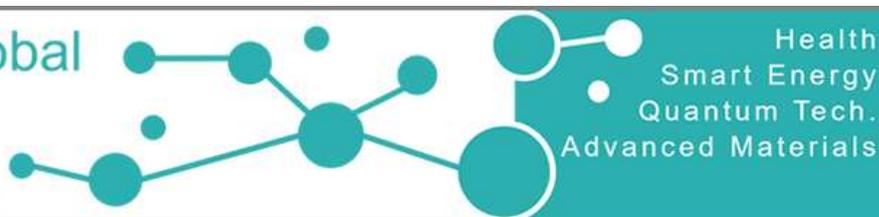


Clustering & Global Challenges

April 07-09, 2021

Online international conference



TENTATIVE PROGRAM (as of 06/04/2021)

Conference Time Zone – Madrid, Spain (GMT+1)



I: Invited Lecture / O: Oral contribution



Wednesday (07/04/2021)

08:45 – 09:30: Opening Session

Tomonobu Nakayama (MANA/NIMS, Japan)

Jose Antonio Garrido (ICREA/ICN2, Spain)

Olivier Buisson (LANEF, France)

09:30 – 10:00: **LLuis Rovira** (CERCA, Spain) |

The contribution of CERCA to the Knowledge Economy in Barcelona

10:00 – 10:30: **Xavier Obradors** (ICMAB, Spain) |

Materials and nanoscience research in Catalonia

10:30 – 11:00: *Break*

11:00 – 11:30: **Jose Antonio Garrido** (graphCAT, Spain) |

GraphCAT: the graphene community of Catalonia. Boosting graphene innovation research and industrial development

11:30 – 12:00: **Pol Forn** (IFAE, Spain) |

Introducing project AVaQus: Annealing-based Variational Quantum processors

12:00 – 12:30: **Luis Fonseca** (CNM, Spain) |

NFFA-Europe PILOT: offering access and researching infrastructure schemes in the nanodomain

12:30 – 14:00: Lunch

Parallel Session 1 - Quantum tech

14:00 – 14:30: **Maciej Lewenstein** (ICFO, Spain) |

The Coming Decades of Quantum Simulation

14:30 – 15:00: **Pietro Massignan** (UPC, Spain) |

Dilute impurities in a Bose-Einstein condensate: Orthogonality catastrophe and perturbative solution at unitarity

15:00 – 15:30: **Leticia Tarruell** (ICFO, Spain) |

Realizing a chiral BF theory in an optically dressed Bose-Einstein condensate

15:30 – 15:50: *Break*

15:50 – 16:20: **Adrian Bachtold** (ICFO, Spain) |

Towards quantum electromechanical states in a nanotube

16:20 – 16:50: **Nicolas Roch** (Neel Institute-CNRS, France) |

A SNAIL Travelling Wave Parametric Amplifier

16:50 – 17:00: **Costantino Agnesi** (Università degli Studi di Padova, Italy) O

Simple and robust QKD system with Qubit4Sync temporal synchronization and the POGNAC polarization encoder

Parallel Session 2 - Advanced materials

14:00 – 14:30: **Jordi Sort** (UAB, Spain) |

Magneto-ionics for energy efficiency: challenges and opportunities

14:30 – 15:00: **José Santiso** (ICN2, Spain) |
Phase coexistence and strain gradients during metal-insulator transition in VO₂ epitaxial films: a structural study
15:00 – 15:10: **Nerea González Pato** (Institut de Ciència de Materials de Barcelona (ICMAB-CSIC), Spain) O
Reversible Switching of the Au (111) Work Function by Near Infrared Irradiation with a Bistable SAM
based on a Radical Donor-Acceptor Dyad
15:10 – 15:20: **Dorina T. Papanastasiou** (Université Grenoble Alpes, CNRS, Grenoble INP, LMGP, France) O
Efficient and stable transparent electrodes based on silver nanowire networks: experimental and simulation
approaches.
15:20 – 15:30: **Fidel Toldra-Reig** (Université Grenoble Alpes, CNRS, Grenoble INP, LMGP, France) O
Spatial Atomic Layer Deposition: a Swiss knife for materials science

15:30 – 15:50: *Break*

15:50 – 16:20: **Klaas-Jan Tielrooij** (ICN2, Spain) |
Graphene electrons for highly efficient thermal transport and nonlinear terahertz photonics
16:20 – 16:50: **Aitor Mugarza** (ICREA/ICN2, Spain) |
Fabricating carbon-based nanoarchitectures with atomic precision
16:50 – 17:20: **Denis Basko** (LPMMC/CNRS, France) |
Demystifying Superradiant Quantum Materials

