 3097 – 3101.
- Tomas-Loba A, Manieri E, Gonzalez-Teran B, Mora A, Leiva-Vega L, Santamans AM, Romero-Becerra R, Rodriguez E, Pintor-Chocano A, Feixas F, Lopez JA, Caballero B, Trakala M, Blanco O, Torres JL, Hernandez-Cosido L, Montalvo-Romeral V, Matesanz N, Roche-Molina M, Bernal JA, Mischo H, Leon M, Caballero A, Miranda-Saavedra D, Ruiz-Cabello J, Nevzorova YA, Cubero FJ, Bravo J, Vazquez J, Malumbres M, Marcos M, **Osuna S** & Sabio G 2019, 'p38 gamma is essential for cell cycle progression and liver tumorigenesis', *Nature*, 568, 7753, 557-560.
- Semivrazhskaya O, Romero-Rivera A, Aroua S, Troyanov SI, Garcia-Borras M, Stevenson S, **Osuna S** & Yamakoshi Y 2019, 'Structures of Gd₃N@C₈₀Prato Bis-Adducts: Crystal Structure, Thermal Isomerization, and Computational Study', *Journal Of The American Chemical Society*, 141, 28, 10988 – 10993.
- Maria-Solano MA, Iglesias-Fernandez J & **Osuna S** 2019, 'Deciphering the Allosterically Driven Conformational Ensemble in Tryptophan Synthase Evolution', *Journal Of The American Chemical Society*, 141, 33, 13049 – 13056.
- Chen X, Zhang H, Maria-Solano MA, Liu W, Li J, Feng J, Liu X, **Osuna S**, Guo R-T, Wu Q, Zhu D & Ma Y 2019, 'Efficient reductive desymmetrization of bulky 1,3-cyclo diketones enabled by structure-guided directed evolution of a carbonyl reductase', *Nature Catalysis*, 2, 10, 931 – 941.
- Arqué X, Romero-Rivera A, Feixas F, Patiño T*, **Osuna S*** & Sánchez S* 2019, 'Intrinsic enzymatic properties modulate the self-propulsion of micromotors', *Nature Commun.* 2019, 10, 2826.

ICREA MEMOIR 2019



Paolo Padoan

Universitat de Barcelona (UB)

Experimental Sciences & Mathematics

Academic Degrees: PhD in Astrophysics, Niels Bohr Institute, Copenhagen, 1997 Degree in Astronomy, University of Padova, 1992 Academic Positions: ICREA Research Professor, University of Barcelona, March 2010 – present Associate Professor, UC San Diego, June 2007 – February 2010 Assistant Professor, UC San Diego, June 2003 – June 2007 Postdoctoral Fellow, Jet Propulsion Laboratory, Caltech, 2001 – 2003 Postdoctoral Fellow, Harvard University, 1999 – 2001 Postdoctoral Fellow, INOAE, Puebla, 1998 – 1999

Research interests

A major goal of my research is to understand the origin of stars. Star formation is a central problem in the study of galaxy evolution and cosmology. Stars are a dominant energy source to the interstellar medium of galaxies and control their chemical enrichment; the first massive stars in the universe contributed to its re-ionization. Because star-forming gas in galaxies is highly turbulent, the study of star formation involves the investigation of turbulence as well. A general theory of turbulence does not exist, but computer simulations provide valuable information on universal properties of turbulent flows. I conduct numerical experiments of super-sonic, self-gravitating magneto-hydrodynamic turbulence with physical parameters appropriate for describing star-forming gas in galaxies. Using adaptive mesh refinement methods, numerical simulations may span a huge range of scales, from the size of a galactic disk to that of an individual circumstellar disk.

Selected publications

- Suri S, Sanchez-Monge A, Schilke P, Clarke SD, Smith RJ, Ossenkopf-Okada V, Klessen R, **Padoan P**, Goldsmith P, Arce HG, Bally J, Carpenter JM, Ginsburg A, Johnstone D, Kauffmann J, Kong S, Dariusz CL, Mairs S, Pillai T, Pineda JE & Duarte-Cabral A 2019, ‘The CARMA-NRO Orion Survey Filamentary structure as seen in (CO)-O-18 emission’, *Astronomy & Astrophysics*, 623, A142.
- Pan L, **Padoan P** & Nordlund A 2019, ‘Inaccuracy of Spatial Derivatives in Riemann Solver Simulations of Supersonic Turbulence’, *Astrophysical Journal*, 876, 2, 90.
- Juvela M, **Padoan P**, Ristorcelli I & Pelkonen VM 2019, ‘Synthetic observations of dust emission and polarisation of Galactic cold clumps’, *Astronomy & Astrophysics*, 629, A63.
- Kong S, Arce HG, Sargent AI, Mairs S, Klessen RS, Bally J, **Padoan P**, Smith RJ, Maureira MJ, Carpenter JM, Ginsburg A, Stutz AM, Goldsmith P, Meingast S, McGehee P, Sanchez-Monge A, Suri S, Pineda JE, Alves J, Feddersen JR, Kauffmann J & Schilke P 2019, ‘The CARMA-NRO Orion Survey: Core Emergence and Kinematics in the Orion A Cloud’, *Astrophysical Journal*, 882, 1, 45.
- Pan L, **Padoan P** & Nordlund A 2019, ‘The Probability Distribution of Density Fluctuations in Supersonic Turbulence’, *Astrophysical Journal*, 881, 2, 155.

ICREA MEMOIR 2019



Emilio Palomares

Institut Català d'Investigació Química (ICIQ)

Experimental Sciences & Mathematics

Emilio Palomares (València, 1974). He studied Biology at the UVEG (1997). After graduating he joined Prof. Hermenegildo García's group at the UPV where he got his PhD (2001). In 2001 he was awarded a "Marie Curie" Fellowship ICL (London, UK). There he began his work with molecular devices for energy conversion, under the direction of Prof. James R. Durrant. In 2004 Emilio got a "Ramón y Cajal" Fellowship at the ICMol. In April 2006 he took a position at ICIQ, where he currently leads a research group which is focussed on energy conversion devices. In 2009 he was awarded an ERC starting grant to work on quantum dots for energy conversion devices and a ERC PoC in 2015. In 2006, Prof. Palomares got the Young Chemist Award by the Spanish Royal Society of Chemistry and in 2010, the INNOVA 2010 Award by the SusChem Spanish Association. In 2019 he has been awarded with Energy & Environmental Solutions International Chair (E2S) by the Université de Pau et des Pays de l'Adour (UPPA).

Research interests

My research is focused on several aspects of light induced electron transfer reactions in supramolecular structures and nanostructured inorganic materials. Such research activity has evolved towards the control and improvement of the reactions that govern the efficiency on molecular and supramolecular optoelectronic devices such as molecular solar cells - strategy which holds the promise for the achievement of low cost light-to-energy conversion devices- and the creation of new hybrid nanomaterials for hydrogen production and molecular based sensing devices to detect toxic substance on the environment. I'm personally also involved in promoting science and education in our society through chemistry workshops for primary and secondary schools. Last but not least, during the last years our group has contributed with efforts towards the use of nanomaterials for biomedical applications in human rare diseases.

Selected publications

- Yalcin E, Can M, Rodriguez-Seco C, Aktas E, Pudi R, Cambarau W, Demic S & **Palomares E*** 2019, 'Semiconductor self-assembled monolayers as selective contacts for efficient PiN perovskite solar cells', *Energy Environ. Sci.*, 12, 230-237.
- Moia D, Gelmetti I, Calado P, Fisher W, Stringer M, Game O, Hu Y, Docampo P, Lidzey D, **Palomares E**, Nelson J & Barnes PRF 2019, 'Ionic-to-electronic current amplification in hybrid perovskite solar cells: ionically gated transistor-interface circuit model explains hysteresis and impedance of mixed conducting devices', *Energy & Environmental Science*, 12, 4, 1296 - 1308.
- Paulo-Mirasol S, Martinez-Ferrero E & **Palomares E** 2019, 'Direct white light emission from carbon nanodots (C-dots) in solution processed light emitting diodes', *Nanoscale*, 11, 23, 11315 - 11321.
- Jimenez-Lopez J & **Palomares E** 2019, 'Interfacial recombination kinetics in aged perovskite solar cells measured using transient photovoltage techniques', *Nanoscale*, 11, 42, 20024 - 20029.

ICREA MEMOIR 2019



Omiros Papaspiliopoulos

Universitat Pompeu Fabra (UPF)

Social & Behavioural Sciences

Previously to becoming ICREA Research Professor I had been Research Associate at Lancaster and Oxford University, Assistant Professor at Warwick University, and Professor at UPF. I am currently the director of the Masters in Data Science and the Data Science Center at Barcelona GSE. I have extensively published in the top journals in Statistics, have served as Associate Editor for several journals and as of January 2018 as Deputy Editor for *Biometrika*. I have delivered more than 100 invited talks & seminars, and given courses at ENSAE in Paris, the Berlin Mathematical School, the Department of Mathematics at University of Copenhagen, the Engineering Department at Osaka University, CEMFI. In 2010 I was awarded the Royal Statistical Society's Guy Medal in Bronze, which is arguably the highest distinction in Statistics in Europe.

Research interests

I am involved with the whole spectrum of Data Science, from real practical problems to serious mathematics for developing and analyzing methods. My current research evolves along the following three non-orthogonal axes: Axis 1: Methodological work in the intersection of Statistics, Machine Learning and Applied Mathematics; Axis 2: Data Science within Social Sciences; Axis 3: Applied Machine Learning projects. Major subtheme in Axis 1 is scalable Bayesian computation. Bayesian models provide an excellent framework for synthesizing heterogenous data, learning and predicting with big but sparse data, and principled regularization in high-dimensional models. Scalable Bayesian computation refers to computational methods for solving large scale Bayesian learning problems whose complexity scales favourably with the amount of data and parameters, ideally as a linear function of these two quantities. This is enormously important in practice: it makes an approach realistic for large scale applications. Within Axis 2 I have been involved in a range of application that despite their apparent diversity they have important common components and strong links with Axis 1: predicting electoral outcomes in elections with emerging political parties, long-term forecasting of real estate prices at zip-code level; understanding channels of central bank communication; surveillance and prediction of social unrest. As founder and director of the Barcelona Graduate School of Economics Data Science Center (DSC), I have been involved in all the projects the DSC undertakes and fall within Axis 3. Recent collaborations include the Reuters Institute for the Study of Journalism in Oxford, Accenture Health Analytics, Banco de España, ZDF (German public-service television broadcaster).

Selected publications

- Montalvo JG, **Papaspiliopoulos O**, Stumpf-Fétizon T 2019, "Bayesian forecasting of electoral outcomes with new parties' competition", *European Journal of Political Economy*, 59, pp.52-70.

Selected research activities

Book Reviews:

High-Dimensional Probability by R. Vershynin, for the Bachelier Finance Society Newsletter

Editorial activities and reviewing for major funding bodies:

- Deputy Editor for **Biometrika**
- **Finnish Academy of Sciences**: member of a six-people panel that decides on the whole funding program of the Academy for the scientific fields of Statistics and Applied Mathematics.
- Associate Editor for **SIAM Journal of Uncertainty Quantification**

Conference organization:

- Scientific committee member for European Meeting of Statisticians, Palermo, July 2019
- Co-organised a BGSE Summer Forum on Machine Learning for Economics

Seminars:

- Department of Mathematics, University of California San Diego, March 2019
- Department of Statistics, University of California Santa Cruz, March 2019

Public lectures:

- Is attention in Twitter turned to the extremes? (Pint of Science, Athens)

Academic Leadership:

- In the BGSE: Director of the Data Science Center; Director of the Master in Data Science; Director of the Summer School in Data Science; and Director of the Winter School in Data Science.

Research stays:

- Caltech, February 2019
- Courant Institute, March 2019

Funding:

- BBVA grant (co-PI)
- Plan Estatal (co-PI)

ICREA MEMOIR 2019



Soraya Pelaz

Centre de Recerca en Agrigenòmica (CRAG)

Life & Medical Sciences

Born in Bilbao, started Biology studies in the Basque Country University but moved to Madrid to follow the Molecular Biology and Biochemistry specialty. She obtained her BSc at Autonomous University of Madrid (UAM) in 1989. For her PhD studies she joined Dr. Morata's laboratory at the CBM where she performed research on *Drosophila* Developmental Genetics with a Basque Predoctoral fellowship and got the PhD in 1993 at UAM. For her postdoctoral research she moved from flies to flowers by joining Dr. Yanofsky's laboratory at the University of California at San Diego. There she performed Developmental Biology on *Arabidopsis* with fellowships from the Spanish Ministry of Education and Science and from the Human Frontiers Science Program Organization. In 2001 she got a "Ramón y Cajal" contract at INIA in Madrid to establish her own line of research in Flower Development. In 2003 she joined ICREA and moved to Barcelona.

Research interests

Floral induction is probably the most important process in plant development since it takes to the formation of flowers and fruits. Flowering must happen in a favorable time of the year to allow successful seed formation and reproduction. Our goal is to elucidate how plants know when to flower in response to a variety of external and endogenous signals and what genes, networks and mechanisms are responsible for the control of this process. The correct timing of flowering, which is crucial to ensure reproductive success, is therefore of economic and adaptive value. Because plants are sessile organisms we lately focused on how plants maximize their chances to survive adversities by reprogramming their development and flowering time for adaptation to environmental changes. In order to unravel new insights into environment adaptation, we also started an evolutionary developmental, evo-devo, approach which may help to deal with the undesired effects of global warming.

Selected publications

- Aguilar-Jaramillo AE, Marin-Gonzalez E, Matias-Hernandez L, Osnato M, **Pelaz S***, Suarez-Lopez P* 2019, 'TEMPRANILLO is a direct repressor of the microRNA miR172', *Plant Journal*, 100, 3, 522 - 535.

Selected research activities

Funded Projects

- * Unmasking the mechanism of RAV genes in FLoral Repression in Abiotic stress (FLORA). **MICIU** (PGC2018-095804-B-I00)
- * *Arabidopsis* Developmental Genomics. **AGAUR**. SGR (Grups de Recerca Reconeguts i Finançats; 2017 SGR 718).
- * Guarantor Researcher of **Centers of Excellence Severo Ochoa** (SEV-2015-0533) awarded to CRAG.

Editorial Board

- * Associated Editor of *Physiologia Plantarum*.
- * Editor of *Plants*, *Plant Development* and *Morphogenesis* section.
- * Academic Editor of *Peer J*.
- * Review Editor of *Frontiers in Plant Genetics and Genomics*.

Invited Talk

TEMs together with MYCs repress flowering and drought escape.
Workshop on molecular mechanisms controlling flower development. Presquile de Giens, France.

Hosting Research Stays

Dr. Michael Purugganan, Professor and Dean of New York University, USA.

Outreach Activities

- * "Mutant Plants" workshop for school children in collaboration with CRECIM.
https://www.youtube.com/watch?time_continue=1&v=WcH7EqQV2d8

ICREA MEMOIR 2019



Carles Pelejero

Institut de Ciències del Mar (CSIC - ICM)

Experimental Sciences & Mathematics

Born in Barcelona in 1968, Carles Pelejero graduated in Chemistry at the Autonomous University of Barcelona in 1991, with a specialty in Organic Chemistry. He obtained his PhD in Chemistry at the University of Barcelona in 2000, doing research in the fields of paleoceanography and paleoclimatology through the study of molecular biomarkers in deep sea sediments. He then spent four years of postdoctoral research in Australia, at the Australian National University and Geoscience Australia. There, he developed new methodologies for the elemental and isotopic analysis of marine biogenic carbonates using MC-ICPMS and TIMS. In 2005 he moved to the Institut de Ciències del Mar (ICM-CSIC), in Barcelona, with a “Ramón y Cajal” contract. In October 2006 he was appointed ICREA Research Professor.

Research interests

I am interested in understanding and quantifying how the marine environment and climate are changing today, in which ways they have changed in the past, and how will they influence marine organisms and ecosystems in the future. To this end, I analyse deep sea sediments and corals as archives of changes in the past, use systems to monitor the present, and run manipulative experiments in aquaria to simulate the future. A main environmental issue that I am currently studying is the progressive acidification of the oceans that is occurring due to the marine absorption of part of the CO₂ that humans are emitting to the atmosphere. I am also setting up culture-based systems to calibrate paleoceanographic proxies in corals, making use of the aquaria facilities at the ICM.

Selected publications

- Moy AD, Palmer MR, Howard WR, Bijma J, Cooper MJ, Calvo E, **Pelejero C**, Gagan MK & Chalk TB 2019, ‘Varied contribution of the Southern Ocean to deglacial atmospheric CO₂ rise’. *Nature Geoscience*, 12, 1006-1011.
- Tilbrook B, Jewett EB, DeGrandpre MD, Hernandez-Ayon JM, Feely RA, Gledhill DK, Hansson L, Isensee K, Kurz ML, Newton JA, Siedlecki SA, Chai F, Dupont S, Graco M, Calvo E, Greeley D, Kapsenberg L, Lebrech M, **Pelejero C**, Schoo KL & Telszewski M 2019. ‘An Enhanced Ocean Acidification Observing Network: From People to Technology to Data Synthesis and Information Exchange’, *Frontiers in Marine Science*, 6, 337.

Selected research activities

- Supervisor of the Marie Curie Fellowship, EC H2020 to Lydia Kapsenberg, project EVOMA: The influence of Environmental Variability On Mussel Aquaculture and adaptation in the context of global ocean change (H2020-MSCA-IF-2016, C.N. 747637).
- Co-PI of the MICINN Project HICCUP: Human-Induced Changes Compromising the open ocean. Generating Understanding from Paleoceanography (RTI2018-095083-B-I00).
- PI of the MICINN Project SCORE: Sediments and cold water Corals to address key questions of the Oceans in the past: two case-study Regions and one Experiment (CGL2015-68194-R).
- Coordinator of the Research Group on Marine Biogeochemistry and Global Change. Generalitat de Catalunya (2017SGR1011).
- Participant of the European Commission H2020 Project CERES: Climate change and European aquatic RESources (H2020-BG-2015-2, C.N. 678193)
- Reviewer of the 6th Intergovernmental Panel on Climate Change (IPCC) Assessment Report to be published in 2021.
- Supervising 2 PhD students (Lucía Quirós-Collazos and Ariadna Martínez-Dios).

ICREA MEMOIR 2019



Antonio Penta

Universitat Pompeu Fabra (UPF)

Social & Behavioural Sciences

Antonio Penta is an economic theorist who joined ICREA in October 2018. He is also Professor of Economics at UPF and at the Barcelona GSE. Prior to that, he was Assistant Professor (2010-2016) and then tenured Associate Professor (2016-2018) at the University of Wisconsin-Madison. He graduated in Economics from Bocconi Univ (2004), and then he obtained a M.A. (2008) and a PhD (2010) in economics from the University of Pennsylvania. He is currently member of the Editorial Board of the Review of Economic Studies, an Associate Editor of the Journal of Economic Theory and of Theoretical Economics, Associate Faculty at the Toulouse School of Economics, and a member of the TSE Digital Center. In 2017, he was awarded an ERC-Starting Grant.

Research interests

My research spans a range of areas within game theory, mechanism design, behavioral economics and auction theory, combining a variety of techniques and methodologies. In game theory and mechanism design, most of my research has focused on questions of robustness with respect to various forms of model misspecification. Within behavioral economics, my research has combined experimental methodology and theoretical work, and it has mostly focused on understanding individuals' reasoning processes, and particularly the interaction between individuals' cognitive abilities and their incentives. Most recently, I have become interested in the market for online advertisement. My research focuses on the impact of Digital Marketing Agencies on the online ad auction platforms, on agencies's opportunities to generate surplus for their clients, and on the design of novel auction formats based on direct measures of users' attention, combining economic theory and datascience.

Selected research activities

2019 Conferences and Workshops:

- Behavioral Research in Economics Workshop (IIM, Ahmedabad, India), *Keynote Speaker*
- International Center of Economic and Finance Microeconomics Workshop (Moscow, Russia), *Keynote Speaker*
- Workshop on "New Directions in Mechanism Design", (Stony Brook, NY, USA), invited speaker
- XIX-SAET Conference on Mathematical Economics, Ischia (ITA), invited speaker
- Warwick Economic Theory Workshop, Univ. of Warwick (UK), invited speaker
- 2019 Barcelona GSE Summer Forum, *Bounded Rationality, Cognition and Strategic Uncertainty*; conference organizer
- 2019 ESEM: Econometric Society European Meeting, Univ. of Maastricht: member of scientific committee

2019 Invited Research Seminars:

- EZH-UZH Microeconomic Theory Seminar, Zurich
- Higher School of Economics Microeconomics Seminar, Moscow
- Hebrew University of Jerusalem Israel Economic Theory Seminar, Jerusalem
- Tel-Aviv University Economic Theory Seminar, Tel-Aviv
- Bar-Ilan University of Jerusalem Israel, Economic Theory Seminar, Tel-Aviv
- University of Bologna, Microeconomics Seminar, Bologna
- European University Institute, Economic Theory Seminar, Florence

2019 Courses:

- Advanced Microeconomics II, Ph.D., Barcelona GSE
- Economic Methods for Data Science: Online Ad Auctions, Master, Barcelona GSE
- Digital Economics: Online Ad Auctions and Spectrum A, Summer Course, Barcelona GSE
- Game Theory and Mechanism Design, Undergraduate UPF

ICREA MEMOIR 2019



Miguel Pérez-Enciso

Universitat Autònoma de Barcelona (UAB)

Life & Medical Sciences

I am a Biologist and obtained my PhD in 1990 in Genetics (Universidad Complutense, Madrid). After that I moved to the USA and France during three years to carry out post doctoral studies, specializing in Bayesian Statistics applied to Animal Breeding and Quantitative Genetics. I worked at the Institut de Recerca i Tecnologia Agroalimentaria (IRTA) from 1993 - 1999 and at INRA (Toulouse, France) from 1999 til 2003, when I became an ICREA Research Professor. I am also part-time professor in Universitat Autònoma of Barcelona, and I am currently based at Centre for Research in Agricultural Genomics (CRAG) on UAB campus.

Research interests

Most of the genes that are of socioeconomic importance, e.g., genes affecting disease susceptibility or that makes Iberian pig meat taste good, are very difficult to find because they are influenced by many genes of small effect. My main area of research is to develop statistical and computational tools that help us to identify these genes. A topic of particular interest is combining different sources of molecular information, including complete genome sequence, to predict genetic merit. I am also concerned with studying how man has shaped the pattern of genetic variation in livestock species, mainly in the pig, through domestication and artificial selection. I participated in the consortium leading to the publication of the pig genome sequence (Nature, 2012) and I am responsible for the first genome sequence of an ancient pig, a sow that lived in the 16th century in Montsoriu Castle (Girona) and of the first Iberian pig genome. My current interests include the application of machine learning technologies to genomics in livestock, humans and plants, the use of sequence data for genomic selection and to study adaptation processes, and software development.

Selected publications

- Dufflocq P, **Perez-Enciso M**, Lhorente JP & Yanez JM 2019, 'Accuracy of genomic predictions using different imputation error rates in aquaculture breeding programs: A simulation study', *Aquaculture*, 503, 225 - 230.
- Zingaretti ML, Monfort A, **Perez-Enciso M** 2019, 'pSBVB: A Versatile Simulation Tool To Evaluate Genomic Selection in Polyploid Species', *G3-genes Genomes Genetics*, 9, 2, 327 - 334.
- **Perez-Enciso M** & Zingaretti LM 2019, 'A Guide on Deep Learning for Complex Trait Genomic Prediction', *Genes*, 10, 7, 553.
- Ramon E, Belanche-Munoz L & **Perez-Enciso M** 2019, 'HIV drug resistance prediction with weighted categorical kernel functions', *Bmc Bioinformatics*, 20, 410.
- Cho IC, Park HB, Ahn JI, Han SH, Lee JB, Lim HT, Yoo CK, Jung EJ, Kim DH, Sun WS., Ramayo-Caldas Y, Kim SG, Kang YJ, Kim YK, Shin HS, Seong PN, Hwang IS, Park BY, Hwang S, Lee SS, Ryu YC, Lee JH, Ko MS, Lee K, Andersson G, **Pérez-Enciso M** & Lee JW 2019, 'A functional regulatory variant of MYH3 influences muscle fiber-type composition and intramuscular fat content in pigs'. *PLOS Genetics*, 15(10), e1008279.

ICREA MEMOIR 2019



Carlos Pérez García-Pando

Barcelona Supercomputing Center - Centro Nacional de Supercomputación (BSC - CNS)

Experimental Sciences & Mathematics

Carlos Pérez García-Pando obtained his PhD in Environmental Eng. from the UPC in 2005. He was then appointed Mineral Dust Group Leader at the recently created Barcelona Supercomputing Center (BSC). Thereafter he worked in the US at NOAA/NCEP, IRI, Columbia University and NASA Goddard Institute for Space studies. After obtaining an AXA Chair on Sand and Dust Storms, he re-joined BSC as Head of the Atmospheric Composition Group, AXA Professor on Sand and Dust Storms and Ramon y Cajal Fellow in 2016. In 2017, he was awarded by the Spanish Royal Academy of Engineering the Agustín de Betancourt y Molina prize for young researchers in recognition for his contributions in the field of environmental risks, and he obtained a ERC Consolidator Grant that started in October 2018. He is Co-I of the Earth Surface Mineral Dust Source Investigation, one of the only two Earth Ventures-Instrument missions funded by NASA in 2018. He was appointed ICREA Research Professor in Dec. 2019.

Research interests

Carlos Pérez García-Pando is interested on understanding atmospheric aerosols and traces gases, from the physical and chemical processes affecting them, to their effects upon weather, climate, ocean biogeochemistry, air quality and health. His research group develops improved representations of pollutants within atmospheric and climate models to characterize their sources, sinks, atmospheric lifecycles and effects. He is known for his work on dust aerosols; in that context, he holds an AXA Chair that tackles both fundamental and applied research questions related to dust and he lead an ERC Consolidator Grant that investigates the role of the dust mineralogical composition in the climate effects of dust based on theory, experimental campaigns, remote spectroscopy and modeling.

Selected research activities

- PI of a ERC Consolidator Grant started in October 2018 entitled FRAGMENT ("FRontiers in dust MinerAloGical coMposition and its Effects upon climaTe"; grant agreement No. 773051).

- AXA Chair on Sand and Dust Storms at the Barcelona Supercomputing Center

- Co-Investigator of the Earth Surface Mineral Dust Source Investigation (EMIT) which is a NASA Earth Ventures-Instrument (EVI-4) Mission to map the surface mineralogy of arid dust source regions of the Earth via imaging spectroscopy in the visible and short-wave infrared.

Selected publications in 2019 prior to the ICREA appointment in December:

-Benavides, J., Snyder, M., Guevara, M., Soret, A., **Pérez García-Pando, C.**, Amato, F., Querol, X., and Jorba, O. 2019, CALIOPE-Urban v1.0: coupling R-LINE with a mesoscale air quality modelling system for urban air quality forecasts over Barcelona city (Spain), *Geosci. Model Dev.*, 12, 2811-2835.

-Querol X, Tobías A, Pérez N, Karanasiou A, Amato F, Stafoggia M, **Pérez García-Pando C**, Ginoux P, Forastiere F, Gumy S, Mudu P & Alastuey A 2019, 'Monitoring the impact of desert dust outbreaks for air quality for health studies', *Environment International*, vol. 5, 104867.

-Guevara, M., Tena, C., Porquet, M., Jorba, O., and **Pérez García-Pando, C.** 2019, HERMESv3, a stand-alone multi-scale atmospheric emission modelling framework - Part 1: global and regional module, *Geosci. Model Dev.*, 12, 1885-1907.

Xian P et al. 2019, 'Current State of the global operational aerosol multi-model ensemble: an update from the International Cooperative for Aerosol Prediction (ICAP)' Quarterly Journal of the Royal Meteorological Society, 145, (suppl 1), 176-209, Special Issue: Special Supplement on 25 Years of Ensemble Forecasting

ICREA MEMOIR 2019



Maria Petrova

Universitat Pompeu Fabra (UPF)

Social & Behavioural Sciences

Maria Petrova received PhD from Harvard University in 2008. She spent 2012 - 2013 as a Visiting Associate Research Scholar at the Center for the Study of Democratic Politics at Princeton University. In 2012-2013, she was Research Director at the Center for New Media and Society at the New Economic School, Russia. Her research interests include political economy, mass media economics, and Internet Economics. Maria has published in American Economic Review, Quarterly Journal of Economics, American Political Science Review, Proceedings of National Academy of Sciences, American Economic Journal: Applied Economics, Journal of Public Economics, Journal of Economic Behavior and Organization, among others. Since 2016, she is a member of the Editorial Board of the Review of Economic Studies and a Co-Editor of the Journal of Public Economics. Since 2019, she is the recipient of ERC Starting Grant.

Research interests

I am an applied microeconomist whose focus is information economics, political economy, and development. I seek to understand how information flows affect complex links between economic and political phenomena. Existing works traditionally underestimate the role of information provision in media for different aspects of development, and my research fills this gap. The main question that I address in my work is how information affects political, economic, and financial outcomes in different countries. My recent research is focused on the political economy of traditional and social media, and on causes of the growth and demise of populism and extremism.

Selected research activities

Since 2019, Maria Petrova is a recipient of ERC Starting Grant "The Rise and Fall of Populism and Extremism." During this year, she was also elected to become a member of the Council of the European Economic Association in 2019-2023. She continued to serve as a member of the Editorial Board of the Review of Economic Studies and a Co-Editor at the Journal of Public Economics.

In 2019, Maria gave a Keynote Address at the German Economic Association Meeting. She also presented at the Invited Session at the Annual Conference of European Economic Association in Manchester, BEROC conference in Minsk, and gave a talk at the University of Amsterdam. She also co-organized workshops on Economic Analysis of Electoral Politics and Political Institutions as a part of Barcelona GSE Summer Forum.

ICREA MEMOIR 2019



Petrović M

Institut Català de Recerca de l'Aigua (ICRA)

Experimental Sciences & Mathematics

ICREA Research Professor since December 2005. PhD in Chemistry (1995), Faculty of Chemical Engineering and Technology, University of Zagreb, Croatia. From 1999-2011 research scientist at the Department of Environmental Chemistry, Institute for Environmental Assessment and Water Studies (IDAEA-CSIC), Barcelona. Since July 2011 senior researcher at the Catalan Institute for Water Research (ICRA), Girona, Spain. At ICRA she is the head of Water Quality Area and responsible for the research line Contaminants in water treatment processes. She has participated in over 20 EU projects since 1999; published 210 papers in SCI journals (Hirsch Index 69); edited 8 books and published 36 book chapters. She was Highly Cited Researcher (ranked in the top 1% by citations) in 2018 in the field of Environment/Ecology and in 2019 in the cross-field according to Clarivate Analytics.

Research interests

My main expertise is in the field of analytical environmental chemistry, specifically analysis of trace organic contaminants, such as pharmaceuticals, endocrine disrupting compounds and surfactants by advanced mass spectrometric techniques (liquid chromatography-tandem and hybrid MS) and the study of their fate and behaviour in the aquatic environment and during wastewater and drinking water treatment. Specific research lines are: (i) suspect screening, non-target analysis and fingerprinting of organic substances in wastewater and receiving environment, (ii) the study of biotic and abiotic transformation of emerging contaminants, identification of transformation products, elucidation of transformation pathways; (iii) the study of occurrence and distribution of emerging contaminants in aquatic environment and environmental risk assessment and (iv) sustainable wastewater management; application of innovative wastewater treatment technologies; innovative practices for reuse of reclaimed waters.

Selected publications

- Mandaric L, Kalogianni E, Skoulikidis N, **Petrović M** & Sabater S 2019, 'Contamination patterns and attenuation of pharmaceuticals in a temporary Mediterranean river', *Science Of The Total Environment*, 647, 561 – 569.
- Pico Y, Belenguer V, Corcellas C, Diaz-Cruz MS, Eljarrat E, Farre M, Gago-Ferrero P, Huerta B, Navarro-Ortega A, **Petrović M**, Rodriguez-Mozaz S, Sabater L, Santin G & Barcelo D 2019, 'Contaminants of emerging concern in freshwater fish from four Spanish Rivers', *Science Of The Total Environment*, 659, 1186 – 1198.
- Gros M, Mas-Pla J, Boy-Roura M, Geli I, Domingo F & **Petrović M** 2019, 'Veterinary pharmaceuticals and antibiotics in manure and slurry and their fate in amended agricultural soils: Findings from an experimental field site (Baix Emporda, NE Catalonia)', *Science Of The Total Environment*, 654, 1337 – 1349.
- Farre JM, Jaen-Gil A, Hawkes J, **Petrović M** & Catalan N 2019, 'Orbitrap molecular fingerprint of dissolved organic matter in natural waters and its relationship with NDMA formation potential', *Science Of The Total Environment*, 670, 1019 – 1027.
- Gusmaroli L, Buttiglieri G & **Petrović M** 2019, 'The EU watch list compounds in the Ebro delta region: Assessment of sources, river transport, and seasonal variations', *Environmental Pollution*, 253, 606 – 615.
- Gros M, Marti E, Luis Balcazar JL, Boy-Roura M, Busquets A, Colon J, Sanchez-Melsio A, Lekunberri I, Borreg CM, Ponsa S & **Petrović M** 2019, 'Fate of pharmaceuticals and antibiotic resistance genes in a full-scale on-farm livestock waste treatment plant', *Journal Of Hazardous Materials*, 378, UNSP 120716.
- Čelić M, Gros M, Farré M, Barceló D & **Petrović M** 2019, Pharmaceuticals as chemical markers of wastewater contamination in the vulnerable area of the Ebro Delta (Spain), *Science of the Total Environment* 652, pp. 952-963

Selected research activities

Editor in chief **Trends in Environmental Analytical Chemistry** (Elsevier), impact factor 5,57 (2018) ranked 8/84 in the category Chemistry/Analytical

ICREA MEMOIR 2019



José Luis Peydró
 Universitat Pompeu Fabra (UPF)
 Social & Behavioural Sciences

Peydró is ICREA Research Professor at UPF and at Barcelona GSE, CREI Research Associate, CEPR Research Fellow, Bundesbank Research Professor, advisor of the Bank of Spain, consultant in several central banks and international organizations, and an independent board member at the Catalan Finance Institute (ICF). He has previously been Professor of Banking and Finance at Cass BS, economist at the ECB, member of the advisory scientific committee at the European Systemic Risk Board, and has held visiting positions at Banque de France, Becker Friedman Institute (U. Chicago), MIT-Sloan, IMF, and the World Bank. Peydró is recipient of an ERC Consolidator grant, an ECB Wim Duisenberg Research Fellowship, a senior Houblon-Norman and George Fellowship from the Bank of England, three MINECO grants and a Fundación BBVA grant. He has also received grants from MICINN (Ramón y Cajal fellowship -declined), the National Bank of Belgium, Bocconi University and the Czech National Bank.

Research interests

Peydró specializes in Finance and Macroeconomics, mainly on systemic risk, financial crises, endogenous risk, central bank policies, monetary and prudential policy, financial globalization, financial contagion, financial innovation, macroeconomics and credit markets, capital and liquidity. He is also working on the effects of financial distress on households' welfare. His research has been published in the top-5 journals in economics: *Econometrica* (lead article), *American Economic Review* and *Journal of Political Economy*, and in the top-3 journals on finance (*Review of Financial Studies*, *Journal of Finance*, and *Journal of Financial Economics*). He has also co-written the book *Systemic Risk, Crises and Macroprudential Policy* (MIT Press, 2015) and several book chapters such as in the Oxford Handbook of Banking (OUP, 2009) or in Finance and Investment: The European Case, (OUP, 2018).

Selected publications

- Morais B, **Peydró JL** & Ruiz C 2019, 'The International Bank Lending Channel of Monetary Policy Rates and Quantitative Easing: Credit Supply, Reach-for-Yield, and Real Effects', *Journal of Finance*, Vol. 74 (1) pp.55-90.
- Abuka C, Alinda R, Minoiu C, **Peydro JL** & Presbitero A 2019, 'Monetary policy and bank lending in developing countries: Loan applications, rates, and real effects', *Journal Of Development Economics*, 139, 185-202.

Selected research activities

- European Central Bank Wim Duisenberg Research Fellowship 2019.
- Ministry of Science, Innovation and Universities 2019 Grant on Long-term Effects of Financial Crises and Inequality.
- 2019 Keynote speeches at Banca d'Italia-ECB Research Workshop Macroprudential Policy: Effectiveness, Interactions and Spillovers (Rome), Knut Wicksell Conference on Financial Intermediation (Lund) and 10th European Banking Center Network Conference 'Banking, Financial Regulation, and Financial Stability' (Luxembourg).
- Co-organizer: CREI-UPF-Bank of Canada Conference on Recent Developments in Macroeconomic Modelling (Barcelona); Barcelona GSE Summer Forum: Workshop on Financial Intermediation and Risk and Workshop on Financial Shocks, Channels and Macro Outcomes (Barcelona), LSE-Imperial College 'Monetary Policy Low Rates and Banks' Workshop (London), Galatina Summer Finance Meetings (Galatina) and UPF Economics Departmental Seminar.
- Associate Editor at *SERIEs*, Journal of the Spanish Economic Association.
- Associate editor at the Consejo Editorial *Revista Estabilidad Financiera* (Bank of Spain).
- Associate editor, *Journal of Financial Stability*.
- Teaching: European Commission DG FISMA course 'Banks, Nonbanks, and Financial Policies'; Barcelona GSE Banking Summer School; graduate courses on banking and systemic risk at Barcelona GSE-UPF.

ICREA MEMOIR 2019



Jordi Poater

Universitat de Barcelona (UB)

Experimental Sciences & Mathematics

Born in 1977. I got my PhD in Chemistry in 2003 at the Universitat de Girona (UdG) with a thesis on the analysis of chemical bonding and aromaticity of organic systems with tools based on the electron-pair density. Next I moved to the Vrije Universiteit Amsterdam (VUA), with a Marie Curie postdoctoral fellowship, where I carried out research on the DNA replication mechanism by means of Kohn-Sham molecular orbital theory complemented with quantitative bond energy decomposition analyses. In 2008 I was awarded with a Ramón y Cajal tenure-track position at the Institute of Computational Chemistry and Catalysis of the UdG. Afterwards I was appointed Senior Associate Researcher at the Department of Theoretical Chemistry and Amsterdam Center for Multiscale Modeling of the VUA. I have published 130 scientific publications in peer-reviewed journals, which have received more than 4.500 citations. My H-Index is 36, and I appear as “Scientist” at the Essential Science Indicators.

Research interests

My research takes off from two main lines, which are interconnected and reinforce each other. First, the study of aromaticity in organic and metal systems, with tools derived from the electron-pair density, with the purpose of analyzing the electronic structure and molecular bonding in a wide range of molecular systems. Afterwards, I have become an expert in the application of Kohn-Sham molecular orbital theory complemented with quantitative bond energy decomposition analyses to biological issues. In particular, the study of the DNA replication mechanism has become my main research line. I have got closer to experiment by studying the selectivity in DNA replication mechanism taking into study the steric shape, hydrogen bonds, pi-stacking and solvent effects in DNA bases.

Selected publications

- Sun X, Soini TM, **Poater J**, Hamlin TA & Bickelhaupt FM 2019, ‘PyFrag 2019-Automating the Exploration and Analysis of Reaction Mechanisms’, *Journal Of Computational Chemistry*, 40, 25, 2227 – 2233.
- Bosmans V, **Poater J**, Hammink R, Tinnemans P, Bickelhaupt FM & Mecnovic J 2019, ‘Probing Through-Space Polar-pi Interactions in 2,6-Diarylphenols’, *Journal Of Organic Chemistry*, 84, 6, 3632 – 3637.
- Ramler J, **Poater J**, Hirsch F, Ritschel B, Fischer I, Bickelhaupt FM & Lichtenberg C 2019, ‘Carbon monoxide insertion at a heavy p-block element: unprecedented formation of a cationic bismuth carbamoyl.’, *Chemical Science*, 10, 15, 4169 – 4176.
- **Poater J** & Solà 2019, ‘Open-shell jellium aromaticity in metal clusters’, *Chemical Communications*, 55, 39, 5559 – 5562.
- Naksomboon K, **Poater J**, Bickelhaupt FM & Fernandez-Ibanez MA 2019, ‘para-Selective C-H Olefination of Aniline Derivatives via Pd/S,O-Ligand Catalysis.’, *Journal Of The American Chemical Society*, 141, 16, 6719 – 6725.
- Sun X, Rocha MVJ, Hamlin TA, **Poater J** & Bickelhaupt FM 2019, ‘Understanding the differences between iron and palladium in cross-coupling reactions’, *Physical Chemistry Chemical Physics*, 21, 19, 9651 – 9664.

Selected research activities

- Co-PI (garante) of María de Maeztu Grant to IQTCUB (2M€, 2018-2022).
- PI of MINECO research grant (2017-2019).
- Member of the evaluation panel of the top research centers of Galicia (Spain).
- Supervised 2 TFG undergraduate students.
- Delivered invited talks in Amsterdam (The Netherlands) and Lisbon (Portugal).
- Member of 3 PhD committees.
- Involved in dissemination activities for the International Year of the Periodic Table.

