

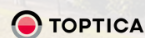
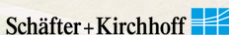
THE 29TH CENTRAL EUROPEAN WORKSHOP ON QUANTUM OPTICS CEWQ029, VILNIUS, LITHUANIA 23 - 27 JUNE 2025

PROGRAM

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PROGRAM

Sunday, 22 June

17:00 - 19:00 **WALKING TOUR of the Old Town of Vilnius**
Starting at the entrance to Vilnius Town Hall

Monday, 23 June

08:00 - 08:45 Registration

08:45 - 09:00 OPENING

09:00 - 10:30 SESSION 1
Chair: Gediminas Juzeliūnas

09:00 - 09:30 **Vectorial light-matter interaction- imprinting polarisation textures into atoms**
Sonja Franke-Arnold (University of Glasgow)

09:30 - 10:00 **TBA**
Christoph Marquardt

10:00 - 10:15 **Towards a 1D Array of Cold Rydberg Atoms Near the Surface of an Optical Nanofibre**
Sile Nic Chormaic (OIST Graduate University)

10:15 - 10:30 **Cavity-Enhanced On-Demand Efficient Solid-State Quantum Memory**
Antariksha Das (ICFO)

10:30 - 11:00 COFFEE BREAK

11:00 - 12:45 SESSION 2
Chair: Yu-Ju Lin

11:00 - 11:30 **Testing the Interplay Between Gravity and Quantum Mechanics with Optomechanical Systems**
David Vitali (University of Camerino)

11:30 - 12:00 **Multiparameter quantum metrology with an array of entangled atomic sensors**
Philipp Treutlein (University of Basel)

12:00 - 12:15 **Quantum Metrology in the Ultrastrong Coupling Regime of Light-Matter Interactions: Leveraging Virtual Excitations without Extracting Them**
Karol Gietka (University of Innsbruck)

12:15 - 12:30 **Visualizing Quantum Dynamics in Phase Space using Wigner's Current**
Ole Steuernagel (NTHU)

12:30 - 12:45	<u>Necessity of non-Gaussianity in the joint Estimation of Position and Momentum with arbitrarily high precision</u> <i>Massimo Frigerio (Sorbonne Université)</i>
12:45 - 14:15	LUNCH
14:15 - 15:45	SESSION 3 <i>Chair: Kęstutis Staliūnas</i>
14:15 - 14:45	<u>Topological state transfer and PT/anti-PT symmetries in dissipatively coupled quantum networks</u> <i>Natalia Korolkova (University of St. Andrews)</i>
14:45 - 15:00	<u>Interference of Photons from Independent Hot Atoms</u> <i>Jaromír Mika (Palacký University Olomouc)</i>
15:00 - 15:15	<u>A tensor network approach to sensing quantum light-matter interactions</u> <i>Francesco Albarelli (Scuola Normale Superiore)</i>
15:15 - 15:30	<u>Optical Key Distribution with a Noisy Laser Source</u> <i>Mateusz Kucharczyk (University of Warsaw)</i>
15:30 - 15:45	<u>Femtosecond laser-based creation of single-photon sources in hBN for quantum communications applications</u> <i>Tadas Paulauskas (FTMC)</i>
15:45 - 16:15	COFFEE BREAK
16:15 - 18:00	SESSION 4 <i>Chair: Karolina Słowik</i>
16:15 - 16:45	<u>Enhanced quantum frequency estimation by nonlinear scrambling</u> <i>Matteo Paris (University of Milan)</i>
16:45 - 17:00	<u>Capacity of phase sensitive preamplified receivers</u> <i>Marcin Jarzyna (Centre of New technologies, University of Warsaw)</i>
17:00 - 17:15	<u>Parametric amplification for witnessing non-classicality and non-Gaussianity</u> <i>Marcello Henrique Marques Passos (Max Planck Institute for the Science of Light)</i>
17:15 - 17:30	<u>Experimental noiseless quantum amplification of coherent states of light by two-photon addition and subtraction</u> <i>Michal Neset (Palacký University Olomouc)</i>
17:30 - 17:45	<u>Control and Scattering Properties in Dipolar Spin Mixtures</u> <i>Louis Lafforgue (Universität Innsbruck)</i>
17:45 - 18:00	<u>STANDA UAB precision positioning products overview</u> <i>Giedrius Mikulis (Standa)</i>
18:00 - 21:00	WELCOME RECEPTION <i>Starting at the Conference Site</i>

Tuesday, 24 June

08:30 - 09:00 Registration

09:00 - 10:30 **SESSION 5**
Chair: C. Marquardt

09:00 - 09:30 **Optical neural networks for computation and computer vision**
Aleksander Lvovski (University of Oxford)

09:30 - 10:00 **Emergence of Quantum Coherence**
Radim Filip (Palacky University Olomouc)

