



TENTATIVE PROGRAM (as of 24/11/2021)

P: Plenary / K: Keynote lecture / I: Invited Lecture / O: Oral contribution



Tuesday (23/11/2021)

08:00 – 09:00: Registration

09:00 – 09:15: Opening Ceremony

09:15 – 09:30: **Adolfo Morais Ezquerro** (Basque Government, Spain)

The Basque Country IKUR Strategy 2030 in Quantum Technologies

09:30 – 10:15: **Ignacio Cirac** (Max Planck Institute of Quantum Optics, Germany) P

Quantum computers and many-body systems

10:15– 11:15: *Coffee Break / Poster Session / Exhibition*

11:15 – 12:00: **Tommaso Calarco** (Forschungszentrum Jülich, Germany) P

The European Quantum initiative: from a flagship to a fleet

12:00 – 12:45: **Andrea Ferrari** (Cambridge Graphene Centre, University of Cambridge, UK) P

The Graphene Flagship: The First 10 years

12:45 – 13:00: **Yolanda de Miguel** (Tecnalia, Spain)

Nanotechnology at the Basque Research and Technology Alliance (BRTA)

13:00 – 14:00: *Cocktail lunch (offered by Imaginenano2021)*

14:00 – 14:30: *Poster session*

Chairperson: **Stephan Roche** (ICREA/ICN2, Spain)

14:30 – 15:00: **David DiVincenzo** (FZ Jülich / RWTH Aachen, Germany) K

Development of Superconducting Quantum Computers

15:00 – 15:20: **Hugues de Riedmatten** (ICFO, Spain) I

Entanglement between Solid-State Quantum Repeater Nodes

15:20 – 15:40: **Silvano de Franceschi** (CEA/UGA, France) I

Semiconductor technology for qubits

15:40 – 15:55: **Carmem M Gilardoni** (University of Groningen, The Netherlands) O

Spin-active color centers in silicon carbide for telecom-compatible quantum devices

15:55 – 16:10: **María Hita Pérez** (Instituto de Física Fundamental, IFF-CSIC, Spain) O

Coupling 3-Josephson junctions flux qubits for Quantum Computation

16:10 – 16:25: **Jaka Vodeb** (Jozef Stefan Institute, Slovenia) O

Quantum Domain Melting in an Electronic Crystal and Its Simulation with a Quantum Computer

16:25 – 16:40: **Paul Dreher** (Donostia International Physics Center, Austria) O

Observation of superconducting Leggett modes from competing pairing instabilities in single-layer NbSe₂

16:40 – 17:00: **Christopher Bauerle** (Neel Institut / CNRS, France) I

Surface acoustic waves as testbed for electron flying qubits

17:00 – 17:30: *Coffee Break / ePoster Session / Exhibition*

Chairperson: **Daniel Sanchez Portal** (CFM/CSIC, Spain)

17:30 – 17:45: **Aron Cummings** (Catalan Institute of Nanoscience and Nanotechnology (ICN2), Spain) O

Intraparticle entanglement in graphene

17:45 – 18:00: **Ipsita Das** (ICFO, Spain) O

Symmetry broken Chern insulator in twisted bilayer graphene

18:00 – 18:15: **Josefine Enkner** (ETH Zürich, Switzerland) O
Breakdown of the topological protection by cavity vacuum fields in the integer quantum Hall effect
18:15 – 18:35: **Prineha Narang** (Harvard University, USA) I
Title to be defined



Wednesday (24/11/2021)

Chairperson: **Celia Rogero** (CFM/CSIC, Spain)

09:00 – 09:20: **Karyn Le Hur** (Ecole Polytechnique, France) I
Topological Phases, Electromagnetic Responses and Bilayer Semimetals
09:20 – 09:40: **Felix von Oppen** (Freie Universität, Germany) I
Quantum magnetism and topological superconductivity in Yu-Shiba-Rusinov chains
09:40 – 09:55: **Jaime Díez-Mérida** (ICFO - Institute of Photonic Sciences, Spain) O
Magnetic Josephson Junctions and Superconducting Diodes in Magic Angle Twisted Bilayer Graphene
09:55 – 10:10: **Marko Petric** (Technical University of Munich, Walter Schottky Institute, Germany) O
Optical Properties of Janus Transition Metal Dichalcogenide Monolayers WSSe and MoSSe
10:10 – 10:25: **Oleksandr Kyriienko** (University of Exeter, UK) O
Quantum simulation and ground state preparation for the honeycomb Kitaev model

10:25– 11:30: *Coffee Break / Poster Session / Exhibition*

Chairperson: **Xavier Waintal** (IRIG - CEA Grenoble, France)

11:30 – 11:50: **Alba Cervera Lierta** (Barcelona Supercomputing Center, Spain) I
Design of quantum optical experiments with logic artificial intelligence
11:50 – 12:10: **Daniel Jirovec** (IST Austria, Austria) I
Dynamics of hole singlet triplet qubits with large g-factor differences
12:10 – 12:25: **Tobias Grass** (ICFO, Spain) O
Quantum Annealing with Bias Fields
12:25 – 12:40: **Beatriz Pérez-González** (Instituto de Ciencia de Materiales de Madrid (ICMM-CSIC), Spain) O
Topology detection in cavity QED
12:40 – 13:00: **Henning Schomerus** (Lancaster University, UK) I
Topological lasers and condensates

13:00 – 14:30: *Lunch Break*

INDUSTRIAL FORUM

Chairperson: **Alejandra Ruiz** (Tecnalia, Spain)