Parallel Session 3 - Smart Energy

14:00 – 14:30: **Nicolas Retière** (Université Grenoble Alpes, France) |
Fractal Analysis of distribution power grids
14:30 – 15:00: **Xavier Obradors** (ICMAB, Spain) |
New opportunities for low cost nanostructured Coated Conductors for superconducting power applications
15:00 – 15:30: **Pascal Tixador** (Institut NEEL CNRS/UGA, France) |
Some results of the EC project FASTGRID

15:30 – 15:50: *Break*

15:50 – 16:20: **Ramon Costa** (UPC, Spain) |
Modelling, control and integration of energy storage systems
16:20 – 16:50: **Xavier Jordà** (IMB-CNM/CSIC, Spain) |
Wide and Ultra-wide bandgap power devices: key technologies to undertake the electrification and
decarbonisation challenge
16:50 – 17:00: **Navid Salehi** (UPC, Spain) O
Inverter Control Analysis in a Community Microgrid based on Droop Control Strategy
17:00 – 17:10: **Luis Fonseca** (CNM, Spain) O
Harvestore and Epistore projects: bridging materials and silicon technologies for micro-energy
or portable energy applications
17:10 – 17:40: **Eduardo Prieto Araujo** (UPC, Spain) |
Modern power electronics dominated systems



Thursday (08/04/2021)

09:00 – 09:30: Opening
Koichi Tsuchiya (ICYS/NIMS, Japan)

09:30 – 10:00: **Ryoma Hayakawa** (MANA/NIMS, Japan) |
Integration of attractive molecular functions into a single-carrier transistor
10:00 – 10:30: **Takuya Iwasaki** (MANA/NIMS, Japan) |
Quantum transport in graphene/hexagonal boron nitride moiré superlattices

10:30 – 11:00: *Break*

11:00 – 11:30: **Adrian Diaz Alvarez** (MANA/NIMS, Japan) |
Dynamical Pathway Tuning in Neuromorphic Nanowire Networks

11:30 – 12:00: **Tadaaki Nagao** (MANA/NIMS, Japan) |
Nanostructured Devices for Wavelength-Selective Radiative Heat Transduction
12:00 – 12:30: Scientific talent I: **J. Mompert & A. Mundet** (Barça Innovation Hub, Spain)
12:30 – 13:00: Master program in Grenoble on Quantum Physics and Nanotechnology (**David Ferrand**, Grenoble)

13:00 – 14:00: Lunch

14:00 – 14:30: Master program in Barcelona on Quantum Science and Technology (**Bruno Julia**: UB, Spain)
14:30 – 15:00: Scientific talent II: Multiple ways for Research Career Development (**Nuria Bayó**: BIST, Spain)
15:00 – 15:20: ePoster session

15:20 – 15:30: *Break*

Parallel Session 1 - Quantum tech

15:30 – 16:00: **Bruno Juliá Díaz** (Universitat de Barcelona, Spain) |
One dimensional lattice quantum droplets
16:00 – 16:30: **Pierre Nataf** (LPMMC/CNRS, France) |
Heisenberg SU(N) models for cold atoms
16:30 – 17:00: **Anna Sanpera** (UAB, Spain) |
Time crystallinity in open quantum systems
17:00 – 17:10: **Aniket Rath** (University Grenoble Alpes, LPMMC, France) O
Importance sampling of randomized measurements for probing entanglement

Parallel Session 2 - Smart Energy

15:30 – 16:00: **José Luis Domínguez-García** (IREC, Spain) |
Beyond SmartGrids: Making the electric grid secure, stable, reliable and resilient
16:00 – 16:30: **Jean-Luc Schanen** (Grenoble INP, France) |
ElectroMagnetic Compatibility in Power Electronics: from packaging to EMC filter optimization
16:30 – 17:00: **Sergio Busquets** (UPC, Spain) |
Progress in Switching-Cell-Array Power Conversion Research
17:00 – 17:30: **Mónica Aragüés** (CITCEA/UPC, Spain) |
Artificial Intelligence based solutions for electrical grids

Parallel Session 3 - Health

15:30 – 16:00: **Núria Montserrat** (IBEC, Spain) |
Title to be defined
16:00 – 16:30: **Camille Raillon** (CEA, France) |
Protein discrimination using aptamer-functionalized nanopores
16:30 – 17:00: **Maria Soler** (ICN2, Spain) |
Label-free nanophotonic biosensors as integrated solution for early and rapid diagnostics



Friday (09/04/2021)

