EUROPHOTON 2022

Report of Contributions

Contribution ID: **1** Type: **Summer School**

Integrated photonic quantum systems

Sunday, 28 August 2022 13:45 (2 hours)

In this lecture, I will give an introduction into the topic of integrated photonic quantum systems, revising the on-chip realization of quantum states and their integrated/fiber-based processing with dedicated application scenarios.

Primary author: KUES, Michael (Institute of Photonics, Leibniz University Hannover, Hannover, Germany)

Presenter: KUES, Michael (Institute of Photonics, Leibniz University Hannover, Hannover, Germany)

Session Classification: Summer School 1: Michael Kues - Integrated photonic quantum systems

Contribution ID: **2** Type: **Summer School**

Optical frequency combs from modelocked lasers

Sunday, 28 August 2022 16:15 (2 hours)

The revolution in optical frequency comb generation started in 1999. This lecture will give an introduction of modelocked frequency comb generation, noise characterization and single-cavity dual-comb generation. I will refer to my new textbook "Ultrafast Lasers" (Springer Verlag 2022) which provides a more comprehensive introduction to fundamental principles and applications.

Primary author: KELLER, Ursula (ETH Zurich, Zürich, Switzerland)

Presenter: KELLER, Ursula (ETH Zurich, Zürich, Switzerland)

Session Classification: Summer School 2: Ursula Keller - Optical frequency combs from modelocked lasers

Contribution ID: **3** Type: **Invited**

From Academia to Industry – Advice for Mastering the Transition

Sunday, 28 August 2022 19:00 (1h 30m)

A large fraction of STEM-graduates does not pursue an academic career, but takes up a position in the industrial sector. This talk will shed light on the points that should be considered for a successful transition into the industrial realm.

Primary author: ZELTNER, Richard (Menlo Systems GmbH, Munich, Germany — European Physical Society Young Minds Programme, Mulhouse, France)

Presenter: ZELTNER, Richard (Menlo Systems GmbH, Munich, Germany — European Physical Society Young Minds Programme, Mulhouse, France)

Session Classification: EPS Young Minds Session

Contribution ID: **4** Type: **Summer School**

Femtosecond optical parametric oscillators and frequency combs

Monday, 29 August 2022 16:15 (2 hours)

Since Burneika's first demonstration in 1972 of a synchronously pumped optical parametric oscillator (OPO), this technology has evolved and matured considerably. I will introduce concepts underpinning femtosecond OPOs, typical architectures, modelling approaches, principles of phase control and several key applications in areas of sensing and metrology.

Primary author: REID, Derryck (Heriot-Watt University, Edinburgh, United Kingdom)

Presenter: REID, Derryck (Heriot-Watt University, Edinburgh, United Kingdom)

Session Classification: Summer School 3: Derryck Reid - Femtosecond optical parametric oscillators and frequency combs

Contribution ID: **5** Type: **Summer School**

Power Scaling of Solid State Lasers

Monday, 29 August 2022 08:00 (2 hours)

Solid-state lasers are attractive sources of coherent radiation. In the past 60 years different laser geometries have been developed to overcome challenges in power scaling conserving the beam quality. This contribution presents the physical and technical basics of solid-state lasers and their power scalability.

Primary author: TÜNNERMANN, Andreas (Fraunhofer Institute for Applied Optics and Precision Engineering IOF, Jena, Germany, Friedrich Schiller University Jena, Institute of Applied Physics, Jena, Germany)

Presenter: TÜNNERMANN, Andreas (Fraunhofer Institute for Applied Optics and Precision Engineering IOF, Jena, Germany, Friedrich Schiller University Jena, Institute of Applied Physics, Jena, Germany)

Session Classification: Summer School 4: Andreas Tuennermann - Power Scaling of Solid State Lasers

Contribution ID: **6** Type: **Summer School**

Fundamentals of attosecond science

Monday, 29 August 2022 13:45 (2 hours)

After a brief historical perspective on the field of harmonic generation in gases, an introduction to the physics of the process will be given covering the single atom response and phase matching. The presentation will also discuss laser-assisted photoionization, used both for measurement and application of attosecond pulses.

Primary author: L'HUILLIER, Anne (Lund University, Lund, Sweden)

Presenter: L'HUILLIER, Anne (Lund University, Lund, Sweden)

Session Classification: Summer School 5: Anne L'Huillier - Fundamentals of attosecond science

Contribution ID: **7** Type: **Summer School**

Temporal compression of ultrashort pulses: principles and technology

Monday, 29 August 2022 10:30 (2 hours)

We introduce the fundamental principles and review experimental implementations of temporal compression setups based on self-phase modulation. For each platform, such as fibers, capillaries, multiplate setups or multipass cells, we try to outline the design principles, the advantages, and the limitations in terms of pulse parameters.

Primary author: HANNA, Marc (Laboratoire Charles Fabry, Palaiseau, France)

Presenter: HANNA, Marc (Laboratoire Charles Fabry, Palaiseau, France)

Session Classification: Summer School 6: Marc Hanna - Temporal compression of ultrashort pulses: principles and technology

Contribution ID: **8** Type: **Invited**

Relativistic Single-Cycle Optics

Tuesday, 30 August 2022 08:15 (30 minutes)

We present the first experimental demonstration of direct light waveform control over collective relativistic electron motion during ultra-high intensity laser-matter interactions driven by near-single-cycle laser transients.

Primary authors: OUILLÉ, Marie (Laboratoire d'Optique Appliquée, Institut Polytechnique de Paris, ENSTA-Paris, Ecole Polytechnique, CNRS, Palaiseau, France); KAUR, Jaismeen (Laboratoire d'Optique Appliquée, Institut Polytechnique de Paris, ENSTA-Paris, Ecole Polytechnique, CNRS, Palaiseau, France); CHENG, Zhao (Laboratoire d'Optique Appliquée, Institut Polytechnique de Paris, ENSTA-Paris, Ecole Polytechnique, CNRS, Palaiseau, France); HAESSLER, Stefan (Laboratoire d'Optique Appliquée, Institut Polytechnique de Paris, ENSTA-Paris, Ecole Polytechnique, CNRS, Palaiseau, France); HUIJTS, Julius (Laboratoire d'Optique Appliquée, Institut Polytechnique de Paris, ENSTA-Paris, Ecole Polytechnique, CNRS, Palaiseau, France); ROVIGE, Lucas (Laboratoire d'Optique Appliquée, Institut Polytechnique de Paris, ENSTA-Paris, Ecole Polytechnique, CNRS, Palaiseau, France); VERNIER, Aline (Laboratoire d'Optique Appliquée, Institut Polytechnique de Paris, ENSTA-Paris, Ecole Polytechnique, CNRS, Palaiseau, France); ANRIYASH, Igor (Laboratoire d'Optique Appliquée, Institut Polytechnique de Paris, ENSTA-Paris, Ecole Polytechnique, CNRS, Palaiseau, France); FAURE, Jérôme (Laboratoire d'Optique Appliquée, Institut Polytechnique de Paris, ENSTA-Paris, Ecole Polytechnique, CNRS, Palaiseau, France); LOPEZ-MARTENS, Rodrigo (Laboratoire d'Optique Appliquée, Institut Polytechnique de Paris, ENSTA-Paris, Ecole Polytechnique, CNRS, Palaiseau, France)

Presenter: LOPEZ-MARTENS, Rodrigo (Laboratoire d'Optique Appliquée, Institut Polytechnique de Paris, ENSTA-Paris, Ecole Polytechnique, CNRS, Palaiseau, France)

Session Classification: SSL 1 Extreme-light lasers

Contribution ID: **9** Type: **Oral**

Efficient XUV out-coupling mechanisms for intra-oscillator HHG

Tuesday, 30 August 2022 08:45 (15 minutes)

We report on two efficient XUV out-coupling methods highly suitable for intra-oscillator HHG. We demonstrate for the first time XUV cavity out-coupling using a coated grazing-incidence plate. We further show a preliminary operation with a pierced mirror reaching 1-GW of intracavity peak power highly suitable for HHG.

Primary authors: DRS, Jakub (Laboratoire Temps-Fréquence, Institut de Physique, Université de Neuchâtel, Neuchâtel, Switzerland); FISCHER, Julian (Laboratoire Temps-Fréquence, Institut de Physique, Université de Neuchâtel, Neuchâtel, Switzerland); MÜLLER, Michael (Laboratoire Temps-Fréquence, Institut de Physique, Université de Neuchâtel, Neuchâtel, Switzerland); MODSCHING, Norbert (Laboratoire Temps-Fréquence, Institut de Physique, Université de Neuchâtel, Neuchâtel, Switzerland); WITTWER, Valentin (Laboratoire Temps-Fréquence, Institut de Physique, Université de Neuchâtel, Neuchâtel, Switzerland); SÜDMEYER, Thomas (Laboratoire Temps-Fréquence, Institut de Physique, Université de Neuchâtel, Neuchâtel, Switzerland)

Presenter: DRS, Jakub (Laboratoire Temps-Fréquence, Institut de Physique, Université de Neuchâtel, Neuchâtel, Switzerland)

Session Classification: SSL 1 Extreme-light lasers

Contribution ID: **10** Type: **not specified**

2020 EPS-QEOD Prize for Research in Laser Science and Applications ; EPS-QEOD Travel Grant Student Awards

Tuesday, 30 August 2022 09:00 (30 minutes)

Session Classification: SSL 1 Extreme-light lasers

Contribution ID: **11** Type: **Invited**

Hybrid Integrated Nonlinear Photonics: From Chipscale frequency combs to cryogenic interconnects

Friday, 2 September 2022 10:00 (30 minutes)

The development of optical frequency combs, and notably self-referencing, has revolutionized precision measurements over the past decade, and enabled counting of the cycles of light. Frequency combs, have enabled dramatic advances in timekeeping, metrology and spectroscopy.

Primary author: KIPPENBERG, Tobias J. (wiss Federal Institute of Technology Lausanne, EPFL, Lausanne, Switzerland)

Presenter: KIPPENBERG, Tobias J. (wiss Federal Institute of Technology Lausanne, EPFL, Lausanne, Switzerland)

Session Classification: SSL 7 Tm, Ho Lasers

Contribution ID: **12** Type: **Oral**

Optical Parametric Oscillator Based on Silicon Nitride Waveguides

Tuesday, 30 August 2022 10:30 (15 minutes)

We demonstrate a silicon nitride waveguide-based optical parametric oscillator exploiting four-wave mixing (FWM), synchronously fiber-laser pumped at 40 MHz repetition rate and showing an idler tunability across 95 nm near 1150 nm with a output pulse energy up to 63 pJ and a bandwidth of about 10 nm.

Primary authors: GAO, Ming (University of Münster, Institute of Applied Physics, Münster, Germany); LÜPKEN, Niklas M. (University of Münster, Institute of Applied Physics, Münster, Germany); BOLLER, Klaus-J. (University of Twente, MESA+ Institute for Nanotechnology, Enschede, Netherlands); FALLNICH, Carsten (University of Münster, Institute of Applied Physics, Münster, Germany)

Presenter: GAO, Ming (University of Münster, Institute of Applied Physics, Münster, Germany)

Session Classification: FWD 1 Planar waveguide devices

Contribution ID: **13** Type: **Oral**

Synchronously Pumped Tantalum Pentoxide Waveguide-based Optical Parametric Oscillator

Tuesday, 30 August 2022 10:45 (15 minutes)

A waveguide-based OPO (WOPO) exploiting four-wave mixing in the emerging tantalum pentoxide platform is investigated. The WOPO, pumped with 500 fs long pulses centered at 1.55 μm wavelength with 2 nJ energy, provided up to 6 pJ pulse energy at 1.46 μm wavelength. It shows potential to be fully integrated on a chip.

Primary authors: TIMMERKAMP, Maximilian (University of Münster, Institute of Applied Physics, Münster, Germany); LÜPKEN, Niklas M. (University of Münster, Institute of Applied Physics, Münster, Germany); ABAZI, Shiqiprim Adrian (University of Münster, Institute of Physics, Münster, Germany); BANKWITZ, Julian Rasmus (University of Münster, Institute of Physics, Münster, Germany); SCHUCK, Carsten (University of Münster, Institute of Physics, Münster, Germany); FALLNICH, Carsten (University of Münster, Institute of Applied Physics, Münster, Germany)

Presenter: TIMMERKAMP, Maximilian (University of Münster, Institute of Applied Physics, Münster, Germany)

Session Classification: FWD 1 Planar waveguide devices

Contribution ID: **14** Type: **Oral**

Efficient and Broadband Generation of Mid-Infrared Pulses by Optical Para- metric Amplification in Dispersion-Engineered Thin Film Lithium Niobate

Tuesday, 30 August 2022 11:00 (15 minutes)

We demonstrate simple and efficient broadband mid-infrared generation via optical parametric amplification driven inside a dispersion-engineered nanophotonic waveguide. Using a commercially-available pulsed pump laser centered at 1045 nm and a CW telecom seed, we achieve up to 60% of conversion efficiency and 140 nm of mid-infrared spectral bandwidth.

Primary authors: HAMROUNI, Marin (Laboratoire Temps-Fréquence, Université de Neuchâtel, Neuchâtel, Switzerland); HWANG, Alex (E. L. Ginzton Laboratory, Stanford University, Stanford, Palo Alto, USA); JANKOWSKI, Marc (E. L. Ginzton Laboratory, Stanford University, Stanford, Palo Alto, USA); MISHRA, Jatadhari (E. L. Ginzton Laboratory, Stanford University, Stanford, Palo Alto, USA); STOKOWSKI, Hubert Sylwester (E. L. Ginzton Laboratory, Stanford University, Stanford, Palo Alto, USA); MCKENNA, Timothy Patrick (E. L. Ginzton Laboratory, Stanford University, Stanford, Palo Alto, USA); JORNOD, Nayara (E. L. Ginzton Laboratory, Stanford University, Stanford, Palo Alto, USA); LANGROCK, Carsten (E. L. Ginzton Laboratory, Stanford University, Stanford, Palo Alto, USA); SÜDMEYER, Thomas (Laboratoire Temps-Fréquence, Université de Neuchâtel, Neuchâtel, Switzerland); SAFAVI-NAEINI, Amir H. (E. L. Ginzton Laboratory, Stanford University, Stanford, Palo Alto, USA); FEJER, Martin M. (E. L. Ginzton Laboratory, Stanford University, Stanford, Palo Alto, USA)

Presenter: HAMROUNI, Marin (Laboratoire Temps-Fréquence, Université de Neuchâtel, Neuchâtel, Switzerland)

Session Classification: FWD 1 Planar waveguide devices

Contribution ID: **15** Type: **Oral**

Recent progress on rare earth amplifiers and lasers directly on silicon

Tuesday, 30 August 2022 11:15 (15 minutes)

We report on our recent developments on rare-earth-based gain and lasing directly on silicon photonic chips. We demonstrate laser emission around 1.8-1.9 μm in thulium-doped tellurium oxide coated silicon hybrid microdisks, with on-chip output powers of > 1 mW and sub-milliwatt threshold pump powers at 1.6 μm.

Primary authors: BRADLEY, Jonathan D. B. (McMaster University, Hamilton, Canada); KIANI, Khadijeh Miarabbas (McMaster University, Hamilton, Canada); FRANKIS, Henry C. (McMaster University, Hamilton, Canada); NARAINE, Cameron M. (McMaster University, Hamilton, Canada); BONNEVILLE, Dawson B. (McMaster University, Hamilton, Canada); KNIGHTS, Andrew P. (McMaster University, Hamilton, Canada)

Presenter: BRADLEY, Jonathan D. B. (McMaster University, Hamilton, Canada)

Session Classification: FWD 1 Planar waveguide devices

Contribution ID: **16** Type: **Invited**

Plasmon-Empowered Nanophotonics: from Circuitry to Metasurfaces

Tuesday, 30 August 2022 11:30 (30 minutes)

Latest developments in nanophotonics associated with advantageous use of surface plasmon polaritons, hybrid excitations involving free electron oscillationsin metals and electromagnetic fields in dielectrics, are overviewed. Special attention is given to the progress in ultra-compact photonic circuitry, including modulators and detectors, and plasmonic metasurfaces dynamically controlling propagation of light.

Presenter: BOZHEVOLNYI, Sergey (Centre for Nano Optics, University of Southern Denmark, Odense M, Denmark)

Session Classification: FWD 1 Planar waveguide devices

Contribution ID: **17** Type: **Poster**

Multi-point, pulse-train laser ignition of methane-air mixtures by a high- peak power passively Q-switched Nd:YAG/Cr4+:YAG compact laser

Tuesday, 30 August 2022 12:00 (2 hours)

Methane-air mixtures were ignited in a constant-volume combustion chamber by a diode-pumped, passively Q-switched Nd:YAG/Cr4+:YAG laser with four beams, yielding single pulses or operating in burst mode with two pulses. A discussion of peak pressure, combustion time and of the ignition limits is made for each type of ignition.

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Primary authors: VASILE, Nicolae-Tiberius (National Institute for Laser, Plasma and Radiation Physics, Magurele, România); CROITORU, Gabriela (National Institute for Laser, Plasma and Radiation Physics, Magurele, România); DUMITRACHE, Ciprian (National Institute for Laser, Plasma and Radiation Physics, Magurele, România); PAVEL, Nicolaie (National Institute for Laser, Plasma and Radiation Physics, Magurele, România)

Presenter: PAVEL, Nicolaie (National Institute for Laser, Plasma and Radiation Physics, Magurele, România)

Session Classification: Lunch and Poster Session 1

Contribution ID: **18** Type: **Poster**

Passively Q-switched Er:YAP laser generating 21 ns pulses at 2.9 µm

Tuesday, 30 August 2022 12:00 (2 hours)

A passively Q-switch Er:YAP laser, emitting 21.8 ns long (FWHM) pulses with energy 0.54 µJ and repetition rate 41.6 kHz at 2.9 µm is presented. In a free-running regime, the Er:YAP laser reached maximal output mean power of 200 mW with 25.5 % slope efficiency.

