

High Intensity Lasers and High Field Phenomena (HILAS)




February 16-18 2011, Ceylan Intercontinental Istanbul Hotel, Istanbul, Turkey

HILAS - a new topical meeting highlighting the dramatic recent advances in research on high field optical science and high intensity sources. [Learn more.](#)

We look forward to seeing you in Istanbul!

[Istanbul Tour](#)

Agenda of Session Now Available!

- [Abstracts](#) (, 1.3 MB)
- [Agenda of Sessions](#) (, 84 KB)
- [Key to Authors and Presiders](#) (, 109 KB)



Take advantage of all HILAS has to offer:

- Access to technical sessions
- [Tabletop exhibit](#)
- [Short courses for professional development](#)
- Renowned experts presenting [invited talks](#)
- Poster sessions providing one-on-one discussion time with presenters
- Post Deadline Session reporting critical breakthroughs
- Networking events

Proceedings from OSA conferences are archived in [Optics InfoBase](#), OSA's online library for OSA flagship journals and partnered and copublished journals.

This event is part of the Lasers, Sources and Related Photonic Devices Congress, allowing attendees to access to all meetings within the Congress for the price of one and to collaborate on topics of mutual interest.

View the conference program and plan your itinerary for the conference



- Browse speakers and the [agenda of sessions](#)
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- [Plan](#) and [print](#) your personal itinerary before coming to the conference
- [Key to Authors and Presiders](#)
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[Lasers, Sources and Related Photonic Devices: OSA Optics & Photonics Congress](#)

- [Advanced Solid-State Photonics \(ASSP\)](#)
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- High-Intensity Lasers and High-Field Phenomena (HILAS)

Sponsor:



High Intensity Lasers and High Field Phenomena (HILAS)

February 16-18 2011, Ceylan Intercontinental Istanbul Hotel, Istanbul, Turkey

Program

[Itinerary Planner](#)

[Invited Speakers](#)

[Tour](#)

[Special Events](#)

[Schedule at a Glance](#)

The aim of the High-Intensity Sources and High-Field Phenomena meeting is to assemble a multi disciplinary group of participants to present and exchange breakthrough ideas relating to the physics and applications of high field sources, and related developments in high intensity lasers and related technology.

The conference topics: includes both fundamental science and applications of high field phenomena, as well as technical aspects related to source development. High quality experimental and theoretical contributions are solicited in any topical area related to the coverage of the conference, including the following:

- high-peak power lasers and high-intensity laser-matter interactions
- recent progress in terawatt to petawatt lasers and the amplification of few cycle pulses
- laser technology for fusion and laser based EUV and X-ray sources
- strong field laser science including interactions with atoms, molecules, clusters, and plasmas
- advances in attosecond science
- high harmonic generation, high-field rescattering physics, relativistic nonlinear phenomena, intense pulse propagation
- plasmas in ultrahigh fields, and laser based particle acceleration

A number of distinguished [invited speakers](#) have been invited to present at the meeting. In addition, the organizers have planned a number of special events to make your meeting experience more enjoyable!

The program for High-Intensity Lasers and High-Field Phenomena (HILAS) will be held Monday, February 14 through Thursday, February 17.

View the conference program and plan your itinerary for the conference



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- [Abstracts](#)

Tour

Explore the main cultural highlights of Istanbul's opulent past - the elegant Blue Mosque and ancient Hippodrome, the magnificent Hagia Sophia, the grandiose Topkapi Palace and the glittering Grand Bazaar.

These are full-day tours offered during the Laser, Sources and Related Photonic Devices Congress. Admission to the sites, an English speaking guide, and lunch is included in the price.

Seating is limited so reserve your space now!



Figure 1 Blue Mosque – Gazella Tours

Tour at a Glance:

- ◇ Blue Mosque – Hippodrome
- ◇ Hagia Sophia
- ◇ Topkapi Palace
- ◇ Lunch break at a local restaurant
- ◇ Topkapi Palace
- ◇ Grand Bazaar
- ◇ Return to the Hotel

Two Options:

Tuesday, February 15, 2011 • 9:00–
15:45

Tour Price per Person \$70 USD

[Detailed Itinerary](#)

Friday, February 18, 2011 • 9:00–16:30

Tour Price per Person \$80 USD

[Detailed Itinerary](#)



Figure 2 Grand Bazaar – Gazella Tours

To reserve your seat

1. Complete the [Reservation Form](#) (be sure to select the day and number of people)
2. Email your completed reservation form to reservation@gazella.com

Any incomplete information will delay or prevent the processing of your reservation. Once your reservation request has been processed Gazella Tours will email you a confirmation.

Special Events

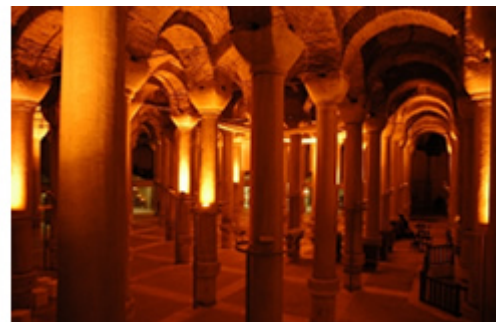
Congress Banquet

Wednesday, 16 February 2011

18:30 – 21:00

Location: Binbirdirek Cistern

The 1001 Columns Cistern, also called the 'Philoxenus Cistern' or 'Binbirdirek Cistern' in Turkish, is the oldest known cistern in Istanbul. Thought to have been constructed in 330 AD by the Roman Senator Philoxenus during the reign of the Byzantine Emperor Constantine, its original purpose was to serve the Lavus Palace. Later it was converted into a silk manufacturing warehouse during Ottoman times until falling into



disrepair. Closed for decades, it was restored a few years ago and functions as a cafe and venue for exhibitions, functions and concerts. – mydestinationinfo.com & *Lonely Planet*

Banquet Speaker:



Optical Fibres: The Untold Story, David Payne, *Univ. of Southampton, UK*

A global internet of 100 million kilometres and the prospect of megawatt fibre lasers? Personal reflections and untold stories.

