



International Conference on
**Quantum Engineered Sensing
and Information Technology**

June 27-30, 2023

**Hotel Mercure Paris 19 Philharmonie-La Villette,
216 Av. Jean Jaures, 75019 Paris, France**



CONFERENCE CHAIR

Prof. Manijeh Razeghi

Benjamin Franklin Award
(2018)



HONORARY CO-CHAIR

Prof. Leo Esaki

Nobel Prize in Physics
(1973)



HONORARY CO-CHAIR

Prof. Klaus Von Klitzing

Nobel Prize in Physics
(1985)



Prof. Gerard Mourou

Nobel Prize in Physics
(2018)



Prof. Alain Aspect

Nobel Prize in Physics
(2022)



Prof. Albert Fert

Nobel Prize in Physics
(2007)



International Conference On Quantum Engineered Sensing And Information Technology

DAY 01
TUESDAY, JUNE 27

Hall Name: ETOILE LOUVRE

08:00-08:30 **Onsite Registrations**

08:30-09:00 **Opening Remarks**

Session - 1

Conference Chairs: **Prof. Manijeh Razeghi, Prof. Leo Esaki, Prof. Klaus Von Klitzing**

Plenary Talk

09:00-09:30 **Prof. Albert Fert, UMR CNRS-THALES, Université Paris-Saclay**
Title: Spintronics: Turning greener the digital technologies and far beyond with skyrmionics, neuromorphic nanochips or orbitronics

09:30-10:00 **Prof. Gerard Mourou, École polytechnique Palaiseau, France**
Title: Searching for Extreme Light

10:00-10:30

Coffee Break@ TROCADERO

Session - 2

Session Chairs: **Dr. Martin Defour, Dr. Ferechteh Hosseini Teherani**

Plenary Talk

10:30-11:00 **Dr. Jean-Pierre Huignard, Prof. Paul-Louis Meunier and Prof. Manijeh Razeghi**
Title: Historical information about, Thomson CSF, Thales, and QUEST conference

11:00-11:30 **Dr. Bernhard Quendt, Chief Technical Officer, Thales, France**
Title: The second Quantum Revolution from an industrial Perspective

11:30-12:00 **Prof. Jerzy M. Langer, Warsaw Scientific Society, Poland**
Title: European Innovation Council -A star in the making

12:00-13:00

Group photo & Lunch @ PANORAMIC

Session - 3

Session Chairs: **Prof. Dr. Wolfgang Elaesser, Prof. Yeshiahu Fainman**

Plenary Talk

13:30-14:00 **Prof. Christos Flytzanis, Ecole Normale Supérieure, France**
Title: Fashioning and Pumping up the Sound. Photodriven Coherent THz Acoustic Phonon Amplification and Quantum Cascade Saser Operation in Semiconductor Superlattices

14:00-14:20 **Prof. Amr Helmy, University of Toronto, Canada**
Title: Semiconductor Circuits for Quantum Enhanced LIDAR Systems

14:20-14:40 **Prof. Mehdi Alouini, Institut Foton, UNIVREN/CNRS, Rennes, France**
Title: Ultra-narrow linewidth self-adaptive photonic oscillator: From principle to product



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DAY 01
TUESDAY, JUNE 27

14:40-15:00

Prof. Joseph Friedman, The University of Texas at Dallas, USA

Title: Spintronic Phenomena for Reversible, Neuromorphic, and Reservoir Computing

15:00-15:30

Coffee Break@ TROCADERO

Session - 4

Session Chairs: **Prof. Masud Mansuripur, Prof. Yossi Paltiel**

15:30-15:50

Dr. Andrew Thain, Space Systems, AIRBUS, Toulouse, France

Title: Space based quantum communications at Airbus

15:50-16:10

Dr. Henri Jaffres, Université Paris-Saclay, Palaiseau, France

Title: Ultrafast spin-charge conversion in topological insulators surface states probed by THz emission spectroscopy

16:10-16:30

Dr. Tonouchi Masayoshi, Osaka University, Japan

Title: Terahertz Emission Spectroscopy and Imaging of Semiconductor Heterostructures and Quantum Wells

16:30-16:50

Prof. Ali Adibi, Georgia Institute of Technology, USA

Title: Phase-change Materials for Reconfigurable Metaphotonics

16:50-17:10

Prof. Mauro Pereira, Khalifa University of Science and Technology, UAE

Title: Giant Control of GHz-THz Nonlinearities in Semiconductor Superlattices

17:10-17:30

Dr. Sébastien Tanzilli, CNRS, Université Côte d'Azur, Institut de Physique de Nice, France

Title: An operational, real-field, entanglement-based quantum key distribution network