14:30 – 14:50: **Niels Bultink** (Qblox BV, the Netherlands) I
Fully-integrated quantum control stacks for a handful to 100s of qubits
14:50 – 15:10: **Ramiro Sagastizabal** (Qilimanjaro, Spain) I
Quantum computing beyond the gate-based paradigm
15:10 – 15:30: **Carlos Abellan** (Quside, Spain) I
Quantum entropy sources for cybersecurity & computation
15:30 – 15:50: **Jan Goetz** (IQM, Finland) I
Co-Design Quantum Computers
15:50 – 16:10: **Roman Orus** (DIPC/Multiverse, Spain) I
Quantum Optimization for Finance and Beyond

16:10 – 17:00: *Coffee Break / ePoster Session / Exhibition*

Chairperson: **Alba Cervera Lierta** (Barcelona Supercomputing Center, Spain)

17:00 – 17:20: **Sebastian Etcheverry** (Luxquanta, Spain) I
Continuous variable quantum key distribution for metropolitan networks
17:20 – 17:35: **Alejandra Ruiz** (Tecnalia, Spain) O
QUANTEK - Towards consolidated Quantum Technologies in Basque Country
17:35 – 17:50: **Maxim Ilyn** (Centro de Física de Materiales CSIC-UPV/EHU, Spain) O
Development of the tunnelling devices with spin-split Al/EuS electrodes for superconducting spintronics and spin qubits applications

- 17:50 – 18:05: **Leonardo Gasparini** (Fondazione Bruno Kessler, Italy) O
Use of SPAD arrays for quantum technology
- 18:05 – 18:20: **Francesc Perez-Murano** (CSIC, Spain) O
Nanofabrication challenges and opportunities for the manufacturing of semiconductor spin qubits
- 18:20 – 18:35: **Junliang Wang** (CNRS Institute Neel, France) O
Single-Electron Transport with Acousto-Electric Chirp Pulses for Quantum Applications



Thursday (25/11/2021)

Chairperson: **Silvano De Franceschi** (CEA, France)

- 09:00 – 09:20: **Xavier Waintal** (IRIG - CEA Grenoble, France) I
What quantum supremacy really means
- 09:20 – 09:35: **Carlos Vega** (IFF - CSIC, Spain) O
Topological quantum optics for robust photon-mediated interactions
- 09:35 – 09:50: **Esteban Rodriguez** (Universidad de Chile, Chile) O
Spin-polarized tunable photocurrents
- 09:50 – 10:05: **Francesco Libbi** (EPFL, Switzerland) O
Phonon-assisted luminescence in qubits from many-body perturbation theory
- 10:05 – 10:20: **Giorgio di Battista** (ICFO, Spain) O
Magic-angle graphene superconducting nano-calorimeter

10:20– 10:55: *Coffee Break / Poster Session / Exhibition*

Chairperson: **Klaas-Jan Tielrooij** (ICN2, Spain)

- 10:55 – 11:15: **Alexandre Jaoui** (ICFO, Spain) I
Quantum critical behaviour in magic-angle twisted bilayer graphene
- 11:15 – 11:30: **Mikel Olano** (Donostia International Physics Center, Spain) O
Moving electrons as spin qubits
- 11:30 – 11:45: **Simon Zihlmann** (CEA Grenoble, France) O
Dispersively Probed Microwave Spectroscopy of a Silicon Hole Double Quantum Dot
- 11:45 – 12:00: **JJ Miguel Varga** (Materials Physics Center, Spain) O
Using spatio-temporal correlations for tuning the biphoton wavefunction
- 12:00 – 12:15: **Rafael Luque Merino** (ICFO, Spain) O
Photodetection at telecom wavelengths using an exfoliated, 2D cuprate superconductor
- 12:15 – 12:30: **Cathryn Michaels** (University of Cambridge, UK) O
Quantum control of the tin-vacancy spin qubit in diamond
- 12:30 – 12:50: **Wister Huang** (ETH Zurich, Switzerland) I
Time-resolved studies of excited states in bilayer graphene quantum dots

12:50 – 14:30: *Lunch Break*

Chairperson: **John Calsamiglia Costa** (UAB, Spain)

- 14:30 – 14:50: **Klaas-Jan Tielrooij** (ICN2, Spain) I
Ultrafast diffusion and dynamics in quantum materials
- 14:50 – 15:05: **Pablo Antonio Moreno Casares** (Universidad Complutense de Madrid, Spain) O
QFold: Quantum Walks and Deep Learning to Solve Protein Folding
- 15:05 – 15:20: **David Zueco** (CSIC-Universidad de Zaragoza, Spain) O
Quantum kernels to learn the phases of quantum matter
- 15:20 – 15:35: **Yue Ban** (University of the Basque Country, UPV/EHU, Spain) O
Mutual Reinforcement between Neural Networks and Quantum Physics
- 15:35 – 15:50: **Benjamin Schiffer** (Max Planck Institute of Quantum Optics, Germany) O
Adiabatic Spectroscopy and a Variational Quantum Adiabatic Algorithm
- 15:50– 16:10: **Gloria Platero Coello** (ICMM-CSIC, Spain) I
Simulation of topological phases in quantum dot arrays

16:10 – 17:00: *Coffee Break*

Chairperson: **Daniel Sanchez Portal** (CFM/CSIC, Spain)

- 17:00 – 17:15: **Wen Wan** (Donostia International Physics Center, Spain) O

Proximity effects on the charge density wave order and superconductivity in single-layer NbSe ₂	
17:15 – 17:30: Alessandro Ciani (Forschungszentrum Jülich, Germany)	O
Error mitigation and quantum-assisted simulation in the error corrected regime	
17:30 – 17:45: Vladyslav Usenko (Palacky University, Czech Republic)	O
Modulation leakage vulnerability in continuous-variable quantum key distribution	
17:45 – 18:00: Xi Chen (UPV/EHU: Universidad del Pais Vasco, Spain)	O
Machine-Learning Assisted Quantum Control in Random Environment	

18:00: Closing