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Primary authors: ŠVEJKAR, Richard (Czech Technical University in Prague, Faculty of Nuclear Sciences and Physical Engineering, Prague, Czech Republic); POPELOVÁ, Dominika (Czech Technical University in Prague, Faculty of Nuclear Sciences and Physical Engineering, Prague, Czech Republic); ŠULC, Jan (Czech Technical University in Prague, Faculty of Nuclear Sciences and Physical Engineering, Prague, Czech Republic); JELÍNKOVÁ, Helena (Czech Technical University in Prague, Faculty of Nuclear Sciences and Physical Engineering, Prague, Czech Republic)

Presenter: ŠVEJKAR, Richard (Czech Technical University in Prague, Faculty of Nuclear Sciences and Physical Engineering, Prague, Czech Republic)

Session Classification: Lunch and Poster Session 1

Contribution ID: **19** Type: **Poster**

0.5 - 1.3 GHz tunable pulse repetition rate solid state laser generating 230 fs pulses with 200 mW average power

Tuesday, 30 August 2022 12:00 (2 hours)

We report a compact ultrafast solid-state laser source with a tunable pulse repetition rate from 0.5 - 1.3GHz. The novel cavity design allows to vary the repetition rate by moving two mirrors, without realignment. The Yb:KYW crystal-based SESAM-modelocked laser emits 230fs pulses with 200mW average power around 1040nm.

Primary authors: WÜST, Roger (Institute of Product and Production Engineering, University of Applied Sciences and Arts North-western Switzerland FHNW, 5210 Windisch, Switzerland); HUG, Daniel (Institute of Product and Production Engineering, University of Applied Sciences and Arts North-western Switzerland FHNW, 5210 Windisch, Switzerland); RUDIN, Benjamin (Menhir Photonics, 8152 Glattbrugg, Switzerland); EMAURY, Florian (Menhir Photonics, 8152 Glattbrugg, Switzerland); RESAN, Bojan (Institute of Product and Production Engineering, University of Applied Sciences and Arts North-western Switzerland FHNW, 5210 Windisch, Switzerland)

Presenter: WÜST, Roger (Institute of Product and Production Engineering, University of Applied Sciences and Arts North-western Switzerland FHNW, 5210 Windisch, Switzerland)

Session Classification: Lunch and Poster Session 1

Contribution ID: **20** Type: **Poster**

Investigation of dual-crystal subnanosecond LBO optical parametric amplifier operating in the visible spectrum range

Tuesday, 30 August 2022 12:00 (2 hours)

Many applications require tunable-wavelength laser radiation, which is provided by optical parametric amplifiers (OPAs) and optical parametric generators (OPGs). We report, to the best of our knowledge, the first dual-crystal LBO subnanosecond OPA system generating widely-tunable radiation in the visible spectrum range from roughly 460 nm to 680 nm.

Primary authors: VENGELIS, Julius (Laser Research Center, Vilnius University, Vilnius, Lithuania); STANIONYTĖ, Gabrielė (Laser Research Center, Vilnius University, Vilnius, Lithuania); ARMALYTĖ, Simona (Laser Research Center, Vilnius University, Vilnius, Lithuania); TAMULIENĖ, Viktorija (Laser Research Center, Vilnius University, Vilnius, Lithuania)

Presenter: VENGELIS, Julius (Laser Research Center, Vilnius University, Vilnius, Lithuania)

Session Classification: Lunch and Poster Session 1

Contribution ID: **21** Type: **Poster**

Pr:YAlO3 microchip lasers operating at crystal temperatures close to liq- uid helium temperature

Tuesday, 30 August 2022 12:00 (2 hours)

Cooling of Pr:YAP crystals close to liquid helium temperature allowed to significantly improve the Pr:YAP laser performances with respect to room temperature, which yielded in Watt-level laser outputs at all studied wavelengths (747 nm, 622 nm, 547 nm, and 493 nm) under 4W InGaN laser diode pumping.

Primary authors: FIBRICH, Martin (Czech Technical University in Prague, FNSPE, Prague, Czech Republic); ŠULC, Jan (Czech Technical University in Prague, FNSPE, Prague, Czech Republic); JELÍNKOVÁ, Helena (Czech Technical University in Prague, FNSPE, Prague, Czech Republic)

Presenter: FIBRICH, Martin (Czech Technical University in Prague, FNSPE, Prague, Czech Republic)

Session Classification: Lunch and Poster Session 1

Contribution ID: **22** Type: **Poster**

Colloidal LiYF4:Pr Nanocrystals Downsized to 10 nm –Part 1: Syn- thesis and Micro-Structural Characteristics

Tuesday, 30 August 2022 12:00 (2 hours)

Nanocrystalline LiYF4:Pr promises exciting design opportunities for composite photonic devices in the visible. Here, we present the spectroscopic properties of monodisperse colloidal LiYF4:Pr nanocrystals. We observed an unexpected yet intense emission with lifetimes comparable to bulk crystals. These results pave the way for applications in quantum optics and biomedicine.

Primary authors: KOMBAN, Rajesh (Fraunhofer-IAP-CAN, Grindelallee 117, D-20146 Hamburg, Germany); SPELTHAN, Simon (Leibniz University Hannover, Institute of Quantum Optics, Welfengarten 1, D-30167 Hannover, Germany); STEINKE, Michael (Leibniz University Hannover, Institute of Quantum Optics, Welfengarten 1, D-30167 Hannover, Germany); RISTAU, Detlev (Leibniz University Hannover, Institute of Quantum Optics, Welfengarten 1, D-30167 Hannover, Germany); RUEHL, Axel (Leibniz University Hannover, QUEST-Leibniz-Research School, D-30167 Hannover, Germany); GIMMLER, Christoph (Fraunhofer-IAP-CAN, Grindelallee 117, D-20146 Hamburg, Germany); WELLER, Horst (Fraunhofer-IAP-CAN, Grindelallee 117, D-20146 Hamburg, Germany)

Presenter: KOMBAN, Rajesh (Fraunhofer-IAP-CAN, Grindelallee 117, D-20146 Hamburg, Germany)

Session Classification: Lunch and Poster Session 1

Contribution ID: **23** Type: **Poster**

Terahertz radiation in tailored two-color laser fields with a stabilized doubly resonant optical parametric oscillator

Tuesday, 30 August 2022 12:00 (2 hours)

The degenerate DROPO was stabilized by using a locking scheme which utilizes monitoring of a "parasitic" sum-frequency generation (SFG) of the signal and pump and together with the phase locked pump laser which can provide high intensities tailored two-color fields and benefit for THz generation.

Primary authors: RAO, Han (Leibniz University Hannover, Institute of Quantum Optics, Hannover, Germany); DIETRICH, Christian M. (Leibniz University Hannover, Institute of Quantum Optics, Hannover, Germany); ANDRADE, Jose R. C. (Max Born Institute, Berlin, Germany); DEMIRCAN, Ayhan (Leibniz University Hannover, Institute of Quantum Optics, Hannover, Germany); BABUSHKIN, Ihar (Leibniz University Hannover, Institute of Quantum Optics, Hannover, Germany); MORGNER, Uwe (Leibniz University Hannover, Institute of Quantum Optics, Hannover, Germany)

Presenter: RAO, Han (Leibniz University Hannover, Institute of Quantum Optics, Hannover, Germany)

Session Classification: Lunch and Poster Session 1

Contribution ID: **24** Type: **Poster**

Growth and optical properties of the newly developed Pr:LGSB bifunctional crystal

Tuesday, 30 August 2022 12:00 (2 hours)

Incongruent melting Pr-doped La0.678Gd0.572Sc2.75(BO3)4 (Pr:LGSB) crystals were grown by the Czochralski method, for the first time to our knowledge. The spectroscopic and nonlinear optical properties of the 2.5 at.% Pr:LGSB crystal shown that it can be a promising self-frequency doubling crystal in the UV range at ˜301.5 nm.

Primary authors: BROASCA, Alin (National Institute for Laser, Plasma and Radiation Physics, Laboratory of Solid-State Quantum Electronics, Magurele, Romania); GRECULEASA, Madalin (National Institute for Laser, Plasma and Radiation Physics, Laboratory of Solid-State Quantum Electronics, Magurele, Romania); VOICU, Flavius (National Institute for Laser, Plasma and Radiation Physics, Laboratory of Solid-State Quantum Electronics, Magurele, Romania); STANCIU, George (National Institute for Laser, Plasma and Radiation Physics, Laboratory of Solid-State Quantum Electronics, Magurele, Romania); HAU, Steania (National Institute for Laser, Plasma and Radiation Physics, Laboratory of Solid-State Quantum Electronics, Magurele, Romania); GHEORGHE, Cristina (National Institute for Laser, Plasma and Radiation Physics, Laboratory of Solid-State Quantum Electronics, Magurele, Romania); GHEORGHE, Lucian (National Institute for Laser, Plasma and Radiation Physics, Laboratory of Solid-State Quantum Electronics, Magurele, Romania)

Presenter: BROASCA, Alin (National Institute for Laser, Plasma and Radiation Physics, Laboratory of Solid-State Quantum Electronics, Magurele, Romania)

Session Classification: Lunch and Poster Session 1

Contribution ID: **25** Type: **Poster**

Development of Czochralski-grown La0.733Nd0.035Gd0.452Sc2.75(BO3)4 as a new bifunctional laser and nonlinear crystal

Tuesday, 30 August 2022 12:00 (2 hours)

High optical quality 3.5-at.% Nd:LGSB crystal with non-congruent melting wasgrown by the Czochralski method. The structural, the linear and nonlinear properties, as well as the laser emission characteristics in the near-infrared spectrum by direct emission and in the green visible range through self-frequency doubling were investigated.

Primary authors: GRECULEASA, Madalin (National Institute for Laser, Plasma and Radiation Physics, Magurele, Romania); BROASCA, Alin (National Institute for Laser, Plasma and Radiation Physics, Magurele, Romania); VOICU, Flavius (National Institute for Laser, Plasma and Radiation Physics, Magurele, Romania); STANCIU, George (National Institute for Laser, Plasma and Radiation Physics, Magurele, Romania); HAU, Stefania (National Institute for Laser, Plasma and Radiation Physics, Magurele, Romania); GHEORGHE, Cristina (National Institute for Laser, Plasma and Radiation Physics, Magurele, Romania); BRANDUS, Catalina-Alice (National Institute for Laser, Plasma and Radiation Physics, Magurele, Romania); PAVEL, Nicolaie (National Institute for Laser, Plasma and Radiation Physics, Magurele, Romania); GHEORGHE, Lucian (National Institute for Laser, Plasma and Radiation Physics, Magurele, Romania)

Presenter: GRECULEASA, Madalin (National Institute for Laser, Plasma and Radiation Physics, Magurele, Romania)

Session Classification: Lunch and Poster Session 1

Contribution ID: **26** Type: **Poster**

Fan-out grating design MgO:PPLN based subnanosecond optical parametric generator with wide and continuous tunability in the near-infrared

Tuesday, 30 August 2022 12:00 (2 hours)

The first subnanosecond pulse duration optical parametric generator (OPG) based on fan-out grating design MgO:PPLN crystal is demonstrated. Fan-out grating OPG enables quickly, widely, and continuously tunable, compact, and effective subnanosecond coherent light source covering near-infrared spectral region (1400 - 4400 nm) with OPG conversion efficiency up to 47 %.

Primary authors: BANYS, Jonas (Vilnius University, Laser Research Center, Vilnius, Lithuania); TAMULIENĖ, Viktorija (Vilnius University, Laser Research Center, Vilnius, Lithuania); BALACHNINAITE, Ona (Vilnius University, Laser Research Center, Vilnius, Lithuania); JARUTIS, Vygandas (Vilnius University, Laser Research Center, Vilnius, Lithuania); VENGELIS, Julius (Vilnius University, Laser Research Center, Vilnius, Lithuania)

Presenter: BANYS, Jonas (Vilnius University, Laser Research Center, Vilnius, Lithuania)

Session Classification: Lunch and Poster Session 1

Contribution ID: **27** Type: **Poster**

Influence of Disk Aberrations on High-Power Thin-Disk Laser Cavities

Tuesday, 30 August 2022 12:00 (2 hours)

We demonstrate a spatially-resolved approach to simulating thin-disk lasers. The model supports exact phase profiles for cavity elements, allowing the impact of experimentally measured non-radially-symmetric aberrations of the thin-disk to be studied. Predicted stability zones, distorted fundamental mode and higher-order mode excitation are in good qualitative agreement with high-power experiments.

Primary authors: SEIDEL, Moritz (Institute for Quantum Electronics, ETH Zurich, Zurich, Switzerland); LANG, Lukas (Institute for Quantum Electronics, ETH Zurich, Zurich, Switzerland); PHILLIPS, Christopher R. (Institute for Quantum Electronics, ETH Zurich, Zurich, Switzerland); KELLER, Ursula (Institute for Quantum Electronics, ETH Zurich, Zurich, Switzerland)

Presenter: SEIDEL, Moritz (Institute for Quantum Electronics, ETH Zurich, Zurich, Switzerland)

Session Classification: Lunch and Poster Session 1

Contribution ID: **28** Type: **Poster**

Cryogenically cooled compact Yb:Lu2O3 laser

Tuesday, 30 August 2022 12:00 (2 hours)

We studied the continuous-wave laser performance of Yb:Lu2O3 at cryogenic temperatures using a modular laser setup. A maximum output power of 15.23 W was achieved for 120 K corresponding to a slope efficiency of 63%.

Primary authors: JAMBUNATHAN, Venkatesan (HiLASE Center, Institute of Physics of the Czech Academy of Sciences, Za Radnicí 828, 25241 , Dolní Břežany, Czech Republic); LE GARREC, Bruno J (Laboratoire pour l'Utilisation des Lasers Intenses (LULI), Unité Mixte n ◦ 7605 CNRS - CEA - Ecole Polytechnique - UPMC, Route de Saclay, 91128, Palaiseau Cedex, France); SMRZ, Martin (HiLASE Center, Institute of Physics of the Czech Academy of Sciences, Za Radnicí 828, 25241 , Dolní Břežany, Czech Republic); MOCEK, Tomas (HiLASE Center, Institute of Physics of the Czech Academy of Sciences, Za Radnicí 828, 25241 , Dolní Břežany, Czech Republic)

Presenter: JAMBUNATHAN, Venkatesan (HiLASE Center, Institute of Physics of the Czech Academy of Sciences, Za Radnicí 828, 25241 , Dolní Břežany, Czech Republic)

Session Classification: Lunch and Poster Session 1

Contribution ID: **29** Type: **Poster**

Thermo-optical wavefront distortions in Nd:YVO4 laser amplifiers

Tuesday, 30 August 2022 12:00 (2 hours)

The power dependence of a Nd:YVO4 laser amplifier beam wavefront was analyzed by Zernike polynomial decomposition. This analysis was performed experimentally and by simulations based on split-step Fourier propagation showing a good agreement. The simulations yield a base for the design of an aberration compensation system.

code

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Presenter: SCHNEEWIND, Merle (Laser Zentrum Hannover e.V. (LZH), Hanover, Germany)

Session Classification: Lunch and Poster Session 1

Contribution ID: **30** Type: **Poster**

Comparison of crossed-Porro prism resonator design with conventional mirror resonator design in a Ho3+:YAG laser

Tuesday, 30 August 2022 12:00 (2 hours)

We compare a Ho$3+:YAG laser cavity that includes two crossed Porro prisms instead of cavity end mirrors with a conventional mirror resonator. While the Porro resonator shows a slightly lower slope efficiency of 67.4 % than the mirror resonator, it is superior in terms of beam quality and stability.

code

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Session Classification: Lunch and Poster Session 1

Contribution ID: **31** Type: **Poster**

Compact cryogenic Tm:LiYF4 laser

Tuesday, 30 August 2022 12:00 (2 hours)

We studied cryogenic laser operation of Tm: YLF using a modular setup pumped by a VBG stabilized diode. At 80K, a maximum output power of 6.50 W corresponding to a slope efficiency of 38% was achieved with excellent beam quality.

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Session Classification: Lunch and Poster Session 1

Contribution ID: **32** Type: **Poster**

Sub-30 fs Kerr-lens mode-locked Ytterbium-activated orthoaluminate laser

Tuesday, 30 August 2022 12:00 (2 hours)

Here, we report on a sub-30 fs Yb:YAP laser delivering soliton pulses as short as 24 fs at 1085 nm with an average output power of 186 mW and a pulse repetition rate of 87.8 MHz via soft-aperture Kerr-lens mode-locking (KLM).

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Session Classification: Lunch and Poster Session 1

Contribution ID: **33** Type: **Poster**

Improvement of noise properties in SESAM mode-locked Er:fiber femtosecond lasers by intra-cavity filtering

Tuesday, 30 August 2022 12:00 (2 hours)

The slow response time of semiconductor saturable absorbers significantly increases the noise of generated pulse train. We report a substantial improvement of amplitude and phase noise properties in a SESAM mode-locked Er:fiber oscillator via intracavity spectral filtering. We observed a 2.6-fold reduction of integrated timing jitter to 1.71 ps.

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Session Classification: Lunch and Poster Session 1

Contribution ID: **34** Type: **Poster**

Optical emission characterization of liquid core fibers filled with colloidal nanoplatelets

Tuesday, 30 August 2022 12:00 (2 hours)

Solution-processed nanoplatelets exhibit exciting optical properties which can be exploited for lasing in novel spectral ranges. Here, we incorporate these nanoplatelets in capillary fused silica fibers and investigate their optical properties. These results are the basis for a novel class of solution-processed nano-material fiber lasers.

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Presenter: SPELTHANN, Simon (Leibniz University Hannover, Institute of Quantum Optics, Hannover, Germany)

Session Classification: Lunch and Poster Session 1

Contribution ID: **35** Type: **Poster**

Mamyshev oscillator based on split-amplifier configuration

Tuesday, 30 August 2022 12:00 (2 hours)

We present a Mamyshev oscillator setup in which a fiber amplifier is split into two equal parts and placed before the filters. At low repetition rates this setup allows to produce pulses which are less affected by nonlinear distortions.

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Presenter: LIAUGMINAS, Gustas (Center for Physical Sciences and Technology, Vilnius, Lithuania)

Session Classification: Lunch and Poster Session 1

Contribution ID: **36** Type: **Poster**

Pulse broadening and compression at 515 nm in a multi-pass cell

Tuesday, 30 August 2022 12:00 (2 hours)

Frequency-doubled 220 fs laser pulses at 515 nm are spectrally broadened and compressed in a multipass cell down to 38 fs using solid and gas as nonlinear media. The efficiency of this process is 90 %. This is the first demonstration of multipass spectral broadening and compression in green.