D. Payne obtained a PhD in 1976 from the University of Southampton, and is now a professor of photonics and Director of the Optoelectronics Research Centre (ORC). He has published over 600 Conference and Journal papers and is co-inventor on over 20 patents. Over the last forty years, he has made several key contributions in optical fibre communications and laser technology. His work in fibre fabrication in the 1970s resulted in many of the special fibres used today, including the revolutionary erbium-doped fibre amplifier (EDFA) and kilowatt-class fibre lasers for manufacturing and defence. He has received the UK Rank Prize for Optics, the 2001 Mountbatten Medal, the 2004 Kelvin Medal for the application of science to engineering, the 2007 IEEE Photonics Award, the 1991 IEEE/LEOS Tyndall Award, the 1998 Benjamin Franklin Medal for Engineering, and is Laureate of the 2008 Millennium Technology Prize. He is also an Eduard Rhein Laureate and a foreign member of the Norwegian and the Russian Academies of Sciences. He is a Fellow of the Royal Society and of the Royal Academy of Engineering. As an entrepreneur, he founded York Technologies, (now PK Technology Inc.) and SPI Lasers plc (now part of the Trumpf Gruppe).

One conference banquet ticket is included in the Full Technical Fee. Guest tickets may be purchased for US\$ 95 per person.

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Chairs & Committee Members

The Technical Program Chairs and Committee Members are integral to the success of the meeting. These volunteers dedicate countless hours to planning, including such critical activities as raising funds to support the event, securing invited speakers, reaching out to colleagues to encourage submissions, reviewing papers, and scheduling sessions. On behalf of OSA, its Board, and its entire staff, we extend enormous gratitude to the following members of the High-Intensity Lasers and High-Field Phenomena (HILAS) Technical Program Committee.

On this page:

[Program Committee](#)
[Information for Conference Chairs and Committee Members](#)
[Information for Session Chairs/Presiders](#)

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If you are a member of the committee and have any questions or concerns at any point along the way, please refer to the [information below](#) or contact your [program manager](#).

Information for Conference Chairs and Committee Members

- View the [Calendar of Deadlines for the Meeting](#)
- View the [Chairs' Manual](#)
- View the Call for Papers (coming soon)
- View [Fundraising Information](#)

- View Exhibit and Sponsorship Information (coming soon)
- View [Author/Presenter Information](#)
- View [Peer Review Instructions](#)
- View [Scheduling Instructions](#)
- View [Student Travel Grant Information](#)
- View Registration Information (coming soon)
- View Housing Information (coming soon)

Information for Session Chairs/Presiders

Presiders are requested to identify themselves at least 20 minutes before the session begins to the audiovisual personnel for a quick review of equipment and procedures.

Guidelines

Remember to introduce yourself as the presider and announce the session. The total amount of time allotted for each paper will be listed in the online program as well as in the conference program book. Generally, invited talks are allowed 25 minutes for presentation and 5 minutes for discussion. Generally, contributed talks are allowed 12 minutes for presentation and 3 minutes for discussion. Generally, tutorials are allotted 45 minutes to 1 hour, with 5 minutes for discussion. A 60-minute mechanical timer will be available for your use. We recommend that the timer is set two minutes prior to the end of the presentation time in order to provide a warning to wrap up the talk and start the discussion period. Notify the authors of this warning system. It is also important to remind the speaker to repeat the questions asked from the audience.

Maintaining the scheduled timing of papers is very important. In cases where the paper is withdrawn or the speaker does not show, use the time for an extended question period for authors of previously presented papers or call a break. PLEASE DO NOT START TALKS EARLIER THAN THEY ARE SCHEDULED. All requests to modify the program schedule should be directed to the program chair.

We encourage you to watch a [short podcast](#) featuring Dr. Ben Eggleton (*CUDOS, Univ. of Sydney, Australia*) giving tips on how to be a great presider. Or [download notes](#) from the podcast.

Speaker Check-in Sheet

Once you arrive at your session room, you'll find a folder at the podium or on the table at the front of the room. This folder will contain a sheet for each session in that room. Please be sure to remove only your session sheet. The check-in sheet will list the talks within your session, the order in which they will be given, and the name of the author giving the presentation. Please be sure to check the box to indicate which speakers presented during the session. Make note of any no-show speakers or replacement speakers. Also, please try to estimate the number of attendees at the session at the start of the session, about halfway into the session, and at the end of the session; note these counts where indicated in the upper right corner. Leave the completed sheet in the folder in the pocket marked "Completed" and leave the folder on the podium or table for the next session presider. The check-in sheet serves two purposes: 1) to assist you in running an effective session and 2) to help us ensure that the appropriate speakers' files are archived on OSA [Optics InfoBase](#) after the meeting. Only those authors who attend and present are included in the InfoBase, so it's important that you make note of any presenters who are absent.

[View a sample check-in sheet.](#)

IMPORTANT NOTICE: Due to licensing restrictions, the use of music in presentations, including video presentations, is prohibited. If a speaker uses music during his/her presentation, please inform Meeting Management immediately.

Lasers, Sources & Related Photonic Devices Congress

- ◆ Advance Solid-State Photonics (ASSP)
- ◆ Advances in Optical Materials (AIOM)
- ◆ High-Intensity Lasers and High-Field Phenomena (HILAS)
- ◆ Fiber Laser Applications (FILAS)

Exhibit: 15-17 February 2011



Istanbul, Turkey

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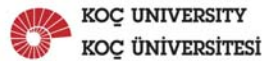
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No photography is permitted in the exhibit hall.

Thank you!

Lasers, Sources and Related Photonic Devices

OSA Optics & Photonics Congress 2011

Update Sheet

Withdrawals

AIThB02 AIFB3
AIThB03 AIFB6
AIThB11 HWC13
AIThB13 HFB3
AIThB17

Presider Updates

Kent E. Mattsson, *Technical Univ. of Denmark, Denmark*, will preside over the session, AIThD, Crystal and Glass Fibers II

Author Block Update

The author block for **HWA3** should read: Xiaowei Chen, Aurelien Ricci, Arnaud Malvache, Aurelie Jullien, Rodrigo Lopez-Martens; *Lab d'Optique Appliquee, Palaiseau Cedex, France*.

Presenter Changes

HWB5 will be presented by Paraskevas Tzallas, IESL, FORTH, *Heraklion, Greece*.

AMB10, ATuD4, and FWB3 will be presented by Lawrence Shah, *CREOL College of Optics and Photonics, Univ. of Central Florida, USA*.

HThE3 will be presented by P. D. Mason, *STFC Rutherford Appleton Laby, Central Laser Facility, UK*

HThC5 will be presented by Rainer Hoerlein, *Ultrafast Innovations, Germany*

Session Changes

AIThF • AIOM Postdeadline Session ends at 19.15.

Special Events

Please join the HILAS and FILAS chairs for an informal "rump" session to discuss the 2011 inaugural offerings of these two meetings and to brainstorm for how to improve in 2012.

