

Mission 10 000: Quantum Science & Technologies

October 22nd - 24th of 2019 | INL, Braga, Portugal

PROGRAMME | October 22nd, 2019

8h45 - 9h10 Registration

OPENING SESSION

9h15 Lars Montelius, Director-General, INL

MORNING SESSION

Session Chair: Nuno Peres

KEYNOTE SPEAKER

09h30 :: *Layered Quantum Materials*

Frank Koppens, ICREA Professor, ERC Starting Grant Award, ERC Consolidator Grant Award, Quantum Nano-Optoelectronics Group Leader, ICFO

Session Chair: Nuno Peres

INVITED TALK

10h15 :: *Quantum Information using Nonlinear Graphene Plasmonics*

Lee Rozema, Templeton Independent Research Fellow, Faculty of Physics, University of Vienna

Q. Plasmonics

Session Chair: Nuno Peres

CONTRIBUTED TALK

10h45 :: *Itinerant Fermion Description of Topological Spin Waves in CrI₃ Monolayers* :: António Costa, INL

11h00 Coffee break

Session Chair: Nuno Peres

CONTRIBUTED TALKS

Q. Imaging

11h30 :: *Excitonic Core-Shell Nanoparticles with Plasmon-Like Response* :: Sara Núñez Sánchez, University of Vigo

11h45 :: *Strong Coupling between Surface Exciton Polaritons and Complementary Optical Modes in Multicomponent Thin Film Structures* :: William P. Wardley, INL

Session Chair: Nuno Peres

INVITED TALK

Q. Plasmonics & Photonics

12h00 :: *Search for Quantum and Nonlocal Electrodynamics in Plasmonic Nanostructures*

Asger Mortensen, Professor, VILLUM Investigator, Quantum Plasmonics, University of Southern Denmark

12h30 Lunch break

Networking Opportunity

AFTERNOON SESSION

Session Chair: Pieter de Beule

INVITED TALK

Q. Imaging

15h00 :: *Quantum Imaging with Incoherently Scattered Light from a Free-Electron Laser*

Joachim von Zanthier, Associate Professor and Group Leader of Quantum Optics and Quantum Information Institute of Optics, Information and Photonics. Friedrich-Alexander University Erlangen-Nürnberg, Germany

Session Chair: Pieter de Beule

CONTRIBUTED TALK

15h30 :: *Temporal Dynamics of Hexagonal Boron Nitride Single Quantum Emitters* :: Jana Nieder, INL

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Session Chair: Pieter de Beule

15h45

POSTER SESSION & Coffe Break

Collaboration opportunities

Session Chair: Jana Nieder

INVITED TALK

17h15

:: *Quantum Sensing and Imaging of 2D Magnets*

Lucas Thiel, Research, Quantum Sensing Group, Department of Physics, University of Basel

Q. Sensing

Session Chair: Jana Nieder

INVITED TALK

17h45

:: *Anomalous Photovoltaic Effects in Monolayer MoSe2*

Jorge Quereda Bernabeu, Postdoctoral Researcher, Nanotechnology Research Group,

Q. Sensing

PROGRAMME | October 23rd, 2019

8h30 - 9h00

Registration

MORNING SESSION

Session Chair: Joaquín Rossier

INVITED TALK

9h15

:: *Kitaev Models and Materials: Quo vadis*

Roser Valentí, Physics Professor, University of Frankfurt

Q. Topological Materials

Session Chair: Joaquín Rossier

INVITED TALK

9h45

:: *Introduction to Majorana-based Topological Qubits*

Ramón Aguado, CSIC

Q. Topological Materials

Session Chair: Joaquín Rossier

CONTRIBUTED TALKS

10h15

:: *Topologically protected Quantization of work* :: Bruno Mera, IST - Instituto Superior Técnico

10h30

:: *Topological Insulator Quantum dots Grown by Molecular Beam Epitaxy* :: Marcel Claro, INL

10h45

:: *Anomalous Kerr Effect in Two-Dimensional Massive Dirac Materials* :: Gonçalo Catarina, INL

Q. Topological Materials

11h00

Coffee break

Session Chair: Ernesto Galvão

INVITED TALK

11h30

:: *From Quantum Computing to Quantum inspired Algorithms*

Juan José García Ripoll, Group Leader, Instituto de Física Fundamental (IFF), CSIC