17:30-17:50

Dr. Mikhail Belkin, Technical University of Munich, Germany

Title: Polaritonic Nonlinear Metasurfaces for Flat Nonlinear Optics in Mid- and Far-Infrared

END OF DAY 01

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Session - 5

Session Chairs: **Dr. Bernhard Quendt, Dr. Jean-Pierre Huignard**

- 08:40-09:00 **Dr. Dafine Ravelosona, Spin-Ion Technologies, France**
Title: Enhancing the Performances of Spintronic Devices using Ion Irradiation
- 09:00-09:20 **Prof. Pedram Khalili, Northwestern University, USA**
Title: Spin-orbit torque switching of metallic antiferromagnets and ferrimagnets
- 09:20- 09:40 **Prof. Wolfgang Elaesser, Technische Universitat Darmstadt, Germany**
Title: Quantum Sensing with Photon Correlations of Classical Light: Ghost Imaging, Ghost Spectroscopy and Ghost Polarimetry
- 09:40-10:00 **Dr. Taichi Otsuji, Tohoku University, Japan**
Title: Graphene-based 2D Heterostructures for Plasmonic Terahertz Laser Transistors and Detectors

Coffee Break@ TROCADERO

Session - 6

Session Chairs: **Prof. Gerard Mourou, Prof. Albert Fert, Prof. Manijeh Razeghi**
Video Presentation

Plenary Talk

- 10:30-11:10 **Prof. Alain Aspect Nobel Lecture, Institut d'Optique Graduate School / Université Paris-Saclay / École Polytechnique / Institut Polytechnique de Paris, France**
Title: Single Photons, Entangled Photons: From Quantum Foundations to Quantum Technologies
- 11:10-12:00 **Prof. Leo Esaki, Prof. Albert Fert, Prof. Gerard Mourou and Prof. Manijeh Razeghi**
Title: Discussion and future trends

Lunch @PANORAMIC

12:00-13:30

Session - 7

Session Chairs: **Prof. Nader Engheta, Prof. Frederic Grillot**

Plenary Talk

- 13:30-14:00 **Prof. Eli Yablonovitch, University of California, USA**
Title: Optical Physics Does Digital Optimization—which we call Onsager Computing for Machine Learning, Control Theory, Backpropagation, etc.
- 14:00-14:20 **Prof. Demetri Psaltis, Ecole Polytechnique Federale de Lausanne (EPFL), Switzerland**
Title: Programming optical learning machines
- 14:20- 14:40 **Prof. Christophe Moser, Ecole Polytechnique Federale de Lausanne, (EPFL), Switzerland**
Title: Nonlinear Processing with Only Linear Optics (nPOLO)
- 14:40-15:00 **Prof. Aydogan Ozcan, University of California, Los Angeles, USA**
Title: Diffractive Optical Networks & Computational Imaging Without a Computer

15:00-15:30

Coffee Break@ TROCADERO

Session - 8

Session Chairs: **Prof. Selim Shahriar, Prof. Paul-Louis Meunier**

- 15:30-15:50 **Prof. Masud Mansuripur, The University of Arizona, USA**
Title: Fundamental properties of beam-splitters in classical and quantum optics
- 15:50-16:10 **Prof. Frederic Grillot, Institut Polytechnique de Paris, France**
Title: Secured free-space optics with mid-infrared quantum cascade lasers
- 16:10-16:30 **Prof. Yong Hang Zhang, Arizona State University, USA**
Title: InAs/InAsSb type-II superlattice: Its material properties and applications in IR lasers and photodetectors
- 16:30-16:50 **Dr. Thierry Debuisschert, Thales Research & Technology, France**
Title: Quantum sensing with ensembles of NV centers in diamond
- 16:50-17:10 **Prof. Arnaud Landragin, Sorbonne Université, France**
Title: Quantum sensors with atomic interferometry
- 17:10-17:30 **Dr. Marina Yakovleva, Université Paris-Saclay, France**
Title: Perfect coupling conditions for MIM antenna in zero magnetic field regions
- 17:30-17:50 **Dr. Yoshie Otake, RIKEN Center for Advanced Photonics, Japan**
Title: RIKEN Accelerator-driven compact neutron sources, RANS, and their applications

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Session - 9

Session Chairs: **Prof. Christos Flytzanis, Prof. Jerzy M. Langer**

Plenary Talk

- 08:30-9:00 **Prof. Nader Engheta, University of Pennsylvania, USA**
Title: Structuring Light with Metastructures
- 09:00-09:20 **Dr. Michel Krakowski, III-V Lab, France**
Title: Highly stable DFB ridge laser diodes at 852nm and 894nm for Cesium atomic clocks
- 09:20-09:40 **Dr. Fabien Bretenaker, LuMin, Université Paris-Saclay, France**
Title: Quantum Optics in a Metastable Helium Vapor
- 9:40-10:00 **Prof. Igor Zutic, University at Buffalo, USA**
Title: Proximitized Quantum Materials: From Superconducting Spintronics to Majorana States
- 10:00-10:30 **Coffee Break@ TROCADERO**