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Presenter: HARITON, Victor (Helmut Schmidt University, Hamburg, Germany)

Session Classification: Lunch and Poster Session 1

Contribution ID: **37** Type: **Poster**

Pulse energy enhancement by means of fiber Bragg gratings in actively Q-switched Tm3+-doped fiber lasers operating at 2050 nm and 2090 nm

Tuesday, 30 August 2022 12:00 (2 hours)

We present a Tm3+-doped actively Q-switched fiber laser providing pulse energies of 960 µJ with 20.5 kW peak power at a wavelength of 2050 nm and pulse energies of 720 µJ with 6.5 kW peak power at a wavelength of 2090 nm. The laser is ideally suited as a pump source for nonlinear frequency conversion.

code

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Presenter: SCHNEIDER, Julian (Fraunhofer IOSB (Instiute of Optronics, System Technologies and Image Exploitation), Ettlingen, Germany)

Session Classification: Lunch and Poster Session 1

Contribution ID: **38** Type: **Poster**

Highly efficient side-fused signal pump combiners based on CO2-laser restructured optical fibers

Tuesday, 30 August 2022 12:00 (2 hours)

We present the manufacturing of side-fused signal-pump combiners with 25/400-µm signal feed-through fibers and >90% pump coupling efficiency. On the basis of CO2-laser restructuring of the used optical fibers, the necessity of splice connection is avoided, which improves the pump coupling efficiency and thus overall laser efficiency.

code

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Presenter: BROCKMÜLLER, Eike (Laser Zentrum Hannover e.V., Hannover, Germany)

Session Classification: Lunch and Poster Session 1

Contribution ID: **39** Type: **Poster**

Synchronized all-PM-fiber Yb-doped amplifiers for high power fs- and ps-pulse generation

Tuesday, 30 August 2022 12:00 (2 hours)

We present two parallel all-PM-fiber Ytterbium amplifiers seeded by a single oscillator at 78.9 MHz repetition rate. An output power of 5 W is available at 7.5 or 50 ps pulse duration. The femtosecond part delivers 13.5 W output power at a compressed pulse duration below 60 fs.

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Session Classification: Lunch and Poster Session 1

Contribution ID: **40** Type: **Poster**

S²-Method-Based Monitoring of Modal Composition in Optical Fibers during Fiber Component Manufacturing

Tuesday, 30 August 2022 12:00 (2 hours)

We developed a high-speed S²-method-based device to monitor the modal content of a beam out of an optical fiber. The device is used to evaluate and optimize a CO2-laser-based fiber end cap manufacturing process.

code

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Presenter: HAVERLAND, Nils (Laser Zentrum Hannover e.V., Hannover, Germany)

Session Classification: Lunch and Poster Session 1

Contribution ID: **41** Type: **Poster**

Rapid characterisation of Photonic Crystal Fibre dispersive properties by a stochastic and tunable picosecond pump source

Tuesday, 30 August 2022 12:00 (2 hours)

We present a picosecond source use to characterise a PCF dispersive properties through Four Wave Mixing. We demonstate that the use of a stochastic pulse train obtain through an Amplified Spontaneous Emission seeder reduce the FWM threshold by several orders of magnitude as compared to a CW seeder.

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Presenter: WALTER, Guillaume (Centre Lasers Intenses et Applications, Bordeaux, France)

Session Classification: Lunch and Poster Session 1

Contribution ID: **42** Type: **Poster**

Temperature-dependent thulium cross sections

Tuesday, 30 August 2022 12:00 (2 hours)

Measurement of absorption and emission cross sections of the 790 nm and 1600-1900 nm thulium peaks relevant for high-power operation of cladding-pumped fiber lasers at 2-micrometers is reported. Up to 40% change of the respective peak values were observed while heating the fiber from -15 to 300℃.

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Presenter: JIŘÍČKOVÁ, Bára (Institute of Photonics and Electronics of the Czech Academy of Sciences, Prague, Czech Republic)

Session Classification: Lunch and Poster Session 1

Contribution ID: **43** Type: **Poster**

1875-nm high-energy mode-locked thulium fiber laser

Tuesday, 30 August 2022 12:00 (2 hours)

An all-fiberized dissipative-soliton mode-locked thulium fiber laser operating at 1875 nm was demonstrated. Using an in-house fabricated thulium fiber as thegain medium, the laser provided ultrashort pulses with 12-ps pulse duration and 10.3-nJ pulse energy. The pulses could be compressed to 547 fs using a grating pair compressor.

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Presenter: SRISAMRAN, Panuwat (Optoelectronics Research Centre, University of Southampton, Southampton SO17 1BJ, United Kingdom)

Session Classification: Lunch and Poster Session 1

Contribution ID: **44** Type: **Invited**

Generation and control of single-cycle mid-infrared waveforms

Tuesday, 30 August 2022 14:00 (30 minutes)

We demonstrate sub-7-fs pulses derived from a carrier-envelope-phase-stabilized Cr:ZnS mode-locked laser. These pulses drive cascaded intra-pulse difference-frequency mixing in a ZGP crystal, leading to multi-octave (0.9 - 12 μm) coherent pulse synthesis. The resultant single-cycle mid-infrared wave-forms can be shaped by varying the CEP of the driving pulses.

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Presenter: STEINLEITNER, Philipp (Max-Planck-Institut für Quantenoptik, Garching, Germany)

Session Classification: SSL 2 Nonlinear Methods

Contribution ID: **45** Type: **Oral**

Sub 15 ps Self Mode-Locked Nd:YVO4 Laser through Intra-Cavity Sum-Frequency Mixing

Tuesday, 30 August 2022 14:30 (15 minutes)

A mode-locked source operating at 1064 nm producing 13 ps pulses with a repetition rate of 276 MHz and output power of 102 mW is demonstrated. It is achieved by two Nd:YVO4 cavities operating at different wavelengths that interact in shared section through a PPRKTP crystal phase-matching for sum-frequency mixing.

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Presenter: BRUNZELL, Martin (Department of Applied Physics, Royal Institute of Technology, Stockholm, Sweden)

Session Classification: SSL 2 Nonlinear Methods

Contribution ID: **46** Type: **Oral**

Rapid THz-TDS Enabled by Single-Cavity Dual-Comb Gigahertz Laser

Tuesday, 30 August 2022 14:45 (15 minutes)

We present a single-mode pumped SESAM-modelocked single-cavity GHz dual-comb laser with widely tunable repetition rate difference. This low noise free-running solid-state laser is applied for THz-TDS using photoconductive antennas. We show nanosecond scans with 36 kHz update rate, yielding a 40-dB dynamic range for an integration time of 2 seconds.

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Presenter: WILLENBERG, Benjamin (Department of Physics, Institute for Quantumelectronics, ETH Zurich, Zurich, Switzerland)

Session Classification: SSL 2 Nonlinear Methods

Contribution ID: **47** Type: **Oral**

Direct broadband infrared generation from 12 to 35 THz with a Kerr-lens modelocked Cr:ZnS oscillator

Tuesday, 30 August 2022 15:00 (15 minutes)

We generate mid-infrared ranging from 12 to 35 THz (9 - 25 μm) via IDFG. Theradiation is directly generated in GaSe by the pulses of an in-house developed KLM Cr:ZnS oscillator. The spectral coverage towards 30 μm is in reach, which is of interest for ultrafast spectroscopy of solids.

Primary authors: MEYER, Johann Gabriel (Helmut-Schmidt-Universität, Hamburg, Germany); PRONIN, Oleg (Helmut-Schmidt-Universität, Hamburg, Germany)

Presenter: MEYER, Johann Gabriel (Helmut-Schmidt-Universität, Hamburg, Germany)

Session Classification: SSL 2 Nonlinear Methods

Contribution ID: **48** Type: **Oral**

Third Harmonic Generation and chi^(5) Effects in Thin Gradient HfO2 Layers

Tuesday, 30 August 2022 15:15 (15 minutes)

We investigate third harmonic generation (THG) in thin dielectric HfO2 gradient layers experimentally and theoretically. This method allows for the first time to quantify the third and fifth order susceptibility in dielectric layer materials.

code

Primary authors: ZUBER, David (Leibniz Universität Hannover, Welfengarten 1, 30167 Hannover, Germany); KLEINERT, Sven (Leibniz Universität Hannover, Welfengarten 1, 30167 Hannover, Germany); TAJALLI, Ayhan (Leibniz Universität Hannover, Welfengarten 1, 30167 Hannover, German); STEINECKE, Morten (aser Zentrum Hannover e.V., Hollerithallee 8, 30419 Hannover, Germany); JUPÉ, Marco (Laser Zentrum Hannover e.V., Hollerithallee 8, 30419 Hannover, Germany); BABUSHKIN, Ihar (Leibniz Universität Hannover, Welfengarten 1, 30167 Hannover, Germany); RISTAU, Detlev (Leibniz Universität Hannover, Welfengarten 1, 30167 Hannover, Germany); MORGNER, Uwe (Leibniz Universität Hannover, Welfengarten 1, 30167 Hannover, Germany)

Presenter: ZUBER, David (Leibniz Universität Hannover, Welfengarten 1, 30167 Hannover, Germany)

Session Classification: SSL 2 Nonlinear Methods

Contribution ID: **49** Type: **Oral**

High Average Power Nonlinear Pulse Compression in a Gas-filled Multi-pass Cell at 2 µm Wavelength

Tuesday, 30 August 2022 15:30 (15 minutes)

We present the post compression of a thulium-doped fiber laser output in a gas-filled multi-pass cell, delivering 51W average power, 35fs pulse duration at 300kHz repetition rate centered at 1940nm wavelength. To the best of our knowledge, this is the highest average-power multi-pass cell post compression in the
short-wave-infrared reported.

code

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Session Classification: SSL 2 Nonlinear Methods

Contribution ID: **50** Type: **Oral**

100W, 1 mJ, few-cycle pulses at 2 µm wavelength

Tuesday, 30 August 2022 16:30 (15 minutes)

We present a post compression of a thulium-doped fiber laser output in a hollow-core fiber, delivering 100W average power, 1mJ pulse energy and 17.6fs pulse duration at 100kHz repetition rate. It is, to the best of our knowledge, the highest average-power mJ-class few-cycle source in the SWIR reported.

code

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Session Classification: FWD 2 Thulium lasers and amplifiers

Contribution ID: **51** Type: **Oral**

High-peak-power Ho3+ and Tm3+ -doped fiber MOPA for mid-IR conversion

Tuesday, 30 August 2022 16:45 (15 minutes)

We present a pulsed polarization-maintaining all-in-fiber MOPA setup based on Ho3+ and Tm3+ -doped silica fibers. By pumping a ZGP OPO an mid-IR output power of 8.1 W and a conversion efficiency of 44 % (slope 61 %) is obtained. M^2 factors of 2.2 (signal) and 2.0 (idler) are determined at maximum power.

code

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Session Classification: FWD 2 Thulium lasers and amplifiers

Contribution ID: **52** Type: **Oral**

High-power and highly-efficient laser operation of Tm3+:Ho3+-codoped silica fiber lasers emitting at 2.1 µm and 2.2 µm

Tuesday, 30 August 2022 17:00 (15 minutes)

We present our recent results in high-power laser emission from 2.1 to 2.2 µm, introducing the 79X nm pumped Tm3+:Ho3+ -codoped silica fiber laser as serious alternative when it comes to power scaling within this wavelength region. In particular, a record power of 145 W has been achieved at 2.2 µm.

code

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Session Classification: FWD 2 Thulium lasers and amplifiers

Contribution ID: **53** Type: **Oral**

Generation of 12 nJ Pulse Energy by a Thulium-doped Fiber Mamyshev Oscillator

Tuesday, 30 August 2022 17:15 (15 minutes)

We report on the generation of up to 12 nJ pulse energy with a compressed pulse duration of 156 fs by an ultrafast thulium-doped fiber Mamyshev oscillator. The oscillator incorporated double-clad fibers to provide a sufficient amplification with a high suppression of amplified spontaneous emission of 22 dB.

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Session Classification: FWD 2 Thulium lasers and amplifiers

Contribution ID: **54** Type: **Oral**

Highly efficient, high-power thulium-doped fibre amplifier via in-band pumping at 1.7 µm

Tuesday, 30 August 2022 17:30 (15 minutes)

We present a high-power, highly efficient thulium-doped fiber amplifier which is cladding-pumped at 1692 nm. For the first time, a Tm-doped fiber suitable for ultrafast operation with considerable pulse energies provides slope efficiencies around 80% with 58 W output power. Using commercially available pump sources, this approach is highly scalable.

code

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Session Classification: FWD 2 Thulium lasers and amplifiers

Contribution ID: **55** Type: **Oral**

Simple method for determining quantum efficiency and background propagation loss in thulium-doped fibres

Tuesday, 30 August 2022 17:45 (15 minutes)

A simple method is presented for determining the quantum efficiency and back-ground core propagation loss in Thulium (Tm)-doped fibre lasers. Since the overall laser efficiency is typically limited by one of these two parameters, quantitatively determining their individual contributions is vital to informing the development of future Tm-doped fibres.

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Session Classification: FWD 2 Thulium lasers and amplifiers

Contribution ID: **56** Type: **Oral**

937 W Thulium:silica fiber MOPA operating at 2036 nm

Tuesday, 30 August 2022 18:00 (15 minutes)

We present our latest results in power scaling in the 2 μm region. The all-fiber laser system is a simple MOPA configuration composed of a seed laser and a high power amplifier. More than 900 W of output power at 2036 nm are demonstrated with a diffraction limited beam quality.

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Session Classification: FWD 2 Thulium lasers and amplifiers

Contribution ID: **58** Type: **Keynote**

Recent advances in SWIR and MWIR solid-state and fiber sources

Wednesday, 31 August 2022 08:15 (45 minutes)

Recent developments in two-micron thulium and thulium-holmium doped solid-state and fiber lasers allow for significant average-power and pulse-energy scaling, important for mid-IR OPO pumping, materials processing and communication. A focus is put on all-fiber designs and robust, if possible self-aligning, laser resonators, which allow for stable and ruggedized designs.

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Session Classification: Keynote Session and SSL 3

Contribution ID: **59** Type: **Oral**

Dual-comb modelocked laser oscillators with high power and low noise

Wednesday, 31 August 2022 10:00 (15 minutes)

We present a platform for high-power dual comb sources from a single spatially-multiplexed oscillator cavity. We demonstrate femtosecond pulses and Watt-level average output powers with low-noise operation over short and long timescales. Our 80 MHz version is ideal for pump-probe measurements, while our 1 GHz version supports coherent dual-comb spectroscopy.

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Presenter: PHILLIPS, Christopher (ETH Zurich, Institute for Quantum Electronics, Zurich, Switzerland)

Session Classification: SSL 4 Short pulse generation & amplification

Contribution ID: **60** Type: **Oral**

Intra and extra-cavity beam shaping for post-compression of Yb:YAG picosecond high-energy pulses

Wednesday, 31 August 2022 10:15 (15 minutes)

We designed and tested phase mirrors for intra and extra-cavity flat-top beam shaping of high energy Ytterbium systems. The concept can be applied as a new approach to perform spectrally homogeneous thin-plate post-compression of picosecond pulses from J-level Yb:YAG systems.

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Session Classification: SSL 4 Short pulse generation & amplification

Contribution ID: **61** Type: **Oral**

10 mJ-level Picosecond OPCPA Pump Laser Based on Room Temperature Hybrid Yb:YAG Amplifier System

Wednesday, 31 August 2022 10:30 (15 minutes)

On the way to developing 100W and 10 mJ class laser we demonstrate a hybrid laser system based on fiber laser seed source and chirped pulse amplification in free-space Yb:YAG cascade. The system is capable of delivering 13 mJ energy 1 ps duration pulses at 20 Hz repetition rate.

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Presenter: KAZAKEVIČIUS, Aivaras (National Center for Physical Sciences and Technology, Vilnius, Lithuania)

Session Classification: SSL 4 Short pulse generation & amplification

Contribution ID: **62** Type: **Oral**

110 MW Thin-Disk Oscillator

Wednesday, 31 August 2022 10:45 (15 minutes)

A compact Kerr-lens mode-locked thin-disk oscillator delivering 110 MW output peak power, the highest among all oscillators, is reported. A pulse train with a repetition rate of 14 MHz carries 115 fs long, 14.5 uJ pulses resulting in 203 W of average power.

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Presenter: GONCHAROV, Semyon (Helmut-Schmidt University, Hamburg, Germany)

Session Classification: SSL 4 Short pulse generation & amplification

Contribution ID: **63** Type: **Oral**

Towards ultra fast pulse generation by gain-switching of diode pumped surface emitting semiconductor lasers

Wednesday, 31 August 2022 11:00 (15 minutes)

We present first results of our research towards ultra-short pulse generation in the sub-100 ps range based on cascaded gain-switched diode-pumped vertical-cavity surface-emitting semiconductor lasers. In particular, we focus on the surface emitters themselves and on the dependence of the output parameters on the pump wavelength and the pump fluence.

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Session Classification: SSL 4 Short pulse generation & amplification

Contribution ID: **64** Type: **Oral**

8.7-W average power femtosecond Ho:CALGO bulk laser at 2.1 µm

Wednesday, 31 August 2022 11:15 (15 minutes)

We report the first mode-locked operation of a bulk laser based on Ho:CALGO. The laser generates up to 8.7 W of average power and 369-fs pulses duration at 2118 nm, representing the highest avergae power achieved from a mode-locked bulk lasers in the 2-3 µm wavelength region.

code

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Presenter: YAO, Weichao (Ruhr Universität Bochum, Bochum, Germany)

Session Classification: SSL 4 Short pulse generation & amplification

Contribution ID: **65** Type: **Oral**

Conversion of Mode-Locked States within an Optical Cavity

Wednesday, 31 August 2022 11:30 (15 minutes)

The conversion of longitudinal mode-locked beam to a transversal mode-locked beam is equivalent to the conversion of temporal pulses to a spatiotemporal oscillation. This is achieved by matching the frequency spacing of incident phase-locked longitudinal modes and the transverse mode spacing of an optical cavity.

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Presenter: ZWILICH, Michael (University of Münster, Institute of Applied Physics, Münster, Germany)

Session Classification: SSL 4 Short pulse generation & amplification

Contribution ID: **66** Type: **Oral**

1 kHz Yb:YAG thin-disk high-energy picosecond regenerative amplifier

Wednesday, 31 August 2022 11:45 (15 minutes)

We report the developement of a sub-ps Yb:YAG thin disk regenerative amplifier delivering 50 mJ at 1 kHz with an optical-optical efficiency of 18%. We discuss how to address thermal issues in the BBO Pockel's crystal to further increase the output energy up to 100 mJ.