ICREA MEMOIR 2019



Albert Pol

Institut d'Investigacions Biomèdiques August Pi i Sunyer (IDIBAPS)
Life & Medical Sciences

In June 1993 I obtained my degree in Biology at the University of Barcelona (UB). I continued my studies in the Biochemistry Dept. and the Cell Biology Dept. of the Medical School (UB). In July 1998 I obtained my PhD and I moved to the laboratory of Prof RG Parton in the University of Queensland (Australia) as a NHMRC Research Officer. My professional independent research career started in 2002 when I was awarded a “Ramón y Cajal” grant from the Spanish Science and Technology Ministry. In November 2006 I obtained an I3 grant from the same ministry and in November 2007 I was incorporated as an ICREA Research Professor at the Cell Proliferation and Signalling team (IDIBAPS). In addition, I am Associated Professor in the Cell Biology Dept. of the Medical School (UB). Today I combine my research with teaching in biomedical sciences and in a PhD Programme for young investigators. www.celltraffichcn.cat/Home.html.

Research interests

The aim of our project is to characterize - in health and in disease - the cellular processes that are regulated or altered due to lipid accumulation within the cells. All prokaryote and eukaryote cells maintain the competence of accumulating lipids in organelles known as intracellular lipid droplets. In healthy cells, a small population of lipid droplets is present at all times, though these organelles become abundant in response to different physiopathological conditions such as obesity, diabetes, fatty liver, arteriosclerosis and even cancer. Recent advances in the cell biology of lipid droplets have shown that they are multifunctional organelles that are metabolically very active and thus constitute key elements in the complex exchange of lipids and proteins in constant movement within the cells. In this scenario, we are especially focused in the biological cost of the accumulation of cholesterol in organelles such as mitochondria and the role of caveolin in these fluxes.

ICREA MEMOIR 2019



Antonio Postigo

Institut d'Investigacions Biomèdiques August Pi i Sunyer (IDIBAPS)
Life & Medical Sciences

CURRENT POSITION:

- * ICREA Professor of Life and Medical Sciences. IDIBAPS (Barcelona)
- * Adjunct Visiting Professor, JG Brown Cancer Center, Univ. of Louisville School of Medicine (USA)

IMMEDIATE PREVIOUS POSITION:

- * Special Fellow & Instructor. Washington University School of Medicine (USA)

RESEARCH FUNDING:

* **Public Agencies:** European Commission / Ministry of Science, Innovation and Universities / Catalan Agency for University and Research Grants (AGAUR)

* **Private Foundations:** Leukemia Research Foundation / Duchenne Parent Project Association / AVON Breast Cancer Campaign / Spanish Association Against Cancer (AECC) / La Marató de TV3 Foundation / Olga Torres Foundation / La Caixa Foundation / Catalan Academy of Medical and Health Sciences

Research interests

Our group studies molecular mechanisms regulating cell plasticity in health and disease with a particular focus on transcriptional regulation. Ongoing projects investigate gene regulation in inflammation, cancer initiation and progression, stem cell determination and differentiation, and tissue injury and regeneration. We use a wide range of technical approaches that include conditional transgenic mice, ex vivo culture and manipulation of normal and malignant primary cells, differentiation of human embryonic stem cells, and high-throughput techniques (e.g., RNAseq, proteomics). As molecular models, we use the EMT transcription factors ZEB1 and ZEB2 that play key roles in the regulation of cell plasticity.

Selected publications

- Siles L, Ninfali C, Cortes M, Darling DS & **Postigo A*** 2019, 'ZEB1 protects skeletal muscle from damage and is required for its regeneration', *Nature Communications*. 10:1364. (*corresponding author). Impact Factor: 12.3
- de Barrios O, Sanchez-Moral L, Cortés M, Ninfali C, Profitós-Pelejà N, Martínez-Campanario MC, Siles L, del Campo R, Fernández-Aceñero MJ, Darling DS, Castells A, Maurel J, Salas A, Dean DC & **Postigo A*** 2019, 'ZEB1 promotes inflammation and progression towards inflammation-driven carcinoma through repression of the DNA repair glycosylase MPG in epithelial cells', *Gut*. 68:2129-41. (* corresponding author). Impact Factor: 17.9. Highlighted by the journal in a video Abstract

Selected research activities

1) Director of Ph.D. dissertations that were defended during 2019: 2

Lidia Sanchez Moral (Univ of Barcelona), awarded in November 2019

Chiara Ninfali (Univ of Barcelona), awarded in December 2019

2) Grant Evaluations for international agencies during 2019: 3

Independent Research Fund, Denmark

Swiss Science National Foundation, Switzerland

Institut National du Cancer, France

ICREA MEMOIR 2019



Pilar Prieto

Universitat Pompeu Fabra (UPF)

Humanities

Pilar Prieto is an ICREA Research Professor at the Department of Translation and Language Sciences at UPF (Universitat Pompeu Fabra), Barcelona, Catalunya. After obtaining her doctoral degree in Romance Linguistics at the University of Illinois at Urbana-Champaign, she worked as a postdoctoral fellow at Bell Laboratories (Murray Hill, New Jersey), where she continued working on the linguistic meaning of prosody across languages. Since 2008 she coordinates the “Prosodic Studies Group” at the Department of Translation and Language Sciences, Universitat Pompeu Fabra.

Research interests

My main research goal is to understand the role of prosody and co-speech gestures in human communication from a crosslinguistic, developmental, and cognitive perspective. Three important strands of this research include: (a) to incorporate this knowledge into semantic models of language that model the interface areas with other components; (b) to empirically investigate how humans process prosodic and gestural patterns in combination with speech; and (c) to investigate the cognitive and developmental benefits of prosody and gesture in different areas, such as first and second language acquisition, as well as communication training for language impaired and non-impaired populations. The social significance of this research topic is high, as ICT training procedures based on prosodic and gestural awareness can be proven valuable to improve language abilities in populations with neurodevelopmental disorders characterized by impaired social interaction.

Selected publications

- Baills F, Suárez N, González S & **Prieto P** 2019, ‘Observing and producing pitch gestures facilitates the learning....’, *Studies In Second Language Acquisition*, 41, 1, 33 - 58.
- Borràs-Comes J, Kiagia, E & **Prieto P** 2019, ‘Epistemic intonation and epistemic gesture are mutually co-expressive: Empirical results from two intonation-gesture matching tasks’, *Journal of Pragmatics*, 150, 39 - 52.
- Cravotta A, Busa MG & **Prieto P** 2019, ‘Effects of Encouraging the Use of Gestures on Speech’, *Journal of Speech Language And Hearing Research*, 62, 9, 3204 - 3219.
- Esteve-Gibert N, Igualada A & Prieto P 2019, “El gest com a facilitador i precursor del desenvolupament del llenguatge”, *Llengua, Societat i Comunicació*, 17.
- Hübscher I, Garufi L & **Prieto P** 2019, “The development of polite stance in preschoolers: how prosody, gesture and body cues pave the way”, *Journal of Child Language*, 46(5), 825-862.
- Hübscher I, Vincze L & **Prieto P** 2019, ‘Children’s Signaling of Their Uncertain Knowledge State: Prosody, Face, and Body Cues Come First’, *Language Learning And Development*, 15, 4, 366 - 389.
- Hübscher I & **Prieto P** 2019, ‘Gestural and Prosodic Development Act as Sister Systems and Jointly Pave the Way for, *Frontiers In Psychology*, 10, 1259.
- Van Maastricht L, Krahmer E, Swerts M & **Prieto P** 2019, “Learning direction matters: A study on L2 rhythm acquisition....”, *Studies in Second Language Acquisition*, 41, 1, 87 - 121.
- Vilà-Giménez I, Igualada A & **Prieto P** 2019, “Observing storytellers who use rhythmic beat gestures improves children’s narrative discourse performance”, *Developmental Psychology* 55(2), 250-262
- Yuan C, González S, Baills F & **Prieto P** 2019, “Observing pitch gestures favors the learning of Spanish intonation by Mandarin speakers”, *Studies in Second Language Acquisition*, 41, 1, 5 - 32.

ICREA MEMOIR 2019



Valerio Pruneri

Institut de Ciències Fotòniques (ICFO)
Engineering Sciences

Valerio Pruneri is Corning Inc. Chair leading the Optoelectronics group at the Institute of Photonic Sciences (ICFO). Previously he worked for Avanex, Corning, Pirelli, and the University of Southampton. He has given 70+ invited talk and is inventor of about 50 patents. He has taken part in 40+ technical or steering committees of international conferences. He serves on the QEOD board of the European Physical Society, the advisory board of ACREO AB Fiber Optic Centre, VLC Photonics and Qside. He was awarded the Philip Morris Prize, Pirelli Fellowship, IBM Faculty award, Paul Ehrenfest award, Corning Inc. Professorship and Duran Farell Prize for technological research. His work has led to numerous industrial collaborations (e.g. Corning Inc., Carl Zeiss and HP) and the creation of two spin offs, qside (2017) and sixsenso (to be launched 2020).

Research interests

Valerio Pruneri leads the Optoelectronics group (OptoGroup) at the Institute of Photonic Sciences (ICFO), which studies and develops new advanced materials, devices and systems for optical telecommunication, sensing and cybersecurity. In particular, the main driving is to carry out research which bridges academia and industry, by developing fundamental ideas which will have an impact on commercial products.

Selected publications

- Sibilo R, Perez JM, Hurth C & **Pruneri V** 2019, 'Surface cytometer for fluorescent detection and growth monitoring of bacteria over a large field-of-view', *Biomedical Optics Express*, 10, 4, 2101 - 2116.
- Maniyara RA, Rodrigo D, Yu R, Canet-Ferrer J, Ghosh DSR, Yongsunthon R, Baker DE, Rezikyan A, **Garcia de Abajo FJ & Pruneri V** 2019, 'Tunable plasmons in ultrathin metal films', *Nature Photonics*, 13, 5, 328.
- Rombaut J, Fernandez M, Mazumder P & **Pruneri V** 2019, 'Nanostructured Hybrid-Material Transparent Surface with Antireflection Properties and a Facile Fabrication Process', *Acs Omega*, 4, 22, 19840 - 19846.
- Gopalan KK, Rodrigo D, Paulillo B, Soni KK, & **Pruneri V** 2019, 'Ultrathin Yttria-stabilised zirconia as a flexible and stable substrate for infrared nano-optics', *Adv. Opt. Mater.* 1800966

Selected research activities

- Corning Inc. Professor and head of Corning Surface Laboratory at ICFO, renewed up to 2023
- 5 patent applications filed
- Coordinator of European Quantum Technology Flagship project CiViQ and FET project Q-MIC
- National representative at European Commission for Quantum Communication Infrastructure programme

ICREA MEMOIR 2019



Natasa Pržulj

Barcelona Supercomputing Center - Centro Nacional de Supercomputación (BSC - CNS)

Life & Medical Sciences

Prof. Natasa Przulj is an elected member of Academia Europaea-The Academy of Europe, The Serbian Royal Academy, and a Fellow of the British Computer Society. She is an ICREA Research Professor at Barcelona Supercomputing Center as of January 1st, 2019. In 2014, she was awarded the British Computer Society Roger Needham Award for a distinguished research contribution in computer science by a UK based researcher within ten years of their PhD. She received two prestigious European Research Council (ERC) grants, ERC Consolidator (2018-23) and ERC Starting (2012-17). She held a prestigious NSF CAREER Award. Her research has also been supported by other large governmental and industrial grants. She was previously a Full Professor (2016-2019) at UCL, Associate Professor (2012-2016) and Assistant Professor (2009-2012) at Imperial College London and an Assistant Prof. at Univ. of California-Irvine (2005-2009). She obtained a PhD in Computer Science from Univ. of Toronto in 2005.

Research interests

- Molecular and clinical data integration for precision medicine: patient stratification, biomarker discovery, drug re-purposing, drug discovery, disease re-classification
- Data analytics, modeling, fusion, dynamics, applied to clinical, molecular and biological data
- Algorithms for uncovering molecular mechanisms of disease from systems-level “omics” data
- Molecular networks: interactome evolution, dynamics, alignment, function prediction
- Large-scale economic data analysis, fusion and modeling the dynamics of economic systems
- Computational graph theory, algorithms, models

Selected publications

- Malod-Dognin N, Petschnigg J, Windels SFL, Povh J, Hemingway H, Ketteler R & **Pržulj N** 2019 ‘Towards a data-integrated cell’. *Nat Commun* **10**, 805.
- Malod-Dognin N, Windels S & **Pržulj N** 2019, ‘Machine Learning for Data Integration in Cancer Precision Medicine: Matrix Factorization Approaches’, in *Analyzing Network Data in Biology and Medicine: An interdisciplinary textbook for biological, medical and computational scientists*, Cambridge University Press.
- **Pržulj N** (ed) 2019, *Analyzing Network Data in Biology and Medicine: An Interdisciplinary Textbook for Biological, Medical and Computational Scientists*, Cambridge University Press
- Malod-Dognin N & **Pržulj N** 2019, ‘Functional geometry of protein interactomes’, *Bioinformatics*, Volume 35, Issue 19, 1 October 2019, Pages 3727-3734,
- Leal L, Kosir R & **Pržulj N**, ‘From Genetic Data to Medicine: from DNA samples to disease risk prediction in personalised genetic tests’, in *Analyzing Network Data in Biology and Medicine: An interdisciplinary textbook for biological, medical and computational scientists*. Cambridge University Press .
- Windels SFL, Malod-Dognin N & **Pržulj N** 2019, ‘Graphlet Laplacians for topology-function and topology-disease relationships’, *Bioinformatics*, 35, 24, 5226 – 5234.

Selected research activities

Grant: ERC CoG · 01/Apr/2018 – 01/Apr/2023 · Horizon 2020 · ‘Integrated Connectedness for a New Representation of Biology (ICON-BIO)’ · Role: Principal Investigator/Director · Total amount: 2.000.000€

ICREA MEMOIR 2019



Aurora Pujol

Institut d'Investigació Biomèdica de Bellvitge (IDIBELL)
Life & Medical Sciences

Dr Aurora Pujol received her MD from the Autonomous University of Barcelona in 1993 and her PhD in Cell and Molecular Biology from the University of Heidelberg/ German Cancer Research Center in 1998. She trained in Human Genetics with Prof JL Mandel at the IGBMC, Strasbourg, generating and characterizing mouse models for a rare neurometabolic disorder, adrenoleukodystrophy (X-ALD), combined with diagnostic activities as Medical Geneticist at the Louis Pasteur Hospital. In 2005, she became ICREA Professor and Director of the Neurometabolic Diseases Lab at IDIBELL. In 2017 she obtained the specialty in Clinical Genomics by the American Board ABMGG, at the NIH, USA. Her lab is a member of the Spanish Network of Rare Diseases CIBERER, and of the Undiagnosed Diseases International Network of NIH (UDNI), USA. Dr Pujol serves at the Neurobiology of Disease and J of Neuroscience Research Editorial Boards.

Research interests

Our mission is to improve disease management of rare brain disorders through precision medicine. This spans the whole spectrum from genomic diagnosis to disease-modifying treatments. A first research line revolves around adrenoleukodystrophy (ALD), made popular by the movie "Lorenzo's Oil". We are integrating multiomic approaches to gain insights into pathomechanisms and for drug target identification. These involve redox and metabolic homeostasis, mitochondria dynamics, proteostasis and cellular stress responses. Tailored preclinical tests have yielded four licensed patents, three phase II/III clinical trials, and two Orphan Drug Designations. A second research line applies clinical and functional genomics for diagnostics and gene discovery. We are identifying novel disease-causing genes and modeling disease using iPS-derived brain organoid cultures and zebrafish. Results are advancing scientific knowledge while serving the undiagnosed patient's community.

Selected publications

- Pant DC, (42 more coauthors) & **Pujol A** 2019, 'Loss of the sphingolipid desaturase DEGS1 causes hypomyelinating leukodystrophy', *Journal Of Clinical Investigation*, vol.129, no. 3, pp 1240-1256.
- Casanovas C, (16 more coauthors) & **Pujol A** 2019, "Biomarker Identification, Safety, and Efficacy of High-Dose Antioxidants for Adrenomyeloneuropathy: a Phase II Pilot Study", *Neurotherapeutics*, 16(4):1167-1182
- Casanovas C, Verdura E, Vélez V, Schlüter A, Pons-Escoda A, Homedes C, Ruiz M, Fourcade S, Launay N & **Pujol A** 2019, 'A novel mutation in the GFAP gene expands the phenotype of Alexander disease', *Journal Of Medical Genetics*, vol. 56, no. 12, pp 846-849.
- De la Casa-Fages B, (24 more coauthors), **Pujol A** & López de Munain A 2019, 'Parkinsonism and spastic paraplegia type 7: Expanding the spectrum of mitochondrial Parkinsonism', *Movement Disorders*, vol. 34, no. 10, pp 1547-1561.
- De la Casa-Fages B, (24 more coauthors), **Pujol A** & López de Munain A 2019, "Reply to: "Mitochondrial Parkinsonism due to SPG7/Paraplegin variants with secondary mtDNA depletion", *Movement Disorders*, vol. 34, no.12, pp. 1932-1933
- Rattay TW, (27 more coauthors), **Pujol A** & Schüle R 2019, 'FAHN/SPG35: a narrow phenotypic spectrum across disease classifications', *Brain*, vol. 142, no. 6, pp 1561-1572.
- Gu S; (14 more coauthors), **Pujol A** & Meng L 2019, 'Truncating variants in UBAP1 associated with childhood-onset nonsyndromic hereditary spastic paraplegia', *Human Mutation*, 2019 Nov 7. doi: 10.1002/humu.23950.

Selected research activities

- Late breaking news Award, 2019 Annual Symposium of the Society for the Study of Inborn Errors in Metabolism (SSIEM), 3 - 6 September, Rotterdam, The Netherlands.
- Albus Award, Grifols Scientific Awards, 2019.

ICREA MEMOIR 2019



Víctor F. Puntos

Institut Català de Nanociència i Nanotecnologia (ICN2) & Vall d'Hebron Institut de Recerca (VHIR)

Experimental Sciences & Mathematics

Born in Barcelona in 1970, Prof. Víctor Franco Puntos studied chemical engineering at the Louis Pasteur University (Strasbourg, France) and chemistry at the Autonomous University of Barcelona (Barcelona, Spain), graduating in 1994. He obtained his PhD in Physics at the University of Barcelona (1998), working on Giant Magnetoresistance in granular alloys. Then he spent more than 3 years in Berkeley (California, USA) as a postdoc, first in the group of Prof. Krishnan Kannan (National Center for Electron Microscopy, Lawrence Berkeley Laboratory) and then in the group of Prof. Paul Alivisatos (College of Chemistry, UC Berkeley). In 2003 he obtained a Ramón y Cajal Fellowship and worked in the Physics Dep. at the University of Barcelona. In 2005, he moves to the Catalan Institute of Nanotechnology (ICN - now ICN2) as ICREA Research Professor and creates the Inorganic Nanoparticles Group. Since December 2014 he holds a double affiliation ICN2 and VHIR.

Research interests

Prof. Víctor Puntos works on the synthesis, characterisation and applications of engineered inorganic nanoparticles (NPs). By controlling the size, structure and shape of the inorganic core, and manipulating the linking of organic molecules to the nanoparticle surface, the group aims to design nanoparticles that interact with a variety of systems (biological, medical, materials, etc.). This allows for the deliberate modification of these systems, or the use of NPs for witnessing and reporting things.

Selected publications

- Patarroyo J, Delgado JA, Merkoçi F, Genç A, Sauthier G, Llorca J, **Arbiol J**, Bastus NG, Godard C, Claver C & **Puntos V** 2019, "Hollow PdAg-CeO₂ heterodimer nanocrystals as highly structured heterogeneous catalysts", *Scientific Reports* 9 (1), 1-8.
- Lorenzo R, Sanchez-Purra M, Rodriguez-Quijada C, Leonardo BM, **Puntos V** & Hamad-Schifferli K 2019, 'Detection of resistance protein A (MxA) in paper-based immunoassays with surface enhanced Raman spectroscopy with AuAg nanoshells', *Nanoscale*, 11, 22, 10819 - 10827.
- Carvajal S, Perramon M, Oro D, Casals E, Fernandez-Varo G, Casals G, Parra M, Gonzalez de la Presa B, Ribera J, Pastor O, Morales-Ruiz M, **Puntos V** & Jimenez W 2019, 'Cerium oxide nanoparticles display antiprogenic effect in rats with non-alcoholic fatty liver disease', *Scientific Reports*, 9, 12848.
- Piella J, Gonzalez-Febles A, Patarroyo J, Arbiol J, Bastus NG & **Puntos V** 2019, 'Seeded-Growth Aqueous Synthesis of Colloidal-Stable Citrate-Stabilized Au/CeO₂ Hybrid Nanocrystals: Heterodimers, Core@Shell, and Clover- and Star-Like Structures', *Chemistry Of Materials*, 31, 19, 7922 - 7932.

Selected research activities

As a significant progress during 2019 combining new synthesized inorganic nanoparticles of cerium oxide and their application in the treatment of degenerative diseases, we have finished the preclinical work to treat Age-related Macular Degeneration, we are preparing the publication of the results, nanoparticles GMP production and protection of the intellectual property to start future phase I/II clinical trials.

ICREA MEMOIR 2019



Josep Quer

Universitat Pompeu Fabra (UPF)
Humanities

As ICREA Research Professor, I am member of the “Grup de Lingüística Formal” (GLiF) at the Department of Translation and Language Sciences (UPF) since January 2009 and head of the LSC Lab (Laboratori de llengua de signes catalana). In 2007-2008 I was professor and chair of Romance Linguistics at the University of Amsterdam and previously I was ICREA Research Professor at the Department of General Linguistics of the University of Barcelona (2002-2006). In that period I set up a new research project on the formal study of sign languages, both with a focus on the morphosyntax and semantics of Catalan Sign Language (LSC) and on crosslinguistic and crossmodal research. I led the research group that published the first comprehensive grammatical description of LSC. I obtained my PhD in Linguistics at Utrecht University in 1998 with a dissertation on the semantics of mood. I am co-editor of the journal *Sign Language & Linguistics*.

Research interests

Research into natural language can no longer ignore sign languages as manifestations of the same innate human faculty realized in a different perceptual-articulatory modality. As a formal linguist, my research has focused on the analysis of a range of phenomena (negation, agreement, quantification, etc.) that hinge on the interaction between different grammar components (morphosyntax, semantics, prosody) both in spoken and sign languages. The goal is to better understand the division of labour across different grammar modules.

Selected publications

- **Quer J** & Steinbach M 2019, ‘Handling Sign Language Data: The Impact of Modality’, *Frontiers In Psychology*, 10, 483.
- Ribera-Llonc E, Espinal MT & **Quer J** 2019, ‘The noun-verb distinction in Catalan Sign Language An exo-skeletal approach’, *Sign Language & Linguistics*, 22, 1, 1 - 43.
- **Quer J** 2019, ‘Delimiting reported discourse: cross-modal criteria’, *Linguistic Typology*, 23, 1, 221 - 228.
- **Quer J** 2019, ‘Reduplication revisited: verbal plurality and exhaustivity in the visual-gestural modality’, *Sensos-e VI* (1).
- Barberà G, Cedillo P, Frigola S, Gelpí C, **Quer J** & Sánchez Amat J 2019, ‘Sign languages as resilient endangered languages’, In Mònica Barriera & Carla Ferrerós (eds.), *Transmissions. Estudis sobre la transmissió lingüística*, 79-100. Vic: EUMO.

ICREA MEMOIR 2019



Romain Quidant

Institut de Ciències Fotòniques (ICFO)

Engineering Sciences

I received a PhD in Physics (2002) from the University of Dijon, in France. Right after defending my thesis, I joined ICFO as a postdoctoral researcher. This was the year of its creation and I was lucky enough to get actively involved into the early developments of the Institute. In 2006, I was appointed junior Professor (tenure-track) and group leader of the Plasmon NanoOptics group at ICFO. In 2009, I became tenure Professor both at ICFO and ICREA. While my core expertise is in fundamental nano-optics, I am very much interested in multidisciplinary research, interfacing physics with other disciplines of science, as well as in technology transfer. I am recipient of 4 ERC grants (StG2010, PoC2011, PoC2015 and CoG2015) and several international and national prizes (Fresnel2009, City of BCN2010, ICO2012, CAT2014, BS2017). Since 2019, I serve as the executive editor of ACSPhotonics (American Chemical Society).

Research interests

Our research focuses on nano-optics, at the interface between Photonics (the science of light) and Nanotechnology. We use the unique optical properties of nanostructures as an enabling toolbox to design solutions to scientific and technological challenges, in a wide set of disciplines, from fundamental physics to biotechnology and medicine. This makes our group highly multidisciplinary and involved in both basic and applied research. The most fundamental part of our work is mainly directed towards enhanced light/matter interaction and quantum physics. From a more applied viewpoint, our team investigates new strategies to control light and heat at the nanometer scale for biomedical applications, including lab-on-a-chip technology and targeted hyperthermia. We are also extensively involved in tech-transfer, with three technologies being incubated in the ICFO KTT Launch pad.

Selected publications

- de Miguel I, Prieto I, Alborno A, Sanz V, Weis C, Turon P & **Quidant R** 2019, 'Plasmon-Based Biofilm Inhibition on Surgical Implants', *Nano Letters*, 19, 4, 2524 - 2529.
- Conangla GP, Ricci F, Cuairan MT, Schell AW, Meyer N & **Quidant R** 2019, 'Optimal Feedback Cooling of a Charged Levitated Nanoparticle with Adaptive Control', *Physical Review Letters*, 122, 22, 223602.
- Berto P, Philippet L, Osmond J, Liu Chang F, Afridi A, Marques Montagut M, Agudo Molero B, Tessier G & **Quidant R** 2019, 'Tunable and free-form planar optics', *Nature Photonics*, 13, 9, 649 - +.
- Meyer N, de los Rios Sommer A, Mestres P, Gieseler J, Jain V, Novotny L & **Quidant R** 2019, 'Resolved-Sideband Cooling of a Levitated Nanoparticle in the Presence of Laser Phase Noise', *Physical Review Letters*, 123, 15, 153601.
- Ricci F, Cuairan MT, Conangla GP, Schell AW & **Quidant R** 2019, 'Accurate Mass Measurement of a Levitated Nanomechanical Resonator for Precision Force-Sensing', *Nano Letters*, 19, 10, 6711 - 6715.

ICREA MEMOIR 2019



Jelena Radjenović

Institut Català de Recerca de l'Aigua (ICRA)

Engineering Sciences

Graduated in Biochemical Engineering and Biotechnology from the University of Belgrade's Faculty of Technology and Metallurgy, Serbia, in 2004. PhD in Environmental Chemistry from the University of Barcelona in July 2009 with "cum laude" distinction. 2009-2014: Advanced Water Management Centre (AWMC), University of Queensland, Australia. November 2014-onwards: Catalan Institute for Water Research (ICRA), Girona, Spain. Awarded several prestigious fellowships: Queensland Early Career Smart Future Fellowship, Marie Curie International Incoming Fellowship, Ramon y Cajal fellowship. 2017-2022: ERC Starting Grant ELECTRON4WATER.

Research interests

I am an expert in chemical and electrochemical advanced (waste)water treatment, with a focus on the fate of chemical contaminants. My research aims to increase the efficiency and resilience of water treatment and reuse through the development of sustainable, energy-efficient and renewable energy-driven technologies. Over the last years, I have been investigating electrochemical treatment systems and surpassing their major limitation – low current efficiency – by integrating them with engineered, low-cost carbon nanostructured materials in a nanoelectrochemical system (NES). In addition, I am developing a hybrid nano-biotreatment based on accelerating the redox microbial reactions in anaerobic respiration by the addition of low-cost carbon nanomaterials. Electron shuttling by graphene derivatives drastically enhances the removal of pollutants and may improve the quality and quantity of the produced biogas, thus generating a positive energy balance.

Selected publications

- Velo-Gala I, Farre MJ, **Radjenovic J** & **Gernjak W** 2019, 'N-Nitrosodimethylamine (NDMA) Degradation by the Ultraviolet/Peroxodisulfate Process', *Environmental Science & Technology Letters*, 6, 2, 106 – 111.
- Sergienko N, Irtem E, Gutierrez O & **Radjenovic J** 2019, 'Electrochemical removal of sulfide on porous carbon-based flow-through electrodes.', *Journal Of Hazardous Materials*, 375, 19 – 25.

ICREA MEMOIR 2019



Ángel Raya

Centre de Medicina Regenerativa de Barcelona (CMRB)

Life & Medical Sciences

Ángel Raya is an ICREA Research Professor at the Center of Regenerative Medicine in Barcelona (CMRB). He obtained his MD in 1990 from the University of Valencia, Spain and a PhD degree from the same university in 1995 for studies carried out at the Department of Physiology and at the Department of Neurology, Mayo Clinic, Rochester, MN. He pursued postdoctoral training at the Instituto de Investigaciones Citológicas (currently, Centro de Investigación Príncipe Felipe) in Valencia, from 1995-2000. He then was a Research Associate (2000-2004) and a Senior Research Associate (2004-2006) in the Gene Expression Laboratory of the Salk Institute for Biological Studies, La Jolla, CA. He returned to Spain in 2006 and was the Scientific Coordinator at the CMRB until 2009, when he joined the Institute for Bioengineering of Catalonia (IBEC) as Group Leader of the Control of Stem Cell Potency group. In 2014 he was appointed Director at CMRB.

Research interests

Our research work aims to understand the tissue, cellular and molecular mechanisms that determine the regenerative response in certain species of vertebrates, as well as the genetic and epigenetic mechanisms that control cellular reprogramming. This phenomenon provides a link between the traditional study of epimorphic regeneration and the induced pluripotency strategies of regenerative medicine.

Selected publications

- Cai R et al. 2019, 'Enhancing glycolysis attenuates Parkinson's disease progression in models and clinical databases'. *J Clin Invest* 129: 4539-49.
- Calatayud C et al. 2019 'CRISPR/Cas9-mediated generation of a tyrosine hydroxylase reporter iPSC line for live imaging and isolation of dopaminergic neurons'. *Sci Rep* 9:6811.
- Carrió M et al. 2019, 'Reprogramming captures the genetic and tumorigenic properties of Neurofibromatosis Type 1 plexiform neurofibromas'. *Stem Cell Rep* 12: 411-26.
- Castaño J et al. 2019, 'GATA2 promotes hematopoietic development and represses cardiac differentiation of human mesoderm'. *Stem Cell Rep* 13:515-29.
- Cutrale F et al. 2019, 'Using enhanced number and brightness to measure protein oligomerization dynamics in live cells'. *Nat Protoc* 14: 616-38.
- di Domenico A et al. 2019, 'Patient-specific iPSC-derived astrocytes contribute to non-cell autonomous neurodegeneration in Parkinson's disease'. *Stem Cell Rep* 12: 213-29.
- Fernández-Santiago R et al. 2019, 'Whole-genome DNA hyper-methylation in iPSC-derived dopaminergic neurons from Parkinson's disease patients'. *Clin Epigenetics* 11:108.
- Garcia-Puig A et al. 2019, 'Proteomics analysis of extracellular matrix remodeling during zebrafish heart regeneration'. *Mol Cell Proteomics* 18:1745-55.
- Saludas L et al. 2019, 'Long-term engraftment of human cardiomyocytes combined with biodegradable microparticles induces heart repair'. *J Pharmacol Exp Ther* 370:761-71.
- Uroz M et al. 2019, 'Traction forces at the cytokinetic ring regulate cell division and polyploidy in the migrating zebrafish epicardium'. *Nat Mater* 18:1015-23.
- Valls-Margarit M et al. 2019, 'Engineered macroscale cardiac constructs elicit human myocardial tissue-like functionality'. *Stem Cell Rep* 13:207-20.

Selected research activities

Co-organizer

ESGCT Annual Congress, Barcelona, Nov

Invited speaker

Aga Khan/NOVA Symposium, Lisbon, Jun

CIBER-BBN Annual Conference, Tarragona, Oct

Jornada Anual FVEA, Valencia, Nov

Jornades d'Edició Genètica al IEC, Dec

ICREA MEMOIR 2019



Victoria Reyes-García

Universitat Autònoma de Barcelona (UAB)

Social & Behavioural Sciences

Victoria Reyes-García (PhD Anthropology, 2001, U. of Florida) is ICREA Research Professor at the Institut de Ciència i Tecnologia Ambientals (ICTA), Universitat Autònoma de Barcelona. Her research focuses on local ecological knowledge systems, including their benefits, drivers of change, and potential contributions to conservation and development. From 1999 to 2004 she lived among Tsimane' hunter-gatherers in the Amazon, where she has long-term research. Since 2006 she coordinates the Laboratory for the Analysis of Socio-Ecological Systems in a Global World (LASEG), which catalyses research on the dynamic relations people-environments. She has about 200 peer-reviewed articles and three edited books. In 2010 she received an ERC Starting Grant to study the adaptive nature of local knowledge using a cross-cultural approach and in 2017 she received an ERC Consolidator Grant to study the contribution of local knowledge to climate change research.

Research interests

My research encompasses the interdisciplinary study of dynamic relations among peoples, biota, and environments. I use a multidisciplinary perspective (working with ecologists, economists, psychologists, agronomists, archaeologists, and computer scientists) and empirical data to analyse 1) the effects of global change on rural societies, and 2) social responses to environmental issues. My research draws on the insights from the natural and behavioural sciences at multiple levels- from the views of villagers in developing nations to those of policy-makers in industrial nations. My current areas of research include 1) local indicators of climate change, 2) public participation in the documentation of local knowledge, 3) the adaptive nature of local environmental knowledge, 4) indigenous peoples and cultural change, and 5) local participation in biodiversity conservation.

Selected publications

- **Reyes-García V** & Benyei P 2019, 'Indigenous knowledge for conservation'. *Nature Sustainability*.2(8): 657-658.
- **Reyes-García V**, García-del-Amo D, Benyei P et al. 'A collaborative approach to bring insights from local observations of climate change impacts into global climate change research'. *Current Opinion in Environmental Sustainability*. 39: 1-8.
- **Reyes-García V**, Andres-Conejero O et al. 2019 'A Road to Conflict: Stakeholder's and Social Network Analysis of the Media Portrayals of a Social-Environmental Conflict in Bolivia', *Society & Natural Resources*, 32, 4, 452 - 472.
- Guadilla-Saez S, Pardo-de-Santayana M, **Reyes-García V** et al. 2019 'Biodiversity conservation effectiveness provided by a protection status in temperate forest commons of north Spain', *Forest Ecology & Management*, 433, 656 - 666.
- **Reyes-García V** et al 2019, 'Dietary transitions among three contemporary hunter-gatherers across the tropics', *Food Security*, 11, 1, 109 - 122.
- **Reyes-García V** et al. 2019, 'The contributions of Indigenous Peoples and local communities to ecological restoration', *Restoration Ecology*, 27(1): 3 - 8.
- **Reyes-García V** et al. 2019, 'Does Income Inequality Influence Subjective Wellbeing? Evidence from 21 Developing Countries', *Journal of Happiness Studies*, 20(4): 1197 - 1215.
- **Reyes-García V** & Fernandez-Llamazares A 2019, 'Sing to Learn: The Role of Songs in the Transmission of Indigenous Knowledge among the Tsimane' of Bolivian Amazonia', *Journal of Ethnobiology*, 39, 3, 460-477.
- **Reyes-García V** 2019, 'Did foragers enjoy more free time?' *Nature Human Behaviour*. 3. 772-773.

Selected research activities

Lead Author, Global Assessment of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)

Academic coordinator, Postgrau en Dinamització Local Agroecològica, UAB

Guarantor, ICTA's Maria de Maeztu Unit of Excellence

ICREA MEMOIR 2019



Marta Reynal-Querol
 Universitat Pompeu Fabra (UPF)
 Social & Behavioural Sciences

Marta Reynal-Querol is an ICREA Research Professor at the Department of Economics and Business at Universitat Pompeu Fabra (UPF) and Research Professor of the Barcelona GSE. She is also an Affiliated Professor at the BGSE, and Director of the Master in Economics at UPF. She is the Director of IPEG since December 2016. She is a Research Fellow at the CEPR, a Research Fellow at the CESifo and a Full Member at the EUDN. She is Fellow of the EEA. She was member of the Council of the European Economic Association (EEA) between 2011 and 2015. She is member of the Editorial Board of the Journal of Conflict Resolution. She won an ERC-Consolidator grant in 2014 and also an ERC-Starting grant obtained in the first call of the ERC. She won the Banco Herrero prize 2011 awarded annually to an Spanish Social Scientist under 40 years old. She worked at the World Bank between 2001 and 2005. She holds a Ph. D. in Economics from the LSE (2001) and a Master with Honors from UPF.

Research interests

My main research interest is the study of the causes and consequences of conflict. I analyzed the relationship between religious and ethnic fractionalization, polarization, and conflict and development. I have also worked on the effectiveness of foreign aid and on the relationship between poverty and civil war and on the study of the institutional designs that may prevent or mitigate, such social conflicts. In particular I construct a database on the characteristics of leaders over the 20th century and I investigated whether there are systematic differences in the type of leaders that can explain the economic development of countries. More recently I am using administrative data on the first colonizers of Latin America to reexamine the issue of institutions versus human capital in the explanation of economic development and conflict. Moreover I am starting a line of research on the analysis of Development and Conflict using Big Data. In particular I am working on the construction of new measures of inequality.

Selected publications

- Montalvo JG & **Reynal-Querol M** 2019, 'Earthquakes and terrorism: The long lasting effect of seismic shocks', *Journal Of Comparative Economics*, 47, 3, 541 - 561.

Selected research activities

Member of the IEA Executive Committee, since June 2017

Research Professor, Barcelona GSE, since December 2016;

Fellow of the EEA since 2015.

Research Fellow CEPR since 2012; Full Member EUDN (European Development Network) since 2012; Research Fellow CESifo, since 2013; Editorial Board, *Journal of Conflict Resolution*, March 2007-present.

ERC-Consolidator Grant (2015-2020)

PI of the Grant (Grant BFU2011-12345), Spanish Ministry of Economy and Competitiveness.

Co-organizer of the workshop "Political Economy of Development and Conflict"

Invited talk: Workshop "Social Diversity, Development and Stability: The Role of Context", Moscow; Workshop on Development Economics, Ramon Areces, Madrid,

Director of IPEG, since December 2016

Director of the Master in Economics (BarcelonaGSE-UPF), since September 2012

ICREA MEMOIR 2019



Paul Reynolds

Universitat de Barcelona (UB)

Humanities

At UCL studied for my BA (1980) and PhD (1991) (Settlement and Pottery of the Vinalopo Valley (Alicante), AD 400-700), which included a detailed review of ceramics and trade in W Mediterranean ports (published as BAR 588 & 604 in 1993, 1995). Have studied and published ceramics from excavations in Spain (Cartagena, Valencia), Roman Syria (Beirut, Homs, Basit, Zeugma), Albania (Butrint, Durrës), Greece (Athens, Corinth, Thesproteia, Nicopolis-Actium, Patras) and North Africa (Carthage, Utica, Leptis Magna). The book *Hispania and the Roman Mediterranean, AD 100-700: ceramics and trade* was published in 2010. Co-editor of the series *Roman and Late Antique Mediterranean Pottery*.

Research interests

The principal aim of my research is the study of the economy of the Classical and Late Antique Mediterranean, the lower Danube-Black Sea and Atlantic through the definition of regional ceramic typologies (forms and archaeometry) and the analysis of the regional distribution of ceramics in major ports. This focuses on the long-distance movement of local, regional and imported fine table-wares, amphorae & cooking wares. I am interested in all factors that contributed to the supply of goods: private, state, city, ecclesiastical & administrative structures.

Selected publications

- **Reynolds P** & Ikäheimo J 2019. 'Late Hellenistic and Roman Pottery from the Tower Deposits of Agios Donatos', in B. Forsén (ed.), *Thesprotia Expedition IV*, Papers and Monographs of the Finnish Institute at Athens 24, Helsinki: 317-386.
- Forsén B, Korhonen K & **Reynolds P** 2019, 'Brick Stamps and Graffiti from Agios Donatos', in B. Forsén (ed.), *Thesprotia Expedition IV. Region Transformed by Empire*, Papers and Monographs of the Finnish Institute at Athens 24, Helsinki 2019: 413-428.
- **Reynolds P** 2019, *Butrint 6. Excavations on the Vrina Plain Volume 3: Roman and late Antique pottery from the Vrina Plain excavations*. Oxford and Philadelphia (Oxbow Books)
- **Reynolds P**, Ripoll G, Michel D'Annoville C, Dugast F 2019, 'L'alimentation dans l'Antiquité tardive (IVe-VIIIe siècles): une introduction'. In Reynolds, P., Ripoll, G., Michel D'Annoville, C., Dugast, F. (eds.), *L'alimentation dans l'Antiquité tardive (IVe-VIIIe siècles)*, Antiquité Tardive 27, 2019, 15-23.
- **Reynolds P**, Ripoll G, Michel D'Annoville C & Dugast F (eds.), *L'alimentation dans l'Antiquité tardive (IVe-VIIIe siècles)*, Antiquité Tardive 27, 2019.