Session - 10

Session Chairs: **Prof. Hooman Mohseni, Prof. Amr Helmy**

- 10:30-10:50 **Prof. Agnes Maitre, Sorbonne Université, France**
Title: Dramatic acceleration and spectral broadening of CdSe /CdS single nanocrystal emission under high excitation or large confinement
- 10:50-11:10 **Prof. Giti Khodaparast, Virginia Tech, USA**
Title: Optical Probe of Coherent States in Multi-Functional Materials
- 11:10- 11:30 **Prof. Yossi Paltiel, The Hebrew University, Israel**
Title: Chiral molecules and the electron spin
- 11:30-11:50 **Dr. Olivier Acher, HORIBA France SAS, Palaiseau, France**
Title: An in-plane position sensing technique with nm resolution based on machine vision: application to microscopy and laboratory activities
- 11:50-12:00 **Dr. Linda J. Olafsen, Baylor University, USA**
Title: Quasi-Fermi Level Pinning and Optical Pumping Analysis toward Reduction of Droop in Interband Cascade Lasers
- 12:00-13:00 **Lunch @PANORAMIC**

Session - 11

Session Chairs: **Prof. Hiroshi Ito, Prof. Eli Yablonovitch**

- 13:30-13:50 **Dr. Matthieu Dupont-Nivet, Thales Research and Technology, France**
Title: Inertial Navigation with cold atom on chip
- 13:50-14:10 **Dr. Sebastien Bidault, Institut Langevin, ESPCI Paris, Université PSL, CNRS, Paris, France**
Title: Purcell Effect in Plasmonic and Dielectric Resonators
- 14:10-14:30 **Dr. Yannick de Wilde, ESPCI Paris, PSL University, CNRS, Institut Langevin, France**
Title: Probing the infrared thermal radiation of patch antennas
- 14:30- 14:50 **Dr. Nils C. Gerhardt, Ruhr-University Bochum, Germany**
Title: Spin-Lasers: With Ultrafast Polarization Modulation to the Next Generation of Optical Communication Systems
- 14:50-15:00 **Dr. Paolo Rocchi, IBM and LUISS University, Italy**
Title: An Engineering Theory of Sensing

15:00-15:30

Coffee Break@ TROCADERO

Session - 12

Session Chairs: **Dr. Binh-Minh Nguyen, Dr. Yannick de Wilde**

- 15:30-15:50 **Dr. John Prineas, University of Iowa, USA**
Title: Purcell Effect versus Auger Scattering in Resonant Mid-Infrared W-Superlattice LEDs
- 15:50-16:10 **Prof. Joseph Tischler, University of Oklahoma, USA**
Title: Hyperbolic Phonon Polaritons as a Route for Nanophotonic Devices
- 16:10-16:30 **Prof. Jeong Woo Han, Universität Duisburg-Essen, Germany**
Title: Nonlinear THz absorption in graphene plasmons
- 16:30-16:50 **Prof. Mi Zetian, University of Michigan, USA**
Title: Ferroelectric nitride semiconductors: Epitaxy, Quantum engineering, and emerging applications
- 16:50-17:10 **Prof. Maria Ines Amanti, Université Paris Diderot, France**
Title: Generation and manipulation of frequency states of light with AlGaAs quantum sources
- 17:10-17:30 **Prof. Hiroshi Ito, The University of Tokyo, Japan**
Title: Low-Noise Terahertz-Wave Detector: Fermi-Level Managed Barrier Diode
- 17:30-17:50 **Prof. Rui Q. Yang, University of Oklahoma, USA**
Title: Recent Progress in Long Wavelength Interband Cascade Lasers
- 17:50-18:10 **Dr. Simeon I. Bogdanov, University of Illinois Urbana-Champaign, USA**
Title: Ultrafast plasmon-enhanced deterministically assembled single-photon sources based on nanodiamond color centers

END OF DAY 03

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Session - 13

Session Chairs: **Dr. Yoshie Otake, Prof. Simeon Bogdanov**

Plenary Talk

- Prof. Afshin Daryoush, Drexel University, USA**
08:30-09:00 Title: Ultra-Broadband Compact Frequency Synthesizers Using Self-Forced Multi-Mode Multi-Quantum Semiconductor Lasers
- Prof. Lars Samuelson , Lund University, Sweden**
09:00-09:20 Title: Realization of InGaN nanoLEDs delivering blue, green and red light
- Dr. Philippe Lalanne, CNRS-IOGS-University of Bordeaux, France**
09:20-09:40 Title: Interaction of light with non-Hermitian plasmonic nanoresonators: The mode volume
- Prof. Hooman Mohseni, Northwestern University, USA**
09:40-10:00 Title: Energy-Efficient Integrated Nano-Phototransistors
- 10:00-10:30