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Session Classification: SSL 4 Short pulse generation & amplification

Contribution ID: **67** Type: **Invited**

Fiber based high power low noise single frequency lasers and applications

Wednesday, 31 August 2022 14:45 (30 minutes)

With the advances in fundamental science such as gravitational wave detection, cold atom physics and quantum computing the need for single frequency high-power fiber lasers has been increasing. We will present several very low noise high power laser sources at different wavelengths and the potential applications.

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Session Classification: FWD 3 CW and novel lasers

Contribution ID: **68** Type: **Oral**

Fiber-based light source with multi-color output and fast wavelength tuning

Wednesday, 31 August 2022 15:15 (15 minutes)

A fiber-based light source with multi-color output and a fast wavelength tuning mechanism is presented. The combination of a frequency modulation scheme for pulse-to-pulse wavelength-switching and low-noise operation with a relative intensity noise of -153.7 dBc/Hz makes this light source well suited for nonlinear microscopy applications.

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Presenter: WALLMEIER, Kristin (University of Münster, Institute of Applied Physics, Münster, Germany)

Session Classification: FWD 3 CW and novel lasers

Contribution ID: **69** Type: **Oral**

High-power low-noise single frequency tunable laser at 624 nm

Wednesday, 31 August 2022 15:30 (15 minutes)

In this work, more than 5 W of output power is obtained between 616.5 nm and 630.8 nm using sum frequency generation of 1 μm and 1.5 μm laser sources in a PPLN crystal with a relative intensity noise lower than -157 dB/Hz at 5 MHz.

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Session Classification: FWD 3 CW and novel lasers

Contribution ID: **70** Type: **Oral**

Record power transmission of intense 343 nm UV radiation in a single-mode inhibiting coupling hollow-core fiber exceeding 20W of 10-ns pulses

Wednesday, 31 August 2022 15:45 (15 minutes)

Thanks to the use of a new-gen UV hollow core fiber, we report here 2 orders of magnitude of gain on the current state of the art, with on a record single-mode delivery of 23.3W (155μJ) with 89.1% transmission from a 343 nm, 10 ns, 150 kHz laser source.

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Presenter: BOULLET, Johan (ALPHANOV, Bordeaux, France)

Session Classification: FWD 3 CW and novel lasers

Contribution ID: **71** Type: **Oral**

Four wave mixing in multimode hollow core waveguides with a two-color pump for the thorium nuclear clock

Wednesday, 31 August 2022 16:00 (15 minutes)

We show an approach to effectively generate tunable vacuum and extreme ultra-violet light with both short (femtosecond) and long (nanosecond) pulses using four wave mixing of the fundamental and its second harmonic in hollow gas-filled capillaries. The particularly important application includes nuclear thorium clock with signal at 160 nm.

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Presenter: TRABATTONI, Andrea (DESY Hamburg)

Session Classification: FWD 3 CW and novel lasers

Contribution ID: **72** Type: **Keynote**

Towards Automated Self-Learning Laser-Process Optimization

Thursday, 1 September 2022 08:15 (45 minutes)

The flexibility of new laser sources and process-monitoring enables new possibilities in laser-based production technology, especially the combination of different laser processes with many adjustable parameters. The fusion of domain knowledge and probabilistic models in the form of hybrid models allows an efficient optimization of these processes with machine learning.

Primary authors: ANDREAS, Michalowski (Institut für Strahlwerkzeuge, Stuttgart, Germany); GRAF, Thomas (Institut für Strahlwerkzeuge, Stuttgart, Germany); KROSCHEL, Alexander (Bosch Research, Renningen, Germany); ILIN, Alexander (Bosch Research, Renningen, Germany); KARG, Stephanie (Bosch Research, Renningen, Germany); STRITT, Peter (Bosch Research, Renningen, Germany); TIGHINEANU, Petru (Bosch Research, Renningen, Germany); BECKER, Sebastian (Bosch Research, Renningen, Germany); DAIS, Adina (Bosch Research, Renningen, Germany); KUNZ, Gerhard (Bosch Research, Renningen, Germany); SONNTAG, Steffen (Bosch Research, Renningen, Germany); LUSTFELD, Martin (Bosch Automotive Products (Suzhou) Co. Ltd., Suzhou , China); NYENHUIS, Fabian (Oertli Instruments, Berneck, Switzerland); RIDDERBUSCH, Heiko (Scintilla AG, Zuchwil, Switzerland)

Presenter: ANDREAS, Michalowski (Institut für Strahlwerkzeuge, Stuttgart, Germany)

Session Classification: Special Symposium 1

Contribution ID: **73** Type: **Invited**

Deep Learning for Control of Light-Matter Interactions

Thursday, 1 September 2022 09:00 (30 minutes)

The team at Southampton are applying the deep learning technology that supports self-driving cars to the real-time control and optimisation of a wide range of light-matter interactions, including femtosecond laser machining. This presentation will provide an overview of recent activity at Southampton at this exciting interface.

Primary author: MILLS, Ben (Optoelectronics Research Centre, Southampton, United Kingdom)

Presenter: MILLS, Ben (Optoelectronics Research Centre, Southampton, United Kingdom)

Session Classification: Special Symposium 1

Contribution ID: **74** Type: **Invited**

Phase locking of fiber laser array using quasi-reinforcement learning, principle and experiments

Thursday, 1 September 2022 10:30 (30 minutes)

We report a new technique for phase control of tiled array of lasers based on a specific quasi-reinforcement learning approach. Principle and experiments on a seven-fiber amplifier laser array will be presented. We will show the dynamic locking of the laser phase relationship, and on-demand wavefront shaping.

Primary authors: KERMENE, Vincent (Institut de recherche XLIM, Université de Limoges-CNRS UMR n◦7252, Faculté des Sciences et Techniques, Limoges, France); BOJU, Alexandre (Institut de recherche XLIM, Université de Limoges-CNRS UMR n◦7252, Faculté des Sciences et Techniques, Limoges, France); SHPAKOVYTCH, Maksym (Institut de recherche XLIM, Université de Limoges-CNRS UMR n◦7252, Faculté des Sciences et Techniques, Limoges, France); MAULION, Geoffrey (Institut de recherche XLIM, Université de Limoges-CNRS UMR n◦7252, Faculté des Sciences et Techniques, Limoges, France); ARMAND, Paul (Institut de recherche XLIM, Université de Limoges-CNRS UMR n◦7252, Faculté des Sciences et Techniques, Limoges, France); BARTHELEMY, Alain (Institut de recherche XLIM, Université de Limoges-CNRS UMR n◦7252, Faculté des Sciences et Techniques, Limoges, France); DESFARGES-BERTHELEMOT, Agnès (Institut de recherche XLIM, Université de Limoges-CNRS UMR n◦7252, Faculté des Sciences et Techniques, Limoges, France)

Presenter: KERMENE, Vincent (Institut de recherche XLIM, Université de Limoges-CNRS UMR n◦7252, Faculté des Sciences et Techniques, Limoges, France)

Session Classification: Special Symposium 2

Contribution ID: **75** Type: **Invited**

Intelligent control of Lasers for Accelerators

Thursday, 1 September 2022 11:00 (30 minutes)

Precise control of lasers is of critical importance for particle accelerators and free electron lasers. We discuss our approach to leverage the power of data science and artificial intelligence to improve the performance (pulse parameters, fast set-point tuning, stability) of our photocathode and pump-probe lasers.

Primary author: TÜNNERMANN, Henrik (Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany)

Presenter: TÜNNERMANN, Henrik (Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany)

Session Classification: Special Symposium 2

Contribution ID: **76** Type: **Invited**

Multi-Core Fibers for Laser, Sensing and Telecommunication Applications

Thursday, 1 September 2022 11:30 (30 minutes)

We will present an overview on our research on novel multi-core fibers towards lasers and amplifiers for telecommunication, sensing as well as for scaling of coherently combined high power and high energy laser systems. We will link the required properties for the fibers to the manufacturing and characterization process chain.

Primary authors: SCHREIBER, Thomas (Fraunhofer IOF, Jena, Germany); KUHN, Stefan (Fraunhofer IOF, Jena, Germany); NOLD, Johannes (Fraunhofer IOF, Jena, Germany); HUPEL, Christian (Fraunhofer IOF, Jena, Germany); HEIN, Sigrun (Fraunhofer IOF, Jena, Germany); SCHULZE, Steffen (Fraunhofer IOF, Jena, Germany); YILDIZ, Benjamin (Fraunhofer IOF, Jena, Germany); HÄSSNER, Denny (Fraunhofer IOF, Jena, Germany); STRECKER, Maximilian (Fraunhofer IOF, Jena, Germany); KLENKE, Arno (Institute of Applied Physics / FSU, Jena, Germany); ALESHIRE, Christopher (Institute of Applied Physics / FSU, Jena, Germany); STEINKOPF, Albrecht (Institute of Applied Physics / FSU, Jena, Germany); JAUREGUI, Cesar (Institute of Applied Physics / FSU, Jena, Germany); LIMPERT, Jens (Fraunhofer IOF, Jena, Germany); WALBAUM, Till (Fraunhofer IOF, Jena, Germany); HAARLAMMERT, Nicoletta (Fraunhofer IOF, Jena, Germany)

Presenter: HAARLAMMERT, Nicoletta (Fraunhofer IOF, Jena, Germany)

Session Classification: Special Symposium 2

Contribution ID: **77** Type: **not specified**

Panel - Al in Laser Science

Session Classification: Special Symposium 2

Contribution ID: **78** Type: **Poster**

Mamyshev regenerator for ultrashort light pulse shaping

Thursday, 1 September 2022 12:00 (2 hours)

We present a Mamyshev regenerator setup with electrically controlled acousto-optic switch. This setup allows the injection of
a long, poor quality pulse through one of the switch inputs. After a few tens of regeneration cycles occur the input pulse is shaped into high quality ultrashort light pulse.

Primary authors: LIAUGMINAS, Gustas (Center for Physical Sciences and Technology, Vilnius, Lithuania); REGELSKIS, Kęstutis (Center for Physical Sciences and Technology, Vilnius, Lithuania); DUBOSAS, Giedrius (Center for Physical Sciences and Technology, Vilnius, Lithuania); ŽELUDEVIČIUS, Julijanas (Center for Physical Sciences and Technology, Vilnius, Lithuania)

Presenter: LIAUGMINAS, Gustas (Center for Physical Sciences and Technology, Vilnius, Lithuania)

Session Classification: Lunch and Poster Session 2

Contribution ID: **79** Type: **Poster**

Comparative study on pump wavelength dependent efficiency in Nd:YVO4

Thursday, 1 September 2022 12:00 (2 hours)

The influence of the pump wavelength on the heat load and efficiency of Nd:YVO4 crystals is investigated with a specially designed crystal mount. The measurements indicate that the change in heat load in the crystal can be solely ascribed to the difference of quantum defects and no further non-radiative effects.

Primary authors: SCHNEEWIND, Merle (Laser Zentrum Hannover e.V. (LZH)); SPIEKERMANN, Stefan (Laser Zentrum Hannover e.V. (LZH)); WESSELS, Peter (Laser Zentrum Hannover e.V. (LZH)); NEUMANN, Jörg (Laser Zentrum Hannover e.V. (LZH)); KRACHT, Dietmar (Laser Zentrum Hannover e.V. (LZH))

Presenter: SCHNEEWIND, Merle (Laser Zentrum Hannover e.V. (LZH))

Session Classification: Lunch and Poster Session 2

Contribution ID: **80** Type: **Poster**

Energy scaling of multi-pass cells for nonlinear optics

Thursday, 1 September 2022 12:00 (2 hours)

We introduce a novel nonlinear multi-pass cell configuration comprising a concave-convex geometry. In a proof-of-principle experiment, 260 fs, 15 μJ pulses are broadened and compressed to approximately 50 fs with 90 % efficiency with excellent spatio-spectral homogeneity. A compact design for 0.5 J and 1 ps laser is also presented.

Primary authors: HARITON, Victor (Helmut Schmidt University, Hamburg, Germany); FRITSCH, Kilian (Helmut Schmidt University, Hamburg, Germany); PRONIN, Oleg (Helmut Schmidt University, Hamburg, Germany)

Presenter: HARITON, Victor (Helmut Schmidt University, Hamburg, Germany)

Session Classification: Lunch and Poster Session 2

Contribution ID: **81** Type: **Poster**

Effect of multilayer substrate interference in planar waveguide scattering loss

Thursday, 1 September 2022 12:00 (2 hours)

A theoretical model is built for scattering loss from the planar waveguide with multilayer substrate and experimentally validated with good agreement. Our work shows that substrate layer interference can significantly suppress scattering loss.

Primary authors: LIU, Zhen (Zepler Institute for Photonics and Nanoelectronics, University of Southampton, SOUTHAMPTON, United Kingdom); ETTABIB, Mohamed (Zepler Institute for Photonics and Nanoelectronics, University of Southampton, SOUTHAMPTON, United Kingdom); WILKINSON, James (Zepler Institute for Photonics and Nanoelectronics, University of Southampton, SOUTHAMPTON, United Kingdom); ZERVAS, Michalis (Zepler Institute for Photonics and Nanoelectronics, University of Southampton, SOUTHAMPTON, United Kingdom)

Presenter: LIU, Zhen (Zepler Institute for Photonics and Nanoelectronics, University of Southampton, SOUTHAMPTON, United Kingdom)

Session Classification: Lunch and Poster Session 2

Contribution ID: **82** Type: **Poster**

Towards a monolithic, multi-gigahertz mode-locked Ti:Sa laser

Thursday, 1 September 2022 12:00 (2 hours)

We demonstrate a design for a monolithic, multi-gigahertz soft-aperture Kerr-lens mode-locked Ti:Sa laser. First experiments did not show mode-locking but cw laser operation with power fluctuations of less than 0.04% rms. We discuss possible obstacles to mode-locking in monolithic lasers like spatial-hole burning or a standing-wave of the pump beam.

Primary authors: FIEHLER, Torben (Münster University of Applied Sciences, Steinfurt, Germany); WITTROCK, Ulrich (Münster University of Applied Sciences, Steinfurt, Germany)

Presenter: FIEHLER, Torben (Münster University of Applied Sciences, Steinfurt, Germany)

Session Classification: Lunch and Poster Session 2

Contribution ID: **83** Type: **Poster**

Numerical Analysis of Tapered Multicore Fibres for Laser System Scaling

Thursday, 1 September 2022 12:00 (2 hours)

Tapered multicore fibers (MCFs) are numerically analyzed in the context of high power MCF lasers using Beam Propagation Method. These simulations facilitate taper design to avoid mode mixing and intercore crosstalk. MCF tapers with active fibers enable scalable fundamental-mode operation in large multimode waveguide cores.

Primary authors: ALESHIRE, Christopher (Institute of Applied Physics, Friederich-Schiller-University Jena, Jena, Germany); STEINKOPFF, Albrecht (Institute of Applied Physics, Friederich-Schiller-University Jena, Jena, Germany); KLENKE, Arno (Institute of Applied Physics, Friederich-Schiller-University Jena, Jena, Germany); JAUREGUI, Cesar (Institute of Applied Physics, Friederich-Schiller-University Jena, Jena, Germany); LIMPERT, Jens (Institute of Applied Physics, Friederich-Schiller-University Jena, Jena, Germany)

Presenter: ALESHIRE, Christopher (Institute of Applied Physics, Friederich-Schiller-University Jena, Jena, Germany)

Session Classification: Lunch and Poster Session 2

Contribution ID: **84** Type: **Poster**

Towards Carrier-Envelope Phase Stabilization of a 110 MW Thin-Disk Oscillator

Thursday, 1 September 2022 12:00 (2 hours)

Here, the beat signal detection towards carrier-envelope phase stabilization of a 110 MW Kerr-lens mode-locked thin-disk oscillator delivering 140 fs-long pulses is presented. The implementation of an f-2f interferometer is demonstrated using an octave-spanning spectrum from a cascade with a multi-pass
cell and photonic-crystal fiber.

Primary author: KOPP, Yasmin (Helmut Schmidt University, Hamburg, Germany)

Presenter: KOPP, Yasmin (Helmut Schmidt University, Hamburg, Germany)

Session Classification: Lunch and Poster Session 2

Contribution ID: **85** Type: **Poster**

Self-phase modulation in periodically-poled thin-film lithium niobate waveguides

Thursday, 1 September 2022 12:00 (2 hours)

We study spectral broadening of sub-picosecond telecom wavelength pulses in periodically-poled thin-film lithium niobate waveguides that results from cascaded nonlinear interaction. We experimentally investigate the effect of phase mismatching on spectral broadening and compare the results with simulations based on a split-step Fourier method.

Primary authors: GUL, Gamze (Graduate Program in Applied Physics, Northwestern University, Evanston, USA); ABDELSALAM, Kamal (CREOL, The College of Optics and Photonics, University of Central Florida, Orlando, USA); FATHPOUR, Sasan (CREOL, The College of Optics and Photonics, University of Central Florida, Orlando, USA); LEE, Kim F. (Center for Photonic Communication and Computing, Department of Electrical and Computer Engineering, Northwestern University, Evanston, USA); KANTER, Gregory S. (Center for Photonic Communication and Computing, Department of Electrical and Computer Engineering, Northwestern University, Evanston, USA); KUMAR, Prem (Graduate Program in Applied Physics, Northwestern University, Evanston, USA)

Presenter: GUL, Gamze (Graduate Program in Applied Physics, Northwestern University, Evanston, USA)

Session Classification: Lunch and Poster Session 2

Contribution ID: **86** Type: **Poster**

Optimized composition of LiREFˆ4 (RE = Tb_xY_(1–x)) crystals for efficient green and yellow lasers - fluorescence quenching in Tb3+ ions

Thursday, 1 September 2022 12:00 (2 hours)

We investigated inversion dependent fluorescence quenching of Tb3+ via a Z-scan technique. Analysis with an analytical model yielded parameters describing the strength of energy transfer upconversion and energy migration between Tb3+ ions. This allows optimizing the quantum efficiency of the emitting ˆ5D_4-level in Tb3+-based lasers by optimized composition

code

Primary authors: BADTKE, Moritz (Leibniz-Institut für Kristallzüchtung, Berlin, Germany); KALUSNIAK, Sascha (Leibniz-Institut für Kristallzüchtung, Berlin, Germany); PÜSCHEL, Stefan (Leibniz-Institut für Kristallzüchtung, Berlin, Germany); TANAKA, Hiroki (Leibniz-Institut für Kristallzüchtung, Berlin, Germany); KRÄNKEL, Christian (Leibniz-Institut für Kristallzüchtung, Berlin, Germany)

Presenter: BADTKE, Moritz (Leibniz-Institut für Kristallzüchtung, Berlin, Germany)

Session Classification: Lunch and Poster Session 2

Contribution ID: **87** Type: **Poster**

Entirely passive thin-disk dual-comb spectrometer operating in green

Thursday, 1 September 2022 12:00 (2 hours)

We have frequency doubled an entirely passive dual-comb thin-disk oscillator to perform spectroscopy of iodine at 515nm. Simultaneous measurement of iodine and acetylene (1034nm) helps to evaluate the jitter characteristics at both wavelengths. It indicates that the approach can be extended to higher harmonics in the deep UV spectral range.

