

ICQSIM 2023: Book of contributions

Invited speakers

Landry Bretheau (Ecole Polytechnique, Palaiseau)

Simulating Weyl Band Structures with Quantum Circuits & More

Iacopo Carusotto (Pitaevskii BEC Center, INO-CNR, Trento)

Simulating quantum Hall physics in clouds of atoms and of light

Leonardo Fallani (University of Florence)

Strongly interacting lattice fermions: flavour-dependent Mott localization and universal Hall response

Louis-Paul Henry (Pasqal, Massy)

TBA

Daniel Jirovec (University of Delft)

Digital and Analog Simulations in Quantum Dot Arrays

Schiro Marco (Collège de France, Paris)

Measurement-Induced Transition in Driven Atomic Ensembles with Collective Decay

Cécile Repellin (LPPMC, Grenoble)

Signatures of fractional quantum Hall states in few-body systems

Christian Roos (University of Innsbruck)

Exploring a new dimension in trapped-ion quantum simulations

Christophe Salomon (Ecole Normale Supérieure, Paris)

Quantum simulation: Quo Vadis

Clément Sayrin (Ecole Normale Supérieure, Paris)

Interacting laser-trapped circular Rydberg atoms

Jon Simon (Stanford University)

TBA

Leticia Tarruell (ICFO, Barcelona)

Engineering exotic superfluids in spin-orbit coupled Bose-Einstein condensates

Contributed speakers

Rohit Prasad Bhatt (Laboratory for Quantum Gases, EPFL)

A cavity microscope for programmable long-range interactions between fermions

Silke Biermann (Center for theoretical physics, Palaiseau)

TBA

Isabelle Bouchoule (Laboratoire Charles Fabry, Palaiseau)

Measuring the local rapidity distribution of a 1D Bose gas

Thomas Bourdel (LCF, Institut optique)

Interactions in Rabi-coupled two component Bose-Einstein condensates

Thomas Chalopin (Max Planck Institute for Quantum Optics, Munich)

Charge order and pairing in mixed-dimensional Fermi-Hubbard systems

Nicolas Cherroret (Laboratoire Kastler Brossel, Paris)

Quench dynamics of 2D Bose superfluids

Nathan Dupont (LCAR, Toulouse)

A non-diffusive Hamiltonian ratchet for matter wave transport

Quentin Glorieux (Laboratoire Kastler Brossel, Paris)

Fluids of light: from superfluidity to turbulence

Mehedi Hasan (Cavendish Laboratory, Cambridge)

Geometric frustration with ultracold bosons

Mengzi Huang (ETH, Zurich)

Irreversible entropy transport between fermionic superfluids

Maxime Jacquet (Laboratoire Kastler Brossel, Paris)

Hawking, Penrose, Zeldovich and others... QFT effects that can be investigated in the laboratory

Andrea Litvinov (IQOQI, Innsbruck)

Observation of vortices in rotating dipolar gases

Leonardo Mazza (LPTMS, Saclay)

Asymptotic quantum scars: from quantum simulation to theory

Sylvain Nascimbene (Laboratoire Kastler Brossel, Paris)

Realization of the entanglement Hamiltonian of a topological quantum Hall system

Sylvain Ravets (Centre de Nanosciences et de Nanotechnologies, Saclay)

Driving topological bands in the nonlinear excitation spectrum of a trivial 1D polariton lattice

Thibault Scoquart (Karlsruhe Institute of Technology)

Simulation of the BCS model on a superconducting quantum computer: crosstalk error mitigation by randomized compiling

Ariane Soret (Department of Physics and Materials Science, University of Luxembourg)

Thermodynamics of coherent energy exchanges between atoms and lasers

Daniel G. Suarez Forero (Joint Quantum Institute (JQI), University of Maryland)

Transition metal dichalcogenides as a platform for quantum simulation of correlated matter

Mohammadamin Tajik (TU Wien)

Analog quantum simulation of the Klein-Gordon model using ultra-cold quantum gases