ICREA MEMOIR 2019



Lluís Ribas de Pouplana

Institut de Recerca Biomèdica de Barcelona (IRB Barcelona)
Life & Medical Sciences

Born in Girona. He studied Biology at the University of Barcelona, and Biochemistry at Edinburgh University, where he obtained a PhD in 1992 with the help of a fellowship from La Caixa/British Council. He then joined the Biology department of the Massachusetts Institute of Technology as a postdoc. In 1997 he moved to The Scripps Research Institute where he became assistant professor of Molecular Biology in 2001. In 2003 he joined ICREA, and became Principal Investigator at the Institute for Research in Biomedicine, where he heads the Laboratory of Gene Translation. He is the founder of two biotechnology companies and has acted as Chief Scientific Officer of Omnia Molecular SL. (2010-2015). In addition, Dr. Ribas serves as a scientific advisor to aTyr Ltd.

Research interests

Our laboratory investigates the process of protein synthesis, its evolution, and its connections to human health. We are preoccupied by two fundamental questions: what are the functional limits of the protein synthesis apparatus, and how is protein synthesis regulated and integrated within the context of the cell. We want to understand what defines the boundaries of the proteomes of species, and what specific adaptations allow certain organisms to fabricate proteins that are inaccessible to other species. In addition, we are studying protein synthesis in the mitochondria, with a particular emphasis on the mechanisms that coordinate mitochondrial protein synthesis to mitochondrial dynamics and cell cycle. How these biosynthetic routes are coordinated, and how are they synchronized with the cell cycle is unknown. We want to contribute to the resolution of this problem through the study of an essential mitochondrial protein that we discovered in the lab.

Selected publications

- Picchioni D, Antolin-Fontes A, Camacho N, Schmitz C, Pons-Pons A, Rodriguez-Escriba M, Machallekidou A, Nur Guler M, Siatra P, Carretero-Junquera M, Serrano A, Hovde SL, Knobel PA, Novoa EM, Sola-Vilarrubias M, Kaguni LS, Stracker TH & **Ribas de Pouplana L** 2019, 'Mitochondrial Protein Synthesis and mtDNA Levels Coordinated through an Aminoacyl-tRNA Synthetase Subunit', *Cell Reports*, 27, 1, 40 - +.
- Torres AG, Reina O, Stephan-Otto Attolini C & **Ribas de Pouplana L** 2019, 'Differential expression of human tRNA genes drives the abundance of tRNA-derived fragments', *Proceedings Of The National Academy Of Sciences Of The United States Of America*, 116, 17, 8451 - 8456.
- Yang P, Beltramo DM, **Ribas de Pouplana L**, Walter Soria N & Gabriel Torres A 2019, 'Loss of the tRNA(Lys)CUU encoding gene, Chr-11 tRNA-Lys-CUU, is not associated with Type 2 diabetes mellitus', *Biomarkers In Medicine*, 13, 4, 259 - 266.
- Roura Frigole H, Camacho N, Castellvi Coma M, Fernandez-Lozano C, Garcia-Lema J, Rafels-Ybern A, Canals A, Coll M & **Ribas de Pouplana L** 2019, 'tRNA deamination by ADAT requires substrate-specific recognition mechanisms and can be inhibited by tRFs', *Rna*, 25, 5, 607 - 619.

ICREA MEMOIR 2019



Jose Luis Riechmann

Centre de Recerca en Agrigenòmica (CRAG)

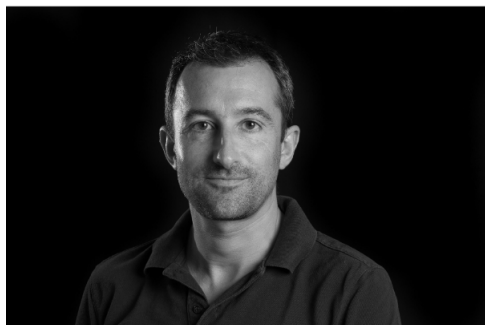
Life & Medical Sciences

Born in Madrid in 1964. Studied Biological Sciences at the Universidad Autónoma de Madrid (UAM, 1987), where he also obtained his PhD (1991; Molecular Biology and Biochemistry), in the field of plant molecular virology. Postdoctoral training in the laboratory of Dr. Elliot Meyerowitz, at the California Institute of Technology (Caltech), studying Arabidopsis flower development. Joined a start-up company in the field of plant functional genomics (Mendel Biotechnology, Hayward, CA), in 1998, studying Arabidopsis transcription factors. In 2002, joined Caltech as Director of the Millard and Muriel Jacobs Genetics and Genomics Laboratory, continuing studies on genome-wide analyses of gene expression, gene expression in Arabidopsis flower development, microRNAs, and microarray technology. Since 2007, ICREA Research Professor at the Center for Research in Agricultural Genomics (CRAG), Barcelona. Director of CRAG since 2013.

Research interests

Developmental processes in multicellular organisms are dependent on the cellular capacity for differential gene expression. That capacity is hardwired and encoded in the genome, in the form of cis-regulatory sequences that determine when, where, and how genes are expressed, of transcription factors and transcriptional co-regulators that act on those sequences, and of other types of regulatory proteins or RNAs. My research interest has focused on transcriptional regulation and development, using the plant Arabidopsis thaliana as a model system. This has included studies on the floral transition and flower development, genomic analyses of transcription factors, and global gene expression analyses, as well as an interest in genomic technologies. The current focus of the laboratory is the study at a global level of gene regulatory networks that control development in Arabidopsis, including proteomic approaches, and the characterization of the Arabidopsis peptidome.

ICREA MEMOIR 2019



Florent Rivals

Institut Català de Paleoeecologia Humana i Evolució Social (IPHES)
Humanities

I graduated in Biology at the University Paul Sabatier in Toulouse, and received my PhD in Prehistory from the University of Perpignan (France) in 2002. In 2004, I completed a postdoctoral research at the American Museum of Natural History and in 2005, I was awarded a postdoctoral fellowship from the Humboldt Foundation at the Universität Hamburg (Germany). I was appointed ICREA Junior Researcher (2007 to 2012) at the Institut Català de Paleoeecologia Humana i Evolució Social (IPHES) in Tarragona and since 2013, I am ICREA Research Professor at the same institution. I participate in several national and international projects, and I am principal investigator of the “NEANDERLIFE 2” project funded by the *Ministerio de Ciencia, Innovación y Universidades*. I am co-author of about 100 peer-reviewed articles in international journals.

Research interests

My primary research interest is in evolutionary paleoecology and the ecological context of evolution. The analysis of mammalian fauna from Plio-Pleistocene sites provides the framework for studying the evolution of hominins. My research focus on the impact of climate-driven environmental changes on hominins, and Neanderthals in particular. Examining mammal teeth, such as bison, deer, horse and mammoth, under a microscope and looking at the marks left by the food they ate (known as the last supper phenomenon), provides insight into the habitats they roamed just before they died. The changes in diet over thousands of years are used to reconstruct ancient environments, to track shifts related to climatic changes, and to understand hominin behavioral strategies in different ecological settings. Beyond Europe, my research is also recently focussing on the Near East (Israel), Africa (Tanzania, Etiopia and Morocco), and South America (Chile, Argentina, Brasil).

Selected publications

- Marín J, Rodríguez-Hidalgo A, Vallverdú J, Gómez de Soler B, **Rivals F**, Rabuñal JR, Pineda A, Chacón MG, Carbonell E & Saladié P 2019 ‘Neanderthal logistic mobility from a taphonomic perspective of Abric Romaní (Capellades, Spain)’, *Quaternary Science Reviews*, vol. 225, 106033.
- Pappa S, Schreve DC & **Rivals F** 2019, ‘The bear necessities: A new dental microwear database for the interpretation of palaeodiet in fossil Ursidae’, *Palaeogeography Palaeoclimatology Palaeoecology*, vol. 514, pp 168-188.
- Ramirez-Pedraza I, Tornero C, Pappa S, Talamo S, Salazar-Garcia DC, Blasco R, Rosell J & **Rivals F** 2019, ‘Microwear and isotopic analyses on cave bear remains from Toll Cave reveal both short-term and long-term dietary habits’, *Scientific Reports*, vol. 9, 5716.
- Sanz M, **Rivals F**, Garcia D & **Zilhao J** 2019, ‘Hunting strategy and seasonality in the last interglacial occupation of Cueva Antón (Murcia, Spain)’, *Archaeological and Anthropological Sciences*, vol. 11, pp 3577-3594.
- Sanchez-Hernandez C, Gourichon L, Pubert E, Rendu W, Montes R & **Rivals F** 2019, ‘Combined dental wear and cementum analyses in ungulates reveal the seasonality of Neanderthal occupations in Covalejos Cave (Northern Iberia)’, *Scientific Reports*, vol. 9, 14335.
- **Rivals F**, Semprebon GM & Lister AM 2019, ‘Feeding traits and dietary variation in Pleistocene proboscideans: a tooth microwear review’, *Quaternary Science Reviews*, vol. 219, pp 145-153.

Selected research activities

- Principal investigator of the research grant “Snapshots of Neanderthal lifestyles 2” funded by the *Ministerio de Ciencia, Innovación y Universidades* (2017-2020).
- Co-direction of the excavations at Toll and Teixoneres caves, Moià (Barcelona), Spain.
- Associate editor for *Frontiers in Ecology and Evolution*.
- Associate Professor at the Universitat Rovira i Virgili in the Erasmus Mundus Master in Quaternary and Prehistory.

ICREA MEMOIR 2019



Stephan Roche

Institut Català de Nanociència i Nanotecnologia (ICN2)
Engineering Sciences

ICREA Prof. Stephan Roche is working at the Catalan Institute of Nanosciences and Nanotechnology-ICN2 and BIST. He leads the “Theoretical and Computational Nanoscience” group which focuses on physics of Dirac materials (graphene & topological insulators) and 2D materials-based van der Waals heterostructures. He pioneered the development of linear scaling quantum transport approaches enabling simulations of billion atoms-scale disordered models. He studied Theoretical Physics at ENS and got PhD (1996) at Grenoble University (France); worked in Japan, Spain & Germany; was appointed as assistant Prof. in 2000, CEA Researcher in 2004 and joined ICREA in 2009. He received the Friedrich Wilhelm Bessel prize from the Alexander von Humboldt Foundation (Germany). Since 2013, he is the PI of ICN2 of the GRAPHENE FLAGSHIP, currently deputy leader of the Graphene Spintronics Workpackage.

Research interests

At ICN2, S. Roche and his group theoretically explore exotic quantum transport in Dirac Matter including graphene and topological insulators, and 2D materials-based van der Waals heterostructures. Main current interests include (i) quantum interferences and decoherence mechanisms in presence of electron-phonon coupling and spin-orbit interaction, (ii) spin dynamics and spin-torque phenomena in van der Waals heterostructures, (iii) spin Hall and quantum spin Hall effects, valley Hall effects in Dirac Matter (iv) thermal transport and thermoelectricity in two-dimensional materials (v) quantum devices simulation and (vi) quantum technologies (quantum computing and entanglement in many body physics).

Roche’s group has developed unrivalled quantum transport methodologies allowing the study of realistic models of disordered materials up to relevant technology and industrial scales (meaning with system sizes reaching up to billions of atoms scale). The final version of a landmark paper was posted at <https://arxiv.org/abs/1811.07387>

Selected publications

- Cummings AW, Dubois SMM, Charlier JC & **Roche S** 2019 ‘Universal Spin Diffusion Length in Polycrystalline Graphene’, *Nano Letters* 19, 7418-7426
- Safeer CK, Ingla-Aynes J, Herling F, Garcia JH, Vila M, Ontoso N, Reyes Calvo M, **Roche S**, Hueso LE & Casanova F 2019, ‘Room-Temperature Spin Hall Effect in Graphene/MoS₂ van der Waals Heterostructures’, *Nano Letters*, 19, 2, 1074 – 1082.
- Bertolazzi S, Bondavalli P, **Roche S**, San T, Choi SY, Colombo L, Bonaccorso F & Samori P 2019, ‘Non-volatile memories based on graphene and related two-dimensional materials’ *Advanced Materials* 31, 1806663.
- Vila M, Tuan Hung N, **Roche S** & Saito R 2019, ‘Tunable circular dichroism and valley polarization in the modified Haldane model’, *Phys. Rev. B* 99, 161404(R)
- Sevinçli H, **Roche S**, Cuniberti G, Brandbyge M, Gutierrez R & Medrano Sandonas L 2019, ‘Green function, quasi-classical Langevin and Kubo-Greenwood methods in quantum thermal transport’ *J. Phys.: Condens. Matter* 31 273003
- **Valenzuela SO & Roche S** 2019, ‘The phase diagram of 2D antiferromagnets’ *Nature Nanotechnology* 14 (12), 1088-1089
- Lopez-Bezanilla A, Cresti A, Biel B, Charlier JC & **Roche S** 2019, ‘Quantum transport in graphene nanoribbons in the presence of disorder’, *Graphene Nanoribbons*, Editors Luis Brey, Pierre Seneor and Antonio Tejeda (IoP science).

Selected research activities

Editor in Chief of J. Phys. Materials (Institute of Physics)

Visiting Professor of National University of Singapore (July-September 2019), working at Center for Advanced 2D Materials

PI of two H2020 projects launched in 2019 on (i) ‘Ultra low-power integrated optical sensor systems for networked environmental multichannel gas Sensing’ (ii) ‘Dissipationless topological channels for information transfer and quantum metrology’

PI of a Competitive Research Grant (CRG) funded by KAUST- King Abdullah University of Science and Technology (South Arabia) on ‘Next Generation UltraLow Power Spin-Orbit Memories’

ICREA MEMOIR 2019



Xavier Rodó

Institut de Salut Global Barcelona (ISGlobal)

Experimental Sciences & Mathematics

Head of the CLIMA (Climate & Health Program at ISGlobal, ORCID ID: 0000-0003-4843-6180). Founding director of the IC3 climate institute and former head of the LRC-PCB. MSc in engineering, completed his PhD in 1997 (UB) on the simulation of extreme ecosystems under climate forcing. Visiting fellow at Princeton and UCSD, and COLA-IGES associated scientist. Background in numerical ecology, climate dynamics and climate impact modeling. Taught ecology, advanced statistics, climate dynamics and sustainability and led/participated in 46 research projects. Over 20 postdoc fellows. Co-chair of CLIVAR-Spain (-2007), SSC of the MEDCLIVAR-ESF, CA and ER of the AR4-WGII and AR6 (IPCC2007, 2021). SCM of the Drought Integration Group (DIG) of the World Climate Research Program (WCRP) and of the ISIMIP Health Impact Models for IPCC AR6. Board Member, Nature Sci. Reports 'Earth & Environmental Sciences' and of the OPCC to monitor climate change in the Pyrenees.

Research interests

The interplay between climate and health, where I attempt to uncover how climate impacts a wide range of diseases. I also work on climate dynamics, particularly the origin and predictability of El Niño and towards improving translational climate services for health, in particular for extremes. I am interested in the development of new statistical techniques and on improving computational models with different levels of complexity. The former to disentangle the interplay between intrinsic (e.g. immunity, demography, malnutrition) and extrinsic factors (e.g. climate, environment). For instance, the modeling of climate-driven infectious diseases (from waterborne, to foodborne, vectorborne and airborne diseases), both in endemic regions and in epidemic conditions (e.g. fringe areas of deserts and highlands in Africa and Asia). An emerging area of my research entails understanding the interaction between climate, pollution and the aerial microbiome for their effects on human health.

Selected publications

- Ballester J, Robine JM, Herrmann FR & **Rodó X** 2019, "Effect of the Great Recession on regional mortality trends in Europe", *Nature Communications*, 10(1):679.
- Petrova D, Ballester J, Koopman SJ & **Rodó X** 2019, "Multi-year statistical prediction of ENSO enhanced by the Tropical Pacific Observing System", *J. Climate* 33(1)
- Varo R, **Rodó X** & **Bassat Q** 2019, "Climate change, cyclones and cholera - Implications for travel medicine and infectious diseases", *Travel Medicine and Infectious Disease*, 9:6-7.
- Johansson MA et al. 2019, "An open challenge to advance probabilistic forecasting for dengue epidemics", *Proc. Nat. Acad. Sci USA*, 116(48):24268-24274.
- Petrova D, Lowe R, Stewart-Ibarra A, Ballester J, Koopman SJ & **Rodó X** 2019, "Sensitivity of large dengue epidemics in Ecuador to long-lead predictions of El Niño", *Clim. Serv.*, 15:100096.

Selected research activities

- ARBOCAT.CAT Model platform for the prevention of arboviral outbreaks.
- New AIRLAB airborne research laboratory at ISGlobal.
- MoU between the CLIMA ISGlobal Programa and the Dep. Applied Mathematics (UB),
- External Reviewer IPCC AR6 WGII 2021.
- WMO & WHO Expert (2019).
- Invited Editor for PLoS Neglected Tropical Diseases. Reviewer for J. Climate, Int. J. Clim., PLoS Negl. Trop. Dis., J. Med. Entomol., J. Geophys. Res., Clim. Services.
- Jury Member Premis Ciutat de Barcelona 2019. Earth & Environmental Sciences.
- Fundació Catalunya-Europa. Scientific Advisory Member.
- Panel Committee Member, ANR France, SEC-35 Environment and Epidemiology of Infectious Diseases.
- Climate Change Challenge UB-Aj. BCN. Scientific Advisor and Hackathon Panel Evaluation Member.
- Five other publications in intl. journals. Over 20 invited lectures and keynote speaker presentations, 2 MSc theses.

ICREA MEMOIR 2019



Antoni Rodríguez-Fornells

Universitat de Barcelona (UB) & Institut d'Investigació Biomèdica de Bellvitge (IDIBELL)

Social & Behavioural Sciences

I got my PhD at the University of Barcelona (UB, 1996) about individual differences in impulsiveness. Afterwards, I worked at the University of Magdeburg (Germany, 1999-2002) as a post-doctoral researcher. My main topics of research were bilingual language processing, executive functions and the brain correlates of error monitoring. In 2002, I got a "Ramón y Cajal" research position from the Spanish Government and afterwards I joined ICREA as a Research Professor. Since then, I have created a interdisciplinary research group (Cognition and Brain Plasticity Unit, CDBU), at ICREA-IDIBELL-UB devoted to the study of learning process and brain plasticity effects in healthy and brain damaged patients. The group is located at the Hospital of Bellvitge – IDIBELL biomedical institute. Our research is inherently interdisciplinary and requires expertise in interfacing research fields as brain plasticity, brain development and learning and memory mechanisms.

Research interests

My recent interests have been on the cognitive neuroscience of language learning and error monitoring. I have tried to combine the use of different neuroimaging techniques (electrophysiological – magnetic resonance imaging), crucial to better understand human cognitive functions. Recently, my research has been focused on t/he investigation of the neural mechanisms involved when adults and infants learn a new language (an specially its interface with executive functions and the reward system). This approach has been recently applied to understand the preserved learning mechanisms in aphasic people. We recently explored the inherent relationship between brain structure and brain function (to which extent individual differences in white-matter connectivity constraint cognitive processing). Finally, we have focused on the possible neurorehabilitation effects of learning specific skills (music training) in stroke patients.

Selected publications

- Ferreri L, Mas-Herrero E, Zatorre RJ, Ripolles P, Gomez-Andres A, Alicart H, Olive G, Marco-Pallares J, Antonijoan RM, Valle M, Riba J & **Rodríguez-Fornells A** 2019, 'Dopamine modulates the reward experiences elicited by music', *Proceedings Of The National Academy Of Sciences Of The United States Of America*, 116, 9, 3793 – 3798.
- Francois C, Ripolles P, Ferreri L, Muchart J, Sierpowska J, Fons C, Sole J, Rebollo M, Zatorre RJ, Garcia-Alix A, Bosch L, **Rodríguez-Fornells A** 2019, 'Right Structural and Functional Reorganization in Four-Year-Old Children with Perinatal Arterial Ischemic Stroke Predict Language Production', *Eneuro*, 6, 4, UNSP ENEURO.0447-18.2019.
- Sierpowska J, Gabarros A, Fernandez-Coello A, Camins A, Castaner S, Juncadella M, Francois C & **Rodríguez-Fornells A** 2019, 'White-matter pathways and semantic processing: intrasurgical and lesion-symptom mapping evidence', *Neuroimage-clinical*, 22, UNSP 101704.
- Sihvonen A, Särkämö T, **Rodríguez-Fornells A**, Ripollés P, Münte TF & Soinila S. 2019 'Neural architectures of music – insights from acquired amusia'. *Neuroscience and Biobehavioral Reviews*, 107, 104 – 114.
- Gomez-Andres A, Grau-Sanchez J, Duarte E, **Rodríguez-Fornells A** & Tajadura-Jimenez A 2019, 'Enriching footsteps sounds in gait rehabilitation in chronic stroke patients: a pilot study', *Annals Of The New York Academy Of Sciences*, .
- Elmer S, Haenggi J, Vaquero L, Olive Cadena G, Francois C & **Rodríguez-Fornells A** 2019, 'Tracking the microstructural properties of the main white matter pathways underlying speech processing in simultaneous interpreters', *Neuroimage*, 191, 518 – 528.

Selected research activities

- Visitant Research Scholar (1 year) at the Dept. Neuroscience, Zuckerman Institute. Columbia University.

ICREA MEMOIR 2019



Angel R. Nebreda

Institut de Recerca Biomèdica de Barcelona (IRB Barcelona)
Life & Medical Sciences

Angel R. Nebreda obtained his PhD in Molecular Biology from the University of Salamanca (Spain) and then worked as a postdoc at the National Institutes of Health in Bethesda (USA) and the Cancer Research-UK Clare Hall Laboratories in South Mimms (UK). In 1995, he started his own group at the European Molecular Biology Laboratory in Heidelberg (Germany) where he worked for 9 years and then moved to the newly created Centro Nacional de Investigaciones Oncológicas in Madrid. He is currently an ICREA Research Professor at the Institute for Research in Biomedicine in Barcelona, where he leads a multidisciplinary team with expertise in biochemistry and molecular and cellular biology techniques as well as in genetically modified mice and preclinical cancer models. He was elected EMBO member in 2003 and has obtained ERC Advanced and Proof of Concept grants.

Research interests

We investigate mechanisms that allow cells to interpret stress signals and elaborate the appropriate responses. Our work focuses on signal integration by p38 MAPKs, addressing physiological functions and their roles in tumorigenesis. Current interests of the group include cancer cell homeostasis and chemoresistance mechanisms, the cross talk between cancer cells and stromal cells, and targeted therapies. We use a combination of biochemical approaches and studies with both cell lines and primary cell cultures, as well as in vivo experiments using genetically modified mice, which allow the regulation of p38 MAPK signaling in a tissue-specific manner. We are very interested in the identification of therapeutic opportunities based on the modulation of p38 MAPK activity using chemical compounds. Moreover, we study the regulation and functions of the RINGO proteins, a family of atypical activators of the cell cycle kinases Cdk1 and Cdk2.

Selected publications

- Batlle R, Andres E, Gonzalez L, Llonch E, Igea A, Gutierrez-Prat N, Berenguer-Llargo A & **Nebreda AR** 2019, 'Regulation of tumor angiogenesis and mesenchymal-endothelial transition by p38alpha through TGF-beta and JNK signaling', *Nature Communications*, 10, 3071.
- Slobodnyuk K, Radic N, Ivanova S, Llado A, Trempolec N, Zorzano A & **Nebreda AR** 2019, 'Autophagy-induced senescence is regulated by p38alpha signaling', *Cell Death & Disease*, 10, 376.
- Navarrete M, Cuartero MI, Palenzuela R, Draffin JE, Konomi A, Serra I, Colie S, Castano-Castano S, Hasan MT, **Nebreda AR** & Esteban JA, Jose A 2019, 'Astrocytic p38alpha MAPK drives NMDA receptor-dependent long-term depression and modulates long-term memory', *Nature Communications*, 10, 2968.
- Martin-Segura A, Casadome-Perales A, Fazzari P, Mas JM, Artigas L, Valls R, **Nebreda AR** & Dotti CG 2019, 'Aging Increases Hippocampal DUSP2 by a Membrane Cholesterol Loss-Mediated RTK/p38MAPK Activation Mechanism', *Frontiers In Neurology*, 10, 675.
- Moreno-Cugnon L, Revuelta M, Arrizabalaga O, Colie S, Moreno-Valladares M, Jimenez-Blasco D, Gil-Bea F, Llarena I, Bolaños JP, **Nebreda AR** & Matheu A 2019, 'Neuronal p38alpha mediates age-associated neural stem cell exhaustion and cognitive decline', *Aging Cell* 18, e13044
- Eftekharzadeh B, Banduseela VC, Chiesa G, Martínez-Cristóbal P, Rauch JN, Schwarz DMC, Shao H, Marin-Argany M, Di Sanza C, Giorgetti E, Yu Z, Pieratelli R, Felli IC, Brun-Heath I, García J, **Nebreda AR**, Gestwicki JE, Lieberman AP & Salvatella X 2019, 'Hsp70 and Hsp40 inhibit an inter-domain interaction necessary for transcriptional activity in the androgen receptor', *Nature Communications* 10, 3562.

ICREA MEMOIR 2019



César R. Ranero

Institut de Ciències del Mar (CSIC - ICM)

Experimental Sciences & Mathematics

My Dr. degree was awarded (1993) by Barcelona University for work at the Earth Sciences Institute (CSIC). After a postdoc (93-99) and tenure (2000) at GEOMAR, I joined ICREA in 2005 to work at the Marine Sciences Institute (CSIC). I have >120 peer-reviewed articles, with > 100 within the SCI with >4800 citations coming from > 2600 articles and h-index = 40. I have >500 contributions to international congresses and delivered >55 invited talks and seminars at European/American/Japan universities, research centers, and congresses/workshops. I have been organizer, convener, or program committee member of >30 international scientific meetings. I have been PI or CO-PI of over a dozen projects that included ship cruises. I have supervised the work of more than 20 graduated and postdoctoral researchers. Since 2007 I coordinate the Barcelona Center for Subsurface Imaging (<http://www.barcelona-csi.cmima.csic.es>) with 20-25 scientists.

Research interests

I study subduction systems, continental rifting, and seafloor spreading. For this end, I regularly lead international scientific teams in experiments to acquire the best possible observations. I work on analysis and processing to obtain robust data sets, and use state-of-the-art imaging techniques. I also work with multibeam bathymetry of seafloor maps. My goal is to interpret seismic observables integrated with other geophysical and geological information to advance conceptually in the understanding of active systems. I study tectonic and magmatic processes at oceanic spreading centers and the rift architecture of continental margins. I also study tectonic processes at convergent plate boundaries, where my interest has been centered on the relations between long-term tectonics, seismogenesis, and fluids in the incoming oceanic and overriding plates. I am particularly interested on the processes that govern the behaviour of earthquakes at subduction zones.

Selected publications

- Sallares V & **Ranero CR** 2019, 'Upper-plate rigidity determines depth-varying rupture behaviour of megathrust earthquakes', *Nature*, 576, 7785, 96-101.
- Gracia E, Grevenmeyer I, Bartolome R, Perea H, Martinez-Loriente S, Gomez de la Pena L, Villasenor A, Klinger Y, Lo Iacono C, Diez S, Calahorrano A, Camafort M, Costa S, d'Acremont E, Rabaute A & **Ranero CR** 2019, 'Earthquake crisis unveils the growth of an incipient continental fault system', *Nature Communications*, 10, 3482.
- Melendez A, Jimenez CE, Sallares V & **Ranero CR** 2019, 'Anisotropic P-wave travel-time tomography implementing Thomsen's weak approximation in TOMO3D', *Solid Earth*, 10, 6, 1857 - 1876.
- Gras C, Dagnino D, Jimenez-Tejero CE, Melendez A, Sallares V & **Ranero CR** 2019, 'Full-waveform inversion of short-offset, band-limited seismic data in the Alboran Basin (SE Iberia)', *Solid Earth*, 10, 6, 1833 - 1855.

Selected research activities

The significance of deformation and hydration of incoming plates at subduction trenches. **EGU General Assembly**. Vienna, Austria. 4 April 2019. Invited

The significance of deformation and hydration of incoming plates at subduction trenches. **Goldschmidt**. Barcelona, Spain. 21 August 2019. Invited

ICREA MEMOIR 2019



Antoni Rosell-Melé

Institut de Ciència i Tecnologia Ambientals - UAB ()
Experimental Sciences & Mathematics

I trained as an analytical chemist at the Chemical Institute of Sarrià (IQS), in Barcelona, and subsequently as an environmental chemist at CSIC under the supervision of J. Grimalt and J. Albaigés. I moved to England in 1990 to earn a PhD in the School of Chemistry at the University of Bristol (completed in 1994), in the group of G. Eglinton, on the application of biomarkers to decipher natural causes of climate change. This has become the central topic of my research career. In 1994 I joined the group of J. Maxwell as a post-doctoral researcher also in the School of Chemistry of Bristol to develop the use of fossil chlorophylls as climatic proxies. In 1996 I was awarded a NERC fellowship at the Department of Fossil Fuels and Environmental Geochemistry at the University of Newcastle, England. In 1999 I became a lecturer in the department of Geography at Durham University, England. In 2001, I joined the UAB and ICTA as an ICREA Research Professor.

Research interests

The main focus of my work is the study of the natural variability of the Earth's climate. My research tools are organic geochemical techniques, which allow the quantitative reconstruction of past climates. My work develops in three main areas i) the development of novel biomarker methods of climate reconstruction; ii) their application to reconstruct the dynamics and role of the ocean on climate over the last 5 million years; and iii) the use of such information to validate and constrain the sensitivity of climate models. I am also involved in the study of the impacts of anthropogenic activities in natural environments. I apply an environmental forensics approach to study the origin and fate of organic pollutants in remote environments, like the deep sea or the Amazonian rainforests. A third area of research is the study of organic matter in an archaeological context, mainly to reconstruct palaeodiets of ancient cultures and the use or function of archaeological artifacts

Selected publications

- Andres, P, **Rosell-Melé A**, Colomer-Ventura F, Deneff K, Cotrufo MF, Riba M & Alcaniz JM 2019, 'Belowground biota responses to maize biochar addition to the soil of a Mediterranean vineyard', *Science Of The Total Environment*, 660, 1522 - 1532.
- Tarifa-Mateo N, Clop-García X, **Rosell-Melé A**, Camalich-Massieu MD, Comes-Bordas P, Martín-Socas D, Nonza-Micaelli A & Rodríguez-Santos FJ 2019, 'New insights from Neolithic pottery analyses reveal subsistence practices and pottery use in early farmers from Cueva de El Toro (Málaga, Spain)' *Archaeological and Anthropological Sciences*, 11, 10, 5199 - 5211.
- Łacka M, Cao M, **Rosell-Melé A**, Pawłowska J, Kucharska M, Forwick M & Zajączkowski M 2019, 'Postglacial paleoceanography of the western Barents Sea: implications for alkenone-based sea surface temperatures and primary productivity', *Quaternary Science Reviews*, 224, UNSP 105973.
- Cartró-Sabaté M, Mayor P, Orta-Martínez M & **Rosell-Melé A** 2019, 'Anthropogenic lead in Amazonian wildlife', *Nature Sustainability* 2, 702-709. doi:10.1038/s41893-019-0338-7

Selected research activities

Advanced Grant, European Research Council:

- "New geochemical approach to reconstruct tropical palaeo-atmospheric dynamics (PALADYN)".

Plenary Address:

- 29th International Meeting on Organic Geochemistry, September 2019, Sweden. "Global drivers of marine organic matter to deep sea sediments", Raja M. & Rosell-Melé A.

PhD thesis supervised, defended:

- Nadia Tarifa, "Pottery use on the Mediterranean coast of the Iberian Peninsula during the Neolithic period (5400-3900 cal BC)", Universitat Autònoma de Barcelona. Co-supervisor: M. Saña.
- Raúl Yusta, "Water and soil pollution due to oil extraction activities in the north Peruvian Amazon", Universitat Autònoma de Barcelona. Co-supervisor: M. Orta.
- Adrià Breu, "Earliest pottery uses in north-eastern Iberia", Universitat Autònoma de Barcelona. Co-supervisor: M. Molist, A. Gómez.
- Maria Raja, "Global Assessment of marine paleoproductivity proxies", Universitat Autònoma de Barcelona.

ICREA MEMOIR 2019



Joan Rosell-Llompart
 Universitat Rovira i Virgili (URV)
 Engineering Sciences

He graduated in physics in 1987 from Universitat Autònoma de Barcelona. Before and during his PhD (Yale University, 1994), he worked with Prof. J. Fernández de la Mora on aerodynamic focusing, inertial impaction, electrospray atomization, and differential mobility analysis. As postdoc associate with Prof. John B. Fenn at Virginia Commonwealth University, he did research on electrospray ionization mass spectrometry. In 1996 he joined Aradigm Corporation (California, USA) to develop liquid micro-jet technology for inhalation drug delivery. There, he co-discovered, with Prof. A. Gañán-Calvo (Universidad de Sevilla, Spain), the “flow blurring” fine liquid atomization regime. Since joining Universitat Rovira i Virgili (URV) in 2004 as ICREA Research Professor, his research has focused on electrospray and electrospinning for the manufacturing of nanomaterials. He leads the Droplets, intErfaces, and floWs (DEW) research lab at URV.

Research interests

My research focuses on the use of fluid mechanics for transforming liquid structures to solid ones (e.g., droplets to particles) and on their assembly to make nanomaterials for niche applications in catalysis, drug delivery, tissue engineering, and energy harvesting. Central to our work is the use of electrostatic charging to deform the liquid-gas interface until it ejects a tiny jet of the desired dimension. By experiment and computer modeling, we aim to (i) understand the precise mechanisms underlying the processes involved, (ii) devise new microfluidic strategies to create functional structures (e.g., ‘smart’ particles for nanobiomedicine), (iii) characterize the properties of such structures, (iv) engineer ways to assemble them into larger functional supra-structures, e.g. high resolution 3D printing for assembling nanofibers into scaffolds for growing cells and tissues, and (v) develop strategies to demonstrate how these processes could be scaled up industrially.

Selected publications

– Sochorakis N, Grifoll J & **Rosell-Llompart J** 2019, ‘Scaling up of extractor-free electrosprays in linear arrays’, *Chemical Engineering Science*, vol. 195, pp 281-298.

Selected research activities

Journal of Aerosol Science, member of the Editorial Board.

Oral presentations:

“Electrosprays for the Production of Nanoparticles” [invited talk] 2nd Symposium of the European Electrohydrodynamic Atomization Group (Universidad de Málaga, Málaga, SPAIN, February 14)

“Charge Reduced Electrospray Plumes for the Production of Nanoparticles” [Oral O5_F3_T04] EAC-2019 (European Aerosol Conference 2019), Gothenburg (SWEDEN), August 25-30, 2019. (with N. Sochorakis, J. Grifoll, E. Bodnár, A. Carrasco-Munoz, E. Barbero-Colmenar)

Poster contributions at Nano&Bio&Med2019 International Conference, Barcelona (SPAIN), November 19-21, 2019: “Mechanical properties of aligned PCL nanofibers made by electrospinning” (with R. Akdemir, H. Ermis, S. de la Flor López); “Curcumin-loaded PVP particles produced by electrospray” (with E. Barbero, A. J. Carrasco-Muñoz, E. Bodnár, J. Grifoll)

Two patent applications submitted.

ICREA MEMOIR 2019



Sven Rosenkranz

Universitat de Barcelona (UB)

Humanities

Sven received his PhD from the University of St Andrews in 1999. After a research fellowship at UNAM, he worked at FU Berlin where he was awarded his senior doctorate (habilitation) in 2004. From 2005 until 2008 he received a DFG Heisenberg Fellowship. Sven joined ICREA in 2008. From 2010 until 2013 he coordinated the FP7 ITN PETAF (EC-GA 238128), from 2010 until 2015 served on the executive committee of the Consolider-Ingenio PERSP (CSD2009-00056), and from 2016 until 2019 coordinated the H2020 ETN *Diaphora* (H2020-MSCA-ITN-2015-675415). He was PI of the project *Fallibility, Rational Belief and Knowledge* (FFI2013-45968-P, 2014-2016). Since 2014 he is coordinator of the consolidated research group LOGOS (2017-SGR-63), and from 2019 until 2021 serves as PI of the research project *Justification, its Structure and Grounds* (PGC2018-099889-B-I00). In 2018 he was elected member of the *Academia Europaea*.

Research interests

Sven's main research interests lie in metaphysics and epistemology. He is particularly interested in realism, objectivity, fallibility, the logic of justification, the limits of thought and knowledge (if any), and the philosophy of time. Recently, Sven published a co-authored monograph on tensed theories of time with Springer. He is about to finish his book manuscript on the nature and logic of epistemic justification, which is based on his 2018 *Mind* paper 'The Structure of Justification' and is under contract with Oxford University Press.

Selected research activities

Sven was awarded funding for the individual research project *Justification, its Structure and Grounds*, financed by the Spanish Ministry, which comes with an associated 4-year PhD position. In pursuit of this project's main objective, he was offered a book contract from Oxford University Press for the monograph *Justification as Ignorance*.

Sven served as network coordinator of the H2020 ETN *Diaphora* from 2016 until the end of 2019. In this capacity, he also co-organised the *Diaphora* Workshop on Philosophical Methodology (Barcelona, March 2019) and the network's Final Conference (Barcelona, September 2019).

ICREA MEMOIR 2019



Barbara Rossi

Universitat Pompeu Fabra (UPF)

Social & Behavioural Sciences

Before joining UPF, Prof. Rossi was Associate Professor (with tenure) at Duke University. She held visiting positions at the Philadelphia Fed, Berkeley, ENSAE-CREST, U. of Montreal, Atlanta Fed, ECB, Norges Bank, UCSD, U. of Sydney and Concordia U. Prof. Rossi is the Editor of the *Journal of Applied Econometrics* and a coeditor of the *International Journal of Central Banking*, and served as associate editor of the *Journal of Business and Economic Statistics*, *Quantitative Economics* and *JEDC*. She is a fellow of the *Econometric Society* and the *IAAE*, and member of the *CEPR Business Cycle Dating Committee*, the *Council of the EEA* and the *European Standing Committee of the Econometric Society*, the *Vice Chair of the Scientific Committee of the EABCN* and a director of the *International Association for Applied Econometrics*. She is also a research associate at *CREI* and a *Barcelona GSE Research Professor*. Her past or present grants include *NSF*, *ERC*, *MICINN*, *BBVA* and *Marie Curie CIG*.

Research interests

Specializing in time series econometrics and empirical applications in international finance and macroeconomics, her current research has both a theoretical and an empirical focus. It encompasses theoretical analyses of the forecasting ability of economic models as well as model selection in the presence of instabilities. Her empirical works range from model comparisons of DSGE models, forecasting exchange rates, purchasing power parity analysis, to impulse response functions. She teaches applied time series econometrics as well as graduate econometrics and macroeconometrics courses.

Selected publications

- **Rossi B** & Sekhposyan T 2019, 'Alternative Tests for Correct Specification of Conditional Forecast Densities', *Journal of Econometrics*, 208, 2, 638 - 657.
- Inoue A & **Rossi B** 2019, 'The effects of conventional and unconventional monetary policy on exchange rates', *Journal Of International Economics*, 118, 419 - 447.

Selected research activities

Fellow, *Econometric Society*, 2019-to date

Keynote Speaker, 2019 *Society for Nonlinear Dynamics and Econometrics* (Dallas, USA)

Keynote Speaker, 2019 *EC² Conference* (Oxford, UK)

Keynote Speaker, 2019 *INFER Conference*, *Vrije Universiteit Brussel* and *National Bank of Belgium* (Brussel, Belgium)

Selected invited seminar presentations: Chicago Booth, Harvard University, Penn State, London Business School, Bank of England, Exeter University, Bank of Finland, Bank of England, Applied macroeconomics and finance workshop (Beijing, China), University of Bologna, Federal Reserve Bank of New York.

ICREA MEMOIR 2019



Carme Rovira

Universitat de Barcelona (UB)

Experimental Sciences & Mathematics

Dr. Rovira is ICREA Research Professor at the University of Barcelona (UB). She did part of her PhD in the US (North Carolina State University and Southern Illinois University) and obtained her PhD degree in Chemistry from the UB in 1995. She performed postdoctoral stays at the Max-Planck-Institut für Festkörperforschung (Stuttgart, Germany, 1996-1998) and UB (1999-2001). In 2002 she obtained a Ramón y Cajal position and started her research group at the Parc Científic de Barcelona. She was appointed ICREA Research Professor in 2007 and moved to the Department of Chemistry of the UB in 2012. Dr. Rovira has received research awards from the Catalan Government (Distinció de la Generalitat 2003), the Barcelona City Council (City Prize 2016) and the European Carbohydrate Organization (Emil Fisher Award 2019). She is the author of about 160 publications in peer-reviewed journals and books, mainly in the fields of Theoretical Chemistry and Computational Biology.

Research interests

The research at Dr. Rovira's group (<http://www.ub.edu/sqpbio>) is focused on the computer simulation of biological processes at atomic-electronic detail, i.e. using computers to understand how biomolecules work. Her goal is to simulate the molecular mechanisms underlying ligand-protein interactions and enzymatic reactions, guiding the design of more efficient enzymes and drugs. Her research is currently focused on catalytic processes in metalloproteins and carbohydrate-active enzymes.