Primary authors: HOFER, Tobias (Helmut-Schmidt University, Hamburg, Germany); FRITSCH, Kilian (Helmut-Schmidt University, Hamburg, Germany); PRONIN, Oleg (Helmut-Schmidt University, Hamburg, Germany)

Presenter: HOFER, Tobias (Helmut-Schmidt University, Hamburg, Germany)

Session Classification: Lunch and Poster Session 2

Contribution ID: **88** Type: **Poster**

Fiber-tip nanothermometer based on up-conversion nanocrystals for electrolysis cells

Thursday, 1 September 2022 12:00 (2 hours)

Temperature measurements inside electrolysis cells pose a challenge for conventional sensors. Since up-conversion-nanocrystals exhibit a temperature dependent emission, we attached such nanocrystals to a fiber facet and applied it as nanothermometer in an electrolysis cell. This approach will yield new insights into the performance of these cells.

Primary authors: KÖTTERS, Lea (Leibniz University Hannover, Institute of Quantum Optics, Hannover, Germany); SPELTHANN, Simon (Leibniz University Hannover, Institute of Quantum Optics, Hannover, Germany); BÜHRE, Lena (Leibniz University Hannover, Institute of Electric Power Systems, Hannover, Germany); KOMBAN, Rajesh (Fraunhofer Center for Applied Nanotechnology CAN, Hamburg, Germany); WELLER, Horst (Fraunhofer Center for Applied Nanotechnology CAN, Hamburg, Germany); HANKE-RAUSCHENBACH, Richard (Leibniz University Hannover, Institute of Electric Power Systems, Hannover, Germany); RISTAU, Detlev (Leibniz University Hannover, Institute of Quantum Optics, Hannover, Germany); GIMMLER, Christoph (Fraunhofer Center for Applied Nanotechnology CAN, Hamburg, Germany); BENSMANN, Boris (Leibniz University Hannover, Institute of Electric Power Systems, Hannover, Germany); STEINKE, Michael (Leibniz University Hannover, Institute of Quantum Optics, Hannover, Germany)

Presenter: STEINKE, Michael (Leibniz University Hannover, Institute of Quantum Optics, Hannover, Germany)

Session Classification: Lunch and Poster Session 2

Contribution ID: **89** Type: **Poster**

High-power optical amplifier with enhanced wall-plug efficiency for 10- channel WDM satellite laser communication systems

Thursday, 1 September 2022 12:00 (2 hours)

An important aspect of optical satellite communication technology is the power consumption of the laser systems. We present a high-efficiency all-fiber amplifier for a WDM communication system. 10 channels combined in a polarization-
maintaining fiber can be efficiently amplified up to a total power level of 100W in the 1 μm wavelength-range.

Primary authors: HOCHHEIM, Sven (Laser Zentrum Hannover e.V., Hannover, Germany); BÜTTNER, Alexander (Laser Zentrum Hannover e.V., Hannover, Germany); BROCKMÜLLER, Eike (Laser Zentrum Hannover e.V., Hannover, Germany); FITTKAU, Willy (Laser Zentrum Hannover e.V., Hannover, Germany); WELLMANN, Felix (Laser Zentrum Hannover e.V., Hannover, Germany); WESSELS, Peter (Laser Zentrum Hannover e.V., Hannover, Germany); NEUMANN, Jörg (Laser Zentrum Hannover e.V., Hannover, Germany); KRACHT, Dietmar (Laser Zentrum Hannover e.V., Hannover, Germany)

Presenter: HOCHHEIM, Sven (Laser Zentrum Hannover e.V., Hannover, Germany)

Session Classification: Lunch and Poster Session 2

Contribution ID: **90** Type: **Poster**

Novel coercive field engineering technique for improved periodic poling of KTiOPO4 isomorphs

Thursday, 1 September 2022 12:00 (2 hours)

We demonstrate high quality, short period QPM structures in KTP and RKTP, produced through coercive field engineering using a new ion exchange based on Ba2+ ion indiffusion. We show advantages of using this method over the previously established coercive field engineering method using Rb+ ions.

Primary authors: BARRETT, Laura (Royal Institute of Technology, Stockholm, Sweden); ZUKAUSKAS, Andrius (Royal Institute of Technology, Stockholm, Sweden); LAURELL, Fredrik (Royal Institute of Technology, Stockholm, Sweden)

Presenter: BARRETT, Laura (Royal Institute of Technology, Stockholm, Sweden)

Session Classification: Lunch and Poster Session 2

Contribution ID: **91** Type: **Poster**

Colloidal LiYF4:Pr nanocrystals downsized to 10 nm – Part 2: spectroscopic properties

Thursday, 1 September 2022 12:00 (2 hours)

Nanocrystalline LiYF4:Pr promises exciting design opportunities for composite photonic devices. Here, we present an in-depth spectroscopic investigation on monodispersed colloidal LiYF4:Pr nanocrystals of 10nm size. We observed an unexpected yet intense emission with comparably long lifetimes. These results
pave the way for applications in quantum optics or biomedicine.

Primary authors: SPELTHANN, Simon (Leibniz University Hannover, Institute of Quantum Optics, Hannover, Germany); STEINKE, Michael (Leibniz University Hannover, Institute of Quantum Optics, Hannover, Germany); KOMBAN, Rajesh (Fraunhofer Center for Applied Nanotechnology CAN - (a research division of Fraunhofer Institute for Applied Polymer Research), Hamburg, Germany); WELLER, Horst (Fraunhofer Center for Applied Nanotechnology CAN - (a research division of Fraunhofer Institute for Applied Polymer Research), Hamburg, Germany); GIMMLER, Christoph (Fraunhofer Center for Applied Nanotechnology CAN - (a research division of Fraunhofer Institute for Applied Polymer Research), Hamburg, Germany); RUEHL, Axel (Leibniz University Hannover, Institute of Quantum Optics, Hannover, Germany); RISTAU, Detlev (Leibniz University Hannover, Institute of Quantum Optics, Hannover, Germany)

Presenter: SPELTHANN, Simon (Leibniz University Hannover, Institute of Quantum Optics, Hannover, Germany)

Session Classification: Lunch and Poster Session 2

Contribution ID: **92** Type: **Poster**

Scalable fabrication of twisted aperiodic multicore fibers for next-generation lens-less endoscopy

Thursday, 1 September 2022 12:00 (2 hours)

A scalable fabrication approach for aperiodic and twisted multicore fibers is presented, which will enable next-generation lens-less endoscopy for 3D imaging deep inside tissue. Particularly, an aperiodic fiber with 1281 cores was developed, which is single-mode throughout the visible spectrum. The design process was supported by in-depth numerical design studies.

Primary authors: STEPHAN, Ronja (Leibniz University Hannover, Institute of Quantum Optics, Hannover, Germany); SCHARF, Elias (U Dresden, Chair of Measurement and Sensor System Technique, Dresden, Germany); ZOLNACZ, Kinga (Wroclaw University of Science and Technology, Department of Optics and Photonics, Wroclaw, Poland); HAUSMANN, Katharina (Leibniz University Hannover, Institute of Quantum Optics, Hannover, Germany); LIESSMANN, Matthias (Leibniz University Hannover, Institute of Quantum Optics, Hannover, Germany); KÖTTERS, Lea (Leibniz University Hannover, Institute of Quantum Optics, Hannover, Germany); CZARSKE, Jürgen (TU Dresden, Chair of Measurement and Sensor System Technique, Dresden, Germany); RISTAU, Detlev (Leibniz University Hannover, Institute of Quantum Optics, Hannover, Germany); KUSCHMIERZ, Robert (TU Dresden, Chair of Measurement and Sensor System Technique, Dresden, Germany)

Presenter: STEPHAN, Ronja (Leibniz University Hannover, Institute of Quantum Optics, Hannover, Germany)

Session Classification: Lunch and Poster Session 2

Contribution ID: **93** Type: **Poster**

Cryogenic Laser Operation of a “Mixed” Yb:YLuAG Garnet Crystal

Thursday, 1 September 2022 12:00 (2 hours)

We report on the cryogenic laser performance of a new “mixed” Yb:LuYAG garnet crystal in the continuous-wave and pulsed regimes. We determined an optimum temperature of 140 K for efficient laser operation. A maximum output of 10.65 W with a slope efficiency of 56% was achieved.

Primary authors: SLIMI, Sami (FiCMA-FiCNA-EMaS, Universitat Rovira i Virgili (URV), Campus Sescelades, E-43007 Tarragona, Spain, Tarragona, Spain); JAMBUNATHAN, Venkatesan (HiLASE Centre, Institute of Physics of the Czech Academy of Sciences, Za Radnicí 828, 252 41 Dolní Břežany, Czech Republic, Dolní Břežany, Czech Republic); PAN, Mingyan (Key Laboratory of Materials for High Power Laser, Shanghai Institute of Optics and Fine Mechanics, Chinese Academy of Sciences, Shanghai 201800, China, Shanghai , China); WANG, Yicheng (Photonics and Ultrafast Laser Science, Ruhr Universität Bochum, Universitätsstrasse 150, 44801 Bochum, Germany, Bochum, Germany); CHEN, Weidong (Fujian Institute of Research on the Structure of Matter, Chinese Academy of Sciences, Fuzhou, 350002 Fujian, China, Fujian, China); LOIKO, Pavel (Centre de Recherche sur les Ions, les Matériaux et la Photonique (CIMAP), UMR 6252 CEA-CNRS-ENSICAEN, Université de Caen Normandie, 6 Boulevard Maréchal Juin, 14050 Caen Cedex 4, France, Caen Cedex, France); SOLÉ, Rosa Maria (FiCMA-FiCNA-EMaS, Universitat Rovira i Virgili (URV), Campus Sescelades, E-43007 Tarragona, Spain, Tarragona, Spain); AGUILÓ, Magdalena (FiCMA-FiCNA-EMaS, Universitat Rovira i Virgili (URV), Campus Sescelades, E-43007 Tarragona, Spain, Tarragona, Spain); DÍAZ, Francesc (FiCMA-FiCNA-EMaS, Universitat Rovira i Virgili (URV), Campus Sescelades, E-43007 Tarragona, Spain, Tarragona, Spain); SMRZ, Martin (HiLASE Centre, Institute of Physics of the Czech Academy of Sciences, Za Radnicí 828, 252 41 Dolní Břežany, Czech Republic, Dolní Břežany, Czech Republic); MOCEK, Tomas (HiLASE Centre, Institute of Physics of the Czech Academy of Sciences, Za Radnicí 828, 252 41 Dolní Břežany, Czech Republic, Dolní Břežany, Czech Republic); MATEOS, Xavier (FiCMA-FiCNA-EMaS, Universitat Rovira i Virgili (URV), Campus Sescelades, E-43007 Tarragona, Spain, Tarragona, Spain)

Presenter: SLIMI, Sami (FiCMA-FiCNA-EMaS, Universitat Rovira i Virgili (URV), Campus Sescelades, E-43007 Tarragona, Spain, Tarragona, Spain)

Session Classification: Lunch and Poster Session 2

Contribution ID: **94** Type: **Poster**

Highly birefringent all-normal dispersion silica fiber with flat dispersion profile in the 1200–2100 nm wavelength range

Thursday, 1 September 2022 12:00 (2 hours)

We present a polarization-maintaining all-normal dispersion fiber with flat dispersion profile over the range of 1200-2100 nm. The fiber possesses the solid core of an elliptical shape that enables high birefringence (with polarization extinction ratio of > 22 dB) and also allows for low-loss fusion splicing to conventional Panda fiber.

Primary authors: SZEWCZYK, Olga (Laser & Fiber Electronics Group, Wrocław University of Science and Technology, Wrocław, Poland); STATKIEWICZ-BARABACH, Gabriela (Department of Optics and Photonics, Wrocław University of Science and Technology, Wrocław, Poland); OLSZEWSKI, Jacek (Department of Optics and Photonics, Wrocław University of Science and Technology, Wrocław, Poland); ŻOŁNACZ, Kinga (Department of Optics and Photonics, Wrocław University of Science and Technology, Wrocław, Poland); MAKARA, Mariusz (Laboratory of Optical Fibers Technology, Institute of Chemical Sciences, Maria Curie Sklodowska University, Lublin, Poland); POTURAJ, Krzysztof (Laboratory of Optical Fibers Technology, Institute of Chemical Sciences, Maria Curie Sklodowska University, Lublin, Poland); MERGO, Paweł (Laboratory of Optical Fibers Technology, Institute of Chemical Sciences, Maria Curie Sklodowska University, Lublin, Poland); SOTOR, Jarosław (Laser & Fiber Electronics Group, Wrocław University of Science and Technology, Wrocław, Poland); SOBOŃ, Grzegorz (Laser & Fiber Electronics Group, Wrocław University of Science and Technology, Wrocław, Poland); URBAŃCZYK, Wacław (Department of Optics and Photonics, Wrocław University of Science and Technology, Wrocław, Poland)

Presenter: SZEWCZYK, Olga (Laser & Fiber Electronics Group, Wrocław University of Science and Technology, Wrocław, Poland)

Session Classification: Lunch and Poster Session 2

Contribution ID: **95** Type: **Poster**

Finite-size scaling behaviour in fully-connected equal-coupling multimode photonic networks

Thursday, 1 September 2022 12:00 (2 hours)

The phase transition in fully-connected, multimode equal-coupling photonic networks is studied via numerical simulations and by using methods from statistical mechanics. Finite-size scaling is used to estimate critical points and exponents, yielding a phase diagram in a relevant parameter plane, and confirming mean-field behavior as for the planar XY model.

Primary author: MELCHERT, Oliver (Leibniz Universität Hannover, Hannover, Germany)

Presenter: MELCHERT, Oliver (Leibniz Universität Hannover, Hannover, Germany)

Session Classification: Lunch and Poster Session 2

Contribution ID: **96** Type: **Poster**

Compact Nd:YAP/V:YAG nanosecond pulse generator at 1342 nm

Thursday, 1 September 2022 12:00 (2 hours)

A compact laser head emitting a linearly polarized radiation at wavelength 1342 nm was designed and constructed. This laser was based on a separate Nd:YAP gain part and V:YAG saturable absorber. Q-switched pulses 12 ns long with energy up to 0.1 mJ were generated with repetition rate 500 Hz.

Primary authors: KADLEC, Kryštof (Czech Technical University in Prague, Prague, Czech Republic); ŠULC, Jan (Czech Technical University in Prague, Prague, Czech Republic); NĚMEC, Michal (Czech Technical University in Prague, Prague, Czech Republic); JELÍNKOVÁ, Helena (Czech Technical University in Prague, Prague, Czech Republic); NEJEZCHLEB, Karel (Crytur, Ltd. Turnov, Turnov, Czech Republic); BERAN, Lukáš (Crytur, Ltd. Turnov, Turnov, Czech Republic); KUDĚLKA, Radim (Crytur, Ltd. Turnov, Turnov, Czech Republic)

Presenter: ŠULC, Jan (Czech Technical University in Prague, Prague, Czech Republic)

Session Classification: Lunch and Poster Session 2

Contribution ID: **97** Type: **Poster**

Experimental and numerical study of a 1.94-µm monolithic single-oscillator thulium-doped fiber laser in continuous-wave regime

Thursday, 1 September 2022 12:00 (2 hours)

A continuous-wave all-fibered single-oscillator thulium-doped fiber laser is developed. Taking advantage of a high absorption at 793 nm (8.42 dB/m), the source exhibits 260 W of maximum output power at 1.94 µm and a slope efficiency of 59 %. Rate equations are applied to numerically study the cavity.

code

Primary authors: SANSON, Félix (French-german research Institute of Saint-Louis, Saint-Louis, France); LOUOT, Christophe (French-german research Institute of Saint-Louis, Saint-Louis, France); MANEK-HÖNNINGER, Inka (Université de Bordeaux, CNRS CEA, CELIA UMR5107, Bordeaux, France); HILDENBRAND-DHOLLANDE, Anne (French-german research Institute of Saint-Louis, Saint-Louis, France)

Presenter: SANSON, Félix (French-german research Institute of Saint-Louis, Saint-Louis, France)

Session Classification: Lunch and Poster Session 2

Contribution ID: **98** Type: **Poster**

577 nm yellow laser source using external pumping

Thursday, 1 September 2022 12:00 (2 hours)

We demonstrated a yellow laser source emitting at 577nm externally pumped by 1029 nm Q-switched laser. With the proper combination of Raman and frequency doubling medium, a maximum output of 9mW is achieved.

code

THU-P-2.15

Primary authors: CHAYRAN, Great (HiLASE Center, Institute of Physics of the Czech Academy of Sciences, Prague, Czech Republic); JAMBUNATHAN, Venkatesan (HiLASE Center, Institute of Physics of the Czech Academy of Sciences, Prague, Czech Republic); SMRZ, Martin (HiLASE Center, Institute of Physics of the Czech Academy of Sciences, Prague, Czech Republic); MOCEK, Thomas (HiLASE Center, Institute of Physics of the Czech Academy of Sciences, Prague, Czech Republic)

Presenter: CHAYRAN, Great (HiLASE Center, Institute of Physics of the Czech Academy of Sciences, Prague, Czech Republic)

Session Classification: Lunch and Poster Session 2

Contribution ID: **99** Type: **Poster**

The impact of heat-load modulation on transverse mode instability in high- power, quasi-continuous wave fibre amplifiers

Thursday, 1 September 2022 12:00 (2 hours)

We report that the modulation of the heat-load in fibre laser systems significantly mitigates the transverse mode instability when carefully choosing the modulation parameters. It is possible to suppress the higher-order modes by inducing a permanent energy transfer from the higher-order modes to the fundamental
mode.