Coffee Break@ TROCADERO

Session - 14

Session Chairs: **Prof. Afshin Daryoush, Prof. Henri-Jean Drouhin**

- Dr. Yeshaiahu (shaya) Fainman, University of California San Diego, USA**
10:30-10:50 Title: Nanoscale Light Emitters and their Dynamics
- Prof. Giuseppe Leo , Université de Paris - CNRS, Paris, France**
10:50-11:10 Title: Second harmonic generation with wavefront control on dielectric metasurfaces
- Dr. Binh-Minh Nguyen, HRL Laboratories, LLC, USA**
11:10-11:30 Title: Antimonide-based Narrow Bandgap Semiconductors for Infrared Technology and Quantum Information Science
- Dr. Jean-Francois Guillemoles, CNRS-Ecole Polytechnique/IPParis-ENSCP/PSL-IPVF/SAS, France**
11:30-11:50 Title: Photovoltaic Conversion by Reciprocity
- Prof. Vijaysekhar Jayaraman, Praevium Research Inc., USA**
11:50-12:00 Title: Detectors and Emitters for Mid-Wave Infrared Optical Communications

12:00-13:00

Lunch @PANORAMIC

Session - 15

Session Chairs: **Dr. Olivier Acher, Prof. Pedram Khalili**

- Prof. Clivia Sotomayor Torres, ICREA and Catalan Inst. Nanoscience and Nanotechnology, Spain**
13:30-13:50 Title: Nanophotonics: from phonon confinement to topological protection

- 13:50 - 14:10 **Prof. Selim Shahriar, Northwestern University, USA**
Title: Advanced Quantum Sensors: Superluminal Lasers, Subluminal Lasers and Schroedinger Cat Atomic Interferometers
- 14:10 - 14:30 **Dr. Murzy Jhabvala, NASA Goddard Space Flight Center, USA**
Title: Overview of SLS-Based Instrument Development at NASA/Goddard Space Flight Center
- 14:30 - 14:50 **Dr. Luc Dame, Laboratoire Atmosphères, Milieux, Observations Spatiales (LATMOS), IPSL/CNRS & University Paris-Saclay, France**
Title: New Disruptive Solar-blind UVC Sensors for New Space Applications
- 14:50-15:00 **Dr. David Heydari, Stanford University, USA**
Title: Electric-field induced nonlinear optics in CMOS silicon nanophotonic waveguides

15:00-15:30

Coffee Break@ TROCADERO

Session - 16

Session Chairs: **Prof. Giti Khodaparast, Prof. Linda J Olafsen**

- 15:30-15:50 **Dr. Maxime Oliva, Atos Quantum Lab, Atos, Les Clayes-Sous-Bois, Yvelines, France**
Title: Towards Fermionic Systems Simulations on Quantum Computers with Myqlm-Fermion
- 15:50-16:10 **Dr. Bertels Koen, University of Ghent and QBee.eu, Belgium**
Title: Quantum Computing Logic - an example for Quantum Genomics
- 16:10-16:30 **Dr. Mikhail Nestoklon, TU Dortmund, Germany**
Title: Exciton Fine Structure in Lead Chalcogenide Quantum Dots: Interplay between Valley Mixing and Exchange Interaction
- 16:30-16:40 **Dr. Paola di Pietro, Elettra-Sincrotrone Trieste S. C. p. A., Italy**
Title: Nonlinear ultrafast terahertz studies at the TeraFERMI beamline
- 16:40-16:50 **Dr. Amur Margaryan, A. I. Alikhanyan, National Science Laboratory, Armenia**
Title: An advanced RF timer of single electrons and photons
- 16:50-17:10 **Dr. Chenzi Guo, CIOMP, Chinese Academy of Sciences, China**
Title: To-tier resources: Light: Science & Applications, eLight and Light: Advanced Manufacturing

Poster Session Day 1-4 at AM-PM Break Timings

- QUEST P-01 **Dr. Szymon Tofil, Kielce University of Technology, Poland**
Title: Different Effects of Laser Removal of Coatings with Different Lasers Devices
- QUEST P-02 **Dr. Kurp Piotr, Kielce University of Technology, Poland**
Title: Mechanically Assisted Laser Forming of New Kind Helical Metal Expansion Joints
- QUEST P-03 **Dr. Leonard Cardinale, University of Oxford, Oxford, UK**
Title: Nuclear Spin Control in GaAs Quantum Dots via Nuclear Quadrupole Resonance

17:10-18:00 Conference Closing Ceremony and Group photo