FILAS Rump Session

Wednesday, 16 February 2011
13.00–14.00
Marmara

HILAS Rump Session

Thursday, 17 February 2011
20.00–21.00
Citronelle

Welcome Event

Please join the ASSP Chairs on Sunday at the City Lights Bar within the hotel from 18.00–19.00.

Student Awards

The ASSP Student Award sponsored by Lockheed Martin will be presented following session AWB on Wednesday, 16 February.



The FILAS Student Award sponsored by Multiwave Photonics will be presented during the IPG dinner on Thursday, 17 February.



Additional Support provided by:



Postdeadline Paper Programs

Postdeadline Paper Programs are available at Registration.

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Invited Speakers

Keynote Speaker:

Thursday, 17 February 2011

HThA1 • 8:00 a.m., Thomson/Compton Scattering Light Sources, Christopher P. Barty, *LLNL, USA*

Invited Speakers:

Wednesday, 16 February 2011

HWA1 • 8:15 a.m., Technologies for Integrated High Power Ultrashort-Pulse Fiber Lasers, A. Galvanauskas, *Univ. of Michigan, USA*

HWB1 • 11:30 a.m., Scaling of Strong-Field Atomic Physics, L. DiMauro, *Ohio State Univ., USA*

Joint with ASSP JWC3 • 3:00 p.m., Progress Toward an Exawatt Laser, T. Ditmire, *Univ. of Texas at Austin, USA*

Thursday, 17 February 2011

HThA2 • 8:45 a.m., High Current Electron Beam Produced with Laser Plasma Accelerators, V. Malka, *LOA, CNRS/ENSTA/Polytechnique, France*

HThB1 • 10:30 a.m., Generalized Double Optical Gating, a Route to High Power Isolated Attosecond Sources, Z. Chang, *Kansas State Univ., USA*

HThB2 • 11:00 a.m., High-Energy Isolated Attosecond Pulses and Applications to Molecular Physics, F. Calegari, F. Ferrari, M. Lucchini, C. Vozzi, S. Stagira, G. Sansone, M. Nisoli, *Politecnico di Milano, Italy*

HThB5 • 12:00 p.m., Bright Coherent Ultrafast X-rays from mid-IR Lasers, T. Popmintchev¹, M. C. Chen¹, P. Arpin¹, M. Gerrity¹, M. Seaberg¹, B. Zhang¹, D. Popmintchev¹, G. Andriukaitis², T. Balciunas², O. D. Mücke², A. Pugzlys², A. Baltuska², M. Murnane¹, H. Kapteyn¹; ¹*JILA and Univ. of Colorado at Boulder, Boulder, CO, USA*, ²*Photonics Inst., Vienna Univ. of Technology, Austria*

HThC1 • 2:30 p.m., Driving Laser-plasma Interactions with Few-cycle Pulses, R. Lopez Martenz, *LOA, France*

HThD1 • 4:30 p.m., High Repetition Rate mJ-level Few-Cycle Pulse Laser Amplifier for XUV-FEL seeding, F. Tavella, *DESY, Germany*

HThE1 • 6:30 p.m.

Towards Joule-scale Few-cycle Pulses—Progress and Challenges of Short-Pulse Pumped OPCPA, Zsuzsanna Major, *MPQ, Garching, Germany*

Friday, 18 February 2011

HFA1 • 8:00 a.m., Watching Ultrafast Motion: High Harmonic Spectroscopy of Electron Dynamics in Molecules, O. Smirnova, *Max-Born-Inst., Germany*

HFA5 • 9:15 a.m.

Molecular-Alignment-Based Frequency-Resolved Optical Gating, H. Zeng, *East China Normal Univ., China*

HFB1 • 10:30 a.m., Intense Terahertz Fields: Electric and Magnetic Nonlinearities on the Sub-cycle Scale, R. Huber, *Univ. of Konstanz, Germany*

HFB2 • 11:00 a.m., Visualization of Nuclear and Electron Motion by Ultrafast Electron Diffraction, P. Baum, *MPQ, Garching, Germany*

Lasers, Sources and Related Photonics Devices Optics & Photonics Congress Agenda of Sessions

	<i>Bosphorus, P Floor</i>	<i>Dolmabahce Foyer, R Floor</i>	<i>Anadolu, P Floor</i>	<i>Citronelle, N Floor</i>	<i>Marmara, P Floor</i>
Sunday, 13 February					
7.00–18.00	Registration Open				
8.00–18.00	Short Courses				
Monday, 14 February					
7.00–18.00	Registration Open				
8.15–10.00	AMA • Nonlinear Sources				
10.00–10.30	Coffee Break, <i>Dolmabahce Foyer, R Floor</i>				
10.00–11.30		AMB • ASSP Student Paper Session			
11.30–12.45	AMC • Coherent Beam Combining				
12.45–14.15	Lunch Break (on your own)				
14.15–16.00	AMD • Ultrafast Sources I				
16.00–16.30	Coffee Break, <i>Dolmabahce Foyer, R Floor</i>				
16.30–18.00	AME • Frequency Combs				
20.00–21.30	AMF • Postdeadline Papers Session				
Tuesday, 15 February					
7.30–18.30	Registration Open				
8.00–10.00	ATuA • Mid-Infrared Lasers				
10.00–10.30	Coffee Break, <i>Dolmabahce Foyer, R Floor</i>				
10.00–16.45	Exhibits Open, <i>Dolmabahce Ballroom, R Floor</i>				
10.00–11.30		ATuB • ASSP Poster Session I			
11.30–13.00	ATuC • Ultrafast Oscillators				
13.00–14.30	Lunch Break (on your own)				
14.30–16.15	ATuD • Fiber and Waveguide Lasers				
16.15–16.45	Coffee Break, <i>Dolmabahce Foyer, R Floor</i>				
16.45–18.15	ATuE • Near Infrared Lasers				
Wednesday, 16 February					
7.00–18.00	Registration Open				
8.00–10.00	JWA • Joint ASSP/FILAS Session		AIWA • Transparent Ceramics and Laser Crystals I	HWA • High-Intensity Fiber and Hollow Waveguide Sources	
10.00–10.30	Coffee Break, <i>Dolmabahce Foyer, R Floor</i>				
10.00–16.30	Exhibits Open, <i>Dolmabahce Ballroom, R Floor</i>				
10.00–11.30		AWA • ASSP Poster Session II			
11.30–13.00	JWB • Joint ASSP/AIOM Session			HWB • Strong-field Atomic Physics	FWA • Fiber Lasers and Applications I (starts at 11.00)
13.00–14.30	Lunch Break (on your own)				