Q. Information & Q. Simulation

Session Chair: Ernesto Galvão

INVITED TALK

12h00

:: *Certification of Integrated Quantum Platforms via Machine Learning*

Fabio Sciarrino, Associate Professor, Department of Physics, University Sapienza

Q. Information & Q. Simulation

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12h30

Lunch break

Networking Opportunity

AFTERNOON SESSION

Session Chair: Enrique Diez Fernández

KEYNOTE SPEAKER

15h00

:: *Spin And Charge Transport In 2D Materials and Heterostructures*

Jeanie Lau, Physics Professor, Ohio State University

Q. Materials

Session Chair: Enrique Diez Fernández

CONTRIBUTED TALK

15h45

:: *Competition between Canted Antiferromagnetic and Spin-Polarized Quantum Hall states at $v=0$ in Single Layer Graphene on a Ferrimagnetic Insulator* ::

Mario Amado, University of Salamanca, University of Cambridge

Q. Materials

16h00

:: *Excitonic effects on the Magneto-Optical Properties of Ferromagnetic 2D Materials* ::

Alejandro Molina, INL

Q. Topological Materials

Session Chair: Enrique Diez Fernández

16h15

POSTER SESSION & Coffe Break

Collaboration opportunities

Session Chair: Ramón Aguado

INVITED TALK

17h15

:: *Two-Dimensional Orbital Hall Insulators*

Tatiana Rappoport, Associate Professor, Physics Institute, Federal University of Rio de Janeiro

Q. Materials

Session Chair: Ramón Aguado

CONTRIBUTED TALK

17h45

:: *Quantum Advantage from Energy Measurements* :: **Leonardo Novo**, ULB Brussels

18h00

:: *Quantum Berry Phase Estimation* :: **Bruno Murta**, INL

18h15

:: *Quantum Oblivious Keys for Secure Multiparty Computation* :: **Armando Pinto**, University of Aveiro

Q. Computing

PROGRAMME | October 24th, 2019

8h30 - 9h00

Registration

MORNING SESSION

Session Chair: Luís Barbosa

KEYNOTE SPEAKER

9h15

:: *Non-classicality, quantum resources and quantum advantage*

Samson Abramsky, Professor, University of Oxford

Q. Information & Q. Programming

Session Chair: Luís Barbosa

INVITED TALK

10h00

:: *A Gentle Introduction to Quantum Programming*

Ugo dal Lago, Associate Professor, University of Bologna

Q. Information & Q. Programming

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Session Chair: Luís Barbosa

CONTRIBUTED TALKS

10h30

:: *A dynamic Logic for QASM Programs* :: Carlos Tavares, INESC TEC

Q. Information & Q. Programming

10h45

:: *Quantum Kolmogorov Complexity of Quantum States and Correlations* :: Ricardo Faleiro, IT Lisbon

11h00

Coffee break

Session Chair: Luís Barbosa

INVITED TALK

11h30

:: *Classical optimization of Quantum Algorithms*

Q. Computing

Artur García-Sáez, Postdoctoral Researcher, Barcelona Supercomputing Center

Session Chair: Luís Barbosa

CONTRIBUTED TALKS

Q. Computing

12h00

:: *Quantum Simulation of Diatomic Molecules: a Case Study using IBM-Q* :: Mikhail I. Vasilevskiy, INL/University of Minho

12h15

:: *Reliable characterization of IBM Q devices* :: Henrique Silvéri, IST/INL

12h30

:: *Searching through Hamiltonian Spectra with Quantum Phase Estimation* :: Pedro Cruz, INL, University of Porto

Session Chair: Luís Barbosa

INVITED TALK

12h45

:: *Entanglement in Space: Devices and Applications*

Antia Lamas-Linares, Speqtral Quantum Technologies

13h15

Lunch break

Networking Opportunity

Session Chair: Joaquín Rossier

AWARDS SESSION & CLOSING REMARKS

14h30

Joaquín Rossier, INL

Rui Vieira de Castro, Dean, University of Minho

AFTERNOON PARALLEL SESSIONS

Session Chair: Luís Barbosa and Joaquín Rossier

HANDS-ON QUANTUM COMPUTING*

15h00

Afonso Rodrigues, CEiiA /
University of Minho

Ana Neri, University of Minho

Bruno Murta, INL

* Limit of 30 participants upon confirmation by the organization.

Session Chair: Elisabeth Nilsson and Sandra Maya

COMMUNICATION SYMPOSIUM

WHY SCIENCE COMMUNICATION MATTERS?

15h00

Elisabeth Nilsson, Learning Organization Developer, INL

INVITED TALK

15h15

:: *Research Blogging: a Quantum Leap in Science Communication*

Francisco Villatoro, Associate Professor, Department of
Computing Science and Language, University of Málaga

INVITED TALK

16h00

:: *Painting the Unpaintable*

Enrique Sahagún, Scixel.es