Selected publications

- Wang B, Walton PH & **Rovira C** 2019, 'Molecular Mechanisms of Oxygen Activation and Hydrogen Peroxide Formation in Lytic Polysaccharide Monooxygenases', *ACS Catalysis*, 9, 6, 4958 - 4969.
- Lopez-Martinez M, Lopez-Ortiz M, Antinori ME, Wientjes E, Nin-Hill A, **Rovira C**, Croce R, Diez-Perez I & **Gorostiza P** 2019, 'Electrochemically Gated Long-Distance Charge Transport in Photosystem I', *Angewandte Chemie-international Edition*, 58, 13280-13284.
- Wang B, Cao Z, **Rovira C**, Song J & Shaik S 2019, 'Fenton-Derived OH Radicals Enable the MPnS Enzyme to Convert 2-Hydroxyethylphosphonate to Methylphosphonate: Insights from Ab Initio QM/MM MD Simulations', *Journal of The American Chemical Society*, 141, 23, 9284 - 9291.
- Artola M, Hedberg C, Rowland RJ, Raich L, Kytidou K, Wu L, Schaaf A, Ferraz MJ, van der Marel GA, Codée JDC, **Rovira C**, Aerts JMFG, Davies GJ & Overkleeft HS 2019, 'α-D-Gal-cyclophellitol cyclosulfamidate is a Michaelis complex analog that stabilizes therapeutic lysosomal α-galactosidase A in Fabry disease'. *Chemical Science*, 10, 9233-9243.
- Savino S, Borg AJE, Dennig A, Pfeiffer M, de Giorgi F, Weber H, Dubey KD, **Rovira C**, Mattevi A & Nidetzky B 2019, 'Deciphering the enzymatic mechanism of sugar ring contraction in UDP-apiose biosynthesis', *Nature Catalysis*, 2, 1115-1123.
- Coines J, Raich L & **Rovira C** 2019, 'Modeling catalytic reaction mechanisms in glycoside hydrolases'. *Curr Opin Chem Biol*, 53, 183-191.
- Maleeva, G, Wutz D, Rustler K, Nin-Hill A, Alfonso-Prieto M, Petukhova E, Bautista-Barrufet A, Gomila-Juaneda A, Scholze P, Peiretti F, **Rovira C**, König B, Gorostiza P & Bregestovski P 2019, 'A photoswitchable GABA receptor channel blocker', *British Journal of Pharmacology*, 176, 15, 2661 - 2677.

Selected research activities

- *Emil Fischer* award 2019. European Carbohydrate Organisation.
- EU project SweetCrossTalk 814102 (H2020-MSCA-ITN-2018).
- Co-organizer of the school "Hybrid QM/MM Approaches to Biochemistry" in Lausanne.
- Invited talks to four conferences in Europe (one plenary).

ICREA MEMOIR 2019



Joan-Pau Rubiés

Universitat Pompeu Fabra (UPF)
Humanities

Joan-Pau Rubiés graduated in Early Modern History at the University of Barcelona (1987), where he received the extraordinary degree prize. He went on to do a PhD at the University of Cambridge, funded with an external studentship from King's College (1987-1991). He was subsequently Research Fellow at Queens's College, Cambridge, and Jean Monnet Fellow at the European University Institute in Florence. In 1994 he became Lecturer in Modern History at the University of Reading, and in 1999 he joined the Department of International History at the London School of Economics and Political Science. He was Reader in International History at the LSE until 2012, when he accepted the offer of a Research Professorship at ICREA, which he holds at Universitat Pompeu Fabra. He has been twice visiting professor at the École des Hautes Études (Paris and Marseille). He is currently leading a Research Project on Ethnographies, Religious Missions and Cultural Encounters in the Early Modern World.

Research interests

I am a historian and have specialized in the study of cross-cultural encounters in the early modern world, from a perspective combining the contextual analysis of ethnographic sources with the intellectual history of early modern Europe. I am currently developing various lines of research: 1. Travel writing and ethnography, literary and visual 2. Religious missions, religious dialogue and cultural mediation 3. The intellectual impact of travel writing and the origins of the Enlightenment 4. Diplomacy and cultural encounters 5. The comparative history of early modern empires and globalization. I am the coordinator of the Research Group on Ethnographies, Cultural Encounters and Religious Missions (ECERM) at Universitat Pompeu Fabra, which has received funding from the ERC (Marie Curie Program), AGAUR (SGR) and MINECO: <http://www.upf.edu/ecerm/>

Selected publications

- **Rubiés JP** 2019, 'The Jesuits and the Enlightenment', in *The Oxford Handbook of Jesuits*. Edited by Ines G. Županov. Oxford: Oxford University Press, 855-890.
- Ollé M & **Rubiés JP** (eds.) 2019, *El Códice Boxer: Etnografía Colonial e Hibridismo Cultural en las Islas Filipinas*. Barcelona: Edicions de la Universitat de Barcelona. Includes 'Introducción: El Redescubrimiento de Códice Boxer', pp. 9-20.
- **Rubiés JP** 2019, 'El Códice Boxer como enigma: en búsqueda de la voz de un autor', in *El Códice Boxer: Etnografía colonial e hibridismo cultural en las islas Filipinas*, eds. Ollé M & Rubiés JP. Edicions de la Universitat de Barcelona, pp. 37-90.
- **Rubiés JP** 2019, 'Histoire sacrée et ethnographie comparative chez Lafitau', in *La plume et le calumet. Joseph-François Lafitau et les sauvages américains*, eds. Mélanie Lozat & Sara Petrella. Paris: Classiques Garnier, pp. 63-81.
- **Rubiés JP** 2019, 'La Unión Europea y el proceso del Brexit', *¿Una Unión Europea en crisis? Reflexiones para un debate urgente*, eds. Fernando Guirao & Josep Pich Mitjana. Los Libros de la Catarata: Madrid, pp.168-200.

Selected research activities

This year saw the completion of the book project on the Boxer Codex, a rare and lavishly illustrated manuscript with ethnographic information produced in Spanish Manila in the late sixteenth century. Other activities included talks on 'Race and Racism in the Colonial Empires of Castile and Portugal' (CORPI conference, Madrid); 'The Jesuit image of the civilization and religion of Japan: contradictions and impacts', *Japan and Spain's Golden Age* (UAM); 'From idolatry to religions: The missionary discourse on Buddhism and the invention of theistic Confucianism', *Seminar for Global Intellectual History* (University of Amsterdam); a keynote lecture on 'Outsiders and Insiders: European perceptions of India and the problem of Cultural Distance' (Nehru Memorial Museum, New Delhi); and further seminar talks at the Universities of Turin, Barcelona, and King's College London.

ICREA MEMOIR 2019



Iñaki Ruiz-Trillo

Institut de Biologia Evolutiva (CSIC - IBE)

Life & Medical Sciences

Iñaki Ruiz-Trillo is an ICREA Research Professor at the Institut de Biologia Evolutiva (CSIC-UPF). His educational background includes a B.S. and a Ph.D. in Biology from the University of Barcelona. Funded by grants from EMBO and the Canadian Institutes of Health Research, he completed a post-doctoral fellowship at Dalhousie University (Canada). He has also performed short term research projects at the Joint Genome Institute, the University of Arkansas and the Kavli Institute for Theoretical Physics. Iñaki has published more than 80 peer-reviewed articles, most of them in high impact journals, such as *Cell*, *Science*, *eLife*, *MBE*, and *PNAS*. He has lead several research projects, including 2 ERC grants. He is an EMBO member and has served on the editorial board of several journals. His current research interests include the origin of multicellular animals, the evolution of complex life forms, and the diversity of eukaryotes.

Research interests

The lab is interested in understanding how multicellular animals emerged from their unicellular ancestors. To this aim, we perform comparative and functional genomic analyses between multicellular animals and their closest unicellular relatives to unravel the nature of the unicellular ancestor that gave rise to animals. We are also currently developing genetic tools in the closest unicellular relatives to Metazoa and trying to address the origin of animal cell differentiation and animal cell types. Finally, we are also interested in unraveling the hidden diversity of eukaryotes using metabarcoding data.

Selected publications

- Denbo S, Aono K, Kai T, Yagasaki R, **Ruiz-Trillo I** & Hiroshi Suga H 2019, 'Revision of the *Capsaspora* genome using read mating information adjusts the view on premetazoan genome', *Development, Growth & Differentiation*, 61:34-42.
- Rafels-Ybern À, Torres AG, Camacho N, Herencia-Ropero A, Roura Frigolé H, Wulff TF, Raboteg M, Bordons A, Grau-Bove X, **Ruiz-Trillo I** & **Ribas de Pouplana L** 2019, 'The expansion of Inosine at the wobble position of tRNAs, and its role in the evolution of proteomes', *Molecular Biology and Evolution*, Volume 36, Issue 4, April 2019, Pages 650-662,
- O'Malley M, Leger MM, Wideman JG & **Ruiz-Trillo I** 2019, 'Concepts of the last eukaryotic common ancestor', *Nature Ecology & Evolution*, 3, 3, 338 - 344.
- Mitsi K, Arroyo AS & **Ruiz-Trillo I** 2019, 'A global metabarcoding analysis expands molecular diversity of Platyhelminthes and reveals novel early-branching clades', *Biology Letters*, 15, 9, 20190182.
- Lopez-Escardo D, Grau-Bove X, Guillaumet-Adkins A, Gut M, Sieracki ME & **Ruiz-Trillo I** 2019, 'Reconstruction of protein domain evolution using single-cell amplified genomes of uncultured choanoflagellates sheds light on the origin of animals', *Philosophical Transactions Of The Royal Society B-biological Sciences*, 374, 1786, 20190088.
- Dudin O, Ondracka A, Grau-Bove X, Haraldsen AAB, Toyoda A, Hiroshi S, Brate J & **Ruiz-Trillo I** 2019, 'A unicellular relative of animals generates a layer of polarized cells by actomyosin-dependent cellularization', *Elife*, 8, e49801.
- Ocaña-Pallarès E, Najle SR, Scuzzocchio C & **Ruiz-Trillo I** 2019, 'Reticulate evolution in eukaryotes: Origin and evolution of the nitrate assimilation pathway', *PLoS GENETICS* 15(2): e1007986

ICREA MEMOIR 2019



Jorge G. Russo

Universitat de Barcelona (UB)

Experimental Sciences & Mathematics

In 1983 JG Russo obtained a fellowship to study physics at the Instituto Balseiro, Bariloche, Argentina, where he obtained the degree (Licenciatura) in Physics (12/1986). He was awarded a SISSA fellowship to follow the PhD programme at SISSA, Trieste, Italy, where he finished his PhD (10/1990) under the supervision of Daniele Amati on Quantum gravity and String theory. As a postdoc at Stanford University, USA, he collaborated with L. Susskind on black hole physics. He continued his research on black holes and string theory first at the University of Texas at Austin, USA, and then at CERN, Geneva. In 1998 JG Russo moved to the University of Buenos Aires as a Professor and in 04/2003 joined ICREA as a Research Professor.

Research interests

A major challenge of theoretical physics is unveiling the fundamental laws that govern the universe. The microscopic world, governed by quantum mechanics, is fuzzy, uncertain and involves three forces among elementary particles: electromagnetic, weak nuclear and strong nuclear. The gravitational force, described by Einstein general relativity, is instead observed at large scales. But this theory is incompatible with quantum mechanics. Superstring theory is presently the best candidate to reconcile gravity with quantum mechanics and thus to provide a unifying framework for the four forces of nature.

Selected publications

- **Russo JG** & Townsend PK 2019, 'Late-time Cosmic Acceleration from Compactification', *Classical & Quantum Gravity*, 36, 9, 095008.
- **Russo JG** & Townsend PK 2019, 'Time-dependent compactification to de Sitter space: a no-go theorem', *Journal Of High Energy Physics*, 6, 097.
- Bourget A, Rodriguez-Gomez D & **Russo JG** 2019, 'Universality of Toda equation in superconformal field theories', *Journal Of High Energy Physics*, 2, 011.
- **Russo JG**, Widen E & Zarembo K 2019, ' $N = 2^*$ phase transitions and holography', *Journal of High Energy Physics*, 02, 196.
- **Russo JG** 2019, 'Properties of the partition function of $N=2$ supersymmetric QCD with massive matter', *Journal Of High Energy Physics*, 7, 125.
- Arias-Tamargo G, Rodriguez-Gomez D & **Russo JG** 2019, 'The large charge limit of scalar field theories and the Wilson-Fisher fixed point at $\epsilon=0$ ', *Journal Of High Energy Physics*, 1910, 201.

Selected research activities

Organizer of the Workshop "Gauge theories, Supergravity and Superstrings" Centro de Ciencias Pedro Pascual, Jun 10-21 2019, Benasque, Spain.

Member of the International Advisory Committee for the '8th Bangkok Workshop on High-Energy Theory', Bangkok, Thailand, Jan 7-11 2019.

Invited seminar "Properties of Supersymmetric QCD with massive matter", KU Leuven, Institute for Theoretical Physics, May 8 2019, Belgium.

Invited seminar "Survey of quantum phase transitions in supersymmetric theories", Università di Roma Tor Vergata, May 6 2019, Italy.

Invited seminar "Conformal anomalies in spaces with boundaries", Universidad de Buenos Aires, Oct 17 2019.

Invited speaker at the "19th Hellenic School on Elementary Particle Physics and Gravity". 10-15 sept 2019, Corfu, Greece.

Invited speaker at "72th Meeting Strings@ar network", Instituto de Física de La Plata, March 6 2019, Argentina.

Invited speaker at "mu-Workshop on Theoretical Physics", Universidad de Oviedo. Nov 26 2019, Spain.

Committee member in PhD thesis and for academic positions.

Evaluator for funding proposals for FNRS, Belgium.

ICREA MEMOIR 2019



Neus Sabaté

Institute of Microelectronics of Barcelona - Centre Nacional de Microelectrònica (CSIC - IMB-CNM)
Engineering Sciences

I obtained my Degree in Physics in 1998 at the University of Barcelona (UB). After that, I joined UB Electronics Dep. to develop ionizing radiation detectors. After that I stayed at the LAAS-CNRS in Toulouse, where I discovered my passion for silicon-based microsystems (MEMS) technologies. In 1999, I started my PhD at the Microelectronics Institute of Barcelona (CSIC) where I developed silicon-based flow and gas sensors for industrial applications. After the obtaining of my PhD, in 2004 I joined the IZM Fraunhofer in Berlin where I played a key role in the development of a new technique for stress measurements in thin films for the microelectronics industry. In 2006 I started a research line in silicon microfabricated fuel cells at IMB-CSIC that has evolved until the biodegradable electrochemical power sources I develop today. In 2015 I founded the spin-off Fuelium, aimed to commercialize disposable paper batteries for single use applications, and became ICREA Professor.

Research interests

Since 2006, I have focused on the development of microfuel cells, with the final goal of integrating them within microdevices requiring power autonomy. After many years of development using silicon-related technologies I decided to approach printed electronics technology that allows to build devices entirely made of polymer-based and paper materials at a very competitive cost. The main goal of my research line is to obtain single-use electrochemical power sources that can provide with power autonomy the new generation of single use smart devices while being environmentally friendly. The creation of greener electronic devices to decrease the global electronic waste is one of the key aspects that drives my research. Moreover, I am highly motivated in transferring the devices I create to the “real world” in order to contribute to the enhancement of the industrial local ecosystem.

Selected publications

- Ortega L, Llorella A, Esquivel JP & **Sabaté N** 2019, ‘Self-powered smart patch for sweat conductivity monitoring’, *Microsystems & Nanoengineering*, 5, UNSP 3.
- Dector D, Olivares-Ramírez JM, Ovando-Medina VM, Sosa Dominguez A, Villa AL, Duarte-Moller A, **Sabaté N**, Esquivel JP & Dector A 2019, ‘Fabrication and evaluation of a passive SU8-based micro direct glucose fuel cell’, *Microsystem Technologies*, 25 (1), 211-216.
- Olivares-Ramírez JM, Dector A, Bañuelos-Días JA, Amaya-Cruz DM, Ortiz-Verdín A, Jiménez-Sandoval O, **Sabaté N** & Esquivel JP 2019, ‘Evaluation of a Passive Anion-Exchange Membrane Micro Fuel Cell Using Glycerol from Several Sources’, *Fuel Cells* - 19, 1, 10 - 18.

Selected research activities

Patent Application: Merino Jimenez, Irene; Llorella Bustins, Anna; Esquivel Bojórquez, Juan Pablo; Sabaté Vizcarra, Neus, Navarro Segarra, Marina; Sailapu, Sunil Kumar, Procedimiento de cuantificación de la concentración de analitos en una celda electroquímica, P201930320, 9 April 2019

ERC-Proof-of-Concept Grant: POWER-PATCH Self-powered skin patch for cystic fibrosis diagnosis (November 2019-December 2021)

Best Prototype/New Product 2019 from the Organic Electronics Association Contest awarded to the “Fully printable single use self-powered glucometer” presented by N.Sabaté team

ICREA MEMOIR 2019



Xavier Salvatella

Institut de Recerca Biomèdica de Barcelona (IRB Barcelona)

Experimental Sciences & Mathematics

I was born in Barcelona, Spain. I obtained my first degree in Chemistry at the University of Barcelona followed by a MSc in Chemical Research at the University of London and a PhD in Organic Chemistry at the University of Barcelona. In 2003, I moved to the University of Cambridge to work as a Research Fellow with Christopher Dobson on the structural and dynamical characterization of proteins. In July 2008, I joined ICREA as a Researcher and the IRB as a Group Leader and in 2013 I became ICREA Research Professor.

Research interests

A high resolution description of the structure and dynamics of proteins is a very useful tool to study the properties and the function of these important biomacromolecules and, most importantly, to understand how changes in sequence or environment can lead to disease. My research work aims, on the one hand, at developing methods to probe the fluctuations of the structure of proteins by combining experimental data and molecular simulations and, on the other hand, at understanding how changes in such motions relate to the molecular recognition of proteins, to their function and to disease.

Selected publications

- Escobedo A, Topal B, Kunze MBA, Aranda J, Chiesa G, Mungianu D, Bernardo-Seisdedos G, Eftekharzadeh B, Gairi M, Pierattelli R, Felli IC, Diercks T, Millet O, García J, Orozco M, Crehuet R, Lindorff-Larsen K & **Salvatella X** 2019, 'Side chain to main chain hydrogen bonds stabilize a polyglutamine helix in a transcription factor', *Nature Communications* 10:2034.
- Eftekharzadeh B, Banduseela VC, Chiesa G, Martinez-Cristobal P, Rauch JN, Nath SR, Schwarz DMC, Shao H, Marin-Argany M, Di Sanza C, Giorgetti E, Yu Z, Pierattelli R, Felli IC, Brun-Heath I, Garcia J, **Nebreda AR**, Gestwicki JE, Lieberman AP & **Salvatella X** 2019, 'Hsp70 and Hsp40 inhibit an inter-domain interaction necessary for transcriptional activity in the androgen receptor', *Nature Communications* 10:3562.
- Crehuet R, Buigues PJ, **Salvatella X** & Lindorff-Larsen K 2019, 'Bayesian-Maximum-Entropy Reweighting of IDP Ensembles Based on NMR Chemical Shifts', *Entropy*, 21, 9, 898.
- Ciges-Tomas JR, Alite C, Bowring J, Donderis J, **Salvatella X**, Humphrey S, Penadés JR & Marina A 2019, 'A polyamorous repressor: deciphering structurally the evolutionary strategy used by the phage-inducible chromosomal islands to spread in nature', *Nat Commun* 10:3676
- Peña-Díaz S, Pujol J, Conde-Jiménez M, Carija A, Dalfó E, García J, Navarro S, Pinheiro F, Santos J, **Salvatella X**, Sancho J & Ventura S 2019, 'ZPD-2, a small compound that inhibits α -synuclein amyloid aggregation and its seeded polymerization', *Front Mol Neurosci* 12:306
- Baum J, Chiti F, De Simone A, Knowles TPJ, Kumita JR, Radford SE, Robinson CV, **Salvatella X**, Valelli K, Vendruscolo M, Pastore A & **Tartaglia GG** 2019, 'Homage to Chris Dobson', *Front Mol Biosci* 12:137

ICREA MEMOIR 2019



Samuel Sánchez

Institut de Bioenginyeria de Catalunya (IBEC)
Engineering Sciences

Samuel (PhD Chemistry, UAB, 2008) is Group Leader at the Institute for Bioengineering of Catalonia (IBEC) and since 2019 Deputy Director. In 2009, he worked at NIMS, Japan, from 2010-2013 he was Group Leader at the Institute for Integrative Nanosciences, IFW Dresden, Germany. From 2013-2018 he was Group Leader at the Max Planck Institute for Intelligent Systems, Stuttgart. He received several awards: Guinness World Record® 2010 and 2017 for smallest jet engine; IFW-IIN Research Prize 2011 for outstanding scientist; ERC Starting Grant 2012 “Lab-in-a-tube and Nanorobotic Biosensors”, ERC Proof-of Concept 2016 (Microcleaners) and 2018 (Lab-in-a-patch); MIT TR35 as “Innovator of the year U35” Spain 2014; Princess of Girona Scientific Research Award 2015; “Joven Relevante” Award by the Círculo Ecuéstre de Barcelona and National Research Award for Young Talent from the Catalan Foundation of Research and Innovation (FCRi) in 2016.

Research interests

Samuel Sánchez is leader of the “Smart Nano-Bio-Devices” group, working in the multidisciplinary field of Nanosciences with interest in self-powered micro- and nano-systems, small-scaled robots, integrated and flexible nano-(bio)-sensors, active drug delivery systems and 3D (Bio) Printed Soft Robotics. Sánchez’s group has been consolidated as one of the leading groups in catalytic nano-motors from fundamental aspects to various proof-of-concept applications. Currently, the main research lines in the group are: 1. Nanofabrication of self-powered micro- and nanorobots using nanotechnology and new fabrication tools for biomedicine and environmental applications. 2. 3D Printing and 3D BioPrinting for soft robotics and biomedical engineering. 3. Fabrication of ultracompact and flexible devices for biosensing. 4. Physics of active colloids near surfaces.

Selected publications

- Arqué X, Romero-Rivera A, Feixas F, Patiño T, **Osuna S & Sánchez S** 2019, ‘Intrinsic enzymatic properties modulate the self-propulsion of micromotors’, *Nature Communications*, vol. 10, no. 1, pp. 2826.
- Patino T, Porchetta A, Jannasch A, Lladó A, Stumpp T, Schäffer E, Ricci F & **Sánchez S** 2019, ‘Self-Sensing Enzyme-Powered Micromotors Equipped with pH-Responsive DNA Nanoswitches’, *Nano Letters*, vol. 19, no. 6, pp. 3440 – 3447.
- Wang L, Hortalão AC, Huang X & **Sánchez S** 2019, ‘Lipase-Powered Mesoporous Silica Nanomotors for Triglyceride Degradation’, *Angewandte Chemie-International Edition*, vol. 58, no. 24, pp. 7992-7996.
- Palacios LS, Katari J, Pagonabarraga I & **Sánchez S** 2019, ‘Guidance of active particles at liquid-liquid interfaces near surfaces’, *Soft Matter*, vol. 15, no. 32, pp. 6581-6588.
- Xu D, Wang Y, Liang C, You Y, **Sanchez S** & Ma X 2019, ‘Self-Propelled Micro/Nanomotors for On-Demand Biomedical Cargo Transportation’, *Small*, 1902464.
- Llopis-Lorente A, García-Fernández A, Murillo-Cremaes N, Hortalão AC, Patiño T, Villalonga R, Sancenón F, Martínez-Mañer R & **Sánchez S** 2019, ‘Enzyme-Powered Gated Mesoporous Silica Nanomotors for On-Command Intracellular Payload Delivery’, *Acs Nano*, vol. 13, no. 10, pp. 12171-12183.
- Hortalão AC, Carrascosa R, Murillo-Cremaes N, Patiño T & **Sánchez S** 2019, ‘Targeting 3D bladder cancer spheroids with urease-powered nanomotors’, *ACS Nano*, vol. 13, no. 1, pp. 429 – 439.
- Mestre R, Patiño T, Barceló X, Anand S, Pérez-Jiménez A & **Sánchez S** 2019, ‘Force Modulation and Adaptability of 3D-Bioprinted Biological Actuators Based on Skeletal Muscle Tissue’, *Advanced Materials Technologies*, vol.4, no. 2, pp.

Selected research activities

Deputy Director of IBEC
15+ scientific invited talks, seminars and outreach, 20+ appearances in the media
ERC-PoC, CaixaImpulse, 2 private agreements, 1 patent
3 Best Poster Awards, 1 best talk
Organizing committee in 2 conferences

ICREA MEMOIR 2019



María Victoria Sánchez-Vives

Institut d'Investigacions Biomèdiques August Pi i Sunyer (IDIBAPS)
Life & Medical Sciences

Mavi Sanchez-Vives, MD, PhD in Neurosciences, has been ICREA Research Professor at the Institut d'Investigacions Biomèdiques August Pi i Sunyer since 2008, where she leads the Systems Neuroscience group. She is also co-Director of the Event Lab (Experimental Virtual Environments in Neuroscience and Technology) and Adjunct Professor at the Dept. of Basic Psychology, University of Barcelona. She was previously Associate Professor of Physiology and Group Leader at the Instituto de Neurociencias de Alicante (UMH-CSIC). She was postdoctoral fellow at Rockefeller University and at Yale University.

Research interests

Neuronal and network properties determining the emergent activity in the cerebral cortex. Spontaneous rhythmic neural activity: regulating mechanisms, information encoding, impact of activity upon the network. Using experimental and computational approach, with an interest in neurotechnology. The integration of the cortical information giving rise to bodily representation and the combination of brain activity and virtual reality for understanding these processes is another research line that we are pursuing.

Selected publications

- Castano-Prat et al. 2019, 'Altered slow (< 1 Hz) and fast (beta and gamma) neocortical oscillations in the 3xTg-AD mouse model of Alzheimer's disease under anesthesia', *Neurobiology of Aging*, 79:142
- Masvidal-Codina X et al. 2019, 'High-resolution mapping of infraslow cortical brain activity enabled by graphene microtransistors', *Nature Materials*, 18, 3, 280
- Capone et al. 2019, 'Slow Waves in Cortical Slices: How Spontaneous Activity is Shaped by Laminar Structure', *Cerebral Cortex*, 29, 1, 319
- 335
- D'Andola et al. 2019, 'Control of cortical oscillatory frequency by a closed-loop system', *Journal of NeuroEngineering and Rehabilitation*, 16:7
- Barbero-Castillo et al. 2019, 'Cortical Network Complexity under Different Levels of Excitability Controlled by Electric Fields', *Brain Stimulation* 12(2): e97
- Bourdin et al. 2019, 'Altered visual feedback from an embodied avatar unconsciously influences movement amplitude and muscle activity', *Scientific Reports*, 9, 19747
- Matamala-Gomez et al. 2019, 'Decreasing pain ratings in chronic arm pain through changing a virtual body: different strategies for different pain types', *Journal of Pain*, 20: 685

Selected research activities

- *Keynote speaker* at Computational Neuroscience Society meeting (CNS 2019); "VR, body, self and other" IDC, Israel; "Intl conference on graphics and interaction", Faro, Portugal.
- *Invited talks* at international events: Priscilla Mayden Lecture, Univ of Utah; Amazon, Seattle; 15th Granada Seminar; VERE symposium: Computational Neuroscience Venice Summer School; Spanish Society of Pain meeting; VIBES workshop EPFL, Laussane.
- *Workshop organizer & speaker* on "Brain states", Spanish Society of Neuroscience meeting.
- *Dissemination*: Frontiers Forum (102K views); IMPAKT festival, Utrecht; Cover of TELOS magazine; Retina LTD El Pais; Telefónica Gran Vía, Las Tablas, Zaragoza; interviews radio RNE; Catalunya Radio; El Pais Retina; El Mundo; CEJFE domestic violence day; Mobile World Congress talks, etc

ICREA MEMOIR 2019



Anna Sanpera

Universitat Autònoma de Barcelona (UAB)

Experimental Sciences & Mathematics

I graduated at Universitat Autònoma de Barcelona in 1986. From 1988-1992 Ph.D fellow (FPI) from the Ministerio de Educación y Ciencia at the Universitat Autònoma de Barcelona. In 1993, I moved to the University of Oxford, first as a research fellow and then as Fleming fellowship. In 1996, I moved to Saclay (Paris) as an European Post-Doctoral Research Fellow. In 1998 I was appointed research fellow at the Leibniz University, in Hannover (Germany) where I did my habilitation and became Professor Assistant. Since 2005 I am an ICREA Research Professor. My research interests are quite interdisciplinary and range from quantum information theory, to quantum gases and more recently condensed matter. Presently, I am working in the interface between quantum information and condensed matter. I have stable collaborations with different research groups both at national and international level. Otherwise I am fond of literature, sports and children.

Research interests

My research interest are Quantum Information, Atomic Physics and more recently Condensed Matter Physics. I study the properties that atoms frozen to very low temperatures display. Ultracold atomic gases permit to study, in a very clean way, a rich variety of systems which appear in Nature but whose exotic properties are difficult to understand. I am also involved in the mathematical description of entanglement, arguably the most distinct feature of quantum physics. Taking advantage of the quantum properties of matter, we engineer more powerful ways to process and distribute information and build, in a near future, a quantum computers and simulators able to perform tasks that classical computers cannot. I am also working in Quantum Thermometry, Quantum Learning and Quantum Metrology to exploit the advantages quantum physics offers us to improve machine learning tasks as well as the determination of unknown parameters with a precision that classical physics cannot achieve.

Selected publications

- Mehboudi M, **Sanpera A** & Correa LA 2019, 'Thermometry in the quantum regime: recent theoretical progress', *Journal Of Physics A-mathematical And Theoretical*, 52, 30, 303001.

ICREA MEMOIR 2019



Joan Seoane

Vall d'Hebron Institut d'Oncologia (VHIO)
Life & Medical Sciences

Preclinical & Translational Research co-program Director at the Vall d'Hebron Institute of Oncology (VHIO) within the Vall d'Hebron Hospital since 2011. In 1998, he obtained his PhD from the University of Barcelona. Previously, in 1993, he obtained his BSc degree in Chemistry. Joan joined the Memorial Sloan-Kettering Cancer Center (MSKCC) in New York as a post-doctoral fellow in 1998 (first as a Research Fellow and then Research Associate since 2001). He was appointed ICREA Research Professor in 2004 and joined VHIO. In 2008, he was the recipient of a European Research Council (ERC) grant. He obtained two ERC Proof of Concept grants (2011, 2013). In 2008, he became Board member of the European Association of Cancer Research (EACR) and Associate Prof. at Universitat Autònoma de Barcelona. In 2012, founded Mosaic Biomedicals as a spin-off company from his lab and, in 2013, he was the recipient of the Dr. Josef Steiner Award. In 2016, he became Secretary General of the EACR.

Research interests

Our main objective is to understand the molecular mechanisms involved in the initiation and progression of cancer. Specifically, our research is focused on the study of brain tumours, including glioma and brain metastasis. Both glioblastoma (the most aggressive form of glioma) and brain metastasis are dismal diseases with limited therapeutic options. The understanding of the molecular mechanisms that govern these types of cancer is required in order to design rational, specific and successful therapeutic approaches.

Selected publications

- **Seoane J**, De Mattos-Arruda L, Le Rhun E, Bardelli A & Weller M 2019, 'Cerebrospinal fluid cell-free tumour DNA as a liquid biopsy for primary brain tumours and brain metastases'. *Annals of Oncology*. 30, 2, 211 - 218.
- De Mattos-Arruda L, Sammut SJ, Ross E, Bashford-Rogers R, Greenstein E, Contente-Cuomo T, Morganella S, Teng Y, Maruvka Y, Pereira B, Rueda O, Chin SF, Ali R, Cope W, Tiezzi D, Markus H, Mayor R, Arias A, Reshef D, Martinez E, Peg V, Ramon y Cajal S, Cortes J, Vassiliou G, Getz G, Nik-Zainal S, Murtaza M, Friedman N, Markowitz F, **Seoane J***, Caldas C*. 2019, 'The integrated genomic and immune landscapes of lethal metastatic breast cancer'. *Cell Reports*. 27, 9, 2690 (*co-corresponding authors).
- Pascual-Garcia M, Bonfill-Teixidor E, Planas-Rigol E, Rubio-Perez C, Ludaro R, Arias A, Cuartas I, Sala-Hojman A, Escudero L, Martinez-Ricarte F, Huber-Ruano I, Nuciforo P, Pedrosa L, Marques C, Brana I, Garralda E, Vieito M, Squatrito M, Pineda E, Graus F, Espejo HC, Sahuquillo J, Tabernero J & **Seoane J** 2019, 'LIF regulates CXCL9 in tumor-associated macrophages and prevents CD8(+) T cell tumor-infiltration impairing anti-PD1 therapy', *Nature Communications*, 10, 2416.
- Janin M et al. 2019 'Epigenetic loss of RNA-methyltransferase NSUN5 in glioma targets ribosomes to drive a stress adaptive translational program'. *Acta Neuropathologica*. 138(6):1053-1074.
- Siravegna G, Mussolin B, Venesio T, Marsoni S, **Seoane J**, Dive C, Papadopoulos N, Kopetz S, Corcoran RB, Siu L & Bardell A 2019, 'How liquid biopsies can change clinical practice in oncology.', *Annals Of Oncology : Official Journal Of The European Society For Medical Oncology*, 30, 10, 1580 - 1590.

ICREA MEMOIR 2019



M. Ángeles Serrano

Universitat de Barcelona (UB)

Experimental Sciences & Mathematics

M. Ángeles Serrano is an ICREA Research Professor at the Department of Condensed Matter Physics of the University of Barcelona (UB). She obtained her Ph.D. in Physics at UB with a thesis about gravitational wave detection, and a master in mathematics for finance from the Centre de Recerca Matemàtica CRM. After four years in the private sector as IT consultant and mutual fund manager, she returned to academia in 2004 to work in the field of complex networks. She completed her postdoctoral research at Indiana University (USA), the École Polytechnique Fédérale de Lausanne (Switzerland) and IFISC Institute (Spain). She came back to Barcelona in 2009, when she was awarded a Ramón y Cajal Fellowship at UB. M. Ángeles obtained the Outstanding Referee Award of the American Physical Society. She is a founding member of Complexitat, the Catalan network for the study of complex systems, and a promoter member of UBICS, the Universitat de Barcelona Institute of Complex Systems.

Research interests

Complex networks -e.g. the Internet, human brain, molecular networks in the cell, or international trade- are ubiquitous and around us. All of them, regardless of their origin, talk a common language that we are starting to understand. A major challenge for a better comprehension of the relation between their structure and function, and so for the prediction of their evolution and adaptation capabilities, is the characterization of the multiscale nature of networks in space and time. We are investigating the role of space in real networks, producing maps in a hidden geometry where distance measures the likelihood of interactions and enables multiscale unfolding. Our focus is also on the impact of time flow on their structure and function, and on multilayer networks in which different types of interactions or nodes coexist. Our applications cover a wide variety of real systems, from biological to economic and sociotechnological systems, that we characterize using massive data.

Selected publications

- Starnini M, Ortiz E & **Serrano MA** 2019, 'Geometric randomization of real networks with prescribed degree sequence', *New Journal of Physics*, 21, 053039.
- Starnini M, Boguna M & **Serrano MA** 2019, 'The interconnected wealth of nations: Shock propagation on global trade-investment multiplex networks', *Scientific Reports*, 9, 13079.
- García-Pérez G, Allard A, **Serrano MA** & Boguñá M 2019, 'Mercator: uncovering faithful hyperbolic embeddings of complex networks', *New Journal of Physics*, 21, 123033.
- **Serrano MA** 2019, 'Renormalización en redes complejas', *Investigación y Ciencia* 508, 16-19.

Selected research activities

- Invited tutorial, *Mapping networks in latent geometry: models and applications*, Complex networks 2019, The 8th International Conference on Complex Networks and their Applications, Lisbon, Portugal, December 9-12, 2019.
- Invited talk, *Geometric renormalization unravels self-similarity of the multiscale human connectome*, Statistical Physics of Complex Systems, Stockholm, Sweden, May 7-11, 2019.
- Invited talk, *Geometric renormalization unravels self-similarity of the multiscale human connectome*, Critical and collective effects in graphs and networks CCEGN-IV, Les Houches, France, May 5-10, 2019.
- Invited talk, *Geometric renormalization of complex networks*, APS March Meeting, Boston, USA, March 4-8, 2019.
- Appointed Editorial Board member of APS journal Physical Review Research, September 1 2019.
- Standing Committee of the Universitat de Barcelona Institute of Complex Systems UBICS; Board member of the Catalan Network for the study of Complex Systems, complexitat.cat.

ICREA MEMOIR 2019



Manuel Serrano

Institut de Recerca Biomèdica de Barcelona (IRB Barcelona)
Life & Medical Sciences

Manuel Serrano obtained his PhD in 1991 for his research at the Centre for Molecular Biology (CSIC/UAM, Madrid)) under the supervision of M. Salas and J.M. Hermoso. From 1992 to 1996 he worked as a Postdoctoral Fellow in the laboratory of D. Beach at the Cold Spring Harbor Laboratory, New York, USA. In 1997, he returned to Spain to start his own research group at the Spanish National Biotechnology Centre (CSIC, Madrid). He moved to the Spanish National Cancer Research Centre (Madrid) in 2003 to lead the Tumour Suppression Group, where he also served as Director of the Molecular Oncology Programme (2012-2017). In May 2017, he relocated to the Institute for Biomedical Research-IRB Barcelona to establish the Cellular Plasticity and Disease Group within the Molecular Medicine Research Programme. He has accomplished important scientific contributions to the understanding of Ageing from different perspectives: Cancer & Ageing, Metabolism & Ageing, Regeneration & Ageing.

Research interests

The unifying concept that has guided our research is that tumour suppressors protect the organism from many types of damage and regardless of the pathology that damage may cause. Protection from cancer is just one of the outcomes of tumour suppressors, others being protection from chronic diseases, nutritional overload, tissue injuries, or aging. Tumour suppressors often trigger a cellular state known as cellular senescence, and we have pioneered the concept that cellular senescence is critical to signal tissue damage and to elicit tissue regeneration. The key emerging paradigm is that tumour suppressors, by triggering cellular senescence, recruit inflammatory cells and create a tissue microenvironment that favours tissue repair and regeneration. Damage → Tumour Suppressors → Cellular Senescence → (secreted factors) → Cellular Plasticity → Tissue Repair

Selected publications

- Llanos S, Megias D, Blanco-Aparicio C, Hernandez-Encinas E, Rovira M, Pietrocola F & **Serrano M** 2019, 'Lysosomal trapping of palbociclib and its functional implications', *Oncogene*, 38, 20, 3886 - 3902.
- Lozano-Torres B, Estepa-Fernandez A, Rovira M, Orzaez M, **Serrano M**, Martinez-Manez R & Sancenon F 2019, 'The chemistry of senescence', *Nature Reviews Chemistry*, 3, 7, 426 - 441.
- Gorgoulis V, Adams PD, Alimonti A, Bennett DC, Bischof O, Bishop C, Campisi J, Collado M, Evangelou K, Ferbeyre G, Gil J, Hara E, Krizhanovsky V, Jurk D, Maier AB, Narita M, Niedernhofer L, Passos JF, Robbins PD, Schmitt CA, Sedivy J, Vougas K, von Zglinicki T, Zhou D, **Serrano M** & Demaria M 2019, 'Cellular Senescence: Defining a Path Forward', *Cell*, 179, 4, 813 - 827.
- Triana-Martínez F, Picallos-Rabina P, Da Silva-Álvarez S, Pietrocola F, Llanos S, Rodilla V, Soprano E, Pedrosa P, Ferreirós A, Barradas M, Hernández-González F, Lalinde M, Prats N, Bernadó C, González P, Gómez M, Ikonopoulou MP, Fernández-Marcos PJ, García-Caballero T, Del Pino P, Arribas J, Vidal A, González-Barcia M, **Serrano M**, Loza MI, Domínguez E, Collado M 2019, 'Identification and characterization of Cardiac Glycosides as senolytic compounds', *Nat Commun.* 10:4731.

ICREA MEMOIR 2019



Luis Serrano

Centre de Regulació Genòmica (CRG)

Life & Medical Sciences

I did my PhD at the CBM in Madrid on the role of the carboxy-terminal region of tubulin on polymerization and MAP binding. Then I moved to the UK to work on protein folding. In 1993 I moved to the EMBL as a GL and started a new activity related to Protein design. After 6 years I was promoted to Senior Scientist. 2 years later I was appointed head of the Structural & Computational Biology programme. At that time we moved into the field of protein misfolding and amyloidoses diseases. We also started a new area of research on Systems Biology, designing small gene networks, doing computer simulations on them and performing experiments to test the predictions. After 14 years at the EMBL I moved to Spain to lead a programme working on Systems Biology. I was appointed vice-director before finally becoming the CRG director in July 2011. My group is focused on Synthetic Biology, engineering and designing of biological systems using our knowledge on protein design and gene networks.