	<i>Bosphorus, P Floor</i>	<i>Dolmabahce Foyer, R Floor</i>	<i>Anadolu, P Floor</i>	<i>Citronelle, N Floor</i>	<i>Marmara, P Floor</i>
Wednesday, 16 February (continued from previous page)					
14.30–16.00	JWC • Joint ASSP/HILAS Session		AIWB • Crystal and Glass Fibers I		FWB • Fiber Laser Frequency Combs
16.00–16.30	Coffee Break, <i>Dolmabahce Foyer, R Floor</i>				
16.30–18.00	AWB • Ultrafast Sources II (ends at 17.45)	HWC • HILAS Poster Session	AIWC • Nonlinear Crystals and Processes I		FWC • Fiber Lasers in LIDAR and Space
18.30–21.00	Joint Conference Banquet				
Thursday, 17 February					
7.30–17.30	Registration Open				
8.00–10.00			AIThA • Transparent Ceramics and Laser Crystals II	HThA • Particles in Intense Fields	FThA • Fiber Lasers and their Applications
10.00–10.30	Coffee Break, <i>Dolmabahce Foyer, R Floor</i>				
10.00–16.30	Exhibits Open, <i>Dolmabahce Ballroom, R Floor</i>				
10.30–12.30		AIThB • AIOM Poster Session (ends at 11.30)		HThB • Enhanced Higher-Order Harmonic Generation	FThB • Short Pulse Fiber Lasers
11.30–13.00			AIThC • Specific Applications		
13.00–14.30	Lunch Break (on your own)				
14.30–16.00			AIThD • Crystal and Glass Fibers II	HThC • Plasma Interactions	FThC • Fiber Lasers and Applications II (starts at 14.00)
16.00–16.30	Coffee Break, <i>Dolmabahce Foyer, R Floor</i>				
16.30–18.00		FThE • FILAS Poster Session	AIThE • Nonlinear Crystals and Processes II	HThD • CEP-controlled High-field Optical Parametric Sources	
18.30–20.00			AIThF • AIOM Postdeadline Session	HThE • Joule-class High-field Facilities	
18.15–21.30		IPG Reception & Dinner (by invitation only)			
Friday, 18 February					
7.30–11.00	Registration Open				
8.00–10.00			AIFA • Nonlinear Crystals and Processes III (ends at 9.45)	HFA • Molecules in a Strong Field	
10.00–10.30	Coffee Break, <i>Dolmabahce Foyer, R Floor</i>				
10.30–12.30			AIFB • Waveguides and Laser Patterning	HFB • Emerging Techniques	
Key to Shading	ASSP	AIOM	FILAS	HILAS	Joint Sessions

• **Sunday, 13 February 2011** •

7.00–18.00

Registration Open

8.00–18.00

Short Courses

• **Monday, 14 February 2011** •

Registration Open

7.00–18.00

Opening Remarks

8.00–8.15

AMA • Nonlinear Sources

Bosphorus, P Floor

8.15–10.00

Alphan Sennaroglu; Koç Univ. Turkey, Presider

AMA1 • 8.15

Invited

Quasi-Phase-matched Nonlinear Optics: History and Prospects, *Martin M. Fejer¹; ¹E. L. Ginzton Lab, Stanford Univ., USA.*

Microstructured ferroelectrics and semiconductors have enabled quasi-phase-matching as a practical technique in nonlinear devices ranging from femtosecond chirped pulse parametric amplifiers to single-photon frequency convertors. Development of materials and device applications will be reviewed, and future prospects discussed.

AMA2 • 9.00

Twin-beam Optical Parametric Generation in Nonlinear Photonic Crystals, *Katia Gallo¹, Martin Levenius¹, Fredrik Laurell¹, Valdas Pasiskevicius¹; ¹Applied Physics, KTH - Royal Inst. of Technology, Sweden.*

We demonstrate dual-beam optical parametric generation in hexagonally poled LiTaO₃. The experimental results indicate a coherent contribution to the parametric gain arising from multiple resonances in the nonlinear lattice.

AMA3 • 9.15

VUV 193 nm emission from micro-twinned crystal quartz, *Sunao Kurimura¹, Masaki Harada^{1,2}, Ken-ichi Muramatsu², Motoi Ueda², Muneyuki Adachi^{1,3}, Tsuyoshi Yamada³, Tokio Ueno³; ¹Nat'l Inst. for Mat. Sci, Tsukuba, Japan; ²Nikon Corp., Sagamihara, Japan; ³Nidek Co., Ltd, Gamagori, Japan.* VUV light at 193 nm was generated by second harmonic generation in quasi-phase-matched crystal quartz. Specially developed mechanical module stabilized a micron-scale twin structure realizing stable QPM wavelength converter to 193 nm.

AMA4 • 9.30

VECSEL-Pumped Tunable CW Raman Laser, *Daniele C. Parrotta¹, Walter Lubeigt¹, Alan J. Kemp¹, David Burns¹, Martin D. Dawson¹, Jennifer E. Hastie¹; ¹Inst. of Photonics, Univ. of Strathclyde, Glasgow, UK.*

Intracavity pumping of a continuous-wave KGW Raman laser within an InGaAs VECSEL is reported. VECSEL tuning resulted in tunable Raman laser emission from 1136–1154.5 nm with total output power up to 120 mW.

AMA5 • 9.45

1.6W Continuous-wave Diamond Raman Laser, *Walter Lubeigt¹, Vasili Savitski¹, Gerald M. Bonner^{1,2}, Jennifer E. Hastie¹, Martin D. Dawson¹, David Burns¹, Alan J. Kemp¹; ¹Inst. of Photonics, Univ. of Strathclyde, Glasgow, UK; ²MQ Photonics, Macquarie Univ., Sydney, NSW, Australia.* Low-birefringence, single-crystal, synthetic diamond is used as a Raman medium in a Nd:YVO₄ laser. CW output powers of 1.6 W at the Raman wavelength were recorded. In quasi-CW operation, on-time output powers of 2.8 W were obtained.

Dolmabahce Foyer, R Floor

10.00–10.30

Coffee Break

AMB • ASSP Student Paper Session

Dolmabahce Foyer, R Floor

10.00–11.30

AMB01

Dispersion compensation schemes for femtosecond Kerr-lens mode-locked Cr:ZnSe lasers, *Melisa N. Cizmeciyan¹, Huseyin Cankaya¹, Adnan Kurt², Alphan Sennaroglu¹; ¹Koc Univ., Istanbul, Turkey; ²Teknofil, Inc., Istanbul, Turkey.* By employing different dispersion compensation schemes, we obtained femtosecond pulses with duration as short as 92 fs and pulse energy as high as 0.45 nJ from a Kerr-lens mode-locked Cr:ZnSe laser operated near 2420 nm.