Takafumi Tomita (National Institute of Natural Sciences, Institute for Molecular Science, Okazaki)

Ultrafast Rydberg experiments with ultracold atoms in optical tweezers

Botao Wang (Université Libre de Bruxelles)

The cold-atom elevator: From edge-state injection to the preparation of fractional Chern insulators

Hepeng Yao (University of Geneva)

Strongly-interacting ultracold bosons at dimensional crossover: single-particle correlation and anomalous cooling

Posters

Will be displayed on Tuesday

T1 *N*-atom cavity QED: from cavity protection to quantum simulations with long-range interactions

Jakob Reichel (Laboratoire Kastler Brossel, ENS, SU, CNRS, CdF)

T2 All-optical control of a quantum fluid of light in hot atomic vapor

Tangui Aladjidi (Laboratoire Kastler Brossel, Sorbonne Université)

T3 Suppression of Bogoliubov pairing in strongly-interacting Bose gases

Maxime Allemand (Laboratoire Charles Fabry, Institut d'Optique)

T4 Non-local Josephson effect in carbon nanotubes

Samy Annabi (PMC, École Polytechnique)

T5 Frustrated extended Bose-Hubbard model and deconfined quantum critical points with optical lattices at the anti-magic wavelength

Niccolò Baldelli (QOT, ICFO)

T6 One dimensional Bose gas with an atom chip

Manon Ballu (Laboratoire de Physique des Lasers, Université Sorbonne Paris Nord)

T7 Experimental quantum key distribution certified by Bell's theorem

Jean-Daniel Bancal (Institut de Physique Théorique, CEA)

T8 Distribution of solitons in topologically protected tunneling-coupled quantum gases

Nataliia Bazhan (TU Wien)

T9 Sub-unity superfluid fraction of a supersolid from self-induced Josephson effect

Giulio Biagioni (University of Florence and CNR-INO, Pisa)

T10 Arrays of dysprosium atoms to study collective light scattering

Damien Bloch (LCF, IOGS)

T11 Study of the dipolar XY model using arrays of Rydberg atoms

Guillaume Borner (LCF, Institut d'Optique)

T12 Disordered quantum liquid droplets

Abdelaali Boudjemaa (LME, UHBC)

T13 Superfluid rotating on a curved surface

Matthieu Cassus (Laboratoire de physique des lasers, Université Sorbonne Paris Nord)

T14 Ionic polaron and bipolaron in a Bose gas

Ubaldo Cavazos-Olivas (Faculty of Physics, University of Warsaw)

- T15 Recent progress towards ultrafast quantum computation using arrays of Rydberg atoms**
Yuki Chew (Institute for Molecular Science)
- T16 Carbon-based point defects in icosahedral boron for solid state quantum applications**
Yeonsoo Cho (Laboratoire des Solides Irradiés, Institut Polytechnique de Paris)
- T17 Designing potentials with Laguerre-Gaussian modes for systematic effects characterization below 10^{-18} level in strontium optical lattice clocks**
Miguel Angel Cifuentes Marin (SYRTE, Observatoire de Paris)
- T18 Enhancing polariton-polariton interactions in microcavities**
Théo Colomer (C2N, CNRS)
- T19 THz sensing with a hydrogen molecular ion clock**
Florin Lucian Constantin (Laboratoire PhLAM, CNRS)
- T20 Understanding the many-body electronic structure the Nitrogen-Vacancy center in diamond**
Alan Custodio dos Reis Souza (Laboratoire des Solides Irradiés, École Polytechnique)
- T21 Phase noise cancellation for Rydberg experiments**
Tom Denecker-Desmots (Institut for Molecular Science)
- T22 Spectral and dynamical properties of the non-Hermitian quantum Ising chain**
Julien Despres (LPTMS, Orsay)
- T23 Electron-mediated entanglement of two distant macroscopic ferromagnets within a nonequilibrium spintronic device**
Rafael Diogo Soares (Université Paris-Saclay)
- T24 Measuring the local rapidity distribution of a 1D Bose gas**
Léa Dubois (Laboratoire Charles Fabry, Université Paris-Saclay)
- T25 Self-organisation dynamics in a unitary Fermi gas coupled to a high-finesse cavity**
Aurélien Fabre (Laboratory for Quantum Gases, EPFL)
- T26 Towards quantum control of an ultracoherent mechanical resonator with a fluxonium qubit**
Kyrylo Gerashchenko (Laboratoire Kastler Brossel, CNRS, Laboratoire de Physique de l'ENS, Collège de France, Sorbonne University)
- T27 Quantum simulation with polaritons**
Elisabeth Giacobino (ENS, Sorbonne Université, Collège de France, CNRS Laboratoire Kastler Brossel)
- T28 Quantum chaos and non-Euclidean physics**
Hugo Girin (Université Paris Saclay Centre de Nanosciences et de Nanotechnologies)