Research interests

The group of Luis Serrano is interested in the quantitative understanding and in the rational design of Biological Systems. To achieve this goal they combine theoretical and experimental approaches and develop appropriate software. Of particular interest for the group is the combination of protein design and network analysis to understand signal transduction and gene regulation. As a more ambitious project the group is part of a consortium with the EMBL in Heidelberg aiming at obtaining for the first time a global quantitative understanding of a living system, *Mycoplasma pneumoniae*.

Selected publications

- Miravet-Verde S, Ferrar T, Espadas-Garcia G, Mazzolini R, Gharrab A, Sabido E, **Serrano L**, Lluch-Senar M 2019, 'Unraveling the hidden universe of small proteins in bacterial genomes', *Molecular Systems Biology*, 15, 2, e8290.
- Martin-Pardillos A, Valls Chiva A, Bande Vargas G, Hurtado Blanco P, Pineiro Cid R, Guijarro PJ, Hummer S, Bejar Serrano E, Rodriguez-Casanova A, Diaz-Lagares A, Castellvi J, Miravet-Verde S, **Serrano L**, Lluch-Senar M, Sebastian V, Bribian A, Lopez-Mascaraque L, Lopez-Lopez R & Ramon y Cajal S 2019, 'The role of clonal communication and heterogeneity in breast cancer', *Bmc Cancer*, 19, 666.
- Yus E, Llorens-Rico V, Martinez S, Gallo C, Eilers H, Bloetz C, Stuelke J, Lluch-Senar M & **Serrano L** 2019, 'Determination of the Gene Regulatory Network of a Genome-Reduced Bacterium Highlights Alternative Regulation Independent of Transcription Factors', *Cell Systems*, 9, 2, 143-158.e13.
- Montero-Blay A, Miravet-Verde S, Lluch-Senar M, Pinero-Lambea C & **Serrano L** 2019, 'SynMyco transposon: engineering transposon vectors for efficient transformation of minimal genomes', *Dna Research*, 26, 4, 327 - 339.
- Delgado J, Radusky LG, Cianferoni D & **Serrano L** 2019, 'FoldX 5.0: working with RNA, small molecules and a new graphical interface', *Bioinformatics*, 35, 20, 4168 - 4169.
- Blanco Delgado J, Radusky LG, Cianferoni D & **Serrano L** 2019, 'Protein-assisted RNA fragment docking (RnaX) for modeling RNA-protein interactions using ModelX', *Proceedings Of The National Academy Of Sciences Of The United States Of America*, 116, 49, 24568 - 24573.

ICREA MEMOIR 2019



James Sharpe

Centre de Regulació Genòmica (CRG)

Life & Medical Sciences

1997: PhD MRC National Institute for Medical Research at Mill Hill, London (UK). “Cis-regulatory mechanisms of the Hox genes in mouse development”. Lab of Dr. Robb Krumlauf. 1997-1998: Postdoc on *Xenopus* development, University of Chile. 1998: MRC Human Genetics Unit, Edinburgh. Postdoc on computational approaches to study mouse limb development. 2001: Development of a 3D optical imaging technique and introduction of the term “Optical Projection Tomography”, commercialised under the name Bioptronics. 2003: Group Leader in Edinburgh. 2006: Senior Group Leader at the Centre de Regulació Genòmica, Barcelona (Spain). 2011: Acting Coordinator of the EMBL-CRG Systems Biology Program. 2014: Coordinator of the EMBL-CRG Systems Biology Program. 2017: Head of the EMBL Barcelona.

Research interests

The physical complexity of a human being, or even a single organ, is truly astounding. The goal of my lab is to understand how the activities of gene networks controls the millions of cells which make up our organs – allowing them to communicate with each other, to decide what to do at each moment during embryo development: whether to divide, which way to move, and which cells types to become (cartilage, bone, connective tissue, etc.) We believe this will only be achieved by integrating information into a computer model, and to this end we are developing new imaging and computational methods to understand one example of organogenesis – vertebrate limb development. We combine various systems biology approaches to integrate data on cell activities and gene networks into a realistic 4D computer simulation of the process. This is a truly interdisciplinary endeavour, and the lab is therefore composed of physicists, engineers and computer scientists as well as biologists.

Selected publications

- **Sharpe J** 2019, ‘Wolpert’s French Flag: what’s the problem?’, *Development* 146(24) pii: dev185967
- Germann P, Marin-Riera M & **Sharpe J** 2019, ‘ya||a: GPU-powered spheroid models for mesenchyme and epithelium’. *Cell Syst* , 8(3):261-266.e3

ICREA MEMOIR 2019



Vassil Skumryev

Universitat Autònoma de Barcelona (UAB)

Engineering Sciences

Vassil Skumryev is ICREA Research Professor at Universitat Autònoma de Barcelona. He received a PhD from the University of Sofia (Bulgaria) in 1983, where he was habilitated in 1991. Prior to joining ICREA in 2003, he had long term appointments, including Visiting Scientist / Professor Positions at Trinity College (Dublin, Ireland); University of Delaware (USA); Max-Planck Institute für Metalforschung (Stuttgart, Germany); The Royal Institute of Technology (Stockholm, Sweden). He has worked in a broad range of magnetic materials and phenomena publishing over 130 scientific papers (incl. Nature, Physical Review Letters, Physics Reports, Physical Review, Advanced Materials, Applied Physics Letters...).

Research interests

Magnetic Structures and Magnetic Phase Transitions (incl. neutron diffraction studies and such at very high magnetic fields); Magnetoelectric Materials and how the interface phenomena in nanostructures of such materials could allow an additional degree of freedom in device design (e.g. new type memory, where the magnetic state is controlled by an electric field or vice versa); Magnetic Nanostructures with Enhanced Thermal Stability (e.g. for a possible application as high-density recording media); Intrinsic Magnetic Phase Separation; Metal-Based Pharmaceuticals (studying the magnetic properties can provide important information for the structure and other properties of such pharmaceuticals); Magnetometry

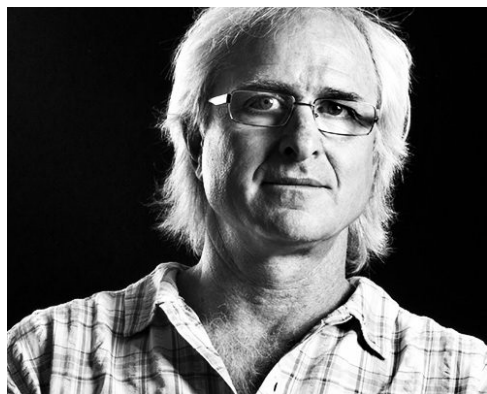
Selected publications

- Golosovsky IV, Vasilev AI, Mukhin AA, Ressouche E & **Skumryev V** 2019, "Complex magnetic order in the $\text{Nd}(\text{Tb})\text{Fe}_3(\text{BO}_3)_4$ multiferroic revealed by single-crystal neutron diffraction", *Physical Review B* **99**, 134439
- Verseils M, Beauvois K, Litvinchuk A, deBrion S, Simonet V, Ressouche E, **Skumryev V** & Gospodinov M 2019, "Investigation of High Pressure Phase Transition by Means of Infrared Spectroscopy in the Cairo Frustrated Pentagonal Magnet $\text{Bi}_2\text{Fe}_4\text{O}_9$ ", *Proceedings 2019*, 26, 31

Selected research activities

- Editorial board member: The European Physical Journal Plus (Springer).
- User Committee Member of the European Magnetic Field Laboratory.

ICREA MEMOIR 2019



Gustavo A. Slafer
Universitat de Lleida (UdL)
 Life & Medical Sciences

Gustavo Slafer (PhD, University of Melbourne) is ICREA Research Professor at the University of Lleida (Catalonia, Spain), where he is also Associate Professor (Dept. Crop & Forest Sci.) He is also currently (i) Honorary Professor of the School of Biosciences, University of Nottingham, UK; (ii) Editor of particular sections of Crop Science and Spanish Journal of Agricultural Research, (iii) Handling Editor of Food and Energy Security, (iv) Associate Editor of Euphytica; and (v) member of the Editorial or Advisory Boards of Field Crops Research, European Journal of Agronomy and Agricultural and Food Science. Until Dec. 2019 he has co-edited 6 scientific books, by publishers in USA and UK, and published 40 chapters in international books and more than 180 papers in JCR-journals. His h-index at Dec. 2019 was 54 (WoS-CoreCollection; h-index of 75 in google scholar). He has been invited several times to deliver talks in international conferences.

Research interests

I study the mechanisms underlying the responses of grain crops to environmental and genetic factors. My research approach has been always focused at the crop level of organization. The environmental factors include management practices such as irrigation or fertilization (among other less manageable environmental factors including radiation, photoperiod and temperature). Genetic factors include from general breeding strategies to the action of particular genes or groups of genes. The general aim is identifying alternatives to traditional farming and breeding practices to enhance the efficiency of resource use, as an avenue to increase simultaneously both crop productivity and agricultural sustainability.

Selected publications

- Perez-Gianmarco TI, **Slafer GA** & Gonzalez FG 2019, 'Photoperiod-sensitivity genes shape floret development in wheat', *Journal Of Experimental Botany*, 70, 4, 1339 - 1348.
- Savin R, Sadras VO & **Slafer GA** 2019, 'Benchmarking nitrogen utilisation efficiency in wheat for Mediterranean and non-Mediterranean European regions', *Field Crops Research*, 241, UNSP 107573.
- Garcia AL, Savin R & **Slafer GA** 2019, 'Fruiting efficiency differences between cereal species', *Field Crops Research*, 231, 68 - 80.
- Ochagavia H, Prieto P, Zikhali M, Griffiths S & **Slafer GA** 2019, 'Earliness Per Se by Temperature Interaction on Wheat Development', *Scientific Reports*, 9, 2584.

Selected research activities

Invited Talks in International Events

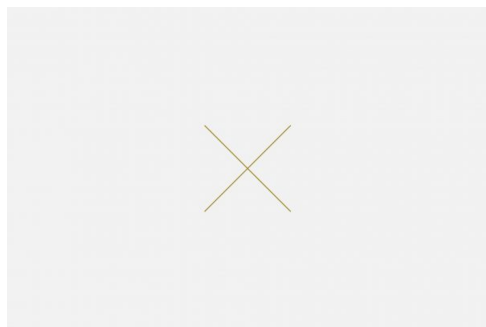
- Crop physiology in relation to breeding grain crops. Invited lecturer at the EUROPE SCIENTISTS MEETING, Corteva-Pioneer. Cremona, Italy. 5-7 February 2019.
- Heat x Nitrogen penalties on yield of cereals. MonoGram 2019. University of Nottingham. UK. 30 April - 2 May 2019.
- Brechas de rendimiento de trigo en ambientes con estrés hídrico: cuantificación y mitigación. Taller "Estrategias para reducir las brechas de rendimiento e incrementar la sostenibilidad de los sistemas de producción de cultivos anuales". Universidad Austral de Chile. 23-25 septiembre 2019

Editorial activity

Editor (with different denominations, always in charge of the review process and of making a final decision on acceptance/rejection of mss) of Crop Science (USA), Euphytica (Netherlands), Food and Energy Security (UK), Spanish Journal Agricultural Research (Spain) and Scientific Reports (UK)

Member of the Editorial or Advisory Board of Field Crops Research (Netherlands), European Journal of Agronomy (EU), International Journal of Molecular Sciences (Section for 'Molecular Plant Sciences'; Switzerland) and Agricultural and Food Science (Finland)

ICREA MEMOIR 2019



Ricard Solé

Universitat Pompeu Fabra (UPF)

Life & Medical Sciences

I am ICREA Research Professor at the Universitat Pompeu Fabra, where I'm the head of the Complex Systems Lab. I am also External Professor of the Santa Fe Institute (New Mexico, USA) fellow member of the European Center for Living Technology (Venice, IT) and external faculty of the Center for Evolution and Cancer at UCSF. I am also member of the editorial board of several international journals. I obtained my degrees in Physics and Biology at the University of Barcelona and received my PhD in Physics at the Universitat Politècnica de Catalunya. I have been awarded with James McDonnell Foundation, Botín Foundation and ERC Advanced Grants.

Research interests

One of my main research interests is understanding the origins of complexity in living and artificial systems, and how major transitions can be explained by means of statistical physics approaches. To this goal, my Lab develops both theoretical and experimental research, including an ambitious program on synthetic biology. The later area includes an exploration of synthetic multicellular systems, synthetic swarm intelligence and strategies to redesign existing ecosystems to fight climate change and its future impact.

Selected publications

- **Sole R**, Moses M & Forrest S 2019, 'Liquid brains, solid brains.', *Philosophical Transactions Of The Royal Society Of London. Series B, Biological Sciences*, 374, 1774, 20190040 - 20190040.
- Pinero J & **Sole R** 2019, 'Statistical physics of liquid brains', *Philosophical Transactions Of The Royal Society B-biological Sciences*, 374, 1774, 20180376.
- Sardanyes J, Pinero J & **Sole R** 2019, 'Habitat loss-induced tipping points in metapopulations with facilitation', *Population Ecology*, .
- Olle-Vila A & **Sole R** 2019, 'Cellular heterogeneity results from indirect effects under metabolic tradeoffs', *Royal Society Open Science*, 6, 9, 190281.
- Aguade-Gorgorio G & **Sole R** 2019, 'Genetic instability as a driver for immune surveillance', *Journal For Immunotherapy Of Cancer*, 7, 1, 345.

ICREA MEMOIR 2019



Martín Sombra

Universitat de Barcelona (UB)

Experimental Sciences & Mathematics

Born in 1970 in Ezpeleta (Argentina), Martín Sombra studied Mathematics as an undergraduate at the University of La Plata. He did his PhD thesis on Computer Algebra at the University of Buenos Aires. He then did postdoctoral stays at the MSRI at Berkeley, the IAS at Princeton, and the IMJ at Paris. He became Maître de Conférences at the University of Lyon 1, then spent four years as a “Ramón y Cajal” Researcher at the University of Barcelona, and became afterwards Full Professor at the University of Bordeaux 1. He finally moved back to Barcelona, joining ICREA in 2009. He works on problems at the interface of Algebraic Geometry, Number Theory and Complexity Theory. He currently collaborates with research groups in Barcelona, Paris, Caen, Bordeaux and Buenos Aires.

Research interests

Polynomials appear in a wide variety of contexts in Mathematics, Engineering and Computer Science. Polynomials in those situations are not random but come up with a certain structure which is important to exploit. I am interested in systems of structured polynomial equations and particularly in questions like: how many solutions does a given system have? How complicated those solutions can be? Can we predict where they will accumulate? Can we efficiently solve systems of polynomial equations? These problems have conduced me to study combinatorial objects like polytopes and fans, geometrical objects like curves and surfaces, and arithmetic objects like height of points and Diophantine equations. This gives a rich interplay between Complexity Theory, Combinatorics, Algebraic Geometry and Number Theory, leading to interesting results and stimulating research directions.

Selected publications

- D’Andrea C, Ostafe A., Shparlinski IE & **Sombra M** 2019, ‘Reduction modulo primes of systems of polynomial equations and algebraic dynamical systems’, *Transactions of the American Mathematical Society*, vol. 371, pp. 1169-1198.
- Burgos Gil JI, Philippon P, Rivera-Letelier J & **Sombra M** 2019, ‘The distribution of Galois orbits of points of small height in toric varieties’, *American Journal of Mathematics*, vol. 141, pp. 309-381.
- Amoroso F & **Sombra M** 2019, ‘Factorization of bivariate sparse polynomials’, *Acta Arithmetica*, 191, 4, 361 – 381.
- Martinez C & **Sombra M** 2019, ‘An arithmetic Berntsen-Kunirenko inequality’, *Mathematische Zeitschrift*, 291, 3-4, 1211 – 1244.

Selected research activities

Journal edition

Cohen A, Dahmen W, Munthe-Kaas H, Sombra M & Szanto A (editors), ‘Special issue on the occasion of the FoCM 2017 conference’, *Foundations of Computational Mathematics* 19 (2019) 963-1190.

Invited talks

- Talk at the ‘BGSMath María de Maeztu unit of excellence closing workshop’ at UB, 6 June
- Talk at the conference ‘Complexity of numerical computation’ at Berlin, 19 – 23 August
- Seminar talks at U. Regensburg (Germany), U. Rochester (USA) and ICMAT (Madrid)

Managerial

- Member of the board of directors of the FoCM Society
- Member of the advisory board of the series of conferences MEGA
- Member of the IMUB steering committee

Supervision of Master thesis

- Sergi Rovira, ‘The polynomial method over varieties’, UB, 26 September

Outreach activity

- Taller al ‘Dia internacional de la dona i la nena a la ciència 2018’, IEC, 14 February

ICREA MEMOIR 2019



Jordi Sort

Universitat Autònoma de Barcelona (UAB)

Engineering Sciences

Jordi Sort leads the 'Group of Smart Nanoengineered Materials, Nanomechanics and Nanomagnetism' (with around 20 researchers) as an ICREA Research Professor at UAB. After finishing his PhD in 2002 in the field of "magnetic interfacial effects" (Extraordinary Award), Prof. Sort performed two postdoctoral stays, at SPINTEC (Grenoble) and at Argonne National Laboratory. His research is focused on a wide variety of materials (thin films, lithographed structures, porous materials and nanocomposites) with emphasis on their magnetic and mechanical performance. He received awards from the Catalan and Spanish Physical Societies as well as the Federation of European Materials Societies. At present, Prof. Sort has supervised 13 PhD Theses, has published 306 articles (7850 citations in ISI WoS, $h = 43$), has issued 5 patents and has managed 30 national/international research projects, being Coordinator of an European Training Network (ITN) and a CoG and a PoC from the ERC.

Research interests

Jordi Sort is investigating the nanomechanical and nanomagnetic properties of innovative and advanced materials, including lithographed structures, thin films and bulk specimens. Among his most relevant recent achievements one can mention: the use of nanoindentation and selective ion irradiation to create magnetic structures embedded in non-magnetic matrices; observation of magneto-electric and magneto-ionic effects in nanoporous alloys; the ductilization of metallic glasses by development of nanostructured morphologies; the growth of new types of coatings with enhanced mechanical, magnetic, corrosion-resistance and catalytic properties; the development of advanced biodegradable materials; the characterization of mesoporous materials and onion-type nanoparticles with interlayer magnetic interactions. Further information at: <http://jsort-icrea.uab.cat/index.htm>.

Selected publications

- Menéndez E, Sireus V, Quintana A, Fina I, Casals B, Cichelero R, Kataja M, Stengel M, Herranz G, Catalán G, Baró MD, Suriñach S & **Sort J** 2019, 'Disentangling highly asymmetric magnetoelectric effects in engineered multiferroic heterostructures', *Phys. Rev. Appl.* 12 (1) 014041.
- Terzopoulou A, Hoop M, Chen XZ, Hirt AM, Charilaou M, Shen Y, Mushtaq F, Pérez del Pino A, Logofatu C, Simonelli L, deMello AJ, Doonan CJ, **Sort J**, Nelson BJ, Pané S & Puigmartí-Luis J 2019, 'Mineralization-inspired synthesis of magnetic zeolitic imidazole framework composites', *Angew. Chem.* 58 (38) 13550-13555.
- Robbennolt S, Nicolenco S, Mercier Fernandez P, Auffret S, Baltz V, Pellicer E, Menéndez E & **Sort J** 2019, 'Electric Field Control of Magnetism in Iron Oxide Nanoporous Thin Films', *ACS Appl. Mater. Interfaces* 11 (40) 37338-37346.
- Jang B, Hong A, Alcantara C, Chatzipiripiridis G, Martí X, Pellicer E, **Sort J**, Harduf Y, Or Y, Nelson BJ & Pané S 2019, 'Programmable Locomotion Mechanisms of Nanowires with Semi-Hard Magnetic Properties Near a Surface Boundary', *ACS Appl. Mater. Interfaces* 11 (3) 3214-3223.
- Navarro-Senent C, Quintana A, Menéndez M, Pellicer E & **Sort J** 2019, 'Electrolyte-gated magnetoelectric actuation: phenomenology, materials, mechanisms and prospective applications', *APL Mater.* 7 (3) 030701.
- Cordero-Edwards K, Kianirad H, Canalias C, **Sort J** & **Catalan G** 2019, 'Flexoelectric fracture-ratchet effect in ferroelectrics', *Phys. Rev. Lett.* 122 (13) 135502.

Selected research activities

- 19 publications (11 with ISI WoS I.F. > 4), 3 review papers and 3 patents (alive).
- Editorial Board of 6 ISI journals.
- 13 invited talks at International Conferences.
- Organizer/Scientific Committee of 6 workshops/conferences.
- 5 ongoing PhD Theses.
- Coordinator: H2020-ETN ('BeMAGIC'), ERC-CoG, ERC-PoC, Spanish and Catalan Governments (Retos, Llabor, SGR).
- Technical Committee member of the IEEE Magnetics Society.
- Research highlighted/Interviews in TV2, TV3, Divulcat, Pint of Science, etc.

ICREA MEMOIR 2019



Salvador Soto-Faraco
 Universitat Pompeu Fabra (UPF)
 Social & Behavioural Sciences

I obtained a BA in Psychology at the Universitat de Barcelona (1994), and completed a PhD in Cognitive Science and Language (1999) in the same university. Thereafter, I worked as a postdoctoral researcher at the Universities of Oxford (UK) and University of British Columbia (Canada). In 2002 I returned to Spain with a “Ramón y Cajal” research fellowship, and started a research group at Universitat de Barcelona, and in 2005 I became ICREA Research Professor and established the Multisensory Research Group at the Parc Científic de Barcelona thanks to public and private funding. Since 2009, I am based at the Universitat Pompeu Fabra, where I combine research and teaching as one of the group leaders at the Center for Brain and Cognition. In 2010 I received an individual Starting Grant from the ERC. Currently, the MRG group works on basic and applied research projects supported by local (MINECO, AGAUR) and EU (ERC) funding agencies.

Research interests

Humans, like other animals, are endowed with a wide range of sensory capacities such as hearing, feeling, seeing, smelling... This rich variety of senses allows our brains to represent the surrounding environment with fidelity and precision, so that we can parse information, store it in memory and, react successfully as a function of events. However, to achieve coherent mental representations of the environment our brains must coordinate the distinct sources of sensory information effectively across their different temporal properties, spatial frames of reference, and encoding formats. I am interested in the neural and behavioural principles underlying the selection and integration of such multi-sensory information. To achieve this, I use an experimental approach based on psychophysics, a variety of neuroimaging methods to measure neural activity (EEG, fMRI), and brain stimulation techniques (TMS).

Selected publications

- Muehlberg S & **Soto-Faraco S** 2019, ‘Cross-modal decoupling in temporal attention between audition and touch’, *Psychological Research-psychologische Forschung*, 83, 8, 1626 - 1639.
- Ikumi N, Torralba M, Ruzzoli M & **Soto-Faraco S** 2019, ‘The phase of pre-stimulus brain oscillations correlates with cross-modal synchrony perception’, *European Journal of Neuroscience*, 49, 2, 150 - 164.
- Ruzzoli M, Torralba M, Moris Fernandez L & **Soto-Faraco S** 2019, ‘The relevance of alpha phase in human perception’, *Cortex*, 120, 249 - 268.
- Kvasova D, Garcia-Vernet L & **Soto-Faraco S** 2019, ‘Characteristic sounds facilitate object search in real-life scenes’. *Front. Psychol.*, 10, 2511.

Selected research activities

Associate Editor: Multisensory Processes

ICREA MEMOIR 2019



Clivia M. Sotomayor Torres

Institut Català de Nanociència i Nanotecnologia (ICN2)

Engineering Sciences

Clivia obtained her PhD in Physics (Manchester Univ., UK 1984). She held tenured appointments at St. Andrews and Glasgow Universities and became a C4 professor at Wuppertal Univ. (Germany 1996). During 2004-8 she was a research professor at Univ. College Cork, Tyndall National Institute (Ireland). Since 2007 she is at ICN2 and heads a 17-strong team working on phonon engineering and nanofabrication. Clivia received awards from the Royal Society of Edinburgh, the Nuffield Foundation and an Amelia Earhart Fellowship from ZONTA International (USA). She is author of over 500 scientific papers, of which 462 are indexed (WoS, Researcher ID: E-8418-2010), has an h-index of 46 and almost 9000 citations. She edited six books on low dimensional structures and nanofabrication. She was a guest professor at the KTH Royal Institute of Technology in Sweden for five years until September last year.

Research interests

Her group investigates new concepts for multi-state variables based on the engineered interactions of phonons with photons, electrons and magnons, in device-like structures. One particular interest is thermal transport at the nanoscale to address heat dissipation in nanoelectronics, the role of phonons in noise and dissipation in nano-scale systems. Another strand is Si-based opto-mechanics for phonon-based information processing. Our experimental research is anchored in novel nanofabrication methods including dimensional and defectivity metrology. The latter is essential to set up standards in manufacturing to ease the uptake of nanotechnology products. During 2019 we made considerable progress in experiments with topological bosons aiming at dissipationless energy transport.

Selected publications

- Sledzinska M, Graczykowski B, Maire J, Chavez-Angel E, **Sotomayor-Torres CM** & Alzina F 2019, '2D Phononic Crystals: Progress and Prospects in Hypersound and Thermal Transport Engineering', *Advanced Functional Materials*, , 1904434.
- Jaramillo-Fernandez J, Whitworth GL, Pariente JA, Blanco A, Garcia PD, Lopez C & **Sotomayor-Torres CM** 2019, 'A Self-Assembled 2D Thermofunctional Material for Radiative Cooling', *Small*, 15, 22, 1905290.
- Arregui G, Lanzillotti-Kimura ND, **Sotomayor-Torres CM** & Garcia PD 2019, 'Anderson Photon-Phonon Colocalization in Certain Random Superlattices', *Physical Review Letters*, 122, 4, 043903.
- Arregui G, Ortiz O, Esmann M, **Sotomayor-Torres CM**, Gomez-Carbonell C, Mauguin O, Perrin B, Lemaitre A, Garcia PD & Lanzillotti-Kimura ND 2019, 'Coherent generation and detection of acoustic phonons in topological nanocavities', *APL Photonics*, 4, 3, 030805.
- Sledzinska M, Graczykowski B, Alzina F, Melia T, Termentzidis K, Lacroix D & **Sotomayor Torres CM** 2019, 'Thermal conductivity in disordered porous nanomembranes', *Nanotechnology*, 30, 26, 265401.
- Colombano MF, Arregui G, Capuj N E, Pitanti A, Maire J, Griol A, Garrido B, Martinez A, **Sotomayor-Torres CM** & Navarro-Urrios D 2019, 'Synchronization of Optomechanical Nanobeams by Mechanical Interaction', *Physical Review Letters*, 123, 017402

Selected research activities

Scientific Advisor to the Research Centre Silicon Austria Lab.
 Board Member Danish National Research Foundation.
 EU FET Open project coordinator "All-phononic circuits enabled by opto-mechanics" (PHENOMEN).
 Member of the Experts Committee for the Excellence Strategy of German Universities.

ICREA MEMOIR 2019



Laura Soucek

Vall d'Hebron Institut d'Oncologia (VHIO)
Life & Medical Sciences

Laura Soucek graduated in 1996 in Biological Sciences at University La Sapienza in Rome, Italy. She obtained her PhD in Genetics and Molecular Biology at the National Research Center, in Rome. In 2001 she joined University of California San Francisco, initially as postdoctoral fellow and later, in 2006 as Assistant Researcher. There she published in high impact international journals. Since early 2011, Dr. Soucek heads the Mouse Models of Cancer Therapies Group at the Vall d'Hebron Institute of Oncology (VHIO), in Barcelona. She received prestigious awards and grants from AACR, the Miguel Servet Program, the FERO Foundation, the Association for International Cancer Research, the European Research Council, FIS and BBVA. In October 2014 she was appointed ICREA Research Professor. In December 2014 she founded a spin-off company, Peptomyc S.L., where she is CEO. In April 2015, she became Associate Professor at the Universitat Autònoma de Barcelona.

Research interests

Our focus is the Myc oncoprotein, whose deregulation is implicated in almost all human cancer types. We have designed a Myc dominant negative, Omomyc, to investigate the therapeutic benefit of inhibiting Myc in cancer. We demonstrated that Myc inhibition has a remarkable therapeutic index in many mouse models of cancer, while only causing mild and reversible side effects in normal tissues. We also showed that Myc is a safe pharmacological target for many, perhaps all, cancers. Our goal is now to push such a therapeutic approach further towards the clinic. To do so we are making use of a new generation of Myc inhibitory cell-penetrating miniproteins, which are supposed to be tested in clinical trials in 2021. These innovative treatments could boost our therapeutic arsenal against the majority of human cancers.

Selected publications

- Marie-Eve Beaulieu, Toni Jauset, Daniel Massó-Vallés, Sandra Martínez-Martín, Peter Rahl, Loïka Maltais, Mariano F. Zacarias-Fluck, Sílvia Casacuberta-Serra, Erika Serrano del Pozo, Christopher Fiore, Laia Foradada, Virginia Castillo Cano, Matthew Guenther, Eduardo Romero Sanz, Marta Oteo, Cynthia Tremblay, Génesis Martín, Danny Letourneau, Martin Montagne, Miguel Ángel Morcillo Alonso, Jonathan R. Whitfield, Pierre Lavigne and **Laura Soucek** 2019. 'Intrinsic cell-penetrating activity propels Omomyc from proof of concept to viable anti-Myc therapy.' *Sci Transl Med.* 11, 484, eaar5012.
- Irina Alimova, Angela Pierce, Etienne Danis, Andrew Donson, Diane K. Birks, Andrea Griesinger, Nicholas K. Foreman, Mariarita Santi, **Laura Soucek**, Sujatha Venkataraman and Rajeev Vibhakar 2019, 'Inhibition of MYC attenuates tumor cell self-renewal and promotes senescence in SMARCB1-deficient Group 2 atypical teratoid rhabdoid tumors to suppress tumor growth in vivo', *International Journal Of Cancer*, 144, 8, 1983 - 1995.
- Jonathan R. Whitfield and **Laura Soucek**. 'Editorial Overview: Peptides in Cancer'. *Current Opinion in Pharmacology*. 47, pp III - V.
- Mireia Pesarrodona, Toni Jauset, Zamira V. Díaz-Riscos, Alejandro Sánchez-Chardi, Marie-Eve Beaulieu, Joaquin Seras-Franzoso, Laura Sánchez-García, Ricardo Baltà-Foix, Sandra Mancilla, Yolanda Fernández, Ursula Rinas, Simó Schwartz Jr, **Laura Soucek**, Antonio Villaverde, Ibane Abasolo and Esther Vázquez. 2019 "Targeting antitumoral proteins to breast cancer by local administration of functional inclusion bodies". *Advanced Sciences*. 24;6(18):1900849.
- Marie-Eve Beaulieu and **Laura Soucek** 2019, 'Finding MYCure', *Molecular & Cellular Oncology*, 6, 5, e1618178.

ICREA MEMOIR 2019



Kestutis Staliunas

Universitat Politècnica de Catalunya (UPC)

Engineering Sciences

Graduated Theoretical Physics, Vilnius University, Lithuania, 1985. PhD in Physics, Vilnius University, 1989. Habilitation in Physics, Vilnius University, 2001. A.v. Humboldt fellow in Physikalisch-Technische Bundesanstalt (PTB) Braunschweig, Germany, 1991-1992. Between 1993-2003 senior research fellow in Braunschweig PTB and University of Hannover on nonlinear pattern formation in laser systems and Bose condensates. Since 2004 ICREA research professor in Universitat Politècnica de Catalunya (UPC), Barcelona, head of research group on lasers, photonics and meta-photonics, nonlinear laser dynamics. Professional experience: around 250 articles in scientific journals with appr. 6000 citations (h-factor 43); appr. 500 presentations in conferences (more than 100 invited ones); 2 patents, 2 monographs. Up to now directed (or currently directing) 17 PhD projects.

Research interests

Spatial quality of laser beams is of high importance in technologies: good quality beams propagate better collimated, can be more tight focused. Not all lasers, however, produce good beams: the radiation of especially very important semiconductor microlasers, microchip lasers, are too random and divergent. We develop new physical concepts and new techniques to manipulate the spatial structure of radiation, by using micro-modulated smart photonic materials: photonic crystals, metamaterials, nonhermitian optical materials. We develop these novel light-manipulation techniques in fundamental level and implement them in photonic industry. Also the good quality beams of microwaves, sound waves, or matter waves are required. We apply our experience in “smart manipulation of light patterns” to the other types of waves, to produce “clean” and well directed sound beams by so called “sonic crystals” in acoustics, as well as “clean” matter wave ensembles in modulated Bose condensates.

Selected publications

- Grineviciute L, Babayigit C, Gailevicius D, Bor E, Turdnev M, Purlys V, Tolenis T, Kurt H & **Staliunas K** 2019, ‘Angular filtering by Bragg photonic microstructures fabricated by physical vapour deposition’, *Applied Surface Science*, 481, 353 – 359
- Bessin F, Perego AM, **Staliunas K**, Turitsyn SK, Kudlinski A, Conforti M & Mussot A 2019, ‘Gain-through-filtering enables tuneable frequency comb generation in passive optical resonators’, *Nature Communications*, 10, 4489.
- Ahmed WW, Herrero R, Botey M, Wu Y & **Staliunas K** 2019, ‘Regularization of Vertical-Cavity Surface-Emitting Laser’s emission by periodic non-Hermitian potentials’, *Opt.Letters*, **44**, 3948
- Gawali S, Gailevicius D, Garre-Werner G, Purlys V, Cojocar C, Trull J, Montiel-Ponsoda J & **Staliunas K** 2019, ‘Photonic crystal spatial filtering in broad aperture diode laser’, *Applied Physics Letters*, 115, 14, 141104.
- Gailevicius D, Purlys V & **Staliunas K** 2019, ‘Photonic crystal spatial filters fabricated by femtosecond pulsed Bessel beam’, *Optics Letters*, 44, 20, 4969 – 4972.
- **Staliunas K**, Ahmed W, Botey M, Herrero R, Hayran Z & Kurt H 2019, ‘Directionality Fields generated by a Local Hilbert Transform in Optics’, *Metamaterials Xii*, 11025, UNSP 1102506.

Selected research activities

Invited and plenary talks: ICTON’19 Angers, Photoni West’19 San Francisco, METANANO’19 St. Peterburg, META’19 Lisbon;
 Master course “Optical Materials and Metamaterials” in Europhotonics programme.
 Defended PhD thesis: Darius Gailevicius (Vilnius University);
 Committees of PhD Thesis: N. Garaev (Vilnius University), D.Zezyulin (ITMO, St.Peterburg);

ICREA MEMOIR 2019



Luc Steels

Universitat Pompeu Fabra (UPF)

Engineering Sciences

Luc Steels studied linguistics at the University of Antwerp (Belgium) and computer science at the Massachusetts Institute of Technology (USA). His main research field is Artificial Intelligence covering a wide range of intelligent abilities, including vision, robotic behavior, conceptual representations and language. In 1983 he became a professor of computer science at the University of Brussels (VUB) and in 1996 he founded the Sony Computer Science Laboratory in Paris and became its first director. Currently he is ICREA Research Professor at the Institute for Evolutionary Biology (CSIC,UPF). Steels has been PI in a dozen large-scale European projects and almost 40 PhD theses have been granted under his direction. He has produced over 300 articles and edited 15 books directly related to his research.

Research interests

The origins and evolution of languages remains one of the most exciting unresolved puzzles of science today. The problem is even more difficult than biological evolution because there are no fossil records. Clearly social, biological and cultural evolution all have played a role but the details still allude scientific explanation. My research over the past decade has focused on developing theoretical models of language evolution. I set up experiments in which a population of robots autonomously develops their own communication systems with properties similar to human languages. We have focused on explaining the origins of color terms, spatial expressions, determiners, case grammar and agreement systems. So far these experiments use exclusively a process of cultural evolution, but through my recent affiliation with the Institute for Evolutionary Biology I now try to complete this picture by looking at the biological evolution of the cognitive foundations needed for language.

ICREA MEMOIR 2019



Massimiliano Stengel

Institut de Ciència de Materials de Barcelona (CSIC - ICMAB)
Experimental Sciences & Mathematics

Massimiliano Stengel graduated in Physics at the University of Trieste (1999) and received his PhD in Science from the Swiss Polytechnic School of Lausanne (EPFL) in 2004. From February 2005 to April 2009 he was a postdoctoral researcher in the group of Prof. Nicola Spaldin at the Materials Department (UC Santa Barbara), and from May to September 2009 at CECAM (EPFL) under the supervision of Prof. Wanda Andreoni. From February 2010 to September 2011 he worked at ICMAB in Barcelona as a “Ramón y Cajal” fellow, before joining ICREA as a Research Professor in October 2011.

Research interests

My research develops and uses frontier electronic-structure methods to tackle key fundamental and technological questions in ferroelectricity, magnetism, surface science and metal/oxide interfaces. In the past few years I have focused on perovskite thin films, and in particular on understanding how the reduced size affects their functional properties. I am currently interested in the study of novel functionalities in oxide-based systems (e.g. flexoelectricity, magnetoelectric effects, confined electron gases, improper ferroelectricity) and in development of accurate modeling strategies to bridge the gap between the microscopic and macroscopic worlds.

Selected publications

- Schiaffino A, Dreyer CE, Vanderbilt D & **Stengel M** 2019, ‘Metric wave approach to flexoelectricity within density functional perturbation theory’, *Physical Review B*, 99, 8, 085107.
- Schoenherr P, Shapovalov K, Schaab J, Yan Z, Bourret ED, Hentschel M, **Stengel M**, Fiebig M, Cano A & Meier D 2019, ‘Observation of Uncompensated Bound Charges at Improper Ferroelectric Domain Walls’, *Nano Letters*, 19, 3, 1659 – 1664.
- Royo M & **Stengel M** 2019, ‘First-Principles Theory of Spatial Dispersion: Dynamical Quadrupoles and Flexoelectricity’, *Physical Review X*, 9, 2, 021050.
- Junquera J, Garcia-Fernandez P & **Stengel M** 2019, ‘Mechanisms to enhance the capacitance beyond the classical limits in capacitors with free-electron-like electrodes’, *Physical Review B*, 99, 23, 235127.
- Menendez E, Sireus V, Quintana A, Fina I, Casals B, Cicheler R, Kataja M, **Stengel M**, Herranz G, **Catalan G**, Baro MD, Surinach S & **Sort 2019**, ‘Disentangling Highly Asymmetric Magnetoelectric Effects in Engineered Multiferroic Heterostructures’, *Physical Review Applied* 12, 014041.
- Schaab J, Shapovalov K, Schoenherr P, Hackl J, Khan MI, Hentschel M, Yan Z, Bourret E, Schneider CM, Nemsk S, **Stengel M**, Cano A & Meier D 2019, ‘Electrostatic potential mapping at ferroelectric domain walls by low-temperature photoemission electron microscopy’, *Applied Physics Letters* 115, 122903.

Selected research activities

Invited talks:

- *New functionalities from gradients: Flexoelectricity and more*. European Meeting on Ferroelectricity (EMF), Lausanne (July 2019)
- *New functionalities from gradients: Flexoelectricity and more*. International Workshop on Topological Structures in Ferroic Materials – TOPO2019, Prague (Czech Republic).
- *Lautrec*. Alessandro De Vita: A Celebration of his Life and Work. King’s College (London), May 2019.
- *First-principles theory of spatial dispersion effects*. ABINIT developer workshop, Louvain-la-Neuve, May 2019.

ICREA MEMOIR 2019



Thomas Sturm

Universitat Autònoma de Barcelona (UAB)

Humanities

After studies in philosophy, history, and political science at the University of Göttingen and the University of California at San Diego (UCSD), I obtained my PhD in 2007 from Marburg University. Before joining ICREA in 2014, I held positions at Marburg (1995-2000); UCSD (2000), the Berlin-Brandenburg Academy of Sciences & Humanities (2001-2005), the Max Planck Institute for the History of Science (2005-2009), and the Dept. of Philosophy, UAB (Ramón y Cajal Scholar, 2009-2014). I am also a member of the CEHIC (UAB), the LOGOS group (UB), the Kant-edition at the Berlin-Brandenburg Academy of Sciences, and Associate Research Fellow at the Wundt Center for Philosophy & History of Psychology, Universidade Federal Juiz de Fora (Brazil). In 2019, I was elected member of the *Academia Europea*; in November 2019, and became Head of the *Kantian Rationality Lab* at the Immanuel Kant Baltic Federal University, Kaliningrad.

Research interests

How is reason or rationality understood in philosophy and the human sciences? How should it be understood? What is its function in various domains? These are the guiding questions for my research, which comprises topics reaching from early modern philosophy – esp. Immanuel Kant’s philosophy – up to current discussions at the interface of philosophy, psychology, and economics. I study aspects of reason in Kant’s philosophy in relation to his notions of truth and the systematicity of science; I analyze the history as well as the potentials and limits of current psychological theories of rationality; and I also study their role in politics, social science, and ethics. I’m moreover interested in the philosophy of knowledge, mind, and science. Methodologically, I combine tools of analytic philosophy and history of science: I am unconvinced by widespread opinions according to which they cannot, or should not, be integrated.

