



IQuMS Program

Monday, the 9th

13:30 - 13:40 Welcome

13:40 - 15:20 Session "SQL and Beyond I", Chair: I. Favero

13:40 - 14:30 **Aashish Clerk**, University of Chicago (Tutorial)

Quantum Limits in Quantum Sensing: From Basic Notions to Non-Hermitian Approaches

14:30 - 15:00 **Yiwen Chu**, ETH Zürich (Invited)

Creating non-classical states of sound

15:00 - 15:20 **Albert Schliesser**, Niels Bohr Institute, Copenhagen

Quantum Measurement of a Mechanical Resonator At and Below the Standard Quantum Limit

15:20 - 15:40 Coffee Break

15:40 - 17:00 Session "SQL and Beyond II", Chair: R. Long

15:40-16:10 **Vladan Vuletić**, Massachusetts Institute of Technology, Cambridge (Invited)

Spin squeezing in optical-clock atoms

16:10-16:30 **Alexandre Evrard**, Collège de France, Paris

Sensing magnetic fields with non-gaussian quantum fluctuations

16:30-17:00 **Jérôme Lodewyck**, Observatoire de Paris (Invited)

Non-destructive detection system in strontium optical lattice clocks

17:00-19:30 Poster Session I

Tuesday, the 10th

09:00 - 10:30 Session "Magnetometry and NV Sensors", Chair: F. Jelezko

09:00 - 09:50 **Dmitry Budker**, Johannes Gutenberg University & U. of California (Tutorial)

Magnetometry in Challenging Environments

09:50 - 10:10 **Aurore Finco**, Université de Montpellier

Imaging spin textures in synthetic antiferromagnets with a single spin sensor

10:10 - 10:30 **Loïc Toraille**, Ecole Normale Supérieure Paris-Saclay

Magnetic imaging at high pressure inside diamond anvil cells using designed NV Centers

10:30 - 11:00 Coffee Break

11:00 - 12:20 Session "NV sensing, Nanomechanics", Chair: A. Tallaire

11:00-11:30 **Ania Bleszynski Jayich**, University of California Santa Barbara (Invited)

Quantum sensing and imaging with diamond spins

11:30-12:00 **Fedor Jelezko**, Ulm University (Invited)

Diamond spin qubits: quantum sensing and photoelectric readout

12:00-12:20 **Tom Delord**, Ecole Normale Supérieure, Paris

Spin-cooling of the motion of a trapped diamond

12:20-14:00 Lunch break

14:00 - 15:20 Session "Atom Interferometry", Chair: F. Pereira dos Santos

14:00-14:30 **Saida Guellati**, Conservatoire National des Arts et Métiers, Paris (Invited)

Determination of the fine structure constant using atom interferometry

14:30-15:00 **Ernst Rasel**, Leibniz Universität Hanover (Invited)

Inertial quantum sensing with Bose-Einstein condensates

15:00-15:20 **Tilman Zibold**, University of Basel

Fundamental limits of the coherence in a two-component BEC

15:20 - 15:40 Coffee Break

15:40 - 17:00 Session "Quantum Microwaves", Chair: A. Clerk

15:40-16:10 **Irfan Siddiqi**, University of California Berkeley (Invited)

Implementation of a canonical phase measurement with quantum feedback

16:10-16:30 **Shabir Barzanjeh**, Institute of Science and Technology Austria

Experimental Realization of Microwave Quantum Illumination

16:30-17:00 **Simon Gröblacher**, Delft University of Technology (Invited)

Microwave to optics conversion using mechanical oscillators

17:00-19:30 Poster Session II

20:00 - 22:00 Public Conference

William D. Phillips, University of Maryland, NIST

De la révolution française à la révolution quantique : le nouveau système métrique

Auditorium Sorbonne Université

Wednesday, the 11th

09:00 - 10:30 Session "Metrology and Quantum Imaging", Chair: F. Schopfer

09:00 - 09:50 **Marc E. Himbert**, LNE-CNAM, Paris (Tutorial)

SI units: new suitable definitions for a quantum world

09:50 - 10:10 **Wolfgang Elsaesser**, Technische Universität Darmstadt

Ghost metrology with classically correlated photons emitted by amplified spontaneous emission

sources: Ghost Imaging, Ghost Spectroscopy and Ghost Polarimetry

10:10 - 10:30 **Soro Gnatiosoro**, Institut FEMTO-ST, Besançon

Correlation Imaging through a Scattering Medium

10:30 - 11:00 Coffee Break

11:00 - 12:20 Session "Nano/Opto Mechanics", Chair: A. Jayich

11:00-11:30 **Cindy Regal**, JILA, Boulder (Invited)

Mechanical sensing and quantum limits

11:30-12:00 **Adrian Bachtold**, The Institute of Photonic Sciences, Barcelona (Invited)

Nanotube Electro-Mechanical Resonators

12:00-12:20 **Bernard Legrand**, CNRS Toulouse
Optomechanics: a key towards next-generation experiments in atomic force microscopy?