AMB02

3D simulations for an OPCPA chain including nonlinear refractive index effects, *Alexandre Thai¹, Christoph Skrobel^{2,3}, Philip K. Bates¹, Gunnar Arisholm⁴, Zsuzsanna Major^{2,3}, Ferenc Krausz^{2,3}, Stefan Karsch^{2,3}, Jens Biegert^{1,5}; ¹ICFO, Castelldefels (Barcelona), Spain; ²Max-Planck-Inst. für Quantenoptik, Garching, Germany; ³Ludwig-Maximilians-Univ. München, Garching, Germany; ⁴Forsvarets ForskningsInst.t (Norwegian Defence Res. Establishment), Kjeller, Norway; ⁵ICREA-Institucio Catalana de Recerca i Estudis Avançats, Barcelona, Spain.* We present 3D OPCPA simulations for a PW system with 3.67 J, 4 fs transform limited pulses. We show that including nonlinear refractive index effects, the energy is reduced by ~11% and the Fourier limit increased by ~17.5%.

AMB03

High pulse energy, picosecond MgO:PPLN optical parametric oscillator using a single-mode fiber for signal feedback, *Florian Kienle¹, Peh Siong Teh¹, Shaif-UI Alam¹, Corin B. E. Gawith², David C. Hanna¹, David J. Richardson¹, David P. Shepherd¹; ¹Optoelectronics Res. Ctr., Univ. of Southampton, Southampton, UK; ²Covesion Ltd., Romsey, UK.* We demonstrate a high-pulse-energy, synchronously-pumped (7.19 MHz), 100 ps, widely tunable MgO:PPLN OPO providing 0.49 μJ

pulses at 1.5 μ m and 0.19 μ J pulses at 3.6 μ m. A single-mode fiber is employed in the OPO to keep the 42m-long cavity compact.

AMB04

Enhanced Mode-hop-free Idler Tuning Range with Frequency Stabilization of a Signal Resonant Optical Parametric Oscillator,

Emeline Andrieux¹, Abdallah Rihan¹, Thomas Zanon¹, Malo Cadoret¹, Jean-Jacques Zondy¹; ¹Length section, LNE-CNAM, La Plaine Saint Denis, France. A continuous-wave signal-resonant optical parametric oscillator is frequency stabilized at the kilohertz level to the transmission peak of an external high finesse Fabry-Perot cavity, allowing a widely tunable mode-hop-free operation over 500 GHz.

AMB05

Phase Locking Thousands of Laser, *Micha Nixon¹, Eitan Ronen¹, Moti Fridman¹, Asher A. Friesem¹, Nir Davidson¹; ¹Weizmann Inst. of Science, Rehovot, Israel.* Experimental realization for phase locking several thousands of lasers arranged in a variety of 2D geometries is presented. Coupling ranges and sign are easily controlled giving rise to a variety of intriguing phase structures.

AMB06

Coherent Beam Combining at 1064 nm Employing an Erbium Doped Fiber Amplifier for Phase Control, *Henrik Tünnermann^{1,2}, Jörg Neumann^{1,2}, Dietmar Kracht^{1,2}, Peter Wessels^{1,2}; ¹Laser Zentrum Hannover e.V., Hannover, Germany; ²Ctr. for Quantum Engineering and Space-Time Res. - QUEST, Hannover, Germany.* We investigated the phase shift induced by a pumped erbium fiber on a 1064 nm signal. Our results were applied to demonstrate all fiber coherent beam combining with an erbium fiber as a phase actuator.

AMB07

All-fiber isolator at multi-watt level operation, *Chunte A. Lu¹, Gerry T. Moore¹; ¹Air Force Res. Lab, Kirtland AFB, NM, USA.* We experimentally demonstrated an all-fiber optical isolator at 1064nm with 0.5dB insertion loss and 14dB isolation operating at input power of 8W. This result shows that magnetic quasi-phase matching technique is feasible for multi-watt level.

AMB08

Inhibition of stimulated Raman scattering using long period gratings in double clad fiber amplifiers, *Dirk Nodop¹, Cesar Jauregui¹, Florian Jansen¹, Jens Limpert¹, Andreas Tünnermann¹; ¹Inst. of Applied Physics, Univ. of Jena, Jena, Germany.* Inhibition of SRS in doubleclad fiber amplifiers using LPGs is reported. Three LPGs couple the Stokes wavelength from core to cladding and double the extractable Raman free output power of a test pulse amplifier.

AMB09

Influence of pump noise and modulation on in-fiber amplification of broadband pulses, *Kutan Gurel¹, Ibrahim L. Budunoglu¹, Cagri Senel¹, Punya P. Paltani¹, F Oemer Ilday¹; ¹Physcis Dept., Bilkent Univ., Ankara, Turkey.* We investigate experimentally and theoretically the coupling of pump laser modulation and noise fluctuations to the

output power of a fiber amplifier for broadband pulse trains using the modulation transfer function approach.

AMB10

Monolithic Polarization Maintaining Thulium Fiber Laser using High and Low Reflectivity FBGs, *Christina C. Willis¹, Joshua Bradford¹, Robert Sims¹, Lawrence Shah¹, Martin Richardson¹, Jens Thomas², Ria Becker², Christian Voigtländer², Andreas Tünnermann^{2,3}, Stefan Nolte^{2,3}; ¹CREOL, Univ. of Central Florida, Orlando, FL, USA; ²Inst. of Applied Physics, Friedrich-Schiller-Univ., Jena, Germany; ³Fraunhofer Inst. for Applied Optics and Precision Engineering, Jena, Germany.* A monolithic thulium laser consisting of polarization maintaining single-mode fiber and integrated high and low reflectivity fiber Bragg gratings is demonstrated with an output power of 16 W at a wavelength of 2054 nm.

AMB11

Robust Single-Mode High Average Power Very Large Mode Area Fiber Amplifiers, *Fabian Stutzki¹, Florian Jansen¹, Tino Eidam^{1,2}, Cesar Jauregui¹, Jens Limpert^{1,2}, Andreas Tünnermann^{2,3}; ¹Inst. for Applied Physics, FSU Jena, Jena, Germany; ²Helmholtz-Inst. Jena, Jena, Germany; ³Fraunhofer Inst. for Applied Optics and Precision Engineering (IOF), Jena, Germany.* Ytterbium-doped Large Pitch Fibers with very large mode area are investigated in a high power fiber amplifier. An average output power of 294W is demonstrated, maintaining robust single-mode operation with a mode field diameter of 62 μ m.