Selected publications

- **Sturm T** 2019, ‘Formal versus bounded norms in the psychology of rationality: Toward a multilevel analysis of their relationship’, *Philosophy of the Social Sciences*, 49, 190-209.
- **Sturm T** 2019, ‘Rationalität versus Vernunft? Über eine Unterscheidung bei John Rawls (und anderen)’, in: D. Hommen & D. Sölch, eds., *Philosophische Sprache zwischen Tradition und Innovation*, Frankfurt a.M., Peter Lang, pp. 211-233.
- **Sturm T** 2019, ‘Scientific innovation and scientific rationality: A conceptual explication and a dilemma’, *Theoria*, 34, 321-341.
- **Sturm T** & Nickles T 2019, ‘Introduction: Innovation in/through science’, *Theoria*, 34, 317-320.

Selected research activities

July 2019: Elected member, *Academia Europea*

November 2019: Major grant from the Russian Ministry of Science for *Kantian Rationality and Its Impact in Contemporary Science, Technology, and Social Institutions* (2019-2021, project no. 2019-220-07-5933). For this, I also act as Head of *Kantian Rationality Lab* at the Immanuel Kant Baltic Federal University, Kaliningrad

Further ongoing projects:

PI, *Naturalism and the sciences of rationality* (2016-2020) – MINECO project FFI2016-79923-P

PI, *Barcelona HPS Group*

Member, project *New edition of Part I, “Works”, of the Academy edition of Kant’s Collected Writings* (2017-2024; PI: V. Gerhardt, Berlin-Brandenburg Academy of Sciences and Humanities) – DFG project GE 657/16-1

Research stays: August 2019 – Associate Research Fellow, Academia Kantiana, Immanuel Kant Baltic Federal University, Kaliningrad

Conference organization: *Nationalism and the European Project* (with S. Döring, Tübingen, March 2019); *Kant and the Systematicity of the Sciences* (with G. Gava & A. Vesper, Frankfurt/Main, July 2019)

Invited speaker (selected): at Kaliningrad (Keynote), Turin (Keynote), and London School of Economics

Director of 4 ongoing PhD theses

Reviewer for (selected): *Spanish Ministry of Science, Innovation, and Universities*; *Kantian Journal*; *Kant-Studien*; *Quaderns de Filosofia*; *Synthese*

ICREA MEMOIR 2019



Fran Supek

Institut de Recerca Biomèdica de Barcelona (IRB Barcelona)
Life & Medical Sciences

Fran Supek is an ICREA professor based at the Institute for Research in Biomedicine (IRB Barcelona), a part of the Barcelona Institute of Science and Technology. Fran leads the Genome Data Science laboratory, which specializes in large-scale statistical analyses of genomic, transcriptomic and epigenomic data. Fran obtained his PhD in Molecular biology in 2010 from the University of Zagreb, while working as an early-stage researcher at the RBI (Croatia). This was followed by a postdoctoral stay at the Centre for Genomic Regulation (as a Marie Curie fellow) and in 2017 he started his group at the IRB as a Ramon y Cajal fellow. Fran is the PI of the ERC Starting Grant HYPER-INSIGHT, an EMBO Young Investigator, and an author on 39 research papers and 2 book chapters, cited 4954 times.

Research interests

My interests focus on computational approaches for elucidating mutational processes that generate genetic diversity within populations and across species, with the goal of understanding mechanisms of mutagenesis and DNA repair. I am also interested in developing statistical frameworks for detecting genomic signatures of negative or positive selection, which are often challenging to distinguish from the background DNA sequence variability that results from accumulated mutations. Such novel methodologies provide opportunities to gain insight into evolution of genomes, by revealing details of the interplay between mutation and selection. The biological questions I addressed include learning about evolution of gene function and regulation, in particular related to mechanisms underlying stress resistance and disease. In addition, I am interested in distributions of genetic variants in the human germline and soma, which can reveal how DNA repair is organized along eukaryotic chromosomes.

Selected publications

- Lindeboom RGH, Vermeulen M, Lehner B & **Supek F** 2019, 'The impact of nonsense-mediated mRNA decay on genetic disease, gene editing and cancer immunotherapy', *Nature Genetics*, **51**(11):1645-1651.
- Salvadorés M, Mas-Ponte D & **Supek F** 2019, 'Passenger mutations accurately classify human tumors', *Plos Computational Biology*, **15**(4): e1006953.
- **Supek F** & **Lehner B** 2019, 'Scales and mechanisms of somatic mutation rate variation across the human genome', *DNA Repair*, **81**:102647.
- Mihelcic M, Smuc T & **Supek F** 2019, 'Patterns of diverse gene functions in genomic neighborhoods predict gene function and phenotype', *Scientific Reports*, **9**:19537.
- Franco I, Helgadottir HT, Moggio A, Larsson M, Vrtacnik P, Johansson A, Norgren N, Lundin P, Mas-Ponte D, Nordström J, Lundgren T, Stenvinkel P, Wennberg L, **Supek F** & Eriksson M 2019, 'Whole genome DNA sequencing provides an atlas of somatic mutagenesis in healthy human cells and identifies a tumor-prone cell type', *Genome Biology*, **20**:285.
- Zhou N, Jiang Y, Bergquist TR, Lee AJ, [...], **Supek F**, [...], Radivojac P & Friedberg I 2019, 'The CAFA challenge reports improved protein function prediction and new functional annotations for hundreds of genes through experimental screens', *Genome Biology*, **20**:244.

Selected research activities

Selected for the EMBO Young Investigator Programme.

ICREA MEMOIR 2019



Hans Supèr
 Universitat de Barcelona (UB)
 Life & Medical Sciences

2017-present: Director of ACAP; 2013-present: CTO Braingaze SL; 2009-2014: Director of the VISCA lab; 2005-present: Research Professor, ICREA; 2005-present: Assistant professor University of Barcelona; 2002-2005: Head of the Vision and Cognition-II group, NIN, KNAW, The Netherlands; 1999-2001: Senior postdoc, NIN, NWO, The Netherlands; 1997-1999: Postdoc in the lab of Prof. Dr. V. Lamme, NORI, The Netherlands; 1992-1996: PhD student in the lab of Prof. Dr. E. Soriano, University of Barcelona.

Research interests

I started my scientific journey by studying the ontogenetic and evolutionary development of the cerebral cortex to get a grasp of the immense complexity of the cortex. To learn about the functional organization of the neocortex, I continued my research studying system neurophysiology in awake, behaving monkeys and neural circuit dynamics using computer simulations. In 2011 we discovered a novel eye movement in cognitive processing. We termed it Cognitive Vergence. The use of Cognitive Vergence has been patented world-wide, and I founded the start-up company (Braingaze) in 2013. End 2017 I started the centre ACAP at the UB where graduate and master students can carry out clinical work using Cognitive Vergence. Currently my research investigates 1) the neural mechanism of dynamic neural interactions, 2) the function of Cognitive Vergence in visual cognition, 3) clinical applications of Cognitive Vergence in early diagnosis of mental pathology being ADHD, Alzheimer, ASD, Dyslexia, 4) interactive eye tracking games to train cognitive behavior. Methods we use are computational spiking networks, eye tracking, machine learning, and psychophysics.

Selected publications

- Varela P, Esposito FL, Morata I, Capdevila A, Solé Puig M, de la Osa N, Ezpeleta L, Faraone SV, Ramos-Quiroga JA, Cañete J & **Supèr H** 2019, 'Clinical validation of eye vergence as an objective marker for diagnosis of Attention Deficit Hyperactivity Disorder in children', *Journal of Attention Disorder*, 23, 6, 599 - 614.
- Lerer A, **Supèr H** & Keil MS 2019, 'Luminance gradients and non-gradients as a cue for distinguishing reflectance and illumination in achromatic images: A computational approach', *Neural Networks*, Volume 110, Pages 66-81.
- Esposito FL & **Supèr H** 2019, 'Eye vergence responses to novel and familiar stimuli in young children', *Acta Psychol (Amst)*, 193, 190 - 196.

ICREA MEMOIR 2019



Thomas Surrey

Centre de Regulació Genòmica (CRG)
Life & Medical Sciences

Thomas Surrey obtained his PhD in Biochemistry from the University of Tübingen in 1995. After postdoctoral training at Princeton University and the European Molecular Biology Laboratory (EMBL) in Heidelberg, he became group leader at EMBL. In 2011, Thomas moved to the CRUK London Research Institute (LRI) to take the position of a senior group leader and later transferred to the newly established Francis Crick Institute in London. In 2019, Thomas relocated to the Centre of Genomic Regulation (CRG), a part of the Barcelona Institute of Science and Technology, to take the position as a CRG senior group leader and ICREA research professor. Thomas is author of 86 research publications, elected EMBO member (2012), recipient of an ERC Advanced Grant (2013) and of the Hooke medal of the British Society of Cell Biology (2015). He was a Whitman Center Fellow at the Marine Biology Laboratory (MBL) in Woods Hole in 2016 and a Visiting Miller Professor at UC Berkeley in 2018.

Research interests

Living cells are internally highly organized, yet also very dynamic. How is dynamic order generated? The cytoskeleton plays a critical role in this process by forming an active filament network that provides a mechanically stable coordinate system for the internal organization of cells. The Surrey lab studies the properties of the microtubule cytoskeleton with a particular interest in its ability to organize itself into different networks in different cell types or at different times of a cell's life cycle. The Surrey lab has pioneered several biochemical in vitro reconstitution approaches in which minimal cytoskeletal subsystems can be generated from purified components. Observing the behaviour of these reconstituted systems by advanced fluorescence microscopy provides insight into the molecular mechanisms underlying cytoskeleton dynamics and function. Our goal is to uncover the design principles governing active biological network organization which is essential for cell function.

Selected research activities

Prior to my ICREA appointment

Selected Publications

Rickman J, Nedelec F, **Surrey T** (2019) Effects of spatial dimensionality and steric interactions on microtubule-motor self-organization. *Physical Biology* 16 (4), 046004.

Hannabuss J, Lera-Ramirez M, Cade NI, Fourniol FJ, Nedelec F, **Surrey T** (2019) Self-Organization of Minimal Anaphase Spindle Midzone Bundles, *Current Biology*, 29 (13) 2120

Most relevant invited conference presentations

Surrey T. Self-organization of a minimal anaphase spindle-like midzone. *Invited lecture* at the Company of Biologists Workshop 'Reconstitution of cell cytoskeleton in vitro' at Wiston House, West Sussex, UK, January 2019

Surrey T. Self-organization of minimal anaphase spindle-like midzone. *Invited lecture* at the conference 'Mitotic spindle: From living and synthetic systems to theory', Split, Croatia, March 2019

Surrey T. In vitro reconstitution of dynamic microtubule systems. *Invited Keynote lecture* at the Gordon Research Conference on Motile and Contractile Systems at Colby-Sawyer College, New London, NH, USA, July 2019

Surrey T. Self-organization of microtubules, motors and bundlers. *Invited lecture* at UIMP Summer School 'Frontiers in Synthetic Biology (III) - Constructing a synthetic cell', Santander, Spain, August 2019

Surrey T. Design principles of dynamic cytoskeleton organization derived from in vitro reconstitutions. Invited Lecture at UNIA Workshop Current Trends in Biomedicine 'From Cancer to Developmental Defects: The Control of DNA Segregation and Human Disease', Baeza Spain, October 2019

ICREA MEMOIR 2019



Marcel Swart

Universitat de Girona (UdG)

Experimental Sciences & Mathematics

Marcel Swart obtained his PhD degree at the University of Groningen under the guidance of Prof. Herman Berendsen, Prof. Gerard Canters and Prof. Jaap Snijders. After postdoctoral stays in Amsterdam, he was appointed ICREA Júnior researcher and in 2009 ICREA Research Professor at the University of Girona. He was elected Fellow of the Young Academy of Europe in 2014, Director of the IQCC institute in 2015, and Fellow of the Royal Society of Chemistry in 2015. He is Founding Member and Vice-President of the QBIC Society, and of the RSEQ-GEQC specialized group on computational chemistry. He organized the Girona Seminars on Predictive Catalysis (2016, 2018), edited the first textbook on spin states "Spin states in Biochemistry and Inorganic Chemistry" (Wiley), and was Chair of COST Action CM1305 (2014-2018). He participates in evaluation committees (ANEP, FWO, LaCaixa), and is member of editorial boards of scientific journals.

Research interests

He works in the field of theoretical (bio)inorganic and supramolecular chemistry, and works on transition-metal complexes, metalloproteins, enzymes, and DNA. The development of computational tools for these studies is an important ingredient, to which he has contributed largely both with his own software (QUILD, DRF90) as in contributions in general purpose software (ADF, NWChem). One of the main areas where these tools are applied is in the field of transition-metal chemistry, the spin states involved, and the effect this has on reactivity, selectivity, chemical bonding and spectroscopy. For this he developed spin-state consistent density functional (SSB-D, S12g). His research on the development of theoretical chemistry tools was awarded the Young Scientist Excellence Award 2005, the 2012 MGMS Silver Jubilee Prize, and a special award by the Serbian Chemical Society in honor of their 120 anniversary for his continuous support for advancing chemical sciences in Serbia.

Selected publications

- Engelmann X, Malik DD, Corona T, Warm K, Farquhar ER, **Swart M**, Nam W & Ray K 2019, "Trapping of a Highly Reactive Oxoiron(IV) Complex in the Catalytic Epoxidation of Olefins by Hydrogen Peroxide", *Angew. Chem. Int. Ed.* 58, 12, 4012 - 4016.
- Stepanovic S, Zlatar M, **Swart M** & Gruden M 2019, 'The Irony of Manganocene: An Interplay between the Jahn-Teller Effect and Close-Lying Electronic and Spin States', *Journal Of Chemical Information And Modeling*, 59, 5, 1806 - 1810. [+Cover]
- Castro AC, Fliegl H, Cascella M, Helgaker T, Repisky M, Komorovsky S, Medrano MA, Quiroga AG & **Swart M** 2019, 'Four-component relativistic P-31 NMR calculations for trans-platinum(II) complexes: importance of the solvent and dynamics in spectral simulations', *Dalton Transactions*, 48, 23, 8076 - 8083. [+BackCover]
- Trammell R, D'Amore L, Cordova A, Polunin P, Xie N, Siegler MA, Belanzoni P, **Swart M** & Garcia-Bosch I 2019, 'Directed Hydroxylation of sp² and sp³ C-H Bonds Using Stoichiometric Amounts of Cu and H₂O₂', *Inorganic Chemistry*, 58, 11, 7584 - 7592.
- Steen JD, Stepanovic S, Parvizian M, de Boer JW, Hage R, Chen J, **Swart M**, Gruden M & Browne WR 2019, 'Lewis vs. Brønsted Acid Activation of a Mn(IV) Catalyst for Alkene Oxidation', *Inorg. Chem.*, 58, 21, 14924 - 14930.

ICREA MEMOIR 2019



Albert Tarancón

Institut de Recerca en Energia de Catalunya (IREC)
Engineering Sciences

Albert holds M.Sc. and PhD in Physics from the University of Barcelona (2001, 2007) and M. Eng. in Materials Science from the Polytechnic University of Catalonia (2007). He worked as research associate at the IMB-CSIC (ES) and as visiting researcher at the University of Oslo (NO), Imperial College London (UK) and Caltech (USA). In 2010, Albert gained a Ramon y Cajal Fellowship and joined the Catalonia Institute for Energy Research (IREC) as the Head of the Nanoionics and Fuel Cells Group. Currently, he is ICREA Professor at IREC and leads a group of 25+ people devoted to nanomaterials for alternative energy technologies and their applicability in powering portable devices and hydrogen/synthetic fuels production. He has been PI of 9 EU projects, including one ERC-CoG and two coordinated H2020, attracting a total amount of 15+ M€. He is currently editor of J. Phys. Energy (IoP) and J. Eur. Ceram. Soc. (Elsevier)

Research interests

The research work carried out by Albert is in advanced materials for energy applications. In particular, he has been developing innovative concepts for improving the performance of different solid state energy devices such as Solid Oxide Fuel and Electrolysis Cells (SOFC/SOEC), ThermoElectric Generators (TEGs) or Li-ion batteries for energy storage and portable power applications. In the last years, Albert has been specifically developing new concepts for the unexplored field of Nanoionics. Nanoionics is called to drive a new revolution similarly to Nanoelectronics, underlining the relevance of size effects and interfaces on mass transfer, transport and storage. Albert's group is pioneer in implementing interface-dominated nanomaterials in real devices for radically new applications. In this direction, he was recently awarded with an ERC CoG to implement disruptive Nanoionics concepts in Si-integrated micro-SOFC technology and a FET Proactive project on new micro energy technologies.

Selected publications

- Chiabrera F, Garbayo I, López-Conesa L, Martín G, Ruiz-Caridad A, Walls M, Ruiz-González L, Kordatos A, Núñez M, Morata A, Estradé S, Chronos A, Peiró F & Tarancón A 2019, 'Engineering Transport in Manganites by Tuning Local Nonstoichiometry in Grain Boundaries', **Advanced Materials**, 31, 4, 1805360. (**Selected for the cover image**)
- **Tarancón A** 2019, 'Powering the IoT revolution with heat', *Nature Electronics* 2, 270.
- Donmez I, Gadea G, Salleras M, Pacios M, Calaza C, Stranz A, Dolcet M, Morata A, **Tarancón A** & Fonseca L 2019, "SiGe nanowire arrays based thermoelectric microgenerator", *Nano Energy* 57, 492-499.
- Garbayo I, Chiabrera F, Alayo N, Santiso J, Morata A & **Tarancón A*** 2019, 'Thin film oxide-ion conducting electrolyte for near room temperature applications', *Journal of Materials Chemistry A* 7, 25772 (selected for the cover image of the issue)
- Chiabrera F, Garbayo I, Pla D, Burriel M, Wilhelm F, Rogalev A, Núñez M, Morata A & **Tarancón A** 2019, "Unraveling bulk and grain boundary electrical properties in La_{0.8}Sr_{0.2}Mn_{1-y}O_{3+d} thin films", *APL Materials* 7, 013205 (Invited Article)

Selected research activities

- Coordinator of the the EU HARVESTORE project granted with 7M€ within the Future Emerging Technologies (H2020-FET Proactive) programme
- Coordinator of the ULTRASOFC (H2020-ERC-CoG) and Cell3Ditor (H2020-FCH JU) EU projects
- Editor of the *Journal of the European Ceramic Society* (Elsevier) and the *Journal of Physics: Energy* (IoP Publishing)
- Guest editor of special issues in the journals *Advanced Materials Interfaces* ("Functional Oxide Thin Films for Advanced Energy and Information Technology") and *Journal of Physics Energy* ("Power-to-X Technologies")
- 2 Plenary, 1 Keynote and 7 Invited Lectures in international reputed conferences
- Dissemination actions towards a zero-emission society at the Port of Barcelona and "La fábrica del Sol" (BCN city council)

ICREA MEMOIR 2019



Gian Gaetano Tartaglia
 Centre de Regulació Genòmica (CRG)
 Life & Medical Sciences

* 2020 ERC Grant * Full Professor of Biochemistry * 2014 ICREA Research Professor * 2013 ERC Grant * 2010 - Group Leader, Bioinformatics and Genomics Program, Centre for Genomic Regulation, Barcelona (Spain) * 2011 - Clare Hall Life Member, University of Cambridge (UK) * 2005-2010 - Postdoctoral Fellow, Clare Hall College, Chemistry Department, University of Cambridge (UK) * 2001-2005 - PhD, Biochemistry Department, University of Zurich, Zurich (CH) * 1996-2000 - MPhil Theoretical Physics, Statistical Mechanics, University la Sapienza, Rome (Italy)

Research interests

My main focus is to understand the role played by RNA molecules in protein networks. Characterizing protein-RNA associations is key to unravel the complexity and functionality of mammalian genomes and will open up therapeutic avenues for the treatment of a broad range of human disorders. I aim to discover the involvement of RNA molecules in regulatory networks controlling protein production and I am interested in understanding mechanisms whose alteration lead to aberrant aggregation. We have recently observed that interaction between proteins and mRNAs induce feedback loops that are crucial in protein homeostasis. We also found that specific proteins and RNAs phase separate in the cytosol and nucleus when their abundance is significantly high and we are investigating how large assemblies formation affects cell function.

Selected publications

- Cerase A, Armaos A, Neumayer C, Avner P, Guttman M & **Tartaglia GG** 2019, 'Phase separation drives X-chromosome inactivation: a hypothesis', *Nature Structural & Molecular Biology*, volume 26, pp. 331-334.
- Zacco E, Grana-Montes R, Martin SR, Sanchez de Groot N, Alfano C & **Tartaglia GG***, Pastore A 2019, 'RNA as a key factor in driving or preventing self-assembly of the TAR DNA-binding protein 43', *Journal Of Molecular Biology*, 431, 8, 1671 - 1688. * Corresponding author.
- de Groot NS, Armaos A, Graña-Montes R, Alriquet M, Calloni G, Vabulas RM & **Tartaglia GG** 2019, 'RNA structure drives interaction with proteins', *Nature Communications*, 10, 3246.
- Bolognesi B, Faure AJ, Seuma M, Schmiedel JM, **Tartaglia GG & Lehner B** 2019, 'The mutational landscape of a prion-like domain', *Nature Communications*, 10, 4162.
- Lang B, Armaos A & **Tartaglia GG** 2019, 'RNAct: Protein-RNA interaction predictions for model organisms with supporting experimental data.' *Nucleic Acids Res.* 47(D1):D601-D606.

Selected research activities

- Award of the ERC Synergy
- Teaching classes of Computational Biology
- Associate Editor at NAR Bioinformatics and Genomics

ICREA MEMOIR 2019



Sergey Tikhonov

Centre de Recerca Matemàtica (CRM)

Experimental Sciences & Mathematics

I graduated from the Lomonosov Moscow State University in 1999 and obtained the PhD degree in Mathematics from MSU in 2003. From September 2012, I am an ICREA Research Professor at the Centre de Recerca Matemàtica.

- 2003: PhD in Mathematics, Lomonosov Moscow State University, Moscow.
- 2004-2006: Marie Curie Fellow at CRM, Barcelona.
- 2006-2008: Post-doctoral Fellow at the Scuola Normale Superiore, Pisa.
- 2008-September 2012: ICREA Researcher at CRM, Barcelona.
- 2009: ISAAC Award.
- 2012: ICREA Research Professor at CRM, Barcelona.
- 2013: Humboldt Research Fellowship for Experienced Researchers.

Research interests

My main research areas are Fourier Analysis and Approximation Theory. Particularly, I study the relationship between “smoothness” of a function and the possibility to approximate or to represent this function by a sum of “simple” functions. The case when “simple” functions have wave structure is of special interest.

Selected publications

- Dyachenko M, Mukanov A & **Tikhonov S** 2019, ‘Uniform convergence of trigonometric series with general monotone coefficients’, *Canadian Journal of Mathematics*, vol. 71, no. 6, pp 1445-1463.
- Gorbachev D & **Tikhonov S** 2019 ‘Doubling condition at the origin for non-negative positive definite functions’, *Proc. AMS*, vol. 147, no. 2, pp 609-618.
- Gorbachev DV, Ivanov VI & **Tikhonov S** 2019, ‘Positive L-p-Bounded Dunkl-Type Generalized Translation Operator and Its Applications’, *Constructive Approximation*, 49, 3, 555 – 605.
- Abell M, Iacob E, Stokolos A, Taylor S, **Tikhonov S** & Zhu J (Eds.) 2019, *Topics in Classical and Modern Analysis*. Applied and Numerical Harmonic Analysis. Birkhäuser Basel.
- Dai F, Prymak A, Temlyakov V & **Tikhonov S** 2019, ‘Integral norm discretization and related problems’, *Russian Math. Surveys*, vol. 74, pp 579-630.
- Dyachenko M, Mukanov A & **Tikhonov S** 2019, ‘Smoothness of functions and Fourier coefficients’, *Sbornik: Mathematics*, 210, 7, 994 – 1018.

Selected research activities

Conference and seminar talks:

- Beijing (2), Budapest, Moscow (2)

Advanced courses:

- CRM, Barcelona and Shanghai Jiao Tong University, China

Managerial Activities:

- Main co-organizer of the research program “Approximation, sampling and compression in data science”, Isaac Newton Institute for Mathematical Sciences, Cambridge, UK, January-June, 2019
- Main co-organizer of the workshop “Approximation, sampling, and compression in high dimensional problems”, Isaac Newton Institute for Mathematical Sciences, Cambridge

Member of Editorial board:

- Journal of Fourier Analysis and Applications
- Demonstratio Mathematica
- Jaen Journal on Approximation
- Analysis Mathematica
- Journal of Mathematical Analysis and Applications
- Bulletin of Mathematical Analysis and Applications

Honors and Awards:

- Visiting Fellow, Pembroke College, Cambridge University, UK
- Simons Fellow, The Isaac Newton Institute for Mathematical Sciences, UK

ICREA MEMOIR 2019



Matthias Tischler

Universitat Autònoma de Barcelona (UAB)

Humanities

Matthias M. Tischler, born 1968 in Münchberg (Germany), studied Medieval and Modern History, Applied Historical Sciences, Latin and Romance Philology, Philosophy, Theology and Islamic Studies at the Universities of Heidelberg, Munich and Frankfurt. He obtained his PhD in Heidelberg (1998). After holding PostDoc positions at Paris (DHI) and Bamberg, he was an Assistant Professor at Frankfurt (2001–2009). After his habilitation at Dresden (2008/2009), he was Associate Professor (2009/2012), Senior Research Fellow at the Autonomous University of Barcelona (UAB) (2013/2014) and Research Group Leader at the Austrian Academy of Sciences (IMAFO) in Vienna (2015/2016). He was a Visiting Professor of the ÉPHÉ in Paris (2015) and a Senior Research Fellow at the Medieval Institute of the University of Notre Dame, USA (2016). In 2016 he accepted a position at ICREA at the Department of Ancient and Medieval Studies of the UAB, which he has held since January 1, 2017.

Research interests

My studies are raising the question about the geographical, linguistic, religious, cultural and mental borders of the multi-layered legacy in the centres and peripheries of the Medieval Worlds. First, I have analyzed the Europe-wide intellectual attraction and radiance of the Parisian abbey of Saint-Victor in the mirror of its exegetical and theological production, focusing on the German, Anglo-Saxon, French, Italian and Hispanic areas. Then, I have broadened my panorama to reconstruct European religious and intellectual identities by conducting extensive research on texts of Christian-Muslim encounters and perceptions in Europe. On this basis, I have been able to pursue studies on early Christian polemics against Islam, on the linguistic and religious borders between Christians, Jews and Muslims, and on processes of religious and cultural passages, entanglement and dis/integration among the members of the three monotheisms, especially in the Carolingian and Iberian Worlds.

Selected publications

- **Tischler M** 2019, 'Karolingisches Schweigen und karolingisches Reden. Karl der Große in der Erinnerung seiner Familie', in: *Einhard - Leben und Werk 2*, ed. by H. Schefers, Regensburg, 17–48.
- **Tischler M** 2019, 'Die Dominikanermission unter den Muslimen im 13. Jahrhundert. Warum der mallorquinische Laie, Universalgelehrte und Missionar Ramon Llull zum Fundamentalkritiker des Dominikanerordens wurde', *Zeitschrift für Missionswissenschaft und Religionswissenschaft* 103, 1–2, 34–52.
- **Tischler M** 2019, 'How Carolingian was Early Medieval Catalonia?', in: *Using and Not Using the Past after the Carolingian Empire, c. 900–c. 1050*, ed. by S. Greer/A. Hicklin/S. Esders, London/New York, 111–133.
- **Tischler M** 2019, 'Warum es unmöglich ist eine Wahrnehmungsgeschichte der ‚Religionen‘ im Frühen und Hohen Mittelalter zu schreiben', *Mitteilungen des Instituts für Österreichische Geschichtsforschung* 127, 317–333.
- **Tischler M** 2019, 'Using the Carolingian Past in a Society of Transformation: The Case of Early Medieval Septimania/Catalonia in the Long Tenth Century (900–1050)', *Medieval Worlds* 10, 72–86.

Selected research activities

Supervisor of the PhD Thesis by Patrick Marschner MA: *Das neue Volk Gottes auf der Iberischen Halbinsel. Die Bibel in der christlich-iberischen Historiographie vom 8. bis zum 12. Jh.*, Univ. of Vienna, October 2, 2019
 Co-Director of the FWF-Project "Bible and Historiography in Transcultural Iberian Societies, 8th to 12th Centuries" (2015–2019) and the HERA-Project "After Empire: Using and Not-Using the Past in the Crisis of the Carolingian World, c.900–c.1050" (2016–2019); Director of the Project "Preaching Christ from a Transcultural Standpoint: Study and Critical Edition of the Homiliary of Luculentius (c. 900)" (2019–2023)
 Director of "Carolingian Text Culture in Septimania and Catalonia"
 Visiting Fellow of the IAS, Princeton, May 2019
 Papers at Heidelberg, Vienna, Leeds, Barcelona and Reichenau
 Peer Reviewer of the FNRS (Belgium) and *Filologia Mediolatina*

ICREA MEMOIR 2019



Xavier Tolsa

Universitat Autònoma de Barcelona (UAB)

Experimental Sciences & Mathematics

I was born in Barcelona in 1966. First I studied engineering, but later I turned to mathematics. After obtaining my PhD in mathematics in 1998 (UAB), I spent about one year in Gotteborg (University of Gotteborg – Chalmers) and another year in Paris (Université de Paris-Sud), until I came back to Barcelona (UAB) by means of a “Ramón y Cajal” position. In 2002 I was awarded the Salem Prize by the Institute of Advanced Study and Princeton University for the proof of the semiadditivity of analytic capacity and my works in the so called Painlevé problem. Since 2003 I am an ICREA Research Professor. In 2004 I received the prize of the European Mathematical Society for young researchers. In 2012 I was awarded an ERC Advanced Grant to develop the project “Geometric analysis in the Euclidean space”. My current research in mathematics focuses in Fourier analysis, geometric measure theory, and potential theory.

Research interests

I work in mathematical analysis. My research deals with complex analysis, Fourier analysis and geometric measure theory. Particularly, I am interested in the relationship between analytic notions such as analytic capacity or harmonic measure, and geometric concepts like rectifiability. In a sense, analytic capacity measures how much a set in the plane is visible or invisible for analytic functions. On the other hand, rectifiability tells you if a set is contained in a countable collection of curves with finite length. Some years ago, I proved that analytic capacity is semiadditive. This was an open problem since the early 1960s. More recently I have studied related problems in higher dimensions. In particular, in a recent collaboration with F. Nazarov and A. Volberg I have proved the so called David-Semmes conjecture in the codimension 1 case. This result has important applications to the study of harmonic measure, which is another of my main interests.

Selected publications

- Azzam J, Mourougolou M, **Tolsa X** & Volberg A 2019. “On a two-phase problem for harmonic measure in general domains”. *Amer. J. Math.*, vol.141(5),1259-1279.
- Conde-Alonso JM, Mourougolou M & **Tolsa X** 2019 ‘Failure of L2 boundedness of gradients of single layer potentials for measures with zero low density’, *Matematische Annalen*, 373, 1-2, 253 – 285.
- **Tolsa X** 2019. “Rectifiability of measures and the β_p coefficients”. *Publicacions Matemàtiques* 63, 491-519.
- Paramonov PV & **Tolsa X** 2019, ‘On C1-approximability of functions by solutions of second order elliptic equations on plane compact sets and C-analytic capacity’. *Analysis and Mathematical Physics*, Volume 9, Issue 3, pp 1133-1161
- Chunaev P, Mateu J & **Tolsa X** 2019, “Singular integrals unsuitable for the curvature method whose L^2 -boundedness still implies rectifiability”. *Journal d’Analyse Mathématique* 138, no.2, 741-764.

Selected research activities

Plenary talks in conferences

- Spaces of Analytic Functions: Approximation, Interpolation, Sampling. Centre de Recerca Matemàtica, Barcelona. November 2019.
- Complex and Fourier Analysis, and Operator Theory. INDAM – Istituto Nazionale di Alta Matematica Francesco Severi. Città Universitaria “La Sapienza”. September 2019.
- Modern Aspects of Complex Analysis and Its Applications (in honor of Don Marshall and John Garnett). University of Washington, Seattle. August 2019.
- Harmonic Analysis in non-homogeneous settings and applications. Birmingham. June 2019.
- Harmonic Analysis and PDEs. Helsinki. June 2019.
- Complex analysis and operator theory. Saint Petersburg. May 2019.

Dissemination talks

- Colloquium of the Facultat de Matemàtiques de la Universitat de València, November 2019.
- Inaugural lesson of the course of the Societat Catalana de Matemàtiques, November 2019.

Codirection of the PhD thesis of Carmelo Puliatti “Singular integrals, rectifiability, and elliptic measure”, UAB, December 2019.

Prize Rei Jaume I of Basic Science, 2019, awarded by Generalitat Valenciana and FVEA.

ICREA MEMOIR 2019



Josefa Toribio

Universitat de Barcelona (UB)

Humanities

I got my PhD in Philosophy from Complutense University, Madrid, in 1988. I worked as an Assistant Professor in the Department of Logic and Philosophy of Science at Complutense between 1989 and 1991. I was then awarded a postgraduate fellowship by the British Council to work in the School of Cognitive and Computing Sciences at the University of Sussex (1991-93). I was Assistant Professor at Washington University in St. Louis (1993-2000), Lecturer in Philosophy in the School of Cognitive and Computing Sciences at the University of Sussex (2000-2002), Associate Professor at the University of Indiana, Bloomington (2002-2004), and Senior Lecturer at the University of Edinburgh (2004-2008). I joined ICREA in 2009. I am a member of the research group LOGOS (Research Group in Analytic Philosophy) at the UB and also a member of the Barcelona Institute of Analytic Philosophy (BIAP). I have been president of the Spanish Society of Analytic Philosophy (SEFA) between 2010 and 2016.

Research interests

My goal in philosophy has long been the same: to explore the nature of the mind within a naturalistic framework. What is most distinctive of my research is my ongoing effort to respect scientific findings about mental phenomena while insisting on the critical importance of the method of analysis and the theoretical tools provided by analytic philosophy. My current research focuses on the analysis of central topics in the philosophy of mind and the philosophy of cognitive science, with a special emphasis on the philosophy of perception and rationally responsive unconscious mental states such as implicit attitudes.

Selected publications

– **Toribio J** 2019, ‘Visual Categorization’, In Brian Glenney and José Filipe Pereira da Silva (Eds.) *The Senses and the History of Philosophy*. Oxford: Routledge, pp. 292-307.

Selected research activities

Grants

- 2019-2021: Awareness, self-awareness, and unawareness: exploring the perception-cognition-action continuum. MICINN. PGC2018-095909-B-I00. €60.500. PI + 1 PhD position.

MA dissertations directed:

- Beñat Esnaola (CCiL 2018-2019): Does state conceptualism make sense? A contentualist approach to nonconceptualism. Defense: 12/09/2019.

Conference Presentations (Refereed)

- Toribio, J. “Sesgos y accesibilismo”. V Congreso Iberoamericano de Filosofía. UNAM, Mexico, 17-21 June, 2019.
- Toribio, J. “Implicit bias and the fragmented mind”. 27th Conference of the European Society for Philosophy and Psychology (ESPP 2019). Athens, Greece, 5-8 September, 2019.

Invited Presentations

- Toribio, J. “Prejuicios y psicología social”. Department of Logic and Philosophy of Science. University of the Basque Country. Donostia / San Sebastián, March 28, 2019.
- Toribio, J. “Fragmentationalism and implicit biases”. Keynote speaker at the Conference on Bias and Automaticity. Dortmund. October 7-8, 2019. Keynote speaker.
- Toribio, J. “Implicit Bias: Affects and responsibility”. Keynote speaker at the IX Congress of the Spanish Society for Analytic Philosophy. Valencia, November 21-23, 2019.

Outreach Activities

- Toribio, J., “Prejuicios: de la psicología social a la reflexión filosófica y viceversa” Sociedad Catalana de Filosofía. Grup De Filosofia Analítica. Instituto de Estudios Catalanes (IEC). March 20th, 2019.

ICREA MEMOIR 2019



Juan Manuel Toro

Universitat Pompeu Fabra (UPF)

Social & Behavioural Sciences

I was born in Bogotá (Colombia) in 1976. I studied Psychology at the Universidad Nacional de Colombia. In 2005, I got a PhD from the Universitat de Barcelona, and moved to work as a postdoc with Jacques Mehler at the Language and Cognitive Development lab at SISSA (Trieste, Italy). Later I was a research fellow under the Ramón y Cajal program. My studies are mainly funded through a grant awarded by the European Research Council (ERC Starting Grant). Currently I am an ICREA Research Professor at the Center for Brain and Cognition of the Universitat Pompeu Fabra, where I coordinate the Language and Comparative Cognition Group.

Research interests

I am interested in studying why the ability of language has only emerged in humans and not in other animals. I tackle this issue using a combination of experimental techniques and populations that include human adults and infants, and non-human animals. Our studies have demonstrated that some of the building blocks of language learning are found in other animals, including the ability to extract information from speech using prosodic and statistical regularities. We have also showed how phonological representations guide general learning mechanisms. Recently, we are also studying music cognition, including consonance processing, brain entrainment to metrical structures and harmonic predictions. Through this work, I have tried to unveil what is uniquely human and what is shared with other animals in the field of complex acoustic processing.

Selected publications

- Celma-Mirallès A & **Toro JM** 2019, 'Ternary meter from spatial sounds: Differences in neural entrainment between musicians and non-musicians', *Brain & Cognition*, 136, UNSP 103594.
- Bouchon C & **Toro JM** 2019, 'Is the consonant bias specifically human? Long-evans rats encode vowels better than consonants', *Animal Cognition*, 22, 839-850.

ICREA MEMOIR 2019



David Torrents

Barcelona Supercomputing Center - Centro Nacional de Supercomputación (BSC - CNS)

Life & Medical Sciences

After graduating in Biochemistry and Molecular Biology, I obtained the PhD in Molecular Biology at the University of Barcelona in 2000 in the group of Manuel Palacín working on amino acid transporters and associated genetic diseases. This PhD was awarded with the University PhD Extraordinary Prize. Then I moved with an EMBO long term fellowship to the group of Peer Bork to enter in the world of genomics, at the EMBL in Heidelberg, where I stayed from 2000 to 2006. There, I worked on genome annotation and analysis using bioinformatics approaches. Currently, since 2006, I'm a group leader at the Barcelona Supercomputing Center doing research on biomedical genomics, studying the relationship between changes in the genome and disease.

Research interests

Genomes are the central molecules of life because they carry all the information necessary for the development, the survival and the reproduction of all organisms. Over the last 20 years, the study of the genome in a biomedical context has provided valuable information about the genetic and molecular basis of diseases. Current sequencing of DNA allows the incorporation of the genome analysis as an integrated and regular protocol within the health-care system, resulting in a Precision Medicine, where the genomic information will be determinant for a more accurate diagnosis and for the selection of a more precise treatment. In this context, our group and my research activity is focused on the design and implementation of analysis protocols, including artificial intelligence approaches to, ultimately, improve our understanding of the relationship between genomic variation and disease, and to generate the basis for more precise medical care.

Selected publications

- Martin-Garcia D et al. 2019, 'CCND2 and CCND3 hijack immunoglobulin light-chain enhancers in cyclin D1(-) mantle cell lymphoma', *Blood*, 133, 9, 940 - 951.
- Warrington NM et al. 2019, 'Maternal and fetal genetic effects on birth weight and their relevance to cardio-metabolic risk factors', *Nature Genetics*, 51, 5, 804 - +.
- Aterido A et al. 2019, 'Genetic variation at the glycosaminoglycan metabolism pathway contributes to the risk of psoriatic arthritis but not psoriasis', *Annals Of The Rheumatic Diseases*, 78, 3, 355 - 364.
- Speedy HE et al. 2019, 'Insight into genetic predisposition to chronic lymphocytic leukemia from integrative epigenomics', *Nature Communications*, 10, 3615.

ICREA MEMOIR 2019



Diego F. Torres

Institut de Ciències de l'Espai (CSIC - ICE)

Experimental Sciences & Mathematics

I was born in Buenos Aires, where I studied up to obtaining my doctoral degree in physics from the National University at La Plata, working on cosmology and astrophysics of extended gravitational theories. After several years in fellowships around the world, I moved to the Institute of Space Sciences to start a research group on high-energy astrophysics. My research focuses on compact objects and cosmic rays. I have received several scientific awards including the Chinese Academy of Science Senior Visiting Professorship, the Friedrich Wilhelm Bessel Award of the Humboldt Foundation of Germany, the Shakti Duggal Award on Cosmic Ray Physics of the International Union of Pure and Applied Physics, the Guggenheim Fellowship, and several others. I became Director of the Institute of Space Sciences in March 2016.

