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Advance Programme

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ROOM 1 ICM

CJ-12.5 THU 11:30

Spectral response of distributed-feedback resonators with a continuously distributed phase shift

•C.C. Kores[1], N. Ismail[2], E. Bernhardi[3], F. Laurell[1], and M. Pollnau[2,4]; [1]Department of Applied Physics, Royal Institute of Technology, Stockholm, Sweden; [2]Department of Materials and Nano Physics, Royal Institute of Technology, Kista, Sweden; [3]Visiting Scientist, Department of Materials and Nano Physics, Royal Institute of Technology, Kista, Sweden; [4]Advanced Technology Institute, University of Surrey, Guildford, United Kingdom

In distributed-feedback laser resonators with a distributed phase shift, the resonance wavelength deviates from design. Calculations and experiments hold an incomplete accumulation of distributed phase shift due to light intensity decaying into the grating responsible.

CJ-12.6 THU 11:45

All-fiber Bi-doped laser continuously tunable from 1317-1375nm

•N.K. Thipparapu, S. Wang, A.A. Umnikov, P. Barua, and J.K. Sahu; University of Southampton, SOUTHAMPTON, United Kingdom

We demonstrate a tunable Bi-doped fiber laser covering 1317-1375nm with a maximum power of 57mW. With further amplification, the output reached more than 100mW over 52nm bandwidth with an OSNR of >40dB.

ROOM 4a ICM

JSIII-2.4 THU 11:30

Slow Light to Reduce the Energy Dissipation of Mach-Zehnder Modulators in Silicon Photonics

M. Passoni[1], D. Gerace[1], G.C.R. Devarapu[2,3], L. O'Faolain[2,3], and •L.C. Andreani[1]; [1]Physics Department, University of Pavia, PAVIA, Italy; [2]Cork Institute of Technology, Cork, Ireland; [3]Tyndall National Institute, Cork, Ireland

We propose the use of band-edge slow light combined with spatially periodic (interlaced) p-n junctions to design Mach-Zehnder modulators for silicon photonics with improved modulation efficiency and reduced energy dissipation per bit.

JSIII-2.5 THU 11:45

Flexible periodic half-cylinder photonic plate as a light recycling device applicable to liquid crystal displays

•G. Martínez-Denegri[1], J. Touderi[1], M. Kramarenko[1], S. Colodrero[1], Q. Liu[1], G. Kozyreff[2], and J. Martorell[1,3]; [1]The Institute of Photonic Sciences - ICFO, Castelldefels, Spain; [2]Université Libre de Bruxelles - ULB, Brussels, Belgium; [3]Universitat Politecnica de Catalunya - UPC, Barcelona, Spain

Efficient light management is essential in photonic technology to minimize the energy cost during its operation. Herein, we propose a novel polarizing photonic plate able to recycle the non-transmitted light normally wasted in standard liquid crystal displays.

ROOM 4b ICM

EF-8.4 THU 11:30

Switching Dynamics of Dark Solitons in Kerr Microresonators

•E. Nazemosadat[1], A. Fülöp[1], Ó.B. Helgason[1], P.-H. Wang[2], Y. Xuan[2], D.E. Leaird[2], M. Qi[2], E. Silvestre[3], A.M. Weiner[2], and V. Torres-Company[1]; [1]Photonics Laboratory, Department of Microtechnology and Nanoscience (MC2), Chalmers University of Technology, Göteborg, Sweden; [2]School of Electrical and Computer Engineering, Purdue University,, West Lafayette, IN 47907-2035, USA; [3]Department of Optics-ICMUV, University of Valencia, 46100 Burjassot, Valencia, Spain

We report the discovery of deterministic switching of dark-pulse Kerr comb states. Our results indicate that these combs arise as a complex interplay of multiple dark solitons circulating in the cavity.

EF-8.5 THU 11:45

Wideband tunability of Kerr parametric oscillation in an MgF2 microresonator

N. Sayson[1,2,3], T. Bi[1,2], V. Ng[1,2], H. Pham[1,2], L. Trainor[2,4], H. Schwefel[2,4], S. Coen[1,2], M. Erkintalo[1,2], and •S. Murdoch[1,2]; [1]Physics Department, University of Auckland, Auckland, New Zealand; [2]The Dodd-Walls Centre for Photonic and Quantum Technologies, Auckland, New Zealand; [3]Physics Department, Mindanao State University - Iligan Institute of Technology, Iligan City, Philippines; [4]Physics Department, University of Otago, Dunedin, New Zealand

The generation of large frequency shift parametric sidebands is achieved in a Kerr microresonator with carefully engineered higher-order dispersion. Experimentally we use three MgF2 microresonators to demonstrate over an octave of sideband tunability.