12:20-14:00 Lunch break

14:00-15:20 Session "Metrology", Chair: C. Salomon

14:00-14:30 **Jacques Haesler**, Centre Suisse d'Electronique et de Microtechnique (Invited)
Hot atomic vapor-cell based quantum sensors

14:30-14:50 **Mathieu Manceau**, Université Paris 13, Villetaneuse
A molecular clock for testing the parity symmetry in cold chiral molecules

14:50-15:20 **Wilfrid Poirier**, Laboratoire National de Métrologie et d'Essais, Trappes (invited)
Advanced quantum standards for more universal electrical measurements

15:20 - 15:45 Coffee Break

15:45 - 16:45 Session "Industry"

15:45-16:00 **Roland Nagy**, ZEISS

16:00-16:15 **Thomas Ferhat**, NKT Photonics

16:15-16:30 **Jean Lautier**, Muquans

16:30-16:45 **Ulrich Eismann**, Toptica

16:45-18:15 Round Table

19:30-22:00 Conference Diner

Thursday, the 12th

09:00 - 10:30 Session "Materials for coherence", Chair: G. Hétet

09:00 - 09:50 **Alexandre Tallaire**, Chimie ParisTech (Tutorial)
Challenges in the synthesis of quantum-grade material platforms for sensing

09:50 - 10:10 **Bess Fang**, Observatoire de Paris
Rare-earth ion doped crystal for quantum metrology

10:10 - 10:30 **Bartolo Albanese**, CEA-Saclay
Cooling a spin ensemble with a cavity

10:30 - 11:00 Coffee Break

11:00 - 12:20 Session "Advanced Quantum Sensing and Control", Chair: A. Sinatra

11:00-11:30 **Christiane Koch**, Freie Universität Berlin (Invited)
Quantum optimal control for quantum technologies

11:30-11:50 **Tommaso Roscilde**, Ecole Normale Supérieure de Lyon
Quantum sensing with strongly correlated phases of matter

11:50-12:20 **Jukka P. Pekola**, Aalto University (Invited)
Quantum heat transport in superconducting circuits

12:10-14:00 Lunch break

14:00-15:10 Session "NV Sensors and Magnetic Imaging", Chair: T. Debuisschert

14:00-14:30 **Quan Li**, The Chinese University of Hong Kong (Invited)
Measuring soft materials using nanodiamond based rotation sensing

14:30-14:50 **Mohamed Aboeih**, QuTech, Delft
Atomic-scale imaging of a 27-nuclear-spin cluster using a quantum sensor

14:50-15:10 **Agustin Palacios-Laloy**, CEA-Leti, Grenoble
Helium-4 optically pumped magnetometers for medical imaging

15:10 - 15:40 Coffee Break

15:40 - 17:00 Session "Superconducting Devices", Chair: S. Djordjevic

15:40-16:10 **Audrey Bienfait**, Ecole Normale Supérieure de Lyon (Invited)
Phonon-mediated quantum state transfer between remote superconducting qubits and phonon interferometry

16:10-16:30 **Arpit Ranadive**, Institut Néel, Grenoble
Near Quantum limited broadband microwave amplification using non-linear superconducting circuits

16:30-16:50 **Jérémy Viennot**, Institut Néel, Grenoble
Phonon number squeezing beyond the classical limit

16:50-19:30 Poster Session III

Friday, the 13th

09:00 - 10:30 Session "Atomic Clocks", Chair: S. Guellati

09:00 - 09:50 **Andrew D. Ludlow**, National Institute of Standards and Technology (Tutorial)
Optical lattice clocks and the search for new physics

09:50 - 10:10 **Johannes Thielking**, Physikalisch-Technische Bundesanstalt, Braunschweig
Search for laser excitation of the nuclear clock isomer Th-229m via an electronic bridge

10:10 - 10:30 **Alice Sinatra**, Ecole Normale Supérieure, Paris
Spin-Squeezing of Bosonic Atoms in an Optical Lattice

10:30 - 11:00 Coffee Break

11:00 - 12:20 Session "Gravity and Inertial Sensing", Chair: M. Leduc

11:00-11:30 **Nobuyuki Matsumoto**, Tokohu University (Invited)
Displacement sensing of a pendulum for gravity measurements

11:30-11:50 **Brynle Barrett**, iXBlue, Bordeaux
Hybrid matter-wave inertial sensors for mobile sensing applications

11:50-12:20 **Arnaud Landragin**, Observatoire de Paris (Invited)
Achieving quantum projection noise limit in inertial sensor based on atom interferometry

12:20-12:30 Closure

Exhibitors



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