PD-2: Postdeadline 2

Chair: Olivier Dulieu, Laboratoire Aimé Cotton, Orsay, France

Time: Wednesday, 19:00–20:30 Location: ROOM 13b ICM

Oral PD-2.1 19:00 ROOM 13b ICM

Demonstration of chip-to-chip quantum teleportation — •Yunhong Ding[1], Daniel Llewellyn[2], Imad Faruque[2], Stefano Paesani[2], Davide Bacco[1], Reffaele Santagati[2], Yan-Jun Qian[3], Y. Li[3], Yun-Feng Xiao[3,4], Marcus Huber[5], Mehul Malik[6], Gary Sinclair[2], X. Zhou[7], Karsten Rottwitt[1], Jeremy O'Brien[2], John Rarity[2], Q. Gong[3,4], Leif Oxenlowe[1], Jianwei Wang[2,3,4], and Mark Thompson[2] — [1]Technical University of Denmark, Copenhagen, Denmark — [2]University of Bristol, Bristol, United Kingdom — [3]Peking University, Beijing, China — [4]Academy of Quantum Information Sciences, Beijing, China — [5]Austrian Academy of Sciences, Vienna, Austria — [6]Heriot-Watt University, Edinburgh, United Kingdom — [7]Sun Yat-sen University, Guangzhou, China

We report the first experimental demonstration of chip-to-chip teleportation of quantum states of light. Integrated quantum transceivers in silicon are able to prepare, manipulate, distribute and transceive quantum photonic states with high fidelity.

Oral PD-2.2 19:10 ROOM 13b ICM

The First Quantum Interference in the Mid-infrared is on a Silicon Chip — •Lawrence M. Rosenfeld, Dominic A. Sulway, Mark G. Thompson, John G. Rarity, and Joshua W. Silverstone — Quantum Engineering Technology Labs, H. H. Wills Physics Laboratory and Department of Electrical and Electronic Engineering, Universityof Bristol, BS8 1FD, UK, Bristol, United Kingdom

In quantum optics, loss of a single photon is a loss of irreplaceable quantum information. We report the first measurement of quantum interference in the low-loss mid-infrared, pointing towards truly scalable quantum photonics.

Oral PD-2.3 19:20 ROOM 13b ICM

Birefringent cavities: effects and applications of a new paradigm in CQED — •Thomas D Barrett, Thomas H Doherty, Ben Yuen, and Axel Kuhn — University of Oxford, Oxford, United Kingdom

Novel intra-cavity polarisation dynamics engender the first observation of single photons with time-dependent polarisation state, emitted from an atom coupled to a birefringent cavity. This offers a route to surpassing previous limitations of Purcell-enhanced emission.

Oral PD-2.4 19:30 ROOM 13b ICM

Topological lasers generating and multiplexing orbital angular momenta on demand — •Boubacar Kante — University of California Berkeley, Berkeley, USA

We report the first room temperature integrated topological lasers directly generating and multiplexing coherent beams carrying arbitrarily large orbital angular momenta (OAM).

Oral PD-2.5 19:40 ROOM 13b ICM

Harper-Hofstadter Topological Laser with Frequency-Dependent Gain — •Matteo Secli[1] and Iacopo Carusotto[2] — [1]International School for Advanced Studies (SISSA), Trieste, Italy — [2]INO-CNR BEC Center and Dipartimento di Fisica, Università di Trento, Trento, Italy

We numerically demonstrate how to obtain topological lasing from a uniformly pumped topological array of optical cavities, by exploiting the naturally frequency-dependent gain that stems from light-matter interaction on a single site.

Oral PD-2.6 19:50 ROOM 13b ICM

Chip-scale optical standard with 2x10-12/?τ stability — •Zachary Newman[1], Vincent Maurice[1], Matthew Hummon[1], John Kitching[1], Susannah Dickerson[2], Mark Mescher[2], and Cort Johnson[2] — [1]National Institute of Standards and Technology, Boulder, USA — [2]Charles Stark Draper Laboratories, Cambridge, USA

We report on the development of a compact optical standard using the rubidium two-photon transition. The physics package has a volume of 35cm3, consumes ~500mW of power and demonstrates a fractional frequency instability of 1x10-13.

Oral PD-2.7 20:00 ROOM 13b ICM

PT-symmetry in Two Synthetic Dimensions — •Andre Luiz Marques Muniz[1], Martin Wimmer[1], Arstan Bisianov[1], Roberto Morandotti[2], and Ulf Peschel[1] — [1]Institute of Solid-State Physics and Optics, Friedrich Schiller University Jena, Jena, Germany — [2]Institut National de la Recherche Scientifique–EMT, Montreal, Canada

Using standard telecommunication equipment, we implement Parity-Time symmetry in a two-dimensional synthetic lattice with tunable gain, loss and phase structure. The fiber nonlinearity enables dissipative PT solitons and an amplified, self-accelerating nonlinear wave packet.

Oral PD-2.8 20:10 ROOM 13b ICM

Multistability-Enabled Composite Soliton and Soliton Collision in a Bichromatically-Pumped Microresonator — •Wenle Weng, Romain Bouchand, and Tobias Kippenberg — Swiss Federal Institute of Technology Lausanne, Lausanne, Switzerland

We enter a dual-pumped multistability regime in a microresonator to observe the breaking down of soliton lattice traps and the emergence of novel dissipative Kerr soliton dynamics, including composite soliton and soliton collision.

Oral PD-2.9 20:20 ROOM 13b ICM

Observation of exceptional points in passive plasmonic nanostructures — •Boubacar Kante, Junhee Park, and Abdoulaye Ndao — University of California Berkeley, Berkeley, USA

We propose a novel approach to exceptional points (EPs) and report their first observation in plasmonics at room temperature. The new platform is shown to enable attomolar immuno-assay nanosensing.