- T29 Binding of $N + 1$ clusters in two dimensions**
Jules Givois (LPTMS, Université Paris Saclay - CNRS)
- T30 Correlated phonon pairs in a time modulated Bose-Einstein condensate**
Victor Gondret (Laboratoire Charles Fabry, Institut d'Optique Graduate School)
- T31 Strain and pseudo-magnetic fields in optical lattices from density-assisted tunneling**
Maxime Jamotte (Centre de physique non-linéaire et systèmes complexes, Université Libre de Bruxelles)
- T32 Fermionization of ultracold bosons in twisted optical potentials**
Dean Johnstone (Ecole Polytechnique CPHT, CNRS)
- T33 Curved and expanding spacetimes studied with a quantum field simulator**
Elinor Kath (Kirchhoff-Institut für Physik, Universität Heidelberg)
- T34 Towards quantum simulation of light-matter interfaces with strontium in optical lattices**
Valentin Klüsener (Max-Planck-Institute of Quantum Optics)
- T35 Measurement of polariton interactions using two-color excitation of a semiconductor micropillar**
Christian Kriso (Centre de Nanosciences et de Nanotechnologies (C2N), Université Paris-Saclay-CNRS)
- T36 Ultracold bosons in optical quasicrystals**
Shengjie Yu (Centre de Physique Théorique, École Polytechnique)
- T37 Competition between quantum jumps and non hermitian evolution in monitored free fermions**
Youenn LE GAL (JEIP, Collège de France)

Will be displayed on Wednesday

- W1 **A new reconstruction algorithm for quantum gas microscopy**
Marc Cheneau (Laboratoire Charles Fabry, Institut d'Optique, CNRS)
- W2 **Emergence of crystalline steady state in a driven superfluid**
Nikolas Liebster (Kirchhoff-Institut für Physik, Universität Heidelberg)
- W3 **Loss features in ultracold dysprosium gases : two versus three-body processes**
Raphael Lopes (Laboratoire Kastler Brossel, Collège de France)
- W4 **Study of linear equation solving on D-Wave QPUs**
Stéphane Louise (LIST, Université Paris-Saclay CEA)
- W5 **Laser-trapped Interacting Circular Rydberg Atoms**
Yohann Machu (LKB, CNRS)
- W6 **Non-Hermitian physics in a one-dimensional $SU(N)$ dissipative Hubbard model**
Alice Marché (Laboratoire de Physique Théorique et Modèles Statistiques, Université Paris-Saclay)
- W7 **Generation of squeezed state of motion for atoms in optical tweezers**
Romain Martin (Institute for Molecular Science, National Institutes of Natural Sciences)
- W8 **Quantum ground state of one-dimensional Wigner crystals in periodic potentials**
Raphaël Menu (Theoretische Physik, Universität des Saarlandes)
- W9 **Quantum simulation with circular rydberg states of strontium**
Baptiste Muraz (Laboratoire Kastler Brossel, Collège de France)
- W10 **TBA**
Alberto Nardin (LPTMS, Université Paris-Saclay)
- W11 **Thermally induced localization of dopants in a magnetic spin ladder**
Kristian Knakkegaard Nielsen (Max-Planck Institute for Quantum Optics, Garching)
- W12 **Effects of dilution in a 2D topological magnon insulator**
Miguel Oliveira (CFP)
- W13 **Truncated Wigner simulations of atom-cavity systems**
Giuliano Orso (Matériaux et Phénomènes Quantiques, Université Paris Cité)
- W14 **Quantum scar affecting the motion of three interacting particles in a circular trap**
David Papoular (LPTM Cergy-Pontoise, CNRS)
- W15 **Melting of a vortex lattice**
Hélène Perrin (USPN Laboratoire de Physique des Lasers, CNRS)