Parallel Session 1 - Advanced Materials

09:00-09:30: **Monica Lira Cantu** (ICN2, Spain) |
Defect passivation in “soft” halide perovskite materials for photovoltaic applications
09:30-09:40: **Mohamed Esmat** (NIMS, Japan) O
Improved co-Catalyst-Free Solar Photocatalytic H₂ Production Activity in Defective Anatase TiO₂
Nanosheet Assembly
09:40-10:10: **Cecile Repellin** (LPMMC/CNRS, France) |
Ferromagnetism and quantum anomalous Hall effect in twisted bilayer Graphene
10:10-10:20: **Hiroaki Hayashi** (NIMS, Japan) O
The Magnetic Properties of S = 21/2 Frustrated Ferromagnetic Trimer Gd₃O₅4Al₁₂
10:20-10:30: **David Hernandez Pinilla** (MANA/NIMS, Japan) O
Spectral tunability of the absorption resonance of DBR-based infrared thermal emitters

10:30-11:00: Break

11:00 – 11:30: **Franck Balestro** (Institut NEEL CNRS/UGA, France) |
Molecular magnets, a fascinating platform for quantum experiments
11:30-12:00: **Taniguchi Takashi** (MANA/NIMS, Japan) |
New functions in diamond and BN crystals obtained under high pressure
12:00-12:30: **Roshan Krishna Kumar** (ICFO, Spain) |
Nano-imaging photoresponse in a moiré unit cell
12:30-13:00: **Mairbek Chshiev** (SPINTEC, UGA/CNRS/CEA, France) |
Spin-orbitronic phenomena in nanostructures comprising transition metals, oxides and 2D materials
13:00-13:10: **María Tenorio** (ICN2, Spain) O
New strategies towards atomically-sharp GNR-based heterojunctions

Parallel Session 2 - Health

09:00-09:30: **Imma Ratera** (ICMAB/CSIC, Spain) |
Impact of Stimuli-Responsive and Hierarchical RGD Nanostructured Surfaces on Integrin-mediated Cell Guidance
09:30-10:00: **Samuel Sanchez** (IBEC, Spain) |
Swarms of nanorobots: smart nanoparticles swimming in vivo
10:00-10:30: **Victor Puntès** (ICN2, Spain) |
How do nanoceraria work? The metabolic control of the immunochemical potential

10:30-10:50: Break

10:50-11:20: **Arben Merkoçi** (ICREA/ICN2, Spain) |
Nanobiosensors for point-of-care diagnostics applications
11:20-11:50: **Cecile Delacour** (Institut NEEL CNRS/UGA, France) |
Sensing neurons at multiple scales
11:50-12:20: **Pascal Mailley** (CEA, France) |
Microsensors for microfluidic integration : toward cell culture and body monitoring
12:20-12:30: **Arántzazu González-Campo** (Institut de Ciència de Barcelona (ICMAB-CSIC), Spain) O
Neurotransmitter's encapsulation on Bipyridinium-functionalized polysilicon microparticles by supramolecular interactions
12:30-12:40: **Bárbara Lisboa** (ICN2, Spain) O
Graphene Nanostructures Integration in Nanophotonic Biosensors
12:40-13:10: **Géraldine Dantelle** (Institut Néel / UGA / CNRS, France) |
Near-infrared luminescent nanoprobe for bioimaging and nanothermometry

Parallel Session 3 - Topological

09:00-09:30: **Vasileios Karanikolas** (NIMS, Japan) |
Weak and strong coupling light-matter dynamics considering non-local effects
09:30-10:00: **Frédéric Bonell** (SPINTEC, UGA/CNRS/CEA, France) |
Molecular beam epitaxy of 2D materials and ferromagnets: towards scalable 2D spin devices
10:00-10:30: **Daria Gusakova** (SPINTEC, UGA/CNRS/CEA, France) |
Three-dimensional magnetization textures
10:30-10:40: **Wataru Namiki** (MANA/NIMS, Japan) O
Room-Temperature Manipulation of Magnetization Direction in Magnetite, Achieved with an All-solid-state Redox Transistor

10:40-11:00: Break

11:00-11:30: **Stephan Roche** (ICREA/ICN2, Spain) |
Topological Spin Transport in Quantum Materials and Entanglement
11:30 – 12:00: **Sergio O. Valenzuela** (ICREA/ICN2, Spain) |
Engineering two-dimensional materials by proximity effects
12:00-12:10: **Serguei Tchoumakov** (Institut Néel, France) O
Guided accumulation of active particles by topological design of a second-order skin effect
12:10-12:40: **Seiya Suzuki** (NIMS, Japan) |
Direct growth of germanene at the interface between a van der Waals material and Ag(111)
12:40-13:10: **Ying-Chiao Wang** (NIMS, Japan) |
Self-powered UV photodetectors with ultrahigh air stability based on a 2D coordination nanosheet

13:10: Closing