AMB12

0.5 μ J femtosecond pulses from a giant-chirp ytterbium fiber oscillator, *Nikolai Chichkov^{1,2}, Christian Hapke^{1,2}, Katharina Hausmann^{1,2}, Thomas Theeg^{1,2}, Dieter Wandt^{1,2}, Uwe Morgner^{2,3}, Jörg Neumann^{1,2}, Dietmar Kracht^{1,2}; ¹Laser Development, Laser Zentrum Hannover e.V., Hannover, Germany; ²Ctr. for Quantum-Engineering and Space-Time Res. - QUEST, Hannover, Germany; ³Inst. für Quantenoptik, Leibniz Univ. Hannover, Hannover, Germany.* We present a mode-locked ytterbium fiber oscillator with output pulse energies of 537 nJ. The oscillator operates at a repetition rate of 4.3 MHz and the output pulses are compressed to durations of 760 fs.

AMB13

All-Fiber Regenerative Amplifier for Nanosecond Optical Pulses at 1053 nm, *Ran Xin¹, Jonathan Zuegel¹; ¹Lab for Laser Energetics, Univ. of Rochester, Rochester, NY, USA.* An all-fiber regenerative amplifier employing amplified spontaneous emission suppression techniques amplifies 2.5-ns, 1053-nm, 180-pJ pulses to 118 nJ, achieving a gain of 28 dB, 23 nm off the gain peak of Yb-doped fiber.

AMB14

Chirped-Pulsed Yb³⁺:YAG Regenerative Amplifier using a Total-Reflection Active-Mirror, *Yasuki Takeuchi¹, Hiroaki Furuse², Akira Yoshida¹, Takuya Nakanishi¹, Toshiyuki Kawashima³, Hirofumi Kan³, Takayoshi Norimatsu¹, Noriaki Miyanaga¹, Junji Kawanaka¹; ¹Inst. of Laser Engineering, Osaka Univ., Osaka, Japan; ²Inst. for Laser Technology, Osaka, Japan; ³Hamamatsu Photonics K.K., Shizuoka, Japan.* The first

chirped-pulse regenerative amplifier using a total-reflection active-mirror with a cryogenic Yb³⁺:YAG/YAG monolithic composite ceramic was demonstrated. 3.6 mJ of output pulse energy was obtained at 100 Hz repetition rate.

AMB15

Efficient Resonantly Inband Pumped Er:YVO₄ Laser Emitting around 1.6 μm, Christian Brandt¹, V. N. Matrosova², Klaus Petermann¹, Günter Huber¹; ¹Inst. of Laser-Physics, Univ. of Hamburg, Hamburg, Germany; ²SOLIX LTD., Minsk, Belarus. Efficient resonantly inband pumped laser operation around 1.6 μm wavelength is demonstrated in Er(1 at.%):YVO₄. The maximum slope efficiency obtained is 57.9% and the maximum output power was 2.3 W.

AMB16

Broadband, diode-pumped Yb:SiO₂ multicomponent glass laser, Markus Loeser¹, Fabian Roeser¹, Almud Reichelt¹, Franziska Kröll¹, Mathias Siebold¹, Ulrich Schramm¹, Stephan Grimm², Johannes Kirchhof², Doris Litzkendorf²; ¹Res. Ctr. Dresden-Rossendorf, Dresden, Germany; ²IPHT, Jena, Germany. We successfully demonstrated cw lasing of ytterbium-doped silica multicomponent glass bulk material. A slope efficiency of 43% and a tuning range from 1010-1080 nm have been achieved.

AMB17

Generation of an Azimuthally Polarized Laser Beam from an End-pumped Laser Cavity with a c-cut Nd:YVO₄ Crystal, Kazufumi Yamagishi¹, Yuichi Kozawa¹, Shunichi Sato¹; ¹Inst. of Multidisciplinary Res. for Advanced Materials, Tohoku Univ., Sendai, Japan. An azimuthally polarized beam with the output power of 750 mW was demonstrated by a new generation scheme from an end-pumped c-cut Nd:YVO₄ crystal using a soft aperture effect of the pump beam.

AMB18

On the potential of 914 nm pumping of Nd:YVO₄ for laser operation at 1064 nm, Xavier Délen¹, François Balembois¹, Olivier Musset², Patrick Georges¹; ¹Laboratoire Charles Fabry, Palaiseau, France; ²Laboratoire Interdisciplinaire Carnot de Bourgogne, Dijon, France. 1064 nm-Nd:YVO₄ lasers were pumped at 808 nm and 914 nm. The comparative study shows that 914 nm-pumping is adapted for cw operation whereas 808 nm-pumping provides higher population inversion interesting for Q-switched operation.

AMB19

Spectroscopy and Laser Action of the Nd-Doped Mixed Sesquioxide Lu_{2-x}Sc_xO₃, Fabian Reichert¹, Klaus Petermann¹, Günter Huber¹, Philipp Koopmann¹, Matthias Fechner¹, Christian Brandt¹; ¹Inst. of Laser Physics, Univ. of Hamburg, Hamburg, Germany. Efficient cw laser action of a Nd-doped mixed sesquioxide is shown at 952.7 nm. The maximum output power and slope efficiency of the quasi three-level-transition ⁴F_{3/2}→⁴I_{9/2} are 356mW and 49 %, respectively.

AMB20

Determination of the thermo-optic coefficient and thermal

conductivity of ytterbium doped sesquioxides ceramics at cryogenic temperature, Vanessa Cardinali^{1,2}, Emilie Marmois¹, Bruno Le Garrec¹, Gilbert Bourdet²; ¹Dept. of Power Lasers, C.E.A., Le Barp, France; ²LULL, Ecole Polytechnique, Palaiseau Cedex, France. This paper presents thermo-mechanical measurements of ytterbium doped sesquioxides of yttrium, scandium and lutetium ceramics at cryogenic temperature. Measurements are also done on ytterbium doped CaF₂ and YAG.

AMB21

Negative Thermo-optic Coefficients and Athermal Directions in Pure and Yb-doped Monoclinic KY(WO₄)₂, Pavel A. Loiko¹, Konstantin V. Yumashev¹, Nikolai V. Kuleshov¹, Anatoly A. Pavlyuk²; ¹Ctr. for Optical Materials and Technologies, Belarusian National Technical Univ., Minsk, Belarus; ²Inst. of Inorganic Chemistry, Siberian Branch of Russian Acad. of Sciences, Novosibirsk, Russian Federation. Thermo-optic coefficients were measured in pure and Yb(20at.%) -doped monoclinic KY(WO₄)₂ crystal by a beam deviation method in the visible and near-IR. Athermal propagation directions were calculated in KY(WO₄)₂ at the wavelength of 1.06 μm.