Research interests

The familiar sights of peacefully shining stars would be replaced by something extreme and variable should you look with gamma-ray eyes. You would be glancing at the most energetic phenomena known in astrophysics: accreting masses around black holes, pulsars, close binaries, regions of stellar formation, explosions of supernovae, and others. I develop theoretical models for these scenarios, and test them with observations using ground-based telescopes and satellites. My research focuses on compact objects and cosmic rays. My earlier research includes gravitation and cosmology; particularly, scalar-tensor theories and non-minimal couplings, scalar dark matter, boson stars, gravitational lensing, and wormholes. I published several papers on all these topics. My research group hosted about 40 scientists since its foundation in 2006. You can know more about all this, including links to my publications, from my webpage, <https://sites.google.com/view/dft-research>

Selected publications

- **Torres DF**, Lin T & Coti Zelati F 2019, 'Towards observing reverberating and superefficient pulsar wind nebulae', *Monthly Notices Of The Royal Astronomical Society*, 486, 1, 1019 - 1033.
- Papitto A, Ambrosino F, Stella L, **Torres DF**, Coti Zelati F, Ghedina A, Meddi F, Sanna A, Casella P, Dallilar Y, Eikenberry S, Israel GL, Onori F, Piranomonte S, Bozzo E, Burderi L, Campana S, de Martino D, Di Salvo T, Ferrigno C, Rea N, Riggio A, Serrano S, Veledina A & Zampieri L 2019, 'Pulsating in Unison at Optical and X-Ray Energies: Simultaneous High Time Resolution Observations of the Transitional Millisecond Pulsar PSR J1023+0038', *Astrophysical Journal*, 882, 2, 104.
- **Torres DF**, Vigano D, Coti Zelati F & Li J 2019, 'Synchrocurvature modelling of the multifrequency non-thermal emission of pulsars', *Monthly Notices Of The Royal Astronomical Society*, 489, 4, 5494 - 5512.
- Viganò D & **Torres DF** 2019, 'A novel approach for the analysis of the geometry involved in determining light curves of pulsars', *Monthly Notices of the Royal Astronomical Society*, Volume 490, Issue 1, p.1437-1450.

Selected research activities

- Published 11 international journals papers this year (of which I selected just a few as examples), plus several others with large collaborations.
- Have been Director of the Institute of Space Sciences (ICE, CSIC), a position I have since April 2016.
- Continued to be a member of Fermi-LAT and the Cherenkov Telescope Array.
- I am Editor-in-Chief, *Journal of High Energy Astrophysics*, Elsevier, since 2013
- Continued to organize the Sant Cugat Forum on Astrophysics.
- Have been an evaluator for projects or promotions of several countries and a peer reviewer for several astrophysical journals.

ICREA MEMOIR 2019



Joan Torruella

Universitat Autònoma de Barcelona (UAB)
Humanities

Joan Torruella holds a PhD in Linguistics by the Autonomous University of Barcelona, a Masters in Philosophy by the University of Manchester, and a Masters in Lexicography by the University Pompeu Fabra in Barcelona. He obtained a research grant by the Ministero degli Affari Esteri of Italy to conduct research on Romance Studies at the University of Florence. Later he worked at the University of Manchester as a Lecturer of Spanish and Catalan, while in turn he conducted his Masters in Philosophy. He has worked on a wide range of computing tools and resources in collaboration with the Istituto di Linguistica Computazionale of the Consiglio Nazionale delle Ricerche in Pisa (Italy). He is ICREA Research Professor since January 2005. He is also co-director of the journal "Scriptum Digital", co-director of the CORHIBER Portal and a member of the Seminar of Philology and Computer Science. In 2009 he was awarded the Research Excellence Prize (PREI 2008).

Research interests

My work consists of the research in the mediaeval Hispanic lexicon and of the development and application of new computer tools in order to understand and describe the process of language from real and quantifiable datum extracted from balanced corpora. At this moment I am working in contrastive studies among different Hispanic languages and in the realization of a corpus of texts of the Catalan language previous to the XVII century (Corpus Informatitzat del Català Antic). I am also working in the development of a portal in internet with scientific information about the lexicon of the Ibero-Romance languages (Portal de Léxico Hispánico). I'm currently working on those projects: development of a semi-automatic lemmatisator of the Old Catalan language; study of how to measure the lexical richness of the texts and the preparation of a computer program to do it, and a corpus of notarial documents written in Castilian language in Catalonia in the XVIII century.

Selected publications

Clavería G & **Torruella J** 2019, "Corpus de documentos castellanos redactados en Cataluña (siglos XVIII y XIX): inicio de in proyecto", in Mónica Castillo Lluch y Elena Díez del Corral Areta (eds.), *Reescribiendo la historia de la lengua española a partir de la edición de documentos*, Colección "Fondo Hispánico de Lingüística y Filología", vol. 30, Frankfurt am Main: Peter Lang, pp. 43-60.

Terrón N & **Torruella J** 2019, "Estudio de la sexta edición del Diccionario de la lengua castellana de la Real Academia Española", in Dolores Azorín, Gloria Clavería y Enrique Jiménez Ríos (eds.), *El diccionario de la Academia y su tiempo: Lexicografía, lengua y sociedad en la primera mitad del siglo XIX*, ELUA, Anexo V, 2019, pp. 109-142.

Torruella J 2019, "Big Data", *Martes neológico*. Centro Virtual Cervantes. <https://blogscvc.cervantes.es/martes-neologico/big-data/>
Blanco Izquierdo MA, Buenafuentes C, Clavería G, Jiménez Ríos E, Terrón N & **Torruella J** 2019, "Lemateca del DRAE: la vida de las palabras en la lexicografía académica", *Revista de Lexicografía (RLex)*, vol. 25 (2019), pp. 131-146.

Terrón N & **Torruella J** 2019: "La definición sinónímica en la sexta edición del *diccionario de la lengua castellana* de la real academia española", *Revista de Filología* de la Universidad de La Laguna, 39, 2019, pp. 287-305.

Selected research activities

Member of the «Scientific Committee» of the *V Congreso Internacional de Corpus Diacrónicos en Lenguas Ibero-románicas (V CoDiLI)*, organized by Ghent University and the Université Libre de Bruxelles, held in Brussels, from 12 to 14 December.

Member of the "Comisión Asesora Externa do Instituto da Lingua Galega".

Director, with Dr. Johannes Kabatek, of the *Portal de Corpus Históricos Ibero-románicos (CORHIBER)*,

<https://portal-corhiber.wixsite.com/portal-corhiber>.

Director of the project *ESenCAT (Corpus del Español en Cataluña)*.

ICREA MEMOIR 2019



Xavier Trepatri

Institut de Bioenginyeria de Catalunya (IBEC)
Engineering Sciences

Xavier Trepatri received a BSc in Physics in 2000 and a BSc in Engineering in 2001. In 2004 he obtained his PhD from the Medical School at the University of Barcelona. He then joined the Program in Molecular and Integrative Physiological Sciences at Harvard University as a postdoctoral researcher. In 2008 he became a “Ramón y Cajal” researcher at the University of Barcelona and in January 2011 an ICREA Research Professor at the Institute for Bioengineering of Catalonia (IBEC). He is Group Leader of the Integrative Cell and Tissue Dynamics research line at IBEC. In 2015 he won the Banc de Sabadell Award for Biomedical Research. In 2018 he was elected EMBO Member.

Research interests

We aim at understanding how physical forces and molecular control modules cooperate to drive biological function. We develop new technologies to map and perturb the main physical properties that determine how cells and tissues grow, move, invade and remodel. By combining this physical information with systematic molecular perturbations and computational models we explore the principles that govern the interplay between chemical and physical cues in living tissues. We study how these principles are regulated in physiology and development, and how they are derailed in cancer.

Selected publications

- Chen T, Callan-Jones A, Fedorov E, Ravasio A, Brugués A, Ong HT, Toyama Y, Low BC, **Trepatri X**, Shemesh T, Voituriez R & Ladoux Benoît 2019, ‘Large-scale curvature sensing by directional actin flow drives cellular migration mode switching’, *Nature Physics*, vol. 15, no. 4, 393-402
- Malandrino A, **Trepatri X**, Kamm RD & Mak M 2019, ‘Dynamic filopodial forces induce accumulation, damage, and plastic remodeling of 3D extracellular matrices’, *Plos Computational Biology*, 15, 4, e1006684.
- Arroyo M & **Trepatri X** 2019, ‘Embryonic self-fracking’, *Science*, vol. 365, no. 6452, pp 442 - 443.
- Garreta E, Prado P, Tarantino C, Oria R, Fanlo L, Martí E, Zalvidea D, **Trepatri X**, Roca-Cusachs P, Gavaldà-Navarro A, Cozzuto L, Campistol JM, Izpisua Belmonte JC, Hurtado Del Pozo C & **Montserrat N** 2019, ‘Fine tuning the extracellular environment accelerates the derivation of kidney organoids from human pluripotent stem cells’, *Nature Materials*, vol. 18, no. 4, pp 397-405.
- Uroz M, Garcia-Puig A, Tekeli I, Elosegui-Artola A, Abenza JF, Marín-Llauradó A, Pujals S, Conte V, Albertazzi L, Roca-Cusachs P, **Raya A & Trepatri X** 2019, ‘Traction forces at the cytokinetic ring regulate cell division and polyploidy in the migrating zebrafish epicardium’, *Nature Materials*, vol. 18, pp 1015-1023.
- Perez-Gonzalez C, Alert R, Blanch-Mercader C, Gomez-Gonzalez M, Kolodziej T, Bazellierres E, Casademunt J & **Trepatri X** 2019, ‘Active wetting of epithelial tissues’, *Nature Physics*, vol. 15, pp 78-88.

ICREA MEMOIR 2019



Isabel Usón

Institut de Biologia Molecular de Barcelona (CSIC - IBMB)
Life & Medical Sciences

Isabel Usón Finkenzeller completed a Chemistry degree (1987) and Ph. D. (1992) in synthetic organometallic chemistry at the U. of Zaragoza. In November 1992, she joined Procter & Gamble as Product Research Scientist in Brussels, gaining insight into the science and management of industrial chemistry. She moved as HCM postdoc to the U. of Göttingen in 1994. She has developed methods for crystallography for 23 years, first within the group of Prof. Sheldrick FRS, author of SHELX, during her postdoctoral research and Habilitation (1994-2001) and as of July 2001 leading an emergent group. September 2003, she moved to Barcelona as ICREA Research Professor. Her work on structural chemistry and biology has led to over 150 publications. The software ARCIMBOLDO and SHELX are the central output of her work. She is one of the 7 members of the Maria de Maeztu Excellence Unit of Structural Biology at IBMB-CSIC.

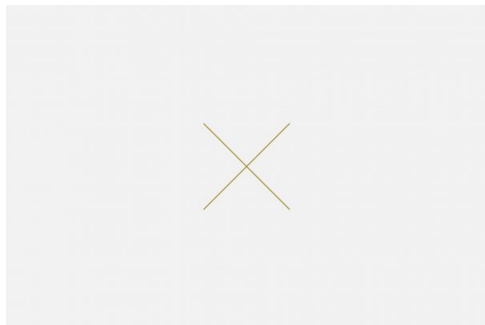
Research interests

Macromolecular crystallography provides conclusive structural info. down to atomic detail and has been inextricable from major advances in the life sciences. Nevertheless, this structural model cannot be directly calculated from the experimental data, as we cannot measure the phases of the diffracted X-ray beams. Our group develops methods to exploit the stereochemical knowledge present in small, accurate units such as secondary structure fragments and their association into local folds. Their use to solve the central phase problem of crystallography is implemented in our software ARCIMBOLDO. This has required devising our own particular toolbox for fragments. We are extending this detailed view to map interpretation within the program SHELXE (Sheldrick) and general structure interpretation within our program BORGES_MATRIX. Also, we are extending our work into electron diffraction. As illustrated in paintings by G. Arcimboldo, the information content derived from a correct combination of fragments goes beyond their simple addition.

Selected publications

- Sevvana M, Ruf M, **Usón I**, Sheldrick GM & Herbst-Irmer R 2019, *Acta Cryst.* D75, 1040-1050.

ICREA MEMOIR 2019



Pablo O. Vaccaro

Institut de Ciències Fotòniques (ICFO)

Engineering Sciences

Pablo Vaccaro earned his MSc in Physics working on LPE of IV-VI compound semiconductors, in 1986, and his PhD in Physics degree working on CdS/CdTe solar cells, in 1991, at Balseiro Institute, Bariloche, Argentina. He joined Prof. Hiroyuki Matsunami's Labs at the Dept. of Electrical Engineering, Kyoto University, Japan, where he conducted post-doctoral research on chemical beam epitaxy of III-V compound semiconductors until 1993. He then moved to Advanced Telecom. Research Institute, in Kyoto, Japan, where he conducted research on MBE of III-V compound semiconductors and optoelectronic devices fabrication, reaching the position of Senior Researcher. In 2006 he was hired by Sharp Corp. at the Advanced Technol. Res. Labs., in Nara, Japan, where he worked on MOCVD of III-N compound semiconductors and fabrication process of blue laser diodes and LEDs. He became ICREA Research Professor at ICMAB-CSIC, Bellaterra, Spain, in 2010 and he moved to ICFO, Castelldefels, Spain, in 2018.

Research interests

SiGe thermoelectric far-infrared sensors integrated on silicon substrates. Tensile strained germanium on silicon substrates for monolithically integrated optoelectronics. SiGe nanowires for thermoelectric applications. Piezoresistivity in Si/Ge nanostructures and III-V heterostructures.

ICREA MEMOIR 2019



Juan Valcárcel

Centre de Regulació Genòmica (CRG)

Life & Medical Sciences

Juan Valcárcel studied biology and chemistry at the Universities of Santiago de Compostela and Autónoma de Madrid. He obtained his PhD in 1990 for work carried out at the Centro de Biología Molecular Severo Ochoa under the supervision of Juan Ortín. He did postdoctoral work in the laboratory of Michael Green at the University of Massachusetts and in 1996 he joined the European Molecular Biology Laboratory in Heidelberg as a group leader. In 2002 his group moved to the Centre de Regulació Genòmica in Barcelona, where he is a senior scientist and ICREA Research Professor. Since the time of his PhD work, his research has focused on how pre-mRNAs are spliced and how this process can be regulated.

Research interests

The genome provides the instructions to build and maintain the function of a living organism. Strangely, in complex organisms these instructions are not written as continuous messages, but rather as smaller pieces interrupted by meaningless text. This arrangement has the advantage that the pieces can be combined in different ways to generate alternative instructions. We study the molecular machinery that puts messages together and how the production of alternative messages is regulated.

Selected publications

- Baeza-Centurion P, Minana B, Schmiedel JM, **Valcarcel J** & **Lehner B** 2019, 'Combinatorial Genetics Reveals a Scaling Law for the Effects of Mutations on Splicing', *Cell*, 176, 3, 549 - +.
- Torres-Mendez A, Bonnal S, Marquez Y, Roth J, Iglesias M, Permanyer J, Almudi I, Ohanlon D, Guitart T, Soller M, Gingras AC, Gebauer F, Rentzsch F, Blencowe BJ, **Valcarcel J** & **Irimia M** 2019, 'A novel protein domain in an ancestral splicing factor drove the evolution of neural microexons', *Nature Ecology & Evolution*, 3, 4, 691 - 701.
- Carbonell C, Ulsamer A, Vivori C, Papasaikas P, Bottcher R, Joaquin M, Minana B, Tejedor JR, de Nadal E, **Valcarcel J** & Posas F 2019, 'Functional Network Analysis Reveals the Relevance of SKIIP in the Regulation of Alternative Splicing by p38 SAPK', *Cell Reports*, 27, 3, 847 - +.
- Huertas CS, Bonnal S, Soler M, Escuela AM, **Valcarcel J** & Lechuga LM 2019, 'Site-Specific mRNA Cleavage for Selective and Quantitative Profiling of Alternative Splicing with Label-Free Optical Biosensors', *Analytical Chemistry*, 91, 23, 15138 - 15146.
- Hoffmann T & **Valcarcel J** 2019, 'Splicing Calls Back', *Cell*, 179, 7, 1446 - 1447.
- Keiper S, Papasaikas P, Will CL, **Valcárcel J**, Girard C & Lührmann R 2019, 'Smu1 and RED are required for the activation of spliceosomal B complexes assembled on short introns', *Nature Communications*, vol 10, pp 3639

ICREA MEMOIR 2019



Alfonso Valencia

Barcelona Supercomputing Center - Centro Nacional de Supercomputación (BSC - CNS)

Life & Medical Sciences

Computational biologist, pioneer scientist applying computer science to solve biological problems, recognized as leader in his field. Focused on the analysis of large collections of genomic data, especially protein interaction networks applied to (epi)Genomics, Cancer Biology and Precision Medicine, his group train the application of Text Mining methodology to biomedical problems. He earned a PhD in Biochemistry and Molecular Biology (UAM) plus a PostDoctoral researcher in Bioinformatics (EMBL Heid). Prof. at ICREA, Scientific Director and Director's of Life Sciences in BSC-CNS, home of the MareNostrum Supercomputer. Head of the Spanish node of the European Infrastructure for Life-Science Information, ELIXIR. Founding member and President of the ISCB. Elected member of the European Molecular Biology Organization (EMBO). Exec. Editor of "Bioinformatics", OUP of FEBS Letters, Prof. Honoris Causa by the Danish Technical University and advisory board in several Institutions.

Research interests

*Personalized Medicine Initiative: Organize resources for the analysis of large scale genomics and phenotypic data and its translation to clinic.*NLP/text mining: Analyzing large biomedical corpora to detect bioentities relations and specific conditions, e.g. disease specific genes affected in particular contexts.*New approaches to predict protein structures and interactions: exploration of the sequence and structure spaces combined with simulations highly improve prediction methods, useful in applications such as drug design.*Network Biology: Investigation of AI approaches for the analysis of biological networks, ontology constructions and diseases comorbidity.*Evaluation of research and social projects: Analyzing large data sets to assess the impact of specific projects, monitoring, and planning. *Building a sustainable bioinformatic infrastructure: In collaboration with the INB and the EBI, systematically catalog, interoperate and benchmark methods and data resources.

Selected publications

- Bazaga A, **Valencia A** & Rementeria M-J 2019, 'BIOLITMAP: a web-based geolocated, temporal and thematic visualization of the evolution of bioinformatics publications', *Bioinformatics*, 35, 14, 2518 - 2520.
- Greco A, Sanchez Valle J, Pancaldi V, Baudot A, Barillot E, Caselle M, **Valencia A**, Zinovyev A & Cantini L 2019, 'Molecular Inverse Comorbidity between Alzheimer's Disease and Lung Cancer: New Insights from Matrix Factorization', *International Journal Of Molecular Sciences*, 20, 13, 3114.
- Wren JD, **Valencia A** & Kelso J 2019, 'Reviewer-coerced citation: case report, update on journal policy and suggestions for future prevention', *Bioinformatics*, 35, 18, 3217 - 3218.
- Saunders G et al 2019, 'Leveraging European European infrastructures to access 1 million human genomes by 2022', *Nature Reviews Genetics*, 20, 11, 692 - 701.
- Rigau M, Juan D, **Valencia A** & Rico D 2019, 'Intronic CNVs and gene expression variation in human populations', *PLoS Genet.* 15(1):e1007902.

ICREA MEMOIR 2019



Sergio O. Valenzuela

Institut Català de Nanociència i Nanotecnologia (ICN2)
Engineering Sciences

Sergio O. Valenzuela is an ICREA Prof. at the Catalan Institute of Nanoscience and Nanotechnology (ICN2), The Barcelona Institute of Science and Technology. He leads the Physics and Engineering of Nanodevices group, which focuses on quantum transport, spintronics, and thermoelectricity in materials such as graphene and topological insulators. He has pioneered the use of nonlocal devices to study the spin Hall effect, thermopiles to isolate the magnon drag in ferromagnetic materials, and implemented novel qubit control and spectroscopy methods. Prof. Valenzuela received a PhD in Physics at the University of Buenos Aires, and held research positions at Harvard University and MIT. He is recipient of the Giambiagi prize, the IUPAP Young Scientist Prize and a ERC Consolidator Grant. He is also Principal Investigator of the Graphene Flagship and Grantor of the ICN2 “Severo Ochoa” Centre of Excellence Project.

Research interests

In recent years, electronic devices have been scaled down to nanoscale sizes where quantum effects begin to interfere with their functioning. Materials and devices in such scales often present unexpected and counterintuitive physical properties. Prof. Valenzuela’s Group focus is the development of novel devices, which are designed to gain insight of specific physical properties of the system components, relevant both for fundamental reasons and applications at the nanoscale. The current research interests of the group span Spintronics, Spin Caloritronics, and quantum transport in particular in graphene and topological insulators. For more information see: <http://nanodevices.icn2.cat>.

Selected publications

- **Valenzuela SO & Roche S** 2019, “The phase diagram of 2D antiferromagnets”, *Nature Nanotechnology*, 14, 1088-1089
- Benítez LA, Sierra JF, Torres WS, Timmermans M, Costache MV & **Valenzuela SO** 2019 “Investigating the spin-orbit interaction in van der Waals heterostructures by means of the spin relaxation anisotropy” *APL Materials*, 7, 12, 120701.
- Gebeyehu ZM, Parui S, Sierra JF, Timmermans M, Esplandiu MJ, Brems S, Huyghebaert C, Garelo K, Costache M & **Valenzuela SO** 2019, ‘Spin communication over 30 μ m long channels of chemical vapor deposited graphene on SiO₂’, *2D Materials*, 6, 3, 034003.

Selected research activities

Selected Invited/Plenary Talks

- Gordon Research Conference, Les Diablerets, Switzerland, July 6-7, 2019.
- Graphene Conference, Rome, Italy, June 25-28, 2019.
- 10th International Symposium on Metallic Multilayers, Madrid, Spain, June 17-21, 2019.
- 2019 Joint MMM/Intermag Conference, Washington DC, USA, January 14-18, 2019.
- Graphene Study, Obergurgl, Austria, February 3- 8, 2019.

Other Activities

- Lecturer, ESONN’19 European School on Nanoscience & Nanotechnologies (Spintronics), Grenoble, France.
- Scientific Advisory Committee Member of the European School on Magnetism (ESM).
- Co-Editor Focus Issue on Tailoring Spin-Dependent Transport in 2D Materials (2D Materials Journal; <http://2dmaterials.org>).
- Coordinator of FET-PROACTIVE Project “Dissipationless topological channels for information transfer and quantum metrology”.

ICREA MEMOIR 2019



Jeroen van den Bergh

Universitat Autònoma de Barcelona (UAB)

Social & Behavioural Sciences

ICREA Research Professor at Institute of Environmental Science & Technology, Universitat Autònoma de Barcelona. Honorary Professor of Environmental & Resource Economics in School of Economics & Business and Institute for Environmental Studies, VU University Amsterdam (VUA). Editor-in-chief of journal *Environmental Innovation & Societal Transitions*. Previously, full professor of Environmental Economics (1997-2007) at VUA. A Master degree in Econometrics & Operations Research from Tilburg University, and a PhD from VUA. His work is much cited, indicated by more than 20,000 citations in Google Scholar. He received the Royal Shell Prize 2002, IEC's (Sant Jordi) Environmental Prize 2011, an ERC Advanced Grant in 2017, and an honorary doctorate from the Netherlands' Open University in 2019. His latest book is 'Human Evolution Beyond Biology and Culture: Evolutionary Social, Environmental and Policy Sciences' (Cambridge University Press).

Research interests

I work on the interface of environmental economics, climate science and innovation studies. Research in recent years focuses on the design of effective and politically-feasible climate policy that accounts for undesirable systemic impacts, such as energy rebound and international carbon leakage. This involves the application of methods and insights of behavioural and evolutionary economics, operationalized through agent-based modelling. Past work covered integrated ecological-economic modelling, contributions to the growth-versus-environment debate, environmental policies applied to urban-transport issues, biodiversity valuation and policy, modelling of recycling in material-product chains, and international dimensions of environmental policy.

Selected publications

- Maestre-Andrés S, Drews S & **van den Bergh J** 2019, 'Perceived fairness and public acceptability of carbon pricing: A review of the literature', *Climate Policy*, 19(9): 1186-1204.
- Martin N & **van den Bergh J** 2019, 'A multi-level climate club with national and sub-national members: theory and application to US states', *Environmental Research Letters*, 14, 12, 124049.
- **van den Bergh JCJM** & Drews S 2019, 'Green "agrowth" - the next development stage of rich countries'. Chapter 3 in *Handbook on Green Growth*, edited by Roger Fouquet, Edward Elgar, Cheltenham, pp. 52-66.
- Drews S, Savin I & **van den Bergh J** 2019, 'Opinion clusters in academic and public debates on growth-vs-environment', *Ecological Economics*: 157: 141-155.
- Braungardt S, **van den Bergh J** & Dunlop T 2019, 'Fossil fuel divestment and climate change: Reviewing contested arguments', *Energy Research & Social Science*, 50:191-200.
- **van den Bergh J**, Savin I & Drews S 2019, 'Evolution of opinions in the growth-vs-environment debate: Extended replicator dynamics', *Futures*, 109: 84-100.
- King L & **van den Bergh J** 2019, 'Normalisation of Paris Agreement NDCs to enhance transparency and ambition', *Environmental Research Letters* 14, 084008.
- Siskova M & **van den Bergh JCJM** 2019, 'Optimal urban form for global and local emissions under electric vehicle and renewable energy scenarios', *Urban Climate* 29, 100472.

ICREA MEMOIR 2019



Niek F. van Hulst

Institut de Ciències Fotòniques (ICFO)

Engineering Sciences

Following study in Astronomy and Physics, I obtained my PhD (1986) in Molecular & Laser-Physics at the University of Nijmegen (the Netherlands), on microwave-laser double resonance molecular-beam spectroscopy. After research in non-linear optics of organic materials, integrated optics, atomic force and near-field optical microscopy, since 1997 full Professor at MESA+ Institute for NanoTechnology, University of Twente (the Netherlands) with focus on single molecule detection and scanning probe technology. In 2005, attracted by the Catalan quality-based science policy, I started as ICREA Research Professor and senior group leader at ICFO – the Institute of Photonic Sciences, within The Barcelona Institute of Science & Technology; also I am Head Academic Programs and NanoFabrication Lab at ICFO. Recipient of 2003 Körber European Science Award, 2010 City of Barcelona Prize; ERC Advanced Grants in 2010 and 2015, PoC in 2017; 2017 European Physical Society Prize.

Research interests

My current interest is to control light interaction at the nanometer scale. To this end, my group specializes on optical antennas, with nanoscale hot spots, and on coherent control schemes to command light on the “femto-nano” scale. We study individual molecules, quantum dots and single proteins, in strong interaction with nanoantenna-cavities and sub-10-fs pulses; controlling excitation-emission rates, direction, spectra, polarization, single photon character. We focus particularly on long-lived coherences in single light-harvesting antenna complexes at native conditions, to unravel the remarkably high efficiency of energy conversion in such natural molecular antennas. At ICFO I aim to stimulate young researchers, towards well-rooted skilled scientists and assertive critical thinkers, ready to shape their future and sustain the world. To recharge, I like to touch ground in the Massis del Garraf or to stroll around the coast, inspired by the ancient Mediterranean waters.

Selected publications

- Piatkowski L, Accanto N, Calbris G, Christodoulou S, Moreels I & **van Hulst NF** 2019, ‘Ultrafast Stimulated Emission Microscopy of Single Nanocrystals’, *Science* **366**, 1240-1243.
- Block A, Liebel M, Yu R, Spector M, Sivan Y, Garcia de Abajo FJ & **van Hulst NF** 2019, ‘Tracking ultrafast hot-electron diffusion in space and time by ultrafast thermomodulation microscopy’, *Science Advances* **5**, eaav8965.
- Remesh V, Grinblat G, Li Y, Maier SA & **van Hulst NF** 2019, ‘Coherent Multiphoton Control of Gallium Phosphide Nanodisk Resonances’, *ACS Photonics* **6**, 2487–2491.

Selected research activities

Selected invited talks:

- OSA Quantum Bio-Photonics Incubator, Washington DC, USA
- NanoPhotonics 2019: Foundations and Applications, Monte Verita, Ascona, Switzerland
- Heraeus Seminar, Ultrafast Quantum Phenomena, Bad Honnef, Germany
- Micro-NanoTech. Workshop, Univ. Gothenburg, Sweden
- Micro-Nanophotonics Days 2019, Ecole Polytechnique, Palaiseau, France
- DINAMO 2019, San Cristóbal, Galapagos, Ecuador
- QUTIF Research School, Freiburg, Germany
- SUNRISE Roadmap, Brussels, Belgium
- NanoSpain 2019, Barcelona
- S3IC 2019, Munich, Germany
- Colloquium, Univ. Bristol, UK

Organization

- CLEO/Europe 2019, München, Germany: Chair EQEC Symposium EG
- S3IC 2020 Barcelona: Co-chairman with Frank Vollmer
- EOSAM2020, Porto, Portugal: Program committee TOM-5
- NanoLight 2020, Benasque, Spain: Organizer with Luis Martin-Moreno
- ICFO: Head Academic Programs; Head NanoFabrication Laboratory

ICREA MEMOIR 2019



Licia Verde

Universitat de Barcelona (UB)

Experimental Sciences & Mathematics

Originally from Venice (Italy) Licia Verde studied physics as an undergraduate at the Università degli Studi di Padova. She obtained her PhD from the University of Edinburgh (UK) sponsored by a Marie Curie grant from the EU, and then moved to a research assistant position at Princeton University and at Rutgers University (USA). At Princeton she held a Chandra postdoctoral fellowship and a Spitzer postdoctoral fellowship and she entered the WMAP science team. She spent 4 years as faculty at the University of Pennsylvania (USA). In September 2007, she moved to Barcelona as an ICREA Research Professor.

Research interests

I am interested in Cosmology, which is the study of the origin, evolution and composition of the universe. One of the recent discoveries in cosmology is that more than 70% of what makes up the universe is not even matter, but something that suggests that some energy is associated with the nothingness of vacuum. This component has been dubbed “dark energy”. Dark energy may as well be one of the major problems in physics today and is motivating a host of future and planned experiments. I study the “large-scale distribution of galaxies” and the statistical properties of the heat left over from the big bang to shed light on the universe composition, including the dark energy component, and its history.

Selected publications

- Raccanelli A, **Verde L** & Villaescusa-Navarro F 2019, ‘Biases from neutrino bias: to worry or not to worry?’, *Monthly Notices Of The Royal Astronomical Society*, 483, 1, 734 – 743.
- **Jimenez R**, Maartens R, Khalifeh AR, Caldwell RR, Heavens AF & **Verde L** 2019, ‘Measuring the homogeneity of the universe using polarization drift’, *Journal Of Cosmology And Astroparticle Physics*, 5, 048.
- **Verde L**, Treu T & Riess AG 2019, ‘Tensions between the early and late Universe’, *Nature Astronomy*, 3, 10, 891 – 895.
- Kalaja A, Bellomo N, Bartolo N, Bertacca D, Matarrese S, Musco I, Raccanelli A & **Verde L** 2019, ‘From primordial black holes abundance to primordial curvature power spectrum (and back)’, *JCAP* 10, 031.

Selected research activities

arXiv Science Advisory Board chair
 Premi Nacional de Recerca 2018
 Narcis Monturiol Medal 2017
 2019 Lodewijk Woltjer Lecture by the European Astronomical Society

ICREA MEMOIR 2019



Isabelle Vernos

Centre de Regulació Genòmica (CRG)

Life & Medical Sciences

Isabelle Vernos obtained a PhD in Biology from the University Autònoma of Madrid in 1989. As a postdoc she moved to Cambridge (UK) and then to EMBL (Heidelberg) in 1992, becoming staff scientist in 1996. In 1999 and 2005 respectively, she obtained competitive positions as junior and senior scientist of the Spanish Research Council (CSIC). In 2001, she established her first independent research group as team leader at EMBL. In 2005, she obtained an ICREA Research Professor position and moved to the CRG in Barcelona as senior researcher. She has published more than 85 research papers and reviews in high impact international journals. She is EMBO member since 2005. In 2011 she integrated the ERC Scientific Council and since 2013 she chairs its Gender Balance working group. From 2012 to 2015, she was a member of the Advisory Board for Science, Technology and Innovation for the Spanish Ministry of Economy and Competitiveness.

Research interests

Life depends on the ability of cells to divide while maintaining their genomic integrity. Cell division is therefore a critical process and yet involves the full reversible reorganization of the intra-cellular components. We are currently trying to understand the mechanism and regulatory signalling pathways involved in the transient formation of the mitotic spindle, the microtubule based molecular machine that segregates the chromosomes during cell division.

Selected publications

- Courthéoux T, Reboutier D, Vazeille T, Cremet JY, Benaud C, **Vernos I** & Prigent C 2019, "Microtubule nucleation during central spindle assembly requires NEDD1 phosphorylation on Serine 405 by Aurora A", J Cell Sci. 132, 10, UNSP jcs231118.

ICREA MEMOIR 2019



Paul Verschure

Institut de Bioenginyeria de Catalunya (IBEC)
Engineering Sciences

Dr. Paul Verschure leads the Synthetic Perceptive, Emotive and Cognitive Systems Laboratory, hosted by the Institute for Bioengineering of Catalunya. Paul has received his MA and Ph.D. in Psychology and pursued his research at different leading institutes in Europe and the US and manages a team of over 30 researchers and technicians with whom he has published over 350 articles in leading journals and conferences in a range of disciplines. Paul is regularly invited as a speaker at relevant scientific conferences and international policy events, a consultant for the European Commission, board member of three journals and reviews for a number of relevant journals and conferences. Paul is founder/CEO of Eodyne Systems S.L, which is commercializing neurorehabilitation, education and cultural heritage technologies, founder/Chairman of the Future Memory Foundation and founder/Chairman of the Convergent Science Network Foundation.

Research interests

His scientific goal is to generate a unified theory of mind and brain and body. Relying on synthetic methods and delivering science grounded technologies that support and advance the human condition added to the application for developing novel real-world technologies and quality of life-enhancing applications. At Specs-Lab activities are organized along seven dimensions: ·Architectures of mind and brain ·Computational neuroscience ·Robotics ·Neuroinformatics ·Human neurophysiology ·Neurorehabilitation ·Education.

The unique synergy between basic and applied science realized in Specs has generated new insights into the organization of mind and brain and provided solutions in neurorehabilitation, education, and cultural heritage used by thousands of people.

Selected publications

- Grechuta K, Rubio BB, Espín M., Usabiaga BT, Molina HB, Mohr B & **Verschure PFMJ** 2019, "Augmented Dyadic Therapy Boosts Recovery of Language Function in Patients With Nonfluent Aphasia: A Randomized Controlled Trial". *Stroke*, vol. 50, no. 5, pp 1270-1274.
- Rubio BB, Maier M, Duff A, Cameirao M, Bermudez S, Duarte E & **Verschure PFMJ** 2019, "A critical time window for recovery extends beyond one-year post-stroke". *Journal of Neurophysiology*, vol. 122, no. 1, pp 350- 357.
- Maier M, Rubio BB, Duff A, Duarte Oller E & **Verschure PFMJ** 2019, 'Effect of Specific Over Nonspecific VR-Based Rehabilitation on Poststroke Motor Recovery: A Systematic Meta-analysis', *Neurorehabilitation And Neural Repair*, vol. 33, no. 2, pp 112-129.
- Estefan PD, Sánchez-Fibla M, Duff A, Principe A, Rocamora R, Zhang H & **Verschure PFMJ** 2019, "Coordinated representational reinstatement in the human hippocampus and lateral temporal cortex during episodic memory retrieval". *Nature Communications*, vol. 10, no. 1, pp 2255.
- Herreros I, Miquel L, Blithikioti C, Nuno L, Rubio BB, Grechuta K, Gual A, Balcells-Olivero M & **Verschure PFMJ** 2019, 'Motor Adaptation Impairment in Chronic Cannabis Users Assessed by a Visuomotor Rotation Task', *Journal Of Clinical Medicine*, vol. 8, no 7, pp 1049.

Selected research activities

RESEARCH DEVELOPMENTS

Rehabilitation Gaming System-RGS: <http://specs-lab.com/portfolio-items/neuro-rehabilitation/?portfolioCats=14>

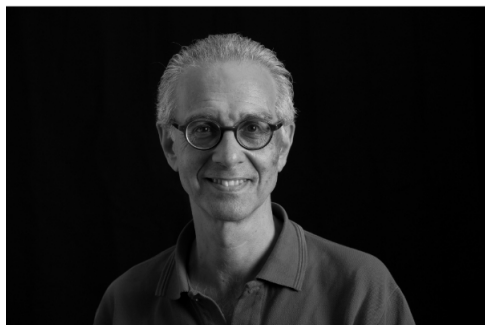
Brainx3 Software: <http://www.brainx3.com/>

Device for monitoring a physics system Patent:

<https://patents.google.com/patent/EP1091334B1/deq=verschure+Delbr%C3%BCck&oq=verschure+Delbr%C3%BCck#citedBy>

Dissemination: http://specs-lab.com/what_we_do/#Installations. SPECS has been developing multimodal and interactive installations since 1998. Over 35 performances, exhibitions and events. Largest one: Ada Sentient Space visited by >500K visitors. Most recent installations focus on conservation and presentation of history of Holocaust and Nazi crimes (<http://www.futurememoryfoundation.org>).

ICREA MEMOIR 2019



Fernando Vidal

Universitat Rovira i Virgili (URV)
Humanities

Born in Buenos Aires, I received a BA from Harvard University, graduate degrees in psychology and the history and philosophy of science from the Universities of Geneva and Paris, and a Habilitation from the École des Hautes Études en Sciences Sociales, Paris. I have long worked on the history of the human sciences and the mind/brain sciences from the Renaissance to the present, and more recently in bioethics and medical anthropology and phenomenology. I have been Guggenheim Fellow, Athena Fellow of the Swiss National Science Foundation, Visiting Scholar at the American Academy in Rome and at Harvard University (History of Science), Fellow at the Brocher Foundation, and Visiting Professor in Buenos Aires, Paris, Rio de Janeiro, Mexico DF and Kyoto. I was until 2012 a permanent Research Scholar at the Max Planck Institute for the History of Science, Berlin. In 2016 I was elected Associate Member of the Centre Alexandre Koyré (Paris) and in 2017 Member of the Academia Europaea.

Research interests

How do values and the production and application of scientific knowledge interact in particular contexts to shape views and practices of the human being? This has been the common question of my main research interests, which have long concerned the history of the mind/brain sciences from the early modern “sciences of the soul” to contemporary neurosciences. I keep working in those areas (see Lines of Research), but now also explore that question in the framework of biomedical ethics and medical anthropology and phenomenology. My main current project, which involves a network of researchers, patients and caregivers in Europe, the US and Japan, examines how the individual and collective experience of neurological conditions articulates with conceptions of personhood and forms of subjectivity. It focuses on the locked-in syndrome (known to the public through the film *The Diving Bell and the Butterfly*), a condition that leaves the mind intact, but the body almost entirely paralyzed.

Selected publications

- **Vidal F** 2019, ‘What makes neuroethics possible?’, *History of the Human Sciences*, 32, 2, 32 - 58.
- Sample M, Aunos M, Blain-Moraes S, Bubltz C, Chandler JA, Falk TH, Friedrich O, Groetzinger D, Jox RJ, Koegel J, McFarland D, Neufeld V, Rodriguez-Arias D, Sattler S, **Vidal F**, Wolbring G, Wolkenstein A & Racine E 2019, ‘Brain-computer interfaces and personhood: interdisciplinary deliberations on neural technology’, *Journal Of Neural Engineering*, 16, 6, 063001.
- **Vidal F** & Ortega F 2019, *Somos nosso cérebro? Neurociências, subjetividade, cultura*, São Paulo, n-1 edições, (translation of *Being Brains*, 2017)

Selected research activities

Among other activities, I organized in 2019 the symposium *Illness Narratives and the Dynamics of Confinement* at the international conference of MLA (Modern Language Association) in Lisbon, and lectured at the Universidad Autónoma Metropolitana (México, DF); in the area of public outreach, I gave a talk at the “Jardin des Sciences” series of the University of Strasbourg, France. The Portuguese translation of my last book, *Being Brains: Making the Cerebral*, was published in Brazil.

ICREA MEMOIR 2019



Anton Vidal-Ferran

Universitat de Barcelona (UB) & Institut Català d'Investigació Química (ICIQ)

Experimental Sciences & Mathematics

Anton Vidal graduated in Chemistry at the “Institut Químic de Sarrià” in 1987 and completed his PhD at the same institution in 1992 with Prof. P. Victory. Throughout the two post-doctoral appointments that followed (at the University of Cambridge with Prof. J.K.M. Sanders and the University of Barcelona with Prof. M.A. Pericàs) he studied topical and diverse areas of chemistry such as Supramolecular Chemistry and aspects of Enantioselective Catalysis. He had the opportunity to complement his academic background with the industrial experience gained during his tenure in a number of research departments at Bayer-AG (Leverkusen). Following the appointment as ICREA Research Professor (Catalan Institution for Research and Advanced Studies) he started his independent research activities as a Group Leader at the ICIQ in September 2003. In October 2019, he moved as Research Professor to the Department of Inorganic and Organic Chemistry at the University of Barcelona.