Primary authors: HOLAIF, Sobhy (Instiute of Applied Physics, Abbe Center of Photonics, Friedrich-Schiller-Universität Jena, Jena, Germany); JAUREGUI, Cesar (Instiute of Applied Physics, Abbe Center of Photonics, Friedrich-Schiller-Universität Jena, Jena, Germany); TU, Yiming (Instiute of Applied Physics, Abbe Center of Photonics, Friedrich-Schiller-Universität Jena, Jena, Germany); LIMPERT, Jens (Instiute of Applied Physics, Abbe Center of Photonics, Friedrich-Schiller-Universität Jena, Jena, Germany)

Presenter: HOLAIF, Sobhy (Instiute of Applied Physics, Abbe Center of Photonics, Friedrich-Schiller-Universität Jena, Jena, Germany)

Session Classification: Lunch and Poster Session 2

Contribution ID: **100** Type: **Poster**

Enhanced Nonlinear Spectral Broadening in Multi-Pass Cells Using Molecular Gases

Thursday, 1 September 2022 12:00 (2 hours)

We demonstrate enhanced spectral broadening in Nitrogen, Nitrous Oxide filled multipass cells. Contrast to atomic gases, molecular gases have stronger effective nonlinearity leading to red-shifted broadband spectrum. For comparison, the spectral span of Argon, Nitrogen and Nitrous Oxide recorded is 45, 106 and 265 nm at 15 μJ input energy.

Primary authors: KADIWALA, Moinuddin (Helmut Schmidt University, Hamburg, Germany); KOVALENKO, Nazar (Helmut Schmidt University, Hamburg, Germany); FRITSCH, Kilian (Helmut Schmidt University, Hamburg, Germany); GONCHAROV, Semyon (Helmut Schmidt University, Hamburg, Germany); PRONIN, Oleg (Helmut Schmidt University, Hamburg, Germany)

Presenter: KADIWALA, Moinuddin (Helmut Schmidt University, Hamburg, Germany)

Session Classification: Lunch and Poster Session 2

Contribution ID: **101** Type: **Poster**

VCSELs as Highly Sensitive Stand-Alone Distance Sensors

Thursday, 1 September 2022 12:00 (2 hours)

We investigate the suitability of vertical-cavity surface-emitting lasers (VCSEL) as highly sensitive distance sensors for topography measurement. The concept relies on the light reflected from a moving sample into the VSCEL resonator inducing a measurable change of operating current and emission wavelength to detect motion of a few nm only.

Primary authors: GÜNTHER, Axel (Institute of High Frequency Technologies, Braunschweig, Germany); KORAT, Divyaben (Hannover Centre for Optical Technologies, Hannover, Germany); KOWALSKY, Wolfgang (Institute of High Frequency Technologies, Braunschweig, Germany); ROTH, Bernhard (Hannover Centre for Optical Technologies, Hannover, Germany)

Presenter: GÜNTHER, Axel (Institute of High Frequency Technologies, Braunschweig, Germany)

Session Classification: Lunch and Poster Session 2

Contribution ID: **102** Type: **Poster**

Packaging of an ultra-stable all-fiber-integrated NALM oscillator at 1 µm center wavelength for FEL faciliites

Thursday, 1 September 2022 12:00 (2 hours)

Previously we have demonstrated an all-fiber-integrated, alignment-free NALM PM Yb: fiber oscillator with sub-fs timing jitter. Here we report on the next steps in engineering this all-fiber compact oscillator. We developed a method to repeatably assemble lasers at a repetition rate required by DESY's FEL facilities.

code

Primary authors: HUA, Yi (Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany); TÜNNERMANN, Henrik (Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany); VIDOLI, Caterina (Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany); SALMAN, Haydar Sarper (Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany); MA, Yuxuan (Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany); GROSSE-WORTMANN, Uwe (Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany); WINKELMANN, Lutz (Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany); HARTL, Ingmar (Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany)

Presenter: HUA, Yi (Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany)

Session Classification: Lunch and Poster Session 2

Contribution ID: **103** Type: **Poster**

Mid-IR Fluorescence of Ho3+ -doped Low-Phonon Single Crystals and Chalcogenide Glasses

Recently there has been renewed interest in rare-earth ion doped low-phonon crystals and glasses as gain media for possible compact mid-IR lasers. In this work, mid-IR fluorescence characterization of Ho3+ doped low-phonon energy crystals (NaYF4, CsCdCl3) and glasses (Ga2Ge5S13) were explored.

Primary authors: BROWN, Ei Ei (DEVCOM Army Research Laboratory, Adelphi, USA); FLEISCHMAN, Zackery (DEVCOM Army Research Laboratory, Adelphi, USA); MCKAY, Jason (DEVCOM Army Research Laboratory, Adelphi, USA); HOMMERICH, Uwe (Hampton University, Hampton, USA); PALOSZ, Witold (Brimrose Corporation of America, Adelphi, USA); TRIVEDI, Sudhir (Brimrose Corporation of America, Adelphi, USA); DUBINSKII, Mark (DEVCOM Army Research Laboratory, Adelphi, USA)

Presenter: BROWN, Ei Ei (DEVCOM Army Research Laboratory, Adelphi, USA)

Session Classification: Lunch and Poster Session 2

Contribution ID: **104** Type: **Poster**

Planar Polymer Optical Waveguide Coated with Metal-Organic Framework for CO2 Sensing Application

Thursday, 1 September 2022 12:00 (2 hours)

An easily fabricated planar polymer optical waveguide sensor with metal-organic framework coating for carbon dioxide sensing is demonstrated. The proposed device exhibits good sensitivity, excellent reversibility and rapid response, which are significant towards the further development of gas sensing products for real-world applications such as environmental monitoring and gas detection.

Primary authors: ZHENG, Lei (Hannover Centre for Optical Technologies, Leibniz University Hannover, Hannover, Germany); KEPPLER, Nils (Institute of Inorganic Chemistry, Leibniz University Hannover, Hannover, Germany); BEHRENS, Peter (Institute of Inorganic Chemistry, Leibniz University Hannover, Hannover, Germany); ROTH, Bernhard (Hannover Centre for Optical Technologies, Leibniz University Hannover, Hannover, Germany)

Presenter: ZHENG, Lei (Hannover Centre for Optical Technologies, Leibniz University Hannover, Hannover, Germany)

Session Classification: Lunch and Poster Session 2

Contribution ID: **105** Type: **Oral**

Smart and agile 88 W Yb-fiber frequency comb laser

Thursday, 1 September 2022 14:00 (15 minutes)

We demonstrate an agile high power Yb-fiber frequency comb laser system with long-term stable remote-controlled operation via digital feedbacks and user-friendly interfaces. A programmable, phase and amplitude filter allows optimization of the laser output pulse for driving a subsequent nonlinear process, such as nonlinear frequency shifting and XUV-comb generation.

Primary authors: SALMAN, Sarper (Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany); FAN, Mingqi (Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany); TÜNNERMANN, Henrik (Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany); BALLA, Prannay (Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany); DARVILL, John (Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany); LAUMER, Dominic (Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany); PECILE, Vito F. (University of Vienna, Faculty of Physics, Faculty Center for Nano Structure Research, Christian Doppler Laboratory for Mid-IR Spectroscopy and Semiconductor Optics, Vienna, Austria); FELLINGER, Jakob (University of Vienna, Faculty of Physics, Faculty Center for Nano Structure Research, Christian Doppler Laboratory for Mid-IR Spectroscopy and Semiconductor Optics, Vienna, Austria); SHUMAKOVA, Valentina (University of Vienna, Faculty of Physics, Faculty Center for Nano Structure Research, Christian Doppler Laboratory for Mid-IR Spectroscopy and Semiconductor Optics, Vienna, Austria); MAHNKE, Christoph (Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany); MA, Yuxuan (Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany); MOHR, Christian (Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany); HECKL, Oliver H. (University of Vienna, Faculty of Physics, Faculty Center for Nano Structure Research, Christian Doppler Laboratory for Mid-IR Spectroscopy and Semiconductor Optics, Vienna, Austria); HEYL, Christoph M. (Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany)

Presenter: SALMAN, Sarper (Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany)

Session Classification: SSL 5 Spectral control and tuning

Contribution ID: **106** Type: **Oral**

Line-search FROG algorithm for retrieval of pulses from noisy datasets

Thursday, 1 September 2022 14:15 (15 minutes)

We present here a new FROG retrieval algorithm which performs well under heavy noise conditions through a structured random search of the available input space. It can retrieve pulses from any FROG geometry, partial datasets, as well as blind FROG retrieval.

Primary authors: KROOK, Christoffer (Royal Institute of Technology, KTH, Stockholm, Sweden); CLAESSEN, Koen (Chalmers University of Technology, CTH, Gothenburg, Sweden); PASISKEVICIUS, Valdas (Royal Institute of Technology, KTH, Stockholm, Sweden)

Presenter: KROOK, Christoffer (Royal Institute of Technology, KTH, Stockholm, Sweden)

Session Classification: SSL 5 Spectral control and tuning

Contribution ID: **107** Type: **Oral**

High Power Alexandrite Laser for Tunable UV-Blue Generation

Thursday, 1 September 2022 14:30 (15 minutes)

We report the very first demonstration of wavelength-tunable operation in the UV from a diode-pumped Alexandrite laser. 375-385nm continuous tuning is obtained using a high-power diode-pumped tunable Alexandrite laser and a Type I critically phase-matched BBO crystal. The use of PPLN waveguides for UV generation is also discussed.

Primary authors: TAWY, Goronwy (Photonics Group, The Blackett Laboratory, Dept. of Physics, Imperial College London SW7 2AZ, London, United Kingdom); DAVIDSON, Noelia Palomar (Optoelectronics Research Centre, University of Southampton, University Road, Hampshire SO17 1BJ, Southampton, United Kingdom); MENNEA, Paolo L. (Optoelectronics Research Centre, University of Southampton, University Road, Hampshire SO17 1BJ, Southampton, United Kingdom); TOPLEY, Glenn M. (Optoelectronics Research Centre, University of Southampton, University Road, Hampshire SO17 1BJ, Southampton, United Kingdom); SMITH, Peter G. R. (Optoelectronics Research Centre, University of Southampton, University Road, Hampshire SO17 1BJ, Southampton, United Kingdom); GATES, James C. (Optoelectronics Research Centre, University of Southampton, University Road, Hampshire SO17 1BJ, Southampton, United Kingdom); GAWITH, Corin B. E. (Optoelectronics Research Centre, University of Southampton, University Road, Hampshire SO17 1BJ, Southampton, United Kingdom); MINASSIAN, Ara (Unilase Ltd, 60 Grays Inn Road, Unit LG04 WC1X 8LU, London, United Kingdom); DAMZEN, Michael J. (Photonics Group, The Blackett Laboratory, Dept. of Physics, Imperial College London SW7 2AZ, London, United Kingdom)

Presenter: TAWY, Goronwy (Photonics Group, The Blackett Laboratory, Dept. of Physics, Imperial College London SW7 2AZ, London, United Kingdom)

Session Classification: SSL 5 Spectral control and tuning

Contribution ID: **108** Type: **Oral**

Highly efficient cavity-dumped Q-switched Alexandrite laser

Thursday, 1 September 2022 14:45 (15 minutes)

We present a cavity-dumped Q-switched Alexandrite laser for LIDAR applications under CW double-pass diode pumping. A record pulse energy of >500 μJ was achieved at 755 nm, 2.8 ns and 5 kHz. Furthermore, efficient laser operation at 10 – 20 kHz repetition rates is demonstrated for the first time.

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Presenter: UNLAND, Stefanie (Laser Zentrum Hannover e.V., Hannover, Germany)

Session Classification: SSL 5 Spectral control and tuning

Contribution ID: **109** Type: **Oral**

7.5W Alexandrite Ring Laser

Thursday, 1 September 2022 15:00 (15 minutes)

We report a 7.5W Alexandrite (Cr-doped Chrysoberyl) ring laser operating at 757nm. Pumping is provided by a 200 μm fibre-coupled red laser diode (640nm) with optical and slope efficiencies of 28% and 35%, respectively. This result shows potential for high-power single-longitudinal-mode operation across 720-800nm and 360-400nm by second-harmonic-generation.

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Presenter: TAWY, Goronwy (Photonics Group, The Blackett Laboratory, Dept. of Physics, Imperial College London SW7 2AZ, London, United Kingdom)

Session Classification: SSL 5 Spectral control and tuning

Contribution ID: **110** Type: **Oral**

Multi-mJ SWIR OPCPA pumped and seeded with 1.2 ps Yb:YAG laser

Thursday, 1 September 2022 15:15 (15 minutes)

We developed a cost-effective broadband SWIR-MIR mJ-level OPCPA pumped and seeded with 1.2 ps Yb:YAG laser. Pulses amplified to 2 mJ in the wavelength range 1900 – 2300 nm with a pump-to-signal record conversion efficiency of ˜30% and compressed up to 50 fs in 3-stage OPCPA based on BiBO.

Primary authors: PETRUL˙ENAS, Augustinas (State research institute Center for Physical Sciences and Technology , Vilnius, Lithuania); BUTKUT˙E, Aist˙e (State research institute Center for Physical Sciences and Technology , Vilnius, Lithuania); MACKONIS, Paulius (State research institute Center for Physical Sciences and Technology , Vilnius, Lithuania); RODIN, Aleksej (State research institute Center for Physical Sciences and Technology , Vilnius, Lithuania)

Presenter: PETRUL˙ENAS, Augustinas (State research institute Center for Physical Sciences and Technology , Vilnius, Lithuania)

Session Classification: SSL 5 Spectral control and tuning

Contribution ID: **111** Type: **Oral**

Spectroscopy and continuous wave laser operation of Tm3+-doped YScO3 mixed sesquioxide crystal

Thursday, 1 September 2022 15:30 (15 minutes)

We present spectroscopic investigations and laser operation of a Czochralski-grown Tm3+:YScO3 mixed sesquioxide crystal. We observed broadband absorption and emission spectra, desirable for ultrafast 2 μm lasers. Continuous wave laser experiments were performed using a 780 nm laser diode, and a maximum slope efficiency of 40% was achieved.

code

Primary authors: SUZUKI, Anna (Institute for Laser Science, University of Electro-Communication, Tokyo, Japan); KALUSNIAK, Sascha (Leibniz-Institut für Kristallzüchtung (IKZ), Berlin, Germany); TANAKA, Hiroki (Leibniz-Institut für Kristallzüchtung (IKZ), Berlin, Germany); BRÜTZAM, Mario (Leibniz-Institut für Kristallzüchtung (IKZ), Berlin, Germany); GANSCHOW, Steffen (Leibniz-Institut für Kristallzüchtung (IKZ), Berlin, Germany); TOKURAKAWA, Masaki (Institute for Laser Science, University of Electro-Communication, Tokyo, Japan); KRÄNKEL, Christian (Leibniz-Institut für Kristallzüchtung (IKZ), Berlin, Germany)

Presenter: SUZUKI, Anna (Institute for Laser Science, University of Electro-Communication, Tokyo, Japan)

Session Classification: SSL 5 Spectral control and tuning

Contribution ID: **112** Type: **Oral**

Single-frequency praseodymium doped YLF laser design and operation with extended wavelength coverage in the visible

Thursday, 1 September 2022 15:45 (15 minutes)

Single-frequency operation of a diode-pumped praseodymium-doped YLF laser has been demonstrated using an elegant cavity design. Over 100 mW of single-frequency operation has been achieved from 687 nm to 705 nm with one cavity arrangement. This laser system targets use in neutral strontium optical clocks.

Primary authors: WHITE, Paul (Fraunhofer Centre for Applied Phootnics, Glasgow, United Kingdom); KEMP, Alan (University of Strathclyde, Glasgow, United Kingdom); MCKNIGHT, Loyd (Fraunhofer Centre for Applied Phootnics, Glasgow, United Kingdom)

Presenter: WHITE, Paul (Fraunhofer Centre for Applied Phootnics, Glasgow, United Kingdom)

Session Classification: SSL 5 Spectral control and tuning

Contribution ID: **113** Type: **Oral**

Crystalline Grating-Waveguide Resonant reflectors

Thursday, 1 September 2022 16:30 (15 minutes)

We report the fabrication and first demonstration of crystalline grating waveguide reflectors comprising a Sc2O3 waveguide grown on a sub-wavelength-patterned sapphire substrate. Operating in the 1- and 2-micron regime, distinct TE- and TM-polarisation resonances were obtained, with reflectance approaching 50% at ˜7◦ incident angle from a single waveguide and GWS.

Primary authors: MOURKIOTI, G. (Optoelectronics Research Centre, University of Southampton, Southampton, SO17 1BJ, United Kingdom); GOVINDASSAMY, G.A. (Fraunhofer Centre for Applied Phootnics, Glasgow, United Kingdom); LI, F. (University of Eastern Finland, FI-80100 Joensuu, Finland); EASON, R.W. (Fraunhofer Centre for Applied Phootnics, Glasgow, United Kingdom); AHMED, M. Abdou (Institut für Strahlwerkzeuge, University of Stuttgart, 70569 Stuttgart, Germany); MACKENZIE, J.I. (Fraunhofer Centre for Applied Phootnics, Glasgow, United Kingdom)

Presenter: MOURKIOTI, G. (Optoelectronics Research Centre, University of Southampton, Southampton, SO17 1BJ, United Kingdom)

Session Classification: FWD 4 Spectral control and tuning

Contribution ID: **114** Type: **Oral**

Serrodyne optical frequency shifting using a nonlinear multi-pass cell

Thursday, 1 September 2022 16:45 (15 minutes)

We introduce a novel wavelength shifting concept for ultrafast lasers. We demonstrate this concept by efficiently tuning the wavelength of a 80 W, 200 fs Ytterbium-fiber laser from 1000 nm to 1060 nm. Our method supports high peak and average power operation and excellent temporal pulse quality.

Primary authors: TÜNNERMANN, Henrik (Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany); BALLA, Prannay (Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany); SALMAN, Sarper H. (Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany); FAN, Mingqi (Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany); ALISAUSKAS, Skirmantas (Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany); HARTL, Ingmar (Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany); HEYL, Christoph M. (Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany)

Presenter: TÜNNERMANN, Henrik (Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany)

Session Classification: FWD 4 Spectral control and tuning

Contribution ID: **115** Type: **Oral**

Self-generation scheme for heteronuclear compound states

Thursday, 1 September 2022 17:00 (15 minutes)

The generation of two-frequency compound states is challenging, since access to two incommensurable, group-velocity matched frequencies is required. For a possible experimental realization, we propose a self-generation scheme enabled by a spectral tunneling process. With this approach, we demonstrate the generation of a compound state from a single input pulse.

