

# Mission 10 000: Quantum Science & Technologies

October 22<sup>nd</sup> - 24<sup>th</sup> of 2019 | INL, Braga, Portugal

NOTE: This is a tentative schedule, times listed are subject to change. Check back often for updates or subscribe to our newsletter at our website:  
<https://nanogateway.eu/en/mission-quantum/>

## PROGRAMME | October 22<sup>nd</sup>, 2019

8h45 - 9h10 Registration

### OPENING SESSION

9h15 Lars Montelius, Director-General, INL

### MORNING SESSION

Session Chair: TBC

### KEYNOTE SPEAKER

09h30 :: *Quantum Materials for Nano-Optoelectronics*

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

Session Chair: TBC

### 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: TBC

### CONTRIBUTED TALK

10h45 :: *Itinerant Fermion Description of Topological Spin Waves in CrI<sub>3</sub> Monolayers* :: António Costa, INL

11h00 Coffee break

Session Chair: TBC

### 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: TBC

### 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: TBC

15h45

POSTER SESSION & Coffe Break

Collaboration  
opportunities

Session Chair: TBC

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: TBC

INVITED TALK

17h45

:: *Anomalous Photovoltaic Effects in Monolayer MoSe2*

Jorge Quereda Bernabeu, Postdoctoral Researcher, Nanotechnology Research Group,

Q. Sensing

## PROGRAMME | October 23<sup>rd</sup>, 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, Group Leader, Materials Science Institute of Madrid (ICMM)

Q. Topological Materials

Session Chair: Joaquín Rossier

CONTRIBUTED TALKS

10h15

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

Q. Topological Materials

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

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: TBC

### KEYNOTE SPEAKER

15h00

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

**Jeanie Lau**, Physics Professor, UC Riverside, California

Q. Materials

Session Chair: TBC

### 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: TBC

16h15

### POSTER SESSION & Coffe Break

Collaboration opportunities

Session Chair: TBC

### INVITED TALK

17h15

**:: Two-Dimensional Orbital Hall Insulators**

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

Q. Materials

Session Chair: TBC

### 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 24<sup>th</sup>, 2019

8h30 - 9h00

Registration

## MORNING SESSION

Session Chair: TBC

### KEYNOTE SPEAKER

9h15

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

**Samson Abramsky**, Professor, University of Oxford

Q. Information & Q. Programming

Session Chair: TBC

### 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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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: TBC

## INVITED TALK

11h30

:: *Classical optimization of Quantum Algorithms*

Q. Computing

**Artur García-Sáez**, Postdoctoral Researcher, Barcelona Supercomputing Center

Session Chair: TBC

## 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: TBC

## INVITED TALK

12h45

:: *Entanglement in Space: Devices and Applications*

**Antia Lamas-Linares**, Spectral 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:

### 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:

### 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