Research interests

Our past and current objectives encompass the Design of Efficient Enantioselective Catalysts for Transformations of Interest, and the study of their use to prepare products with relevance in the life-science sector and fine chemicals arena. We are working in an area of research in which cutting-edge chemistry combines concepts from supramolecular and physical organic chemistry with traditional approaches from enantioselective catalysis. Crucial aspects of this work include modular design of the catalysts; use of versatile synthetic procedures; incorporation of regulation mechanisms to optimize the geometry of the catalyst's active-site; and computational study of their catalytic cycles (through collaborations).

Selected publications

- Carreras L, Benet-Buchholz J, Franconetti A, Frontera A, van Leeuwen PWNM & **Vidal-Ferran A** 2019, ‘Halogen Bonding Effects on the Outcome of Reactions at Metal Centres’, *Chem Commun*, 55, 2380-2383.
- Corella-Ochoa MN, Tapia JB, Rubin HN, Lillo V, González-Cobos J, Núñez Rico JL, Balestra SRG, Almora-Barrios N, Lledós M, Güell-Bara A, Cabezas-Giménez J, Escudero-Adán EC, **Vidal-Ferran A**, Calero S, Reynolds MM, Martí-Gastaldo C & Galán-Mascarós JR 2019 ‘Homochiral Metal Organic Frameworks for Enantioselective Separations in Liquid Chromatography’, *J Am Chem Soc*, 141, 14306–14316.
- Fernández-Pérez H & **Vidal-Ferran A** 2019, ‘Stereoselective Catalytic Synthesis of *P*-Stereogenic Oxides via Hydrogenative Kinetic Resolution’, *Org Lett*, 21, 7019-7023.
- Llorente N, Fernández-Pérez H, Núñez-Rico JL, Carreras L, Martínez-Carrión A, Iniesta E, Romero-Navarro A, Martínez-Bascuñana A & **Vidal-Ferran A** 2019, ‘Efficient Modular Phosphorus-Containing Ligands for Stereoselective Catalysis’, *Pure Appl Chem*, 91, 3-15.
- Martínez-Carrión A, Howlett MG, Alamillo-Ferrer C, Clayton AD, Bourne RA, Codina A, **Vidal-Ferran A**, Adams RW & Burés J 2019, ‘Kinetic Treatments for Catalyst Activation and Deactivation Processes based on Variable Time Normalization Analysis’, *Angew Chem, Int Ed*, 58, 10189-10193.
- Puértolas B, Rellán-Piñeiro M, Núñez-Rico JL, Amrute AP, **Vidal-Ferran A**, López N, Pérez-Ramírez J & Wershofen S 2019, ‘Mechanistic Insights into the Ceria-Catalyzed Synthesis of Carbamates as Polyurethane Precursors’, *ACS Catalysis*, 9, 7708-7720.

Selected research activities

Ten invited talks in International Conferences and University Departments (*e.g.* Keynote lecture at ICNI 2019, Lisbon)
 Publication of a patent (**Vidal-Ferran A. et al.** 2019, WO2019185608A1) within a collaborative research program with COVESTRO AG
 Evaluator of projects and articles for a number of chemistry panels and editorial boards
 Student promotion: Lucas Carrera (PhD Thesis, Univ. Rovira i Virgili)
 Visiting Professor at the “Freie Universität Berlin”

ICREA MEMOIR 2019



Miquel Vila

Vall d'Hebron Institut de Recerca (VHIR)

Life & Medical Sciences

Miquel Vila received his MD from the University of Barcelona (Spain) and then moved to the laboratory INSERM U289 (Prof. Y. Agid) at the Salpêtrière Hospital (Paris, France), where he obtained a Master degree (DEA) and PhD in Neuroscience from the University of Paris 6. From 1998 to 2001 he worked as a postdoctoral researcher at the laboratory of Dr. S. Przedborski at the Dept. of Neurology of Columbia University (New York, USA). In 2001, he obtained a tenure-track position as Assistant Professor of Neurology at Columbia University, a \$1M-R01 NIH grant and the US permanent residency (outstanding researcher category). In December 2005, he moved back to Barcelona as an ICREA Research Professor to create and lead a new research group on Neurodegeneration at the Vall d'Hebron Research Institute, with the support of a 1.5M€ European Commission's Marie Curie Excellence Grant. He also holds positions as Associate Professor at the UAB and as Principal Investigator at the CIBERNED.

Research interests

Our research is geared toward elucidating the molecular mechanisms of neuron cell death occurring in Parkinson's disease, the second most common neurodegenerative disorder after Alzheimer's dementia, in order to: (i) identify biomarkers for the diagnosis, early detection, patient stratification, disease progression, prognosis or response to treatment, (ii) identify new molecular targets for potential therapeutic intervention, (iii) develop novel therapeutic strategies with disease-modifying potential for this currently incurable disease, (iv) unravel molecular pathways common to other neurodegenerative diseases.

Selected publications

- Carballo-Carbajal I, Laguna A, Romero-Gimenez J, Cuadros T, Bové T, Martinez-Vicente M, Parent A, Gonzalez-Sepulveda M, Peñuelas N, Torra A, Rodriguez-Galvan B, Ballabio A, Hasegawa T, Bortolozzi A, Gelpi E & **Vila M** 2019 'Brain tyrosinase overexpression implicates age-dependent neuromelanin production in Parkinson's disease pathogenesis'. *Nature Communications*, volume 10, 973.
- **Vila M** 2019, 'Neuromelanin, aging, and neuronal vulnerability in Parkinson's disease', *Movement Disorders*, 34(10): 1440-1451.
- **Vila M**, Laguna A & Carballo-Carbajal I 2019, 'Intracellular crowding by age-dependent neuromelanin accumulation disrupts neuronal proteostasis and triggers Parkinson disease pathology', *Autophagy*, 15, 11, 2028 - 2030.

ICREA MEMOIR 2019



Josep Vilardell

Institut de Biologia Molecular de Barcelona (CSIC - IBMB)
Life & Medical Sciences

Since 2010 ICREA Research Professor at the Molecular Biology Institute of Barcelona (IBMB). (2002) Group Leader at the Center for Genomic Regulation. (1991) Post-doc at the Albert Einstein College of Medicine (New York), working on pre-mRNA splicing in yeast. (1990) PhD in Biochemistry by the Universitat Autònoma de Barcelona (UAB), with research on the regulation of gene expression by the plant hormone abscisic acid in maize, supervised by Dr. Montserrat Pagès at the Center for Research and Development (CID), Barcelona. (1988) BA in Sciences (Biochemistry), UAB. IBMB Vice-director since Nov 2018.

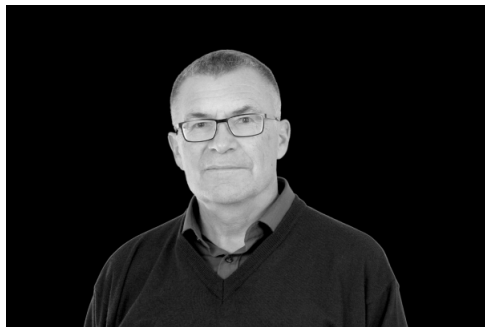
Research interests

Living systems carry on the information to reproduce (“Genetic” Information) themselves. This is subjected to Natural Selection and there are many examples of strategies to optimize the storage of genetic information. However, apparently this does not hold in multicellular organisms, including us. Most our genes are repeatedly interrupted by many comparatively large, apparently meaningless, segments, that are neatly removed before decoding the gene. This removal is done by the spliceosome, a machine akin to a genome’s ghostwriter and possibly the most complex enzyme in a eukaryotic cell. Our research aims at what controls the spliceosome and how this is achieved. For this we follow a reductionist scheme with the yeast model, using molecular and computational approaches. We study the initial steps in the recognition of “meaningless” segments and their regulation. In addition, taking advantage of large datasets publicly available, we investigate how the spliceosome responds to aging, mutations, or disease, both in yeast and human cells.

Selected research activities

Oral Presentation in the 12th Bi-Annual Meeting of the Yeast Spanish Network 11-13 December 2019, El Escorial
Inspirer and organizer of the bi-monthly Barcelona Yeast Group (BYG) meetings
Master Thesis (Bioinformàtica UPF) Helena Rodríguez Lloveras

ICREA MEMOIR 2019



Alexander Voityuk

Universitat de Girona (UdG)

Experimental Sciences & Mathematics

Dr. Alexander Voityuk joined the Institut de Química Computacional at the Universidad de Girona as an ICREA research professor in May 2004. 1973-1978 Master degree with honor NSU, Russia. Speciality: Chemistry, Specialization: Physical and Inorganic chemistry. 1979-1983 PhD in Physical Chemistry (Institute of Inorganic Chemistry, Academy of Sciences, USSR). 1985-1992 Associate Professor in Physical Chemistry and Quantum Chemistry group leader at the Institute of Bioorganic Chemistry (Novosibirsk, Russia). Before obtaining his ICREA position in 2004, he was a senior research associate at the University of Zurich, Switzerland (1992-1995), Technical University of Munich (1995-2000) and Max-Planck-Institute of Quantum Optics, Garching, Germany (2000-2004). He has published >170 articles with more than 3500 total citations in the field of quantum chemistry and computational modeling of charge transfer in biomolecules and organic materials.

Research interests

Electron transfer (ET) and excitation energy transfer (EET) are important processes in biochemistry and material science. The main area of my research is the development of theoretical and computational tools to explore ET and EET in molecular systems and their application to biomolecules and organic materials to understand underlying mechanisms that control the charge and exciton migration in the systems. Semiempirical methods, the development of computer codes and simulation of ET and EET in DNA and related systems are of special interest.

Selected publications

- Stasyuk AJ, Stasyuk OA, Sola M & **Voityuk AA** 2019, 'Hypsochromic solvent shift of the charge separation band in ionic donor-acceptor Li+@C-60-[10]CPP', *Chemical Communications*, 55, 75, 11195 - 11198.
- Izquierdo M, Platzer B, Stasyuk AJ, Stasyuk OA, **Voityuk AA**, Cuesta S, Sola M, Guldi DM & Martin N 2019, 'All-Fullerene Electron Donor-Acceptor Conjugates', *Angewandte Chemie-international Edition*, 58, 21, 6932 - 6937.
- Stasyuk AJ, Stasyuk OA, Sola M & **Voityuk AA** 2019, 'Photoinduced Charge Shift in Li+-Doped Giant Nested Fullerenes', *Journal Of Physical Chemistry C*, 123, 27, 16525 - 16532.
- Stasyuk AJ, Stasyuk OA, Sola M & **Voityuk AA** 2019, 'Peculiar Photoinduced Electron Transfer in Porphyrin-Fullerene Akamptisomers', *Chemistry-a European Journal*, 25, 10, 2577 - 2585.
- **Voityuk AA** & Vyboishchikov SF 2019, 'A simple COSMO-based method for calculation of hydration energies of neutral molecules', *Physical Chemistry Chemical Physics*, 21, 34, 18706 - 18713.
- Vyboishchikov SF & **Voityuk AA** 2019, 'Iterative Atomic Charge Partitioning of Valence Electron Density', *Journal of Computational Chemistry*, 40, 7, 875 - 884.

Selected research activities

Visiting professor . Nanyang Technological University, October-November 2019.

ICREA MEMOIR 2019



Peter Wagner

Universitat de Barcelona (UB)

Social & Behavioural Sciences

Educated in economics, political science and sociology in Hamburg, London and Berlin, Peter Wagner has been academically active in various European countries, including Germany, the United Kingdom, France, Italy and Norway, as well as in the USA and South Africa, before coming to Barcelona in 2010. He was Research Fellow at the Wissenschaftszentrum Berlin für Sozialforschung, Professor of Sociology at the U of Warwick and the U of Trento as well as Professor of Social and Political Theory at the European University Institute in Florence. Furthermore, he is currently project director at Ural Federal University, Ekaterinburg, and held visiting positions at the University of Hamburg (2019-20), Université de Paris 8 (2011); U catholique de Louvain-la-neuve (2009-10); U of Cape Town (2009-10); EHESS, Paris (1998; 2001); U of California at Berkeley (1996; 1997); Swedish Collegium for Advanced Study, Uppsala; Institute for Advanced Study, Princeton (1990-91), among others.

Research interests

Peter Wagner's research is based in comparative historical and political sociology, social and political theory, and sociology of the social sciences. It focuses on the identification and comparative analysis of different forms of social and political modernity and of the historical trajectories of modern societies. In this perspective, the term "modernity" does not signal a single and unique model of social organization, but rather variable interpretations of basic human problématiques in the light of specific historical experiences. It was initially applied to a comparative political sociology of European societies, and subsequently to transformations in the self-understanding of Europe. Over the past few years, it was elaborated further towards a "world-sociology", focusing on the tensions between struggles for autonomy and persisting forms of domination and exploring current possibilities of progress in the light of historical experiences in different world-regions.

Selected publications

- **Wagner P** 2019, "Historisches Unrecht im Zeitalter von Menschenrechten und Demokratie", *WestEnd. Neue Zeitschrift für Sozialforschung*, vol. 16, no. 2.
- Mota A & **Wagner P** 2019, *Collective action and political transformations: the entangled experiences in Brazil, South Africa and Europe*, Edinburgh: Edinburgh University Press
- Mota A & P Wagner, 'The Amazon, the Rhino, and the blue sky over the Ruhr. Ecology and politics in the current global context', *Changing Societies and Personalities*, vol. 4
- Agridopoulos A, Honneth A, Karagiannis N, **Wagner P** 2019, (eds) Schuld und Schulden, *WestEnd. Neue Zeitschrift für Sozialforschung*, vol. 16, no. 2, pp. 77-148.

Selected research activities

The year 2019 witnessed intense research work in the project "Varieties of modernity in the current global context: the role of BRICS and the Global South". Based at Ural Federal University in Ekaterinburg and funded by the Russian Science Foundation, this project allows the extension of the historical-comparative perspective on modernity to include further world-regions and thus to take an important step in the envisaged elaboration of a world-sociology of modernity. Furthermore, the concluding steps of the research project "The debt: historicizing Europe's relations with the 'South'" have been taken. This project was funded by the consortium Humanities in the European Research Area (HERA) and has had a strong focus on inter-disciplinary conceptual elaboration, exploring varieties of social bonds such as debt, solidarity, recognition and responsibility. Two special issues of journals have been published in 2019 and an edited volume will be forthcoming in 2020. From October 2019 Peter Wagner has been Fellow at the Centre for Advanced Studies in the Humanities "Futures of sustainability" at the University of Hamburg. This stay has allowed him to further develop an innovative historico-sociological perspective on questions of global social and ecological justice, which will be the focus of his work in 2020.

ICREA MEMOIR 2019



Leo Wanner

Universitat Pompeu Fabra (UPF)
Humanities

Leo Wanner earned his Diploma degree in Computer Science from the University of Karlsruhe and his PhD in Computational Linguistics from the University of The Saarland, Germany. Prior to joining ICREA he held positions at the German National Centre for Computer Science (GMD), University of Waterloo, the University of Stuttgart and the Pompeu Fabra University, Barcelona. As visiting researcher, he was affiliated with U of Montreal, U of Sydney, U of Southern California's Institute for Information Sciences, U Paris 7, Columbia University, and U of Augsburg. Throughout his career, Leo has been involved as Principal Investigator in a series of national and European research projects. He has published eight books and about 200 peer reviewed papers. He is Associate Editor of the Computational Intelligence Journal and serves as regular reviewer for a number of high profile conferences and journals in the areas of (Computational) Linguistics and Artificial Intelligence.

Research interests

Leo Wanner is working in the field of computational linguistics, teaching the computer to understand spoken and written natural language material, to supply people with information that might be useful to them and to interact with people. His research areas include human-computer interaction (in particular, the design and realization of conversation agents that reveal social and cultural competence), automatic written and spoken graph transduction-based language generation, automatic summarization of written material, data-driven parsing, information extraction, and, more recently, profiling of authors of written material and the information structure-prosody interface. He is furthermore interested in lexicology and lexicography, and there, in particular, in the automatic recognition, representation and use of lexical idiosyncrasies (so-called "collocations") by both native speakers and learners of a language. An important characteristics of his research is that it is multilingual.

Selected publications

- Mille S, Dasiopoulou S & **Wanner L** 2019, 'A portable grammar-based NLG system for verbalization of structured data', *Sac '19: Proceedings Of The 34th Acm/sigapp Symposium On Applied Computing*, 1054 - 1056.
- Espinosa-Anke L, **Wanner L** & Schockaert S 2019, 'Collocation Classification with Unsupervised Relation Vectors', *57th Annual Meeting Of The Association For Computational Linguistics (acl 2019)*, 5765 - 5772.
- Mille S, Fisas B, Dasiopoulou S & **Wanner L** 2019, 'Teaching FORGe to Verbalize DBpedia Properties in Spanish'. In *Proceedings of the 12th International Conference on Natural Language Generation*. Tokyo, Japan, 2019.
- Soler-Company J & **Wanner L** 2019, 'Automatic Classification and Linguistic Analysis of Extremist Online Material'. In: Kompatsiaris I., Huet B., Mezaris V., Gurrin C., Cheng WH., Vrochidis S. (eds) *MultiMedia Modeling. MMM 2019. Lecture Notes in Computer Science*, vol 11296. Springer, Cham.
- Fortuna P, Rocha da Silva J, Soler-Company J, **Wanner L** & Nunes S 2019, 'A Hierarchically-Labeled Portuguese Hate Speech Dataset' In *Proceedings of the 3rd WS on Abusive Language Online*, collocated with ACL. Florence, Italy.
- Mille S, Belz A, Bohnet B, Graham Y & **Wanner L** 2019, 'The Second Multilingual Surface Realisation Shared Task (SR'19): Overview and Evaluation Results'. In *Proceedings of the Second Workshop on Multilingual Surface Realisation* at EMNLP, pp. 1 - 17, Hong Kong, China.

Selected research activities

During 2019, Leo has also been PI of five ongoing large scale European and several national research projects, and co-organizer of a shared task on surface-oriented multilingual natural language generation.

ICREA MEMOIR 2019



Andrew Williams

Universitat Pompeu Fabra (UPF)
Humanities

Andrew Williams read Philosophy, Politics and Economics at the University of Oxford and was a graduate student at Nuffield College, Oxford and Harvard University. He then became a Junior Research Fellow at Jesus College, Oxford, and later taught at York, Reading and Warwick, where he was a Professor of Philosophy before joining ICREA in October 2009. He has also been a visiting professor in the Program in Ethics, Politics and Economics at Yale University and the Department of Philosophy at Harvard, and a Faculty Fellow in Ethics at the Kennedy School of Government at Harvard. His work has been published in such journals as *Ethics*, *Economics and Philosophy*, *Philosophical Quarterly*, *Philosophy & Public Affairs*, and *Utilitas*, and he is Editor of *Politics, Philosophy & Economics*.

Research interests

My interests lie in moral and political philosophy and practical rationality, as well as intersecting areas in economics and political science. My research focusses in particular on questions about distributive justice, including ones arising across states and generations. I explore how egalitarian distributive principles should guide the design of social institutions that shape the prospects of children, parents, the elderly, and future generations. My most recent work examines how we should deal with the needs of the elderly and with variations in lifespan as well as the role that demographic factors should play in our response to climate change.

Selected publications

– **Casal P & Williams A** 2019, ‘Human iPSC-Chimera Xenotransplantation and the Non-Identity Problem’, *Journal of Clinical Medicine* 8, 1, 95.

Selected research activities

“Fertility and Collective Responsibility”, Conference on Collective Responsibility, Katmandu University, Nepal, March 13, 2019

“Comment on Budolfson and Spears on Population, Well-Being, and Animals”, Conference on Population, Public Policy, and Climate Change, Tulane University, March 15, 2019

“Kolodny on Equality and Institutions”, New Directions in Social Justice Theorizing, Department of Philosophy, University of California, San Diego, May 26, 2019

“Age, Time, and the Priority View”, Society for Applied Philosophy Annual Conference, Cardiff University, June 29, 2019

“Demography, Justice, and Climate Change”, Justice and Climate Change Forum, Universidad Pontificia Javeriana de Bogotá, August 5, 2019

“Instrumental and Non-Instrumental Arguments for Equality” (co-presented with Paula Casal), Faculty of Philosophy, Universidad Pontificia Javeriana de Bogotá, August 8, 2019

“The Impact of Procreation on Climate Change”, Conference on Climate Change, EAFIT University, Medellin, August 15, 2019

“Aging as Equals: Right or Responsibility?”, Conference on Justice, Inequality and Old Age, University of Salzburg, November 28, 2019

Organizer of Conference on Population, Public Policy, and Climate Change, Tulane University, March 15, 2019

Supervisor of three UPF Masters theses: A Libertarian Defense of Gun Control; A Case for Research on Geoengineering; and The Lessons of Historical Materialism for Intergenerational Justice

ICREA MEMOIR 2019



Martina Wiltschko

Universitat Pompeu Fabra (UPF)
Humanities

In my graduate education at the University of Vienna, I was trained in theoretical linguistics with an emphasis on syntactic theory as well as interface-issues (syntax-morphology, syntax-semantics, and syntax-pragmatics). At this time my primary language focus was on Germanic. After completing my graduate work I came to the University of British Columbia in 1996 as a postdoctoral researcher and later as a faculty member. Here I expanded my language specialization to include Upriver Halkomelem (Salish), Blackfoot (Algonquian) and Ktunaxa (aka Kutenai). I have published extensively on typological issues viewed from the angle of theoretical linguistics, which I more recently expanded to include the language of interactional language. My relocation to ICREA and UPF coincides with the start of a new research agenda: the modelling of language variation in neuro-diverse populations.

Research interests

My research explores the fundamental building blocks of human language, and how languages differ in their realization. I pursue this research focusing on three empirical domains: traditional grammatical categories, categories belonging to interactional language, and the linguistic profiles in neuro-diverse populations. I do this by using the framework I developed in my 2014 monograph: the Universal Spine Hypothesis according to which the grammar of all languages (including interactional language) are constrained by a set of hierarchically organized universal functions (the spine). The question raised by the language profile of neuro-diverse populations is that it involves a different type of language variation, one in which the spine itself may be affected. Thus, my research links to neighboring fields, including philosophy (referential semantics, pragmatics), sociology (conversation analysis), and psychology (theory of mind).

Selected research activities

Prior to ICREA's Appointment:

Burton S & **Wiltschko M** 2019, 'Flipping LING 100: A Case Study in Flipping a Large Undergraduate Class'. In: J. Golding, K. Kern, K. Rawn (eds.) *Strategies for Teaching Large Classes Effectively in Higher Education*. Cognella Publishing). 105-120.

Wiltschko M 2019. 'Now can be the end of the past or the beginning of the future'. In: Matthewson, L., E. Guntley, M. Huijsmanns and M. Rochemont (eds.) *Wa7 xweysás i nqwal'úttensa i ucwalmícwa: He loves the people's languages*, Essays in Honour of Henry Davis. UBC Working Papers in Linguistics. 385-400.

Bliss H, Ritter E & **Wiltschko M** 2019. 'Inverse marking and person hierarchies'. In: D. Siddiqi, M. Barrie, C. Gillon, J. Haugen, E. Mathieu (eds.) *Routledge Handbook of North American Languages*. 181-198.

Ritter E & **Wiltschko M** 2019. 'Nominal speech act structure: Evidence from the structural deficiency of impersonal pronouns'. *Canadian Journal of Linguistics*, 64, 4, 709-729.

ICREA MEMOIR 2019



Andreas Winter

Universitat Autònoma de Barcelona (UAB)

Experimental Sciences & Mathematics

Andreas Winter was born in Altötting, a small rural town near Munich, known also as the Heart of Bavaria. After developing an infatuation with science early on, and in particular with mathematics, he decided to study this subject in Konstanz and Berlin. He graduated in 1997 from the Freie Universität Berlin, and went on to obtain a doctorate in mathematics from the Universität Bielefeld in 1999, with the late Rudolf Ahlswede. In 2001 he joined the quantum information group in Bristol as a postdoc, became Lecturer in Applied Mathematics there in 2003, and Professor of the Physics of Information in 2006. In 2012 he left Bristol after 11 years, to move to the Universitat Autònoma de Barcelona as ICREA Research Professor, where he is now part of the quantum information group.

Research interests

I work on quantum information, especially quantum Shannon theory, which aims at incorporating information-theoretic ideas into physics. The Shannon theoretic approach has succeeded in quantifying entanglement as a resource in information processing task, and likewise for other properties of quantum systems such as channel and storage capacities of quantum systems. One of my favourite topics is the interplay between classical and quantum information, evident in the intricate structure of local operations in composite systems, such as data hiding or “information locking”. I also work on additivity and non-additivity of quantum channel capacities, quantum data compression, and zero-error quantum communication. Further interests include statistical mechanics, thermodynamics, resource theories, entropy characterization and entanglement measures. But at heart I am a mathematician and will still get fascinated by classic problems: existence of Hadamard matrices, incompleteness, ...

Selected publications

- Melo N & **Winter A** 2019, ‘Intersection patterns of linear subspaces with the hypercube’, *J. Comb. Theory A*, vol. 164, pp. 60-71.
- Bera MN, Lewenstein M & **Winter A** 2019, ‘Thermodynamics from Information’, in: *Thermodynamics in the Quantum Regime, Fund. Theor. Physics*, vol. 195, Springer Verlag, pp. 799-820.
- Bera MN, Riera A, Lewenstein M, Khanian ZB & **Winter A** 2019, ‘Thermodynamics as a Consequence of Information Conservation’, *Quantum*, vol. 3, 121.
- Castellini A, Lo Franco R, Lami L, **Winter A**, Adesso G & Compagno G 2019, ‘Indistinguishability-enabled coherence for quantum metrology’, *Phys. Rev. A*, vol. 100, 012308.
- Strasberg P & **Winter A** 2019, ‘Stochastic thermodynamics with arbitrary interventions’, *Phys. Rev. E*, vol. 100, 022135.
- Gour G & **Winter A** 2019, ‘How to Quantify a Dynamical Quantum Resource’, *Phys. Rev. Lett.*, vol. 123, 150401.
- Datta N, Hirche Ch & **Winter A** 2019, ‘Convexity and Operational Interpretation of the Quantum Information Bottleneck Function’, *ISIT 2019*, pp. 1157-1161.
- Khanian, ZB & **Winter A** 2019, ‘Distributed Compression of Correlated Classical-Quantum Sources’, *ISIT 2019*, pp. 1152-1156.
- Khanian ZB & **Winter A** 2019, ‘Entanglement-Assisted Quantum Data Compression’, *ISIT 2019*, pp. 1147-1151.
- Yang D, Horodecki K & **Winter A** 2019, ‘Distributed Private Randomness Distillation’, *Phys. Rev. Lett.*, vol. 123, 170501.
- Das S, Kaur E, Wilde MM & **Winter A** 2019, ‘Extendibility Limits the Performance of Quantum Processors’, *Phys. Rev. Lett.*, vol. 123, 070502.
- Bäuml S, **Winter A** & Yang D 2019, ‘Every entangled state provides an advantage in classical communication’, *J. Math. Phys.*, vol. 60, 072201.
- Zhao Q, Liu Y, Yuan X, Chitambar E & **Winter A** 2019, ‘One-Shot Coherence Distillation: Towards Completing the Picture’, *IEEE Trans. Inf. Theory*, vol. 60, 6441-6453.

Selected research activities

- Co-organiser, with IG Todorov, M Laurent & S Severini: workshop *Analytical and combinatorial aspects of quantum information theory*, ICMS Edinburgh, 9-13 Sept 2019.
- Senior editor IEEE Journal on Selected Areas of Information Theory.

ICREA MEMOIR 2019



Andriy Yaroshchuk

Universitat Politècnica de Catalunya (UPC)

Experimental Sciences & Mathematics

Born on 7 March 1959 in Kiev, Ukraine. Candidate of Sciences (equivalent to PhD) in Colloid Chemistry, A.V. Dumanskiy Institute of Colloid and Water Chemistry, National Academy of Sciences of Ukraine, Kiev, 1983. Doctor of Sciences in Physics and Mathematics, Institute of Physical Chemistry of Russian Academy of Sciences, Moscow, 1992. ICREA Research Professor at the Polytechnic University of Catalonia, since 2007. Invited researcher/professor at Karl-Franzens Universität, Graz, Austria; École Nationale Supérieure de Chimie et de Physique de Bordeaux (France); École Supérieure Chimie Physique Electronique de Lyon (France); Universität Duisburg – Essen (Germany); Paul-Scherrer-Institute (Switzerland), etc. Member of Editorial Board of Desalination and Water Treatment (Taylor & Francis UK). Published 122 papers on theoretical and experimental studies of membranes, colloids, porous media and micro-/nano-fluidic systems.

Research interests

The keyword is behaviour of fluids at nano-scale. I study the transfer of ions and water molecules through nano-metric (tens of nanometers) barrier layers of composite nanofiltration membranes. Another example is the transfer of ions and water through nano-porous track-etched membranes having identical cylindrical pores. I also study processes of current-induced concentration polarization of nano-/micro-interfaces where concentration polarization is strongly-coupled to electroosmosis and fine separation of solutes like peptides can occur. Recently, I discovered that a layered structure consisting of a micro-perforated ion-exchange membrane and a nanoporous layer can have very interesting properties useful for AC electroosmotic pumping. Another topic is experimental and theoretical studies of ion transfer across polyelectrolyte multilayers where we have recently discovered very high (>1000) selectivities in the electrically-driven transfer of ions of different charge magnitudes.

Selected publications

- **Yaroshchuk A**, Bruening ML & Zholkovskiy E 2019, 'Modelling nanofiltration of electrolyte solutions', *Adv. Colloid & Interface Sci.*, 268, 39-63
- Ahmad M, Tang C, Yang L, **Andriy Yaroshchuk** & Bruening ML 2019, 'Layer-by-layer modification of aliphatic polyamide anion-exchange membranes to increase Cl⁻/SO₄²⁻ selectivity', *J.Membr.Sci.*, 578, 209-219
- Fernandez de Labastida M & **Yaroshchuk A** 2019, 'Transient membrane potential after concentration step: a new method for advanced characterization of ion-exchange membranes', *J.Membr.Sci.*, 585, 271-281
- Bondarenko MP, Bruening ML & **Yaroshchuk A** 2019, 'Highly Selective Current-Induced Accumulation of Trace Ions at Micro-/NanoPorous Interfaces', *Advanced Theory And Simulations*, 2, 6, 1900009.
- **Yaroshchuk A**, Bondarenko M, Tang C & Bruening ML 2019, 'Limiting Case of Constant Counterion Electrochemical Potentials in the Membrane for Examining Ion Transfer at Ion-exchange Membranes and Patches', *Langmuir*, 35, 40, 13243 – 13256.

ICREA MEMOIR 2019



Santiago Zabala

Universitat Pompeu Fabra (UPF)

Humanities

I was raised in Rome, Vienna, and Geneva and studied philosophy at the University of Turin and at the Pontifical Lateran University of Rome, where I obtained my PhD in 2006. The following year I was awarded the Humboldt Research Fellowship at the University of Potsdam for two years. After a visiting scholarship in 2010 at Johns Hopkins University, I was appointed ICREA Research Professor at the University of Barcelona. Since 2015 I am ICREA Research Professor at Pompeu Fabra University, where I currently teach contemporary and political philosophy and supervise PhD students. I am also the founding director of the “UPF Center for Vattimo’s Archives and Philosophy.” My writing has appeared in *The New York Times*, *Al-Jazeera*, and the *Los Angeles Review of Books*.

Research interests

My research focuses in three areas each of which has generated several authored and edited books and journals special issues. These areas are political, social, and aesthetic Continental Philosophy. I study each of these following the hermeneutic principle according to which Being is not an objective entity that philosophy must describe but rather the effect of interpretations. Following the work of Gadamer, Vattimo, and Rorty, I emphasize the ontological and political nature of hermeneutics in order to demonstrate the danger of dogmatic beliefs for religious and political practices. My next books and essays will explore “fake news” and “post-truth” in this so-called age of alternative facts to argue, as Bruno Latour said, that “facts remain robust only when they are supported by a common culture, by institutions that can be trusted, by a more or less decent public life, by more or less reliable media.”

Selected publications

- **Zabala S** 2019, “Tugendhat” and “Vattimo” in *The Cambridge Habermas Lexicon* edited by Mendieta E & Allen A, *Cambridge University Press*, pp. 698-699 and 700-702.
- (**Zabala**, series editor) Gutiérrez Aguilar R (ed.) *Predicar con el ejemplo Ser y deber (de) ser en lo público*. Bellaterra, Barcelona, 2019.

Selected research activities

Research Group: This year the 1st International Workshop of the UPF Center for Vattimo’s Archives and Philosophy took place with the participation of scholars from Italy, Canada, and Spain. The impact of the group is evident not only in the publications that have emerged from the group’s activities but also in the various visitors from China, Italy, South and North America have visited the center and participated in seminars throughout the year. This year another student (Gabriel Serbu) has defended his PhD thesis on Vattimo.

Series Editor: I am the coeditor, along with Adrian Parr, of a new book series for McGill-Queen’s University Press titled “Outspoken,” which will release two volumes per year starting in 2020. I also continue to edit for the Spanish publisher Bellaterra Publishers the series Political Philosophy, which has released so far a total of eleven titles since 2010.

Media Outreach: My opinion articles in media outlets and journals such as the *New York Times*, *La Stampa*, *Ara*, *Al-Jazeera*, the *Los Angeles Review of Books*, *Aeon*, *La Maleta de Portbou* are meant not only to communicate my philosophical findings to a wider audience but also to stir political and cultural debates. This activity also takes place through my collaboration with cultural centers, such as Escola Europea d’Humanitats and the CCCB, where I participate in seminars and recommend guest speakers.

ICREA MEMOIR 2019



João Zilhão

Universitat de Barcelona (UB)

Humanities

Prior to current appointment, taught at the Universities of Bristol and Lisbon, as well as, on a temporary basis, Paris and Bordeaux. Appointed January 1996 by the Portuguese government to set up the Côa Valley Archeological Park, coordinate scientific research to establish the age of its Paleolithic rock art, and prepare the nomination of the site for World Heritage status (listing date, December 1998). Created and directed the Instituto Português de Arqueologia (IPA), a department of the Ministry of Culture for the supervision of archaeological activity in the country (May 1997-2002). Member of the Executive Board of the European Association of Archeologists (2003-06). Humboldt Foundation Research Awardee (2003-04, University of Cologne) for "past achievements in teaching and research". Recipient of the London Prehistoric Society's Europa Prize (2005), for "significant and enduring contribution to the study of European prehistory". In 2012 profiled in "Science".

Research interests

The Middle-to-Upper Paleolithic transition has been the focus of my research for the last 20 years, leading to fieldwork at several sites: (a) the Lagar Velho rock-shelter (Portugal) and its burial of an early modern human child with diagnostic Neandertal features (evidence for interbreeding at the time of Neandertal/modern contact); (b) the Almonda karst system (Portugal), whose archeology spans half-a-million years and includes such important fossils as the 400,000 year-old Aroeira 3 cranium; (c) the Pesteră cu Oase (Romania), site of Europe's oldest modern humans; (d) Cueva Antón and Cueva de los Aviones (Murcia, Spain), with the earliest known use of personal ornaments, 115,000 years ago; (e) several caves in Iberia, France and Italy where U-Th dating of associated speleothems showed rock art to be >65,000 years old. These early artists were Neandertals, whose behavioral modernity and late persistence to the south of the Ebro drainage remain my main areas of interest.

Selected publications

- ALBA, D. M.; DAURA, J.; SANZ, M.; SANTOS, E.; YAGUE, A. S.; DELSON, E.; **ZILHÃO, J.** — 'New macaque remains from the Middle Pleistocene of Gruta da Aroeira, Portugal', «American Journal Of Physical Anthropology», 168, 2019, 3-3.
- NABAIS, M.; **ZILHÃO, J.** — *The consumption of tortoise among Last Interglacial Iberian Neanderthals*. «Quaternary Science Reviews», 217, 2019, p. 225-246
- HOFFMANN, D. L.; STANDISH, C. D.; GARCÍA-DÍEZ, M.; PETTITT, P. B.; MILTON, J. A.; **ZILHÃO, J.**; ALCOLEA-GONZÁLEZ, J. J.; CANTALEJO-DUARTE, P.; COLLADO, H.; de BALBÍN, R.; LORBLANCHET, M.; RAMOS-MUÑOZ, J.; WENIGER, G.-Ch.; PIKE, A. W. G. — *Response to Aubert et al.'s reply 'Early dates for 'Neanderthal cave art' may be wrong' [J. Hum. Evol. 125 (2018), 215-217]*. «Journal of Human Evolution», 135, 2019, article 102644.
- **ZILHÃO, J.** — *Tar adhesives, Neandertals, and the tyranny of the discontinuous mind*. «Proceedings of the National Academy of Sciences USA», 116 (44), 2019, p. 21966-21968.
- SANZ, M.; RIVALS, F.; GARCÍA, D.; **ZILHÃO, J.** — *Hunting strategy and seasonality in the last interglacial occupation of Cueva Antón (Murcia, Spain)*. «Archaeological and Anthropological Sciences», 11, 7, 3577 - 3594.

Selected research activities

Fieldwork at La Boja (Mula, Murcia; Middle and Upper Paleolithic), Ardales (Middle Paleolithic cave art) and the Almonda karst system (Lower Paleolithic to Early Neolithic)

ICREA MEMOIR 2019



Patrizia Ziveri

Universitat Autònoma de Barcelona (UAB)

Experimental Sciences & Mathematics

Patrizia Ziveri is an ICREA Research Professor and Scientific Director of the Institute of Environmental Science and Technology (ICTA) Center of Excellence 'María de Maeztu' at the Universitat Autònoma de Barcelona (UAB). She started to work on marine global change in the 1990's during her PhD dissertation at the Univ. of Padua (Italy), and Univ. of South Carolina (USA), focusing on the impacts of El Niño climate oscillations on calcareous phytoplankton in the Eastern Pacific. After a postdoc at USC, she moved to the Vrije Univ. Amsterdam, The Netherlands, first as a researcher then as associate professor/senior scientist. She joined ICREA in 2014. She coordinates the Marine and Environmental Biogeosciences Research Group (MERS) that catalyzes research on the natural and human-driven marine processes addressing major marine global change and sustainability challenges.

Research interests

Global environmental change on marine ecosystems, ecology, and biogeochemistry at various time scales and complexity is a key theme of her research group, focusing on multidisciplinary investigation of marine calcifying organisms at the base of the food web. With her work on the ocean in a changing climate and under human pressure, she is linking CO₂ dynamics, climate change and target marine processes and systems. Interest on pressing threats to the marine environment and their societal relevance has led to developing research on ocean acidification, warming and oxygen loss in Africa and in the North Pacific. The study of marine litter and the cycle of marine microplastics is another research area in her group and a new clean laboratory for microplastic studies opened recently at ICTA-UAB. These interactive global and local change processes alter the marine systems affecting economic activities and human welfare.

Selected publications

- Simon-Sanchez L, Grelaud M, Garcia-Orellana J, **Ziveri P** 2019, 'River Deltas as hotspots of microplastic accumulation: The case study of the Ebro River (NW Mediterranean)', *Science of the Total Environment*, 687, 1186-1196.
- Mallo M, **Ziveri P**, **Reyes-García V** & Rossi S 2019, 'Historical record of *Corallium rubrum* and its changing carbon sequestration capacity: A meta-analysis from the North Western Mediterranean', *PLoS ONE* 14(12): e0223802.
- Incarbona A, Abu-Zied RH, Rohling EJ & **Ziveri P** 2019, 'Reventilation episodes during the sapropel S1 deposition in the eastern Mediterranean based on holococcolith preservation', *Paleoceanography and Paleoclimatology*, 34, 10, 1597-1609.
- Chaabane S, López Correa M, **Ziveri P**, Trotter J, Kallel N, Douville E, Taviani M, Linares C, Montagna P 2019, 'Elemental systematics of the calcitic skeleton of *Corallium rubrum* and implications for the Mg/Ca temperature proxy', *Chemical Geology*, 524, 237-258.
- Stoll H, Guitian J, Hernández Almeida I, Meji LM, Phelps S, Polissar P, Rosenthal Y, Zhang, H, **Ziveri P** 2019, Upregulation of phytoplankton carbon concentrating mechanisms during low CO₂ glacial periods and implications for the phytoplankton pCO₂ proxy, *Quaternary Science Reviews*, 208, 1-20.
- Rossi S, Isla E, Bosch-Belmar M, Galli G, Gori A, Gristina M, Ingrosso G, Milisenda G, Piraino S, Rizzo L, Schubert N, Soares M, Thurstan R, Viladrich N, Willis T & **Ziveri P** 2019, 'Changes of energy fluxes in marine animal forests of the Anthropocene: factors shaping the future seascape', *ICES Journal of Marine Science*, 76, 7, 2008-2019.

Selected research activities

'Climate Change' presentation at the opening high-level panel of the Blue Oceans Conference, Monrovia, Liberia; Research cruise chief scientist on microplastic dispersion off Ebro River Delta; Member of the SOLAS/IMBER Carbon Res. WG on Ocean Acidification (SIOA) and of the advisory board of IAEA Ocean Acidification International Coordination Center; Scientific Director of ICTA-UAB center of excellence.