Primary authors: WILLMS, Stephanie (Cluster of Excellence PhoenixD, Leibniz University Hannover, Hannover, Germany); BOSE, Surajit (Cluster of Excellence PhoenixD, Leibniz University Hannover, Hannover, Germany); MELCHERT, Oliver (Cluster of Excellence PhoenixD, Leibniz University Hannover, Hannover, Germany); MORGNER, Uwe (Cluster of Excellence PhoenixD, Leibniz University Hannover, Hannover, Germany); BABUSHKIN, Ihar (Cluster of Excellence PhoenixD, Leibniz University Hannover, Hannover, Germany); DEMIRCAN, Ayhan (Cluster of Excellence PhoenixD, Leibniz University Hannover, Hannover, Germany)

Presenter: WILLMS, Stephanie (Cluster of Excellence PhoenixD, Leibniz University Hannover, Hannover, Germany)

Session Classification: FWD 4 Spectral control and tuning

Contribution ID: **116** Type: **Oral**

Adaptive liquid-core optical fibers for advanced soliton control

Thursday, 1 September 2022 17:15 (15 minutes)

We highlight the potential of liquid-core fibers as nonlinear devices for adaptive fiber applications featuring low-coupling losses, full fiber-system connectivity, and picojoule pump energy requirements. We experimentally showcase this potential by controlling the soliton fission point, the soliton self-frequency shift, and the tuneable emission of cascaded dispersive waves.

Primary authors: CHEMNITZ, Mario (Leibniz Institute of Photonic Technology, Jena, Germany); SCHEIBINGER, Ramona (Leibniz Institute of Photonic Technology, Jena, Germany); HOFMANN, Johannes (Leibniz Institute of Photonic Technology, Jena, Germany); JUNAID, Saher (Leibniz Institute of Photonic Technology, Jena, Germany); SCHMIDT, Markus (Leibniz Institute of Photonic Technology, Jena, Germany)

Presenter: CHEMNITZ, Mario (Leibniz Institute of Photonic Technology, Jena, Germany)

Session Classification: FWD 4 Spectral control and tuning

Contribution ID: **117** Type: **Oral**

Stabilization of the unidirectionality phenomenon observed in a fully reciprocal fiber ring laser by retarding the seeding of Raman stokes

Thursday, 1 September 2022 17:30 (15 minutes)

We report on the recent developments regarding unidirectional lasing observed in a reciprocal fiber ring laser. In this talk we present how retardation of Stokes assisted broadening results in a considerable reduction of required threshold power accompanied by stabilization enhancement in terms of output power and directionality in unidirectional regime.

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Presenter: ARSHAD, Muhammad Assad (eibniz-Institut für Photonische Technologien e. V, Jena, Germany)

Session Classification: FWD 4 Spectral control and tuning

Contribution ID: **118** Type: **Oral**

Optimization of the temporal quality of ultrafast pulses using dispersion scan based on tunable chirped fiber Bragg gratings

Thursday, 1 September 2022 17:45 (15 minutes)

By using the dispersion scan technique based on tunable chirped fiber Bragg gratings, the 650 ps pulses can be compressed to ˜650 fs with optimized pedestals. This method allows reliable pulse-characterization and optimization without movable parts and therefore improve the stability of a laser system used in 24/7 operation.

Primary authors: LIU, Meng (Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany); TAJALLI, Ayhan (Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany); FAN, Mingqi (Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany); MAHNKE, Christoph (Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany); ZHENG, Jiaan (Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany); HARTL, Ingmar (Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany)

Presenter: LIU, Meng (Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany)

Session Classification: FWD 4 Spectral control and tuning

Contribution ID: **119** Type: **Oral**

Spectral Band-Pass Filtering to Reduce the Impact of Higher Order Dis- persion in Fibre-Based Laser Amplifiers

Thursday, 1 September 2022 18:00 (15 minutes)

High repetition rates in fiber-based laser systems can be achieved through multiplication in asymmetric Mach-Zehnder interferometers. We utilize a spectral band-pass filter to reduce the asymmetric dispersion that is accumulated in the different paths to increase the compressibility of the pulses.

Primary authors: REPGEN, Paul (Department of Physics, Bilkent University, Ankara, Turkey); LACIN, Mesut (Department of Physics, Bilkent University, Ankara, Turkey); MAGHSOUDI, Amirhossein (Department of Physics, Bilkent University, Ankara, Turkey); ILDAY, Ömer (Department of Physics, Bilkent University, Ankara, Turkey)

Presenter: REPGEN, Paul (Department of Physics, Bilkent University, Ankara, Turkey)

Session Classification: FWD 4 Spectral control and tuning

Contribution ID: **120** Type: **Oral**

Synchronized and tunable femtosecond laser source from CW laser

Thursday, 1 September 2022 18:15 (15 minutes)

We present an agile novel laser source delivering clean and stabilized ultrashort pulses < 500 fs at different pulse repetition rates from 10 MHz to 100 MHz and 100 mW of average power. This laser source can be easily synchronized.

Primary authors: RENARD, William (IRISIOME, Pessac, France); CHAN, Clément (IRISIOME, Pessac, France); DUBROUIL, Antoine (FEMTOEASY, Pessac, France); LHERMITE, Jérôme (CELIA, Talence, France); SANTARELLI, Giorgio (LP2N, Talence, France); ROYON, Romain (IRISIOME, Pessac, France)

Presenter: SANTARELLI, Giorgio (LP2N, Talence, France)

Session Classification: FWD 4 Spectral control and tuning

Contribution ID: **121** Type: **Oral**

Spatially-multiplexed tunable dual-comb optical parametric oscillator at 250 MHz

Friday, 2 September 2022 08:15 (15 minutes)

We demonstrate a spatially-multiplexed dual-comb 250-MHz OPO from a single linear cavity. The adjustable repetition-rate difference is 4.1 kHz. Each idler comb has >200 mW average power at 3.5 ⊠m with 30 nm bandwidth. The OPO is wavelength-tunable from 1.36 μm to 1.7 μm and 2.9 μm to 4.17 μm.

Primary authors: BAUER, Carolin P. (Institute of Quantum Electronics, ETH Zurich, Zurich, Switzerland); PUPEIKIS, Justinas (Institute of Quantum Electronics, ETH Zurich, Zurich, Switzerland); WILLENBERG, Benjamin (Institute of Quantum Electronics, ETH Zurich, Zurich, Switzerland); BEJM, Zofia A. (Institute of Quantum Electronics, ETH Zurich, Zurich, Switzerland); PEZZOLI, Noè (Institute of Quantum Electronics, ETH Zurich, Zurich, Switzerland); PHILLIPS, Christopher R. (Institute of Quantum Electronics, ETH Zurich, Zurich, Switzerland); KELLER, Ursula (Institute of Quantum Electronics, ETH Zurich, Zurich, Switzerland)

Presenter: BAUER, Carolin P. (Institute of Quantum Electronics, ETH Zurich, Zurich, Switzerland)

Session Classification: SSL 6 Piskarskas memorial

Contribution ID: **122** Type: **Oral**

Inline Amplification of Mid-Infrared Intrapulse Difference Frequency Generation

Friday, 2 September 2022 08:30 (15 minutes)

We present an inline mid-infrared source based on intrapulse-difference-frequency-generation and subsequent optical parametric amplification, with pump recycling. Driven by an Yb-doped-fiber amplifier at 1030 nm, at a repetition rate of 250 kHz, the source delivers 1 μJ 73 fs pulses at 8 μm, corresponding to an unprecedented efficiency of 2%.

Primary authors: BOURNET, Quentin (Université Paris-Saclay, Institut d'Optique Graduate School, CNRS, Laboratoire Charles Fabry, Palaiseau, France); GUICHARD, Florent (Amplitude, 11 Avenue de Canteranne, Cité de la Photonique, Pessac, France); NATILE, Michele (Amplitude, 11 Avenue de Canteranne, Cité de la Photonique, Pessac, France); ZAOUTER, Yoann (Amplitude, 11 Avenue de Canteranne, Cité de la Photonique, Pessac, France); ZHENG, Antoine (Université Paris-Saclay, Institut d'Optique Graduate School, CNRS, Laboratoire Charles Fabry, Palaiseau, France); JOFFRE, Manuel (Laboratoire d'Optique et Biosciences, Ecole Polytechnique, CNRS, INSERM, Institut Polytechnique de Paris, Palaiseau, France); BONVALET, Adeline (Laboratoire d'Optique et Biosciences, Ecole Polytechnique, CNRS, INSERM, Institut Polytechnique de Paris, Palaiseau, France); JONUSAS, Mindaugas (Laboratoire d'Optique et Biosciences, Ecole Polytechnique, CNRS, INSERM, Institut Polytechnique de Paris, Palaiseau, France); DRUON, Frédéric (Université Paris-Saclay, Institut d'Optique Graduate School, CNRS, Laboratoire Charles Fabry, Palaiseau, France); HANNA, Marc (Université Paris-Saclay, Institut d'Optique Graduate School, CNRS, Laboratoire Charles Fabry, Palaiseau, France); GEORGES, Patrick (Université Paris-Saclay, Institut d'Optique Graduate School, CNRS, Laboratoire Charles Fabry, Palaiseau, France)

Presenter: BOURNET, Quentin (Université Paris-Saclay, Institut d'Optique Graduate School, CNRS, Laboratoire Charles Fabry, Palaiseau, France)

Session Classification: SSL 6 Piskarskas memorial

Contribution ID: **123** Type: **Oral**

High repetition rate, low noise and wavelength stable OPCPA laser system with highly efficient broadly tunable UV conversion for FEL seeding

Friday, 2 September 2022 08:45 (15 minutes)

We present the concept and first results of a novel OPCPA system with highly-efficient, broadly-tunable UV conversion for XUV/VUV FEL seeding. The start-to-end simulation allows to predict the system performance regarding tunability, beam-quality, stability and pointing, depending on the measured input parameters and fluctuations of the high-power CPA pump laser.

Primary authors: LANG, Tino (Deutsches Elektronen Synchrotron DESY, Hamburg, Germany); KAZEMI, Mehdi (Deutsches Elektronen Synchrotron DESY, Hamburg, Germany); ZHENG, Jiaan (Deutsches Elektronen Synchrotron DESY, Hamburg, Germany); HARTWELL, Samuel (Deutsches Elektronen Synchrotron DESY, Hamburg, Germany); HOANG, Nhat-Phi (Deutsches Elektronen Synchrotron DESY, Hamburg, Germany); FERRARI, Eugenio (Deutsches Elektronen Synchrotron DESY, Hamburg, Germany); ALLARIA, Enrico (Deutsches Elektronen Synchrotron DESY, Hamburg, Germany); SCHAPER, Lucas (Deutsches Elektronen Synchrotron DESY, Hamburg, Germany); HARTL, Ingmar (Deutsches Elektronen Synchrotron DESY, Hamburg, Germany)

Presenter: LANG, Tino (Deutsches Elektronen Synchrotron DESY, Hamburg, Germany)

Session Classification: SSL 6 Piskarskas memorial

Contribution ID: **124** Type: **Oral**

Visible, femtosecond, high power, ultra-broadband noncollinear optical parametric oscillator (VIS-NOPO)

Friday, 2 September 2022 09:00 (15 minutes)

The visible spectral range is difficult to cover by non-parametric laser gain media. Therefore, optical parametric oscillators offer a versatile solutions to this problem but have rather low tuning speeds. We demonstrate a quickly tunable, high power, femtosecond, noncollinear optical parametric oscillator which covers nearly the entire visible spectral range.

Primary authors: MEVERT, Robin (Leibniz University Hannover, Institute of Quantum Optics, Hannover, Germany); BINHAMMER, Yuliya (Leibniz University Hannover, Institute of Quantum Optics, Hannover, Germany); DIETRICH, Christian M. (Leibniz University Hannover, Institute of Quantum Optics, Hannover, Germany); ANDRADE, José R. Cardoso de (Max-Born Institute, Berlin, Germany); BEICHERT, Luise (Leibniz University Hannover, Institute of Quantum Optics, Hannover, Germany); BINHAMMER, Thomas (neoLASE GmbH, Hannover, Germany); FAN, Jintao (Leibniz University Hannover, Institute of Quantum Optics, Hannover, Germany); MORGNER, Uwe (Leibniz University Hannover, Institute of Quantum Optics, Hannover, Germany)

Presenter: MEVERT, Robin (Leibniz University Hannover, Institute of Quantum Optics, Hannover, Germany)

Session Classification: SSL 6 Piskarskas memorial

Contribution ID: **125** Type: **Oral**

Multi-µJ 12 µm Femtosecond GaSe-based OPCPA at 1 kHz Repetition Rate

Friday, 2 September 2022 09:15 (15 minutes)

We present a LWIR OPCPA containing a fs Cr:ZnS laser as front-end. Sub-200 fs idler pulses at 11.4 µm with 50 µJ energy are generated in the 1 kHz pulse train.

code

Primary authors: FUERTJES, Pia (Max Born Institute, Berlin, Germany); BOCK, Martin (Max Born Institute, Berlin, Germany); VON GRAFENSTEIN, Lorenz (Max Born Institute, Berlin, Germany); GRIEBNER, Uwe (Max Born Institute, Berlin, Germany)

Presenter: FUERTJES, Pia (Max Born Institute, Berlin, Germany)

Session Classification: SSL 6 Piskarskas memorial

Contribution ID: **126** Type: **Oral**

High-power nonlinear amplification of an electro-optic frequency comb at GHz repetition rates

Friday, 2 September 2022 13:30 (15 minutes)

We present an electro-optic comb seeded ultrafast nonlinear fiber amplifier at 1.03 μm. By tuning and dividing the driving radiofrequency of the EO comb, the system can deliver up to 200 W picosecond pulses compressible down to hundreds of femtoseconds at flexible GHz repetition rate.

Primary authors: YE, Hanyu (Laboratoire Photonique Numérique et Nanosciences (LP2N), Talence, France); LEROI, Florian (ALPhANOV, Talence, France); PONTAGNIER, Lilia (Laboratoire Photonique Numérique et Nanosciences (LP2N), Talence, France); SANTARELLI, Giorgio (Laboratoire Photonique Numérique et Nanosciences (LP2N), Talence, France); BOULLET, Johan (ALPhANOV, Talence, France); CORMIER, Eric (Laboratoire Photonique Numérique et Nanosciences (LP2N), Talence, France)

Presenter: YE, Hanyu (Laboratoire Photonique Numérique et Nanosciences (LP2N), Talence, France)

Session Classification: FWD 5 GHz lasers

Contribution ID: **127** Type: **Invited**

Recent Progress in Laser Crystals and Ceramics for Femtosecond Mode- Locked Lasers at ˜2 µm

Tuesday, 30 August 2022 10:00 (30 minutes)

We report on the recent progress in solid-state lasers emitting ultrashort pulses around 2 µm based on broadband-emitting gain media: disordered crystals (garnets and aluminates) and "mixed" transparent ceramics (sesquioxides) doped with Tm3+ and Tm3+/Ho3+ ions. The role of multiphonon-assisted long-wave emissions in reaching sub-50 fs pulse durations is discussed.

code

Primary authors: LOIKO, Pavel (Centre de Recherche sur les Ions, les Matériaux et la Photonique (CIMAP), UMR 6252 CNRS, Université de Caen, Caen, France); CHEN, Weidong (Fujian Institute of Research on the Structure of Matter, Chinese Academy of Sciences, Fuzhou, China); MATEOS, Xavier (FiCMA-FiCNA-EMaS, Universitat Rovira i Virgili (URV), Tarragona, Spain); CAMY, Patrice (Centre de Recherche sur les Ions, les Matériaux et la Photonique (CIMAP), UMR 6252 CNRS, Université de Caen, Caen, France); GRIEBNER, Uwe (Max Born Institute for Nonlinear Optics and Short Pulse Spectroscopy, Berlin, Germany); PETROV, Valentin (Max Born Institute for Nonlinear Optics and Short Pulse Spectroscopy, Berlin, Germany)

Presenter: LOIKO, Pavel (Centre de Recherche sur les Ions, les Matériaux et la Photonique (CIMAP), UMR 6252 CNRS, Université de Caen, Caen, France)

Session Classification: FWD 1 Planar waveguide devices

Contribution ID: **128** Type: **Oral**

Dual-wavelength pumping of a Tm:LYF laser at 2.3 µm

Friday, 2 September 2022 10:30 (15 minutes)

We report on a mid-infrared thulium laser operating on the 3H4 ⟶ 3H5 transition with a dual-wavelength pumping at 0.78 and 1.05 µm (direct and upconversion pumping schemes). The reciprocal interplay between the two pump is studied to evaluate the benefits in terms of the pump absorption and laser efficiency.

code

Primary authors: DUPONT, Hippolyte (Université Paris-Saclay, Institut d'Optique Graduate School, CNRS, Laboratoire Charles Fabry, Palaiseau, France); GUILLEMOT, Lauren (Centre de Recherche sur les Ions, les Matériaux et la Photonique (CIMAP), UMR 6252 CEA-CNRS-ENSICAEN, Université de Caen, Caen , France); LOIKO, Pavel (Centre de Recherche sur les Ions, les Matériaux et la Photonique (CIMAP), UMR 6252 CEA-CNRS-ENSICAEN, Université de Caen, Caen , France); BRAUD, Alain (Centre de Recherche sur les Ions, les Matériaux et la Photonique (CIMAP), UMR 6252 CEA-CNRS-ENSICAEN, Université de Caen, Caen , France); DOUALAN, Jean-Louis (Centre de Recherche sur les Ions, les Matériaux et la Photonique (CIMAP), UMR 6252 CEA-CNRS-ENSICAEN, Université de Caen, Caen , France); CAMY, Patrice (Centre de Recherche sur les Ions, les Matériaux et la Photonique (CIMAP), UMR 6252 CEA-CNRS-ENSICAEN, Université de Caen, Caen , France); GEORGES, Patrick (Université Paris-Saclay, Institut d'Optique Graduate School, CNRS, Laboratoire Charles Fabry, Palaiseau, France); DRUON, Frédéric (Université Paris-Saclay, Institut d'Optique Graduate School, CNRS, Laboratoire Charles Fabry, Palaiseau, France)

Presenter: DUPONT, Hippolyte (Université Paris-Saclay, Institut d'Optique Graduate School, CNRS, Laboratoire Charles Fabry, Palaiseau, France)

Session Classification: SSL 7 Tm, Ho Lasers

Contribution ID: **129** Type: **Oral**

Watt-level femtosecond Tm:(Lu,Sc)2O3 ceramic laser

Friday, 2 September 2022 11:15 (15 minutes)

We report on a SESAM mode-locked Tm:(Lu,Sc)2O3 ceramic laser in-band pumped by a Raman fiber laser at 1627 nm.An average output power up to 1.02 W at 2060 nm is achieved for transform-limited 280-fs pulses at a repetition rate of 86.5 MHz, giving an optical efficiency of 36.4%.