AMB22

Fabrication of composite Yb:YAG lasers by use of the room-temperature-bonding technique, Konosuke Takayanagi¹, Kenjiro Hara¹, Takuya Ishikawa¹, Ken Imura¹, Ichiro Shoji¹; ¹Dept. of Electrical, Electronic, and Communication Engineering, Chuo Univ., Tokyo, Japan. We have succeeded in fabricating composite Yb:YAG lasers using the roomtemperature-bonding technique. YAG/Yb:YAG/YAG showed better slope efficiency than YAG/Yb:YAG, which indicates the efficient heat removal through the bonded interfaces.

AMB23

Thermal lensing effects of edge-pumped Yb:YAG/YAG thin disk laser with crisscross edges, Mustafa Yadegari^{1,2}, Hamed Aminpour²; ¹Physics, Univ. of Guilan, Rasht, Islamic Republic of Iran; ²physics, Iranian Ctr. of Laser Science and Technology, tehran, Islamic Republic of Iran. Thermal behavior in an edge-pumped Yb:YAG thin disk laser is presented. Ray tracing method is used to calculate absorbed power through the disk. Temperature distribution, stress, displacement in crystal and optical path differences are calculated.

AMC • Coherent Beam Combining

Bosphorus, P Floor

11.30–12.45

Benoit Boulanger; Univ. de Grenoble, France, Presider

AMC1 • 11.30

120 μJ Pulses from Coherently Coupled Femtosecond Fiber Laser Systems, Enrico Seise^{1,2}, Arno Klenke¹, Sven Breitkopf¹, Marco Plötner¹, Jens Limpert^{1,2}, Andreas Tünnermann^{1,2}; ¹Inst. of Applied Physics, Friedrich Schiller Univ. Jena, Jena, Germany; ²Helmholtz Inst. Jena, Jena, Germany. We present the coherent combination of high-energy

ultrashort pulses from two fiber CPA channels. We achieved a combining efficiency of 91% with a compressed pulse duration of 800 fs and 120 μ J pulse energy.

AMC2 • 11.45

Coherent combining of two femtosecond fiber chirped pulse amplifiers, Louis Daniault¹, Marc Hanna¹, Laurent Lombard², Didier Goular², Pierre Bourdon², Frédéric Druon¹, Patrick Georges¹; ¹Laboratoire Charles Fabry de l'Inst. d'Optique, Palaiseau, France; ²ONERA, Palaiseau, France. We demonstrate coherent combining of two fiber chirped pulse amplifiers seeded by a common oscillator. A phase stability of $\lambda/20$ is obtained using a fiber electro-optic phase modulator, and the recombined pulsewidth is 485 fs.

AMC3 • 12.00

All-Fiber Phase-locked Multi-core Photonic Crystal Fiber Laser, Michio Matsumoto¹, Tetsuya Kobayashi¹, Akira Shirakawa¹, Ken-ichi Ueda¹; ¹Inst. for laser science, UEC, Chofu, Japan. We propose and demonstrated all-fiber in-phase mode selection in an Yb-doped multi-core photonic crystal fiber laser. A high slope efficiency of 71% and significantly improved beam profile by fill-factor enlargement were achieved.

AMC4 • 12.15

Coherent Combining with Imperfect Beams, Gregory Goodno¹, Chun-Ching Shih¹, Joshua Rothenberg¹; ¹Northrop Grumman Aerospace Systems, Redondo Beach, CA, USA. Coherent combining efficiency losses from spatially and temporally mismatched input fields are quantified in terms of normalized variances of the field parameters. We derive expressions for Gaussian beams relevant for coherent fiber arrays.

AMC5 • 12.30

CEP Stable, High Repetition Rate, Two-cycle Pulses from an OPCPA System with μ J Pulse Energies, Marcel Schultze¹, Thomas Binhammer², Guido Palmer¹, Moritz Emons¹, Tino Lang¹, Uwe Morgner^{1,3}; ¹Inst. of Quantum Optics, Leibniz Univ. Hannover, Hannover, Germany; ²VENTEON Laser Technologies GmbH, Garbsen, Germany; ³Ctr. for Quantum Engineering and Space-Time Res. (QUEST), Hannover, Germany. We present a compact two-stage OPCPA system producing CEP-stabilized pulses with compressed pulse energies of more than 3 μ J and durations of less than 6 fs at high repetition rates between 100 and 500 kHz.

12.45–14.15

Lunch Break (on your own)

Bosphorus, P Floor

14.15–16.00

F Oemer Ilday; Bilkent Univ., Turkey, Presider

AMD1 • 14.15

Invited

Carrier-Envelope-Phase Stable Few-Optical-Cycle Pulses from Optical Parametric Amplifiers, Daniele Brida¹, Cristian Manzoni^{2,3}, Dario Polli^{1,2}, Giulio Cerullo^{1,2}; ¹Politecnico di Milano, Milano, Italy; ²IFN-CNR, Milano, Italy. We review different schemes of ultrabroadband optical parametric amplification to generate few-optical-cycle light pulses tunable from visible to mid-IR. We demonstrate passive, all-optical carrier-envelope-phase stabilization of such pulses.

AMD2 • 14.45

CEP Stable, High Repetition Rate, Two-cycle Pulses from an OPCPA System with μ J Pulse Energies, Marcel Schultze¹, Thomas Binhammer², Guido Palmer¹, Moritz Emons¹, Tino Lang¹, Uwe Morgner^{1,3}; ¹Inst. of Quantum Optics, Leibniz Univ. Hannover, Hannover, Germany; ²VENTEON Laser Technologies GmbH, Garbsen, Germany; ³Ctr. for Quantum Engineering and Space-Time Res. (QUEST), Hannover, Germany. We present a compact two-stage OPCPA system producing CEP-stabilized pulses with compressed pulse energies of more than 3 μ J and durations of less than 6 fs at high repetition rates between 100 and 500 kHz.

AMD3 • 15.00

High stability OPCPA in the mid-infrared, Alexandre Thai¹, Olivier Chalus¹, Philip K. Bates¹, Jens Biegert^{1,2}; ¹ICFO, Castelldefels (Barcelona), Spain; ²ICREA-Institucio Catalana de Recerca i Estudis Avancats, Barcelona, Spain. We present an all solid state mid-IR system operating at 100 KHz with unprecedented power fluctuations of less than 0.75% rms over 30 min and which has delivered 3.8 μ J 67 fs pulses at 3.1 μ m.