- W16 **Two-component fluids of light in a Rubidium vapor**
Clara PiekarSKI (Laboratoire Kastler-Brossel, Sorbonne Université)
- W17 **Josephson effect and Landau critical velocity throughout the BCS-BEC crossover in ultracold atomic gases**
Leonardo Pisani (University of Camerino)
- W18 **FermiQP: A Fermionic Quantum Processor**
Liyang Qiu (Max Planck Institute of Quantum Optics)
- W19 **Superfluid fraction of a spatially-modulated BEC**
Franco Rabec (LKB, College de France)
- W20 **Spin- and momentum-correlated atom pairs mediated by photon exchange**
Rodrigo Rosa-Medina (Institute for Quantum Electronics, ETH Zurich)
- W21 **Quantum error mitigation for Physics and vice versa**
Vasily Sazonov (LVML, CEA)
- W22 **Non-destructive imaging of ultra-cold atoms**
Rishabh Sharma (Laboratoire de Physique des Lasers, Université Sorbonne Paris Nord)
- W23 **Variational quantum simulation with continuous variable non gaussian states**
Paolo Stornati (QOT, ICFO Barcelona)
- W24 **Toroidal dipolar supersolid with a weak link**
Philipp Sturmer (Division of Mathematical Physics, Lund University)
- W25 **Quantum error mitigation for physics and vice versa**
Mohamed Tamaazousti (LVML, CEA List)
- W26 **Non-destructive state-selective imaging of cold Rubidium atoms**
Aito Tanaka (Institute for molecular science)
- W27 **Measuring the local rapidity distribution of a 1D Bose gas**
Guillaume Themeze (Laboratoire Charles Fabry, Institut d'Optique)
- W28 **Dynamical decoupling for the manipulation of spins undergoing magnetic dipolar interactions in an ultracold gaz**
Lauprêtre Thomas (Laboratoire de Physique des Lasers, CNRS)
- W29 **Collective behaviour in Rabi-coupled two-component Bose-Einstein condensates**
Sara Tiengo (Laboratoire Charles Fabry, Institut d'Optique Graduate School)
- W30 **Gas-to-soliton transition of attractive bosons on the surface of a sphere**
Andrea Tononi (LPTMS, CNRS)
- W31 **Entanglement generation in large-S dipolar spin Hamiltonian**
Youssef Trifa (Laboratoire de Physique de l'ENS de Lyon)

- W32 **Computing quantum mean values in the deep chaotic regime**
Denis Ullmo (Université Paris-Saclay, CNRS LPTMS)
- W33 **Diagrammatic Monte Carlo for Dissipative Quantum Impurity Models**
Matthieu Vanhovecke (Jeunes Equipes de l'Institut de Physique, Collège de France)
- W34 **Simulating a periodic driving with a sudden interaction quench**
Etienne Wamba (OPTIMAS, Fachbereich Physik/ RPTU Kaiserslautern-Landau)
- W35 **Quantum simulation with circular Rydberg atoms**
Aurore Young (LKB, Collège de France)
- W36 **Ultracold atoms in strong disorder: Towards the Anderson transition**
Xudong Yu (LCF, IOGS, Université Paris-Saclay)
- W37 **Thermodynamic Phase Diagram of Two-Dimensional Bosons in a Quasicrystal Potential**
Zhaoxuan Zhu (CPHT, École Polytechnique)