10:00 - 10:15 **Programmable quantum photonic circuit in free space**
Filippo Cardano (Università degli Studi di Napoli Federico II)

10:15 - 10:30 **Disordered Gauge Fields for Atomic Bose Gases**
Edvinas Gvozdiovas (National Institute of Standards and Technology and University of Maryland, Vilnius University)

10:30 - 11:00 COFFEE BREAK

11:00 - 12:45 **SESSION 6**
Chair: Anna Musiał

11:00 - 11:30 **Photonic Interconnects: Advancing Quantum Networking for Communication and Computing**
Julien Laurat (Sorbonne Université)

11:30 - 12:00 **Engineering Unitary and Dissipative Dynamics for Quantum Applications**
Chiao-Hsuan Wang (National Taiwan University)

12:00 - 12:15 **Noise correlation measurements as a probe of spontaneously symmetry-broken phases in cold atoms**
Javier Argüello (Universitat Politècnica de Catalunya)

12:15 - 12:30 **Inelastic Scattering of a Photon by a Quantum Phase-Slip**
Leonid Glazman (Yale University)

12:30 - 12:45 **Is Diamagnetism Really Acausal?**
Niclas Westerberg (University of Glasgow)

12:45 - 14:15 LUNCH

14:15 - 15:45 **SESSION 7**
Chair: M. Parrisi

14:15 - 14:45 **Hybrid State Discrimination Strategy Exploiting Classical And Nonclassical Features**
Alessia Allevi (University of Insubria)

14:45 - 15:15 **Light interactions with polar quantum systems**
Karolina Słowik (Nicolaus Copernicus University in Toruń)

15:15 - 15:30 **Enabling Hybrid Quantum Networks: Protocols and Experimental Progress Toward Memory-Compatible Links**
Matteo Pasini (The Barcelona Institute of Science and Technology)

15:30 - 15:45 **Building a neutral atoms platform for the study of collective light-matter interactions**
Sara Pancaldi (Universite Paris Saclay)

15:45 - 16:00 **From Lasers for Quantum Technologies to Optical Clocks**
Jennifer Koch (TOPTICA Photonics AG)

16:00 - 19:00 COFFEE BREAK & POSTER SESSION I (NO. 1-50)

Wednesday, 25 June

08:30 - 09:00 Registration

09:00 - 10:30 SESSION 8
Chair: Radim Filip

09:00 - 09:30 **Quantum Mechanics in a Quantum Reference Frame**
Eugene Polzik (Copenhagen University)

09:30 - 10:00 **Exploiting Quantum Photonics for Quantum Machine Learning**
Philip Walther (University of Vienna)

10:00 - 10:15 **Interaction between atoms and light: the ultimate bounds precision for atomic clock frequency measurement**
Stefano Olivares (University of Milan)

10:15 - 10:30 **Critical quantum metrology with KERR resonators**
Roberto Di Candia (Aalto University)

10:30 - 11:00 COFFEE BREAK

11:00 - 12:45 SESSION 9
Chair: Egidijus Anisimovas

11:00 - 11:30 **Intertwined entanglement in topological pumps**
Tilman Esslinger (ETH Zürich)

11:30 - 12:00 **Vortex nucleations in spinor Bose condensates under localized synthetic magnetic fields**
Yu-Ju Lin (Institute of Atomic and Molecular Sciences, Academia Sinica)

12:00 - 12:15 **Self organisation and metastability of cavity bosons beyond the adiabatic elimination approximation**
Piotr Deuar (Polish Academy of Sciences)

12:15 - 12:30 **Engineering interactions by collective coupling of atom pairs to cavity photons for entanglement generation**
Tomasz Wasak (Nicolaus Copernicus University in Toru)

12:30 - 12:45 **Quantum Morse-Smale topology for Kerr-Cat qubits**
Kilian Seibold (University of Konstanz)

12:45 - 12:55 Conference PHOTO

12:55 - 14:15 LUNCH

14:15 - 15:45

SESSION 10

Chair: Mažena Mackoit

14:15 - 14:45

Manipulating Light with Bound States in the Continuum

Grazia Salerno (Aalto University School of Science)

14:45 - 15:00

Stabilization of Spin Mixtures and Sub-Microsecond Feshbach Resonance Probing in Dipolar Bose Gases

Alexandre Journeaux (Laboratoire Kastler Brossel - ENS-PSL, Collège de France, CNRS)

15:00 - 15:15

Two-dimensional sub-wavelength topological lattices for dark-state ultracold atoms

Domantas Burba (Vilnius University)

15:15 - 15:30

Unmasking the Polygamous Nature of Quantum Nonlocality

Wiesław Laskowski (University of Gdansk)

15:30 - 15:45

Transfer and conversion of intra- and inter-mode correlations in a system of coupled bosonic modes

Zbigniew Ficek (University of Zielona Gora)