ROOM 5 ICM

EB-6.5 THU 11:30

Refuting observer-independence in quantum theory

•M. Proietti[1], A. Pickston[1], F. Graffitti[1], P. Barrow[1], D. Kundys[1], C. Branciard[2], M. Ringbauer[1,3], and A. Fedrizzi[1]; [1]Scottish Universities Physics Alliance (SUPA), Institute of Photonics and Quantum Sciences, School of Engineering and Physical Sciences, Heriot-Watt University, Edinburgh, United Kingdom; [2]Universite' Grenoble Alpes, CNRS, Grenoble INP, Institut Neel, 38000 Grenoble, Grenoble, France; [3]Institut fur Experimentalphysik, Universitat Innsbruck, 6020 Innsbruck, Innsbruck, Austria

We present the first experimental implementation of an extended Wigner's friend scenario, where quantum mechanics is shown to be incompatible with a framework where "facts of the world" can coexist independently from observers and observations.

EB-6.6 THU 11:45

Experimental Violation of Bell's Inequality for Temporal Orders

•L. Rozema[1], G. Rubino[1], F. Massa[1], M. Araújo[2], M. Zych[3], Č. Brukner[1,4], and P. Walther[1]; [1]Vienna Center for Quantum Science and Technology (VCQ), Faculty of Physics, University of Vienna, Vienna, Austria; [2]Institute for Theoretical Physics, University of Cologne, Cologne, Germany; [3]Centre for Engineered Quantum Systems, School of Mathematics and Physics, University of Queensland, St Lucia, Australia; [4]. Institute for Quantum Optics & Quantum Information (IQOQI), Austrian Academy of Sciences, Vienna, Austria

Bell's inequality has been violated using different physical systems, but never for the temporal order between events. Here we present such a Bell inequality and experimentally violate it by entangling the temporal order between events.

ROOM 13a ICM

CB-9.5 THU 11:30

Interband Cascade Lasers for Monolithic and Battery Driven Dual-Comb Spectrometers

•B. Schwarz[1], J. Hillbrand[1], M. Beiser[1], A.M. Andrews[1,2], G. Strasser[1,2], H. Detz[2,3], A. Schade[4], R. Weih[5], and S. Höfling[4,6]; [1]Institute of Solid State Electronics, TU Wien, Vienna, Austria; [2]Center for Micro- and Nanostructures, TU Wien, Gerbrunn, Austria; [3]Central European Institute of Technology, Brno University of Technology, Brno, Czech Republic; [4]Technische Physik, Physikalisches Institut, University Würzburg, Würzburg, Germany; [5]Nanoplus Nanosystems and Technologies GmbH, Am hubland, Germany; [6]SUPA, School of Physics and Astronomy, University of St Andrews, St. Andrews, United Kingdom

We present a dual-comb platform combinging interband cascade laser frequency combs and sensitive on-chip heterodyne detection functinoality. FM-type frequency comb operation is obtained by utilizing the inherent nonlinearity of the laser gain medium.

CB-9.6 THU 11:45

Compressed Pulses from a Mid-Infrared Quantum Cascade Frequency Comb

•M. Singleton, M. Beck, and J. Faist; ETH Zürich, Zuerich, Switzerland

A Martinez-style grating compressor is used to compensate the intermodal phase differences of a mid-IR QCL comb, resulting in a train of pulses 12 ps FWHM and peak-to-average ratio exceeding 40.

ROOM 13b ICM

EC-2.4 THU 11:30

Inducing topological effects in locally resonant metamaterials

S. Yves[1], G. Lerosey[2], and •E. Lemoult[1]; [1]Institut Langevin, ESPCI Paris, PSL University, CNRS UMR 7587, Paris, France; [2]Greenerwave, Paris, France

The concept of topological insulators is investigated macroscopically for the propagation of electromagnetic waves within a metamaterial. We explain how structural deformations, although sub-wavelength scaled, induce topological phase transition and experimentally map some topological invariants.

EC-2.5 THU 11:45

Floquet topological metals

•L.K. Upreti and P. Delplace; École normale supérieure de Lyon, Lyon, France

We propose a new phase with no static counterpart: the Floquet topological metal. Two types of such a phase are found in scattering networks models, with possible experimental implementation in several photonic platforms.