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Presenter: CHEN, Weidong (Chinese Academy of Sciences, Fujian, China)

Session Classification: SSL 7 Tm, Ho Lasers

Contribution ID: **130** Type: **Oral**

50-W, >2-µJ SESAM-modelocked Ho:YAG thin-disk oscillator at 2.1 µm

Friday, 2 September 2022 11:00 (15 minutes)

We report our recent progress in power-scaling of short-wave infrared laser systems by demonstrating high-power SESAM-modelocked thin-disk Ho:YAG oscillator, delivering record average power of 50 W and more than 2 µJ of pulse energy at the central wavelength of 2092 nm.

code

Primary authors: TOMILOV, Sergei (Photonics and Ultrafast Laser Science, Ruhr Universität Bochum, Bochum, Germany); WANG, Yicheng (Photonics and Ultrafast Laser Science, Ruhr Universität Bochum, Bochum, Germany); HOFFMANN, Martin (Photonics and Ultrafast Laser Science, Ruhr Universität Bochum, Bochum, Germany); HEIDRICH, Jonas (Department of Physics, Institute for Quantum Electronics, ETH Zürich, Zürich, Switzerland); GOLLING, Matthias (Department of Physics, Institute for Quantum Electronics, ETH Zürich, Zürich, Switzerland); KELLER, Ursula (Department of Physics, Institute for Quantum Electronics, ETH Zürich, Zürich, Switzerland); SARACENO, Clara (hotonics and Ultrafast Laser Science, Ruhr Universität Bochum, Bochum, Germany)

Presenter: TOMILOV, Sergei (Photonics and Ultrafast Laser Science, Ruhr Universität Bochum, Bochum, Germany)

Session Classification: SSL 7 Tm, Ho Lasers

Contribution ID: **131** Type: **Oral**

Sub-40 fs Kerr-lens mode-locked Tm,Ho:CALGO laser

Friday, 2 September 2022 10:45 (15 minutes)

In the present work, we explored further reduction of the pulse duration in ML Tm,Ho:CALGO laser via soft-aperture Kerr-lens mode-locking (KLM).Pulses as short as 37 fs were generated from KLM Tm,Ho:CALGO laser at 2061.3 nm with an average output power of 55 mW and a repetition rate of 76 MHz.

Primary authors: CHEN, Weidong (Max Born Institute for Nonlinear Optics and Short Pulse Spectroscopy, Berlin, Germany); WANG, Li (Max Born Institute for Nonlinear Optics and Short Pulse Spectroscopy, Berlin, Germany); GRIEBNER, Uwe (Max Born Institute for Nonlinear Optics and Short Pulse Spectroscopy, Berlin, Germany); ZHANG, Ge (Fujian Institute of Research on the Structure of Matter, Chinese Academy of Sciences, Fuzhou, China); LOIKO, Pavel (Centre de Recherche sur les Ions, les Matériaux et la Photonique (CIMAP), UMR 6252 CEA-CNRS- ENSICAEN, Université de Caen, Caen, France); MATEOS, Xavier (Universitat Rovira i Vir- gili, Tarragona, Spain); BAE, Ji Eun (Korea Advanced Institute of Science and Technology (KAIST), Daejeon, South Korea); ROTERMUND, Fabian (Korea Advanced Institute of Science and Technology (KAIST), Daejeon, South Korea); XU, Xiaodong (Jiangsu Normal University, Xuzhou, China — 7University of Manitoba, Winnipeg, Canada); MAJOR, Arkady (University of Manitoba, Winnipeg, Canada); PETROV, Valentin (Max Born Institute for Nonlinear Optics and Short Pulse Spectroscopy, Berlin, Germany)

Presenter: CHEN, Weidong (Max Born Institute for Nonlinear Optics and Short Pulse Spectroscopy, Berlin, Germany)

Session Classification: SSL 7 Tm, Ho Lasers

Contribution ID: **132** Type: **Oral**

LED-pumped CTH:YAG luminescent concentrator as broadband incoher- ent source in the SWIR

Friday, 2 September 2022 11:30 (15 minutes)

We have demonstrated an incoherent source centred at 2100nm with a bandwidth of 300nm. It is three times brighter spectrally than a blackbody and 10 times brighter than SWIR LEDs. This source consists of a cascade of luminescent concentrators with a Ce:YAG in first and a CTH:YAG in second.

Primary authors: LOPEZ, Lisa (Université Paris-Saclay, Institut d'Optique Graduate School, Centre National de la Recherche Scientifique, Laboratoire Charles Fabry, Palaiseau, France); PICHON, Pierre (Université Paris-Saclay, Institut d'Optique Graduate School, Centre National de la Recherche Scientifique, Laboratoire Charles Fabry, Palaiseau, France); DRUON, Frédéric (Université Paris-Saclay, Institut d'Optique Graduate School, Centre National de la Recherche Scientifique, Laboratoire Charles Fabry, Palaiseau, France); GEORGES, Patrick (Université Paris-Saclay, Institut d'Optique Graduate School, Centre National de la Recherche Scientifique, Laboratoire Charles Fabry, Palaiseau, France); BALEMBOIS, François (Université Paris-Saclay, Institut d'Optique Graduate School, Centre National de la Recherche Scientifique, Laboratoire Charles Fabry, Palaiseau, France)

Presenter: LOPEZ, Lisa (Université Paris-Saclay, Institut d'Optique Graduate School, Centre National de la Recherche Scientifique, Laboratoire Charles Fabry, Palaiseau, France)

Session Classification: SSL 7 Tm, Ho Lasers

Contribution ID: **133** Type: **Oral**

Iterative 3D modeling of thermal effects in end-pumped continuous- wave Ho3+:YAG lasers

Friday, 2 September 2022 11:45 (15 minutes)

In this work we present a highly accurate model for simulating laser resonators based on a beam propagation method algorithm including thermal effects in the laser. An experimental Ho3+:YAG resonator setup is used to validate the model, which shows excellent agreement in output power, resulting M2 and output field distribution.

code

Primary authors: RUPP, Marius (Fraunhofer Institute of Optronics, System Technologies and Image Exploitation, Ettlingen, Germany); GOTH, Katharina (Fraunhofer Institute of Optronics, System Technologies and Image Exploitation, Ettlingen, Germany); EICHHORN, Marc (Fraunhofer Institute of Optronics, System Technologies and Image Exploitation, Ettlingen, Germany); KIELECK, Christelle (Fraunhofer Institute of Optronics, System Technologies and Image Exploitation, Ettlingen, Germany)

Presenter: RUPP, Marius (Fraunhofer Institute of Optronics, System Technologies and Image Exploitation, Ettlingen, Germany)

Session Classification: SSL 7 Tm, Ho Lasers

Contribution ID: **134** Type: **Oral**

Photocathode Laser based on a 3 GHz Electro-Optical Comb Generator for the Ultrafast Electron Diffraction Facility REGAE

Friday, 2 September 2022 13:45 (15 minutes)

We present a photocathode laser generating a train of 1030 nm, picosecond pulses with a repetition rate of 3 GHz, which is converted to 257 nm by two stages of second harmonic generation. The system is able to generate bursts of microsecond duration for the application of ultrafast electron diffraction.

Primary authors: MAHNKE, Christoph (Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany); LI, Chen (Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany); TÜNNERMANN, Henrik (Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany); VIDOLI, Caterina (Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany); GROSSE-WORTMANN, Uwe (Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany); HEYL, Christoph M. (Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany); WINKELMANN, Lutz (Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany); HARTL, Ingmar (Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany)

Presenter: MAHNKE, Christoph (Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany)

Session Classification: FWD 5 GHz lasers

Contribution ID: **135** Type: **Oral**

Multi-GHz repetition rate, femtosecond pulse generation in burst mode based on a phase-only modulated electro-optic frequency comb

Friday, 2 September 2022 14:00 (15 minutes)

We present a 17.5 GHz repetition rate, femtosecond fiber laser operating in the burst mode, achieved by nonlinearly shaping and amplifying a phase-only modulated electro-optic comb at 1.03 μm. The system delivers 1.2 W output pulses compressible down to <100 fs level.

Primary authors: YE, Hanyu (Laboratoire Photonique Numérique et Nanosciences (LP2N), Talence, France); LILIA, Pontagnier (Laboratoire Photonique Numérique et Nanosciences (LP2N), Talence, France); CORMIER, Eric (Laboratoire Photonique Numérique et Nanosciences (LP2N), Talence, France); SANTARELLI, Giorgio (Laboratoire Photonique Numérique et Nanosciences (LP2N), Talence, France)

Presenter: YE, Hanyu (Laboratoire Photonique Numérique et Nanosciences (LP2N), Talence, France)

Session Classification: FWD 5 GHz lasers

Contribution ID: **136** Type: **Oral**

Versatile GHz Burst-Mode Operation in High-Power Femtosecond Laser

Friday, 2 September 2022 14:15 (15 minutes)

A new versatile patent-pending method to generate ultra-high (>2 GHz) repetition rate bursts of ultrashort laser pulses containing any number of pulses within a burst with identical pulse separation and adjustable amplitude is introduced in industrial-grade 30 W-level average power ultrashort (sub-1 ps) pulse laser system.

Primary authors: BARTULEVIČIUS, Tadas (Ekspla, Vilnius, Lithuania); LIPNICKAS, Mykolas (Ekspla, Vilnius, Lithuania); MADEIKIS, Karolis (Ekspla, Vilnius, Lithuania); BUROKAS, Raimundas (Ekspla, Vilnius, Lithuania); MICHAILOVAS, Andrejus (Ekspla, Vilnius, Lithuania)

Presenter: BARTULEVIČIUS, Tadas (Ekspla, Vilnius, Lithuania)

Session Classification: FWD 5 GHz lasers

Contribution ID: **137** Type: **Oral**

Controlled multi-pulsing dynamics for superior harmonic mode-locking

Friday, 2 September 2022 14:30 (15 minutes)

Despite the importance of multi-pulsing modelocking as a nonlinear phenomenon and a potential source of high repetition-rate ultrashort pulses, it remains poorly controlled. Guided by the slaving principle in a hierarchy of timescales, we achieved excellent control of a multi-pulsing oscillator, allowing reliable and stable harmonic modelocking with superior characteristics.

Primary authors: ŞURA, Aladin (UNAM, Institute of Materials Science and Nanotechnology, Bilkent University, Ankara, Turkey); İLDAY, Fatih Ömer (UNAM, Institute of Materials Science and Nanotechnology, Bilkent University, Ankara, Turkey)

Presenter: ŞURA, Aladin (UNAM, Institute of Materials Science and Nanotechnology, Bilkent University, Ankara, Turkey)

Session Classification: FWD 5 GHz lasers

Contribution ID: **138** Type: **Oral**

Femtosecond OPO pumped by a high power ytterbium rod-type fiber laser mode locked at harmonic repetition rates

Friday, 2 September 2022 14:45 (15 minutes)

An OPO pumped by femtosecond pulses delivered by a large-mode-area, ytterbium-doped, rod-type fiber laser mode locked at harmonic repetition rates. The repetition rate is changed by adjusting the pulse polarization inside the laser cavity. The OPO delivers femtosecond signal pulses that are tunable from 1450nm to 1700nm.

Primary authors: FREYSZ, Valerian (ALPhANOV, Institut d'optique d'Aquitaine, Rue François Mitterrand, 33400 Talence, France); FREYSZ, Eric (Laboratoire Ondes et Matière d'Aquitaine (LOMA),UMR 5798, CNRS-Université Bordeaux, 33400 Talence, France)

Presenter: FREYSZ, Valerian (ALPhANOV, Institut d'optique d'Aquitaine, Rue François Mitterrand, 33400 Talence, France)

Session Classification: FWD 5 GHz lasers

Contribution ID: **139** Type: **Oral**

Sputtered dielectric coatings for high average power petawatt laser technology

Wednesday, 31 August 2022 09:00 (15 minutes)

Highest peak powers pave new insights for fundamental research. The performance of laser beam lines is mainly determined by the quality of the optical components. This paper presents novel approaches to manufacture laser mirrors with optimized laser induced damage threshold applying ion beam sputtering up to substrate sizes of 550mm.

Primary authors: WILLEMSEN, Thomas (LASEROPTIK GmbH, Garbsen); GAUCH, Melanie (LASEROPTIK GmbH, Garbsen); GROß, Tobias (LASEROPTIK GmbH, Garbsen); EHLERS, Henrik (LASEROPTIK GmbH, Garbsen); EBERT, Wolfgang (LASEROPTIK GmbH, Garbsen)

Presenter: WILLEMSEN, Thomas (LASEROPTIK GmbH, Garbsen)

Session Classification: Keynote Session and SSL 3

Contribution ID: **140** Type: **Poster**

Multimodal optical device for non-contact skin examination

Thursday, 1 September 2022 12:00 (2 hours)

The melanoma incidence is rising for all skin types. While being responsible for 75 % of deaths from skin cancer, melanoma is highly curable at early stages. We demonstrate a multimodal device for the early detection of melanoma that comprises non-contact dermoscopy, 3D measurement technology and Mueller matrix polarimetry.

Primary authors: JÜTTE, Lennart (Hannoversches Zentrum für Optische Technologien); SHARMA, Gaurav (Hannoversches Zentrum für Optische Technologien); ROTH, Bernhard (Hannoversches Zentrum für Optische Technologien)

Presenter: JÜTTE, Lennart (Hannoversches Zentrum für Optische Technologien)

Session Classification: Lunch and Poster Session 2

Contribution ID: **141** Type: **Poster**

Towards optical integrated ion traps

Thursday, 1 September 2022 12:00 (2 hours)

Ion traps are a promising platform for the realization of high-fidelity quantum information processors. To scale the systems to a large number of qubits, integrated photonic components are crucial for guiding and manipulating laser light on a chip-scale level. We will present our first design of surface-electrode ion-trap chips with integrated optics.

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Presenter: GRIMPE, Carl-Frederik (Physikalisch-Technische Bundesanstalt, Bundesallee 100, 38116 Braunschweig, Germany)

Session Classification: Lunch and Poster Session 2

Contribution ID: **142** Type: **Oral**

Spectral Two-Photon Quantum Interference via Electro-optic Modulation Between Light States Of Different Photon Statistics

Tuesday, 30 August 2022 18:25 (10 minutes)

Frequency-domain two-photon quantum interference between a thermal field and a heralded-state is studied theoretically and experimentally, revealing the dependency of visibility on the multiphoton components within the heralded-state.

Primary authors: KHODADAD KASHI, Anahita (Institute of Photonics, Leibniz University, Hannover); KUES, Michael (Institute of Photonics, Leibniz University, Hannover)

Presenter: KHODADAD KASHI, Anahita (Institute of Photonics, Leibniz University, Hannover)

Session Classification: Postdeadline Session

Contribution ID: **143** Type: **Oral**

Environmentally Stable Harmonic Modelocked All-Fibre Oscillator

Tuesday, 30 August 2022 18:35 (10 minutes)

We present an environmentally stable laser oscillator, mode-locked through nonlinear-polarisation evolution, that is entirely based on polarisation-maintaining fibres, except for the Yb-doped gain fibre. The laser is reliably operated at the fourth harmonic repetition rate, at 250 MHz, with output pulse energies of 1 nJ.

Primary authors: LAÇIN, Mesut (Department of Physics, Bilkent University, Ankara); REPGEN, Paul (Department of Physics, Bilkent University, Ankara); ILDAY, F. Ömer

Presenter: REPGEN, Paul (Department of Physics, Bilkent University, Ankara)

Session Classification: Postdeadline Session

Contribution ID: **144** Type: **Oral**

Spectral broadening of 2-mJ ultrashort pulses in a convex-concave multipass cell in ambient air

Tuesday, 30 August 2022 18:55 (10 minutes)

We demonstrate nonlinear spectral broadening of 2.1-mJ, 670-fs pulses at 210 W of average power in a focus-free compact 61.5 cm distance, convex-concave MPC in ambient air. We show pulse broadening from 21 nm to 24.5 nm, and we demonstrate compressibility down to 134 fs with excellent spectral homogeneity.

Primary authors: OMAR, Alan (Ruhr-Universität Bochum, Bochum); VOGEL, Tim (Ruhr-Universität Bochum, Bochum); HOFFMANN, Tim (Ruhr-Universität Bochum, Bochum); SARACENO, Clara J. (Ruhr-Universität Bochum, Bochum)

Presenter: OMAR, Alan (Ruhr-Universität Bochum, Bochum)

Session Classification: Postdeadline Session

Contribution ID: **145** Type: **Oral**

Broadband Conical Third Harmonic Generation in Fused Silica with Femtosecond Laser Pulses

Tuesday, 30 August 2022 19:05 (10 minutes)

We report on conical third harmonic generation that accompanies supercontinuum generation in fused silica using broadly tunable femtosecond pulses. Third harmonic radiation carries a broadband, octave-spanning spectrum, with propagation angles of individual spectral components precisely following the entire phase matching curve, as attested by the measurements of angle-resolved spectra.

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Session Classification: Postdeadline Session

Contribution ID: **146** Type: **not specified**

Self-Starting Kerr-Lens-Modelocked 1-GHz Ti:sapphire Oscillator Pumped by a Single Laser Diode

Tuesday, 30 August 2022 19:15 (10 minutes)

We present a 108-fs Kerr-lens-modelocked, diode-pumped 1-GHz Tisapphire laser. Self-starting operation producing 103 mW was obtained for 1-Watt pumping with a single 520-nm laser diode. From 1 Hz1 MHz the relative intensity noise was 0.01 and the repetition rate was externally referenced with a phase error of 1.7 mrad.

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Broadband continuum generation by double-stage hybrid multi-pass multi-plate spectral broadening

Tuesday, 30 August 2022 18:45 (10 minutes)

We report the compression of 1 ps duration, 112 muJ energy pulses from an YbYAG amplifier to 11 fs and the generation of an octave-spanning spectrum by two hybrid multi-pass multi-plate spectral broadening stages. Both, the compression factor and the output pulse duration set new records for bulk multi-pass cells.

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Session Classification: Postdeadline Session