15:45 - 16:15

COFFEE BREAK

16:15 - 18:00

SESSION 11

Chair: Nikolay Vitanov

16:15 - 16:45

Preparation and Characterization of non-Gaussian Quantum States of Motion in a Mechanical Resonator

Matteo Fadel (ETH Zurich)

16:45 - 17:00

Hierarchical verification of non-Gaussian coherence in bosonic quantum states

Lukaš Lachman (Sorbonne Université)

17:00 - 17:15

Up-Conversion Photon-Number-Resolving Detector

Silvia Cassina (University of Insubria)

17:15 - 17:30

Interaction-based and imaginary time-based bosonic pairing mechanisms

Tomasz Polak (Adam Mickiewicz University in Poznań)

17:30 - 17:45

Control of Mechanical Systems in the Quantum Regime

Piotr T. Grochowski (Palacký University)

19:15 - 22:00

CONFERENCE DINNER

At the Palace of the Grand Dukes of Lithuania (Katedros Square 4, Vilnius)

Thursday, 26 June

08:30 - 09:00 Registration

09:00 - 10:30
SESSION 12
Chair: Yvonne Gao

09:00 - 09:30 **TBA**
Nikolay Vitanov (Sofia University)

09:30 - 10:00 **Quantum Theory of Rotor-Like Systems**
Zdeněk Hradil (Palacký University)

10:00 - 10:15 **Bosonic Two-Stroke Heat Engines with Polynomial Nonlinear Coupling**
Giovanni Chesi (Universita degli Studi di Pavia)

10:15 - 10:30 **Bosonic error mitigation and suppression with linear optics**
Yong Siah Teo (Seoul National University)

10:30 - 11:00 **COFFEE BREAK**

11:00 - 12:45
SESSION 13
Chair: N. Mayer

11:00 - 11:30 **Collective light matter interactions in free-space atomic ensembles**
Igor Ferrier-Barbut (Institut d'Optique, CNRS)

11:30 - 12:00 **Critical parametric sensing with a Kerr superconducting resonator**
Gheorghe-Sorin Paraoanu (Aalto University)

12:00 - 12:15 **Towards generating a GKP Bell state by entangling two qunaught states with a beamsplitter**
Florence Berterottière (Institute for Quantum Electronics)

12:15 - 12:30 **Strongly interacting counter propagating photons**
Aditya Prakash (Weizmann Institute of Science)

12:30 - 12:45 **Memory-Dependent Quantum Transformations with a Photonic Quantum Memristor**
Karol Bartkiewicz (Adam Mickiewicz University)

12:45 - 14:15 **LUNCH**

14:15 - 15:45
SESSION 14
Chair: Michał Parniak

14:15 - 14:45 **Quantum dot-based non-classical light sources for quantum cryptography applications at telecom wavelengths**
Anna Musiał (Wrocław University of Science and Technology)

14:45 - 15:15 **Applications of pulsed quantum light**
Bejnamin Brecht (Paderborn University)

15:15 - 15:30 **Quantum optimal precision by inner-variable resolving two-photon correlations**
Danilo Triggiani (Politecnico di Bari)

15:30 - 15:45

Distinguishability tomography of multiple interfering photons
Emilio Annoni (C2N / Quandela)

15:45 - 18:30

COFFEE BREAK & POSTER SESSION II (NO. 51-99)

Friday, 27 June

08:30 - 09:00

Registration

09:00 - 10:30

SESSION 15

Chair: David Vitali

09:00 - 09:30

Quantum information processing via on-demand light-matter interaction

Yvone Gao (National University of Singapore)

09:30 - 10:00

Quantum Metrology with Rydberg Atoms

Michał Parniak (University of Warsaw)

10:00 - 10:15

All-fiber microendoscopic polarization sensing at single-photon level aided by deep-learning

Martin Bielak (Palacky University Olomouc)

10:15 - 10:30

Inhibition of circular Rydberg atoms decay: towards the realisation of quantum simulation of slow processes

Guillaume Coeuret Cauquil (Sorbonne Universite)

10:30 - 11:00

COFFEE BREAK

11:00 - 12:45

SESSION 16

Chair: Mariusz Gajda

11:00 - 11:30

Accelerated State Expansion of a Nanoparticle in a Dark Inverted Potential

Nadine Meyer (ETH Zurich)

11:30 - 12:00

Entanglement distillation rates exceeding the direct transmission bound

Farzad Ghafari (Griffith University)

12:00 - 12:15

Environment-Assisted Generation of Bosonic Wavepacket Quantum States

Maryam Khanahmadi (Chalmers University of Technology)

12:15 - 12:30

A single emitter emitting resonance fluorescence into a coherent probe beam

Tomas Lamich (The Barcelona Institute of Science and Technology)

12:30 - 12:45

Closing remarks

12:45 - 14:15

LUNCH

14:30 - 19:00

EXCURSION

Starting at the entrance to Vilnius Town Hall