AMD4 • 15.15

Continuum generation in laser host materials with pump pulse durations covering the entire femtosecond regime, Maximilian Bradler¹, Eberhard Riedle¹; ¹LS fuer BioMolekulare Optik, Munich, Germany. We demonstrate supercontinuum generation in laser host materials with pulses from 7 fs to 1 ps. At most μ J pulses are necessary for stable continua with smooth, plateau-like spectra from deep UV to the infrared.

AMD5 • 15.30

High Peak and Average Power Ultrashort Pulses from Double Stage Nonlinear Compression of a Fiber Chirped Pulse Amplification System, Steffen Hädrich^{1,2}, Henning Carstens¹, Jan Rothhardt^{1,2}, Jens Limpert^{1,2}, Andreas Tünnermann^{1,3}; ¹Inst. of Applied Physics, Jena, Germany; ²Helmholtz Inst. Jena, Jena, Germany; ³Fraunhofer Inst. for Applied Optics and Precision Engineering, Jena, Germany. Double stage nonlinear compression by use of self-phase modulation in noble gases is used to shorten 1 mJ, <600 fs pulses at 50 kHz. This

leads to 35 fs, 380 μ J (19 W), 5.7 GW pulses.

AMD6 • 15.45

Generation of ultrafast visible and mid-IR pulses via adiabatic frequency conversion, Barry D. Bruner¹, Haim Suchowski¹, Ayelet Ganany-Padowicz², Irit Juwiler³, Ady Arie², Yaron Silberberg¹; ¹Dept. of Physics of Complex Systems, Weizmann Inst. of Science, Rehovot, Israel; ²Dept. of Physical Electronics, Faculty of Engineering, Tel Aviv Univ., Tel Aviv, Israel; ³Dept. of Electrical and Electronics Engineering, Sami Shamoon College of Engineering, Ashdod, Israel. A method for efficient, broadband sum and difference frequency generation of ultrafast pulses is demonstrated. Using aperiodically poled nonlinear crystals and a single step nonlinear mixing process, conversion efficiencies up to 50% are reported.

Dolmabahce Foyer, R Floor

16.00–16.30

Coffee Break

AME • Frequency Combs

Bosphorus, P Floor

16.30–18.00

Uwe Griebner; Max Born Inst., Germany, Presider

AME1 • 16.30

Invited

Rapid, High Resolution Frequency Comb Measurements, Ian R. Coddington, Fabrizio R. Giorgetta, Esther Baumann, William C. Swann, Nathan R. Newbury¹ Optoelectronics Division (815.00), NIST, Boulder, CO, USA. Frequency combs serve as an extremely high accuracy reference across broad portions of the optical spectrum. Dual frequency combs harness this accuracy and allow for fast and highly flexible measurements of passive and active sources.

AME2 • 17.00

4.4-5.4 μ m frequency comb from a subharmonic OP-GaAs OPO pumped by a femtosecond Cr:ZnSe laser, Konstantin Vodopyanov¹, Evgeni Sorokin², Peter Schunemann⁴, Irina Sorokina³; ¹Photonics Inst., TU Vienna, Vienna, Austria; ²Physics Dept., NTNU, Trondheim, Norway; ³BAE Systems, Nashua, NH, USA; ⁴Stanford Univ., Stanford, CA, USA. More than 1000-nm-wide frequency comb centered at 4.9 μ m was produced in an OPO based on orientation-patterned GaAs (OP-GaAs), synchronously pumped at 182 MHz repetition rate by femtosecond Cr:ZnSe laser pulses at 2.45 μ m.

AME3 • 17.15

Development and characterization of all-normal dispersion fiber laser for frequency comb generation, Cagri Senel¹, F Oemer Ilday¹, Oguzhan Kara², Ramiz Hamid³, Cihangir Erdogan³; ¹Physics, Bilkent Univ., Ankara, Turkey; ²Physics Engineering, Hacettepe Univ., Ankara, Turkey; ³National Metrology Inst. (UME), Kocaeli, Turkey. Development of an all-normal-dispersion Yb-doped fiber laser-based frequency comb is reported. Repetition-frequency stabilization to the cesium standard, amplitude and phase noise measurements indicate low-noise performance.

AME4 • 17.30

Broadband Phase-Noise Suppression in a Yb-based Optical Frequency Comb, Dylan C. Yost¹, Arman Cingoz¹, Thomas K. Allison¹,

Jun Ye¹, Axel Ruehl², Ingmar Hartl², Martin E. Fermann²; ¹JILA- Univ. of Colorado Boulder, Boulder, CO, USA; ²IMRA America Inc., Ann Arbor, MI, USA. We achieve 10dB suppression of phase-noise in a Yb-based frequency comb with 300kHz bandwidth by implementing robust intensity servo. The results are important for precision comb applications including femtosecond enhancement cavities.

AME5 • 17.45

Lab Demonstration and Characterization of a Green Astro-comb, Chih-Hao Li¹, Guoqing Chang², Li-Jin Chen², David F. Phillips¹, Franz Kärtner², Ronald L. Walsworth¹; ¹Harvard-Smithsonian Ctr. for Astrophysics, Cambridge, MA, USA; ²MIT, Cambridge, MA, USA. A green astro-comb, generated from a Ti:Sa comb laser, broaden by a photonic crystal fiber and filtered by a Fabry-Perot cavity, is demonstrated. We characterized the unwanted mode suppression with a quick and broadband method.

AMF • Postdeadline Paper Session

Bosphorus, P Floor

20.00–21.30

• Tuesday, February 15, 2011 •

7.30–18.30

Registration Open

ATuA • Mid-Infrared Lasers

Bosphorus, P Floor

8.00–10.00

Mark Dubinskii; US Army Res. Lab, USA, Presider

ATuA1 • 8.00

Invited

Progress in mid-IR Cr²⁺ and Fe²⁺ doped II-VI Materials and Lasers, Sergey Mirov¹; ¹Dept. of Physics, Univ. of Alabama at Birmingham, Birmingham, USA. Recent advances in Cr²⁺ and Fe²⁺ doped mid-IR polycrystalline, hot-pressed ceramic, waveguides, powders, powders in the liquid suspension and polymer-film, and quantum dot laser materials fabrication and lasing under optical excitation are presented.

ATuA2 • 8.30

Broadly tunable high-power continuous-wave Cr²⁺:CdS laser, Evgeni Sorokin¹, Dmitry Klimentov², Irina Sorokina², Vladimir Kozlovskii³, Yu Korostelin³, A. Landman³, Yuri Podmar'kov³, Yan Skasyrskii³, Mikhail Frolov³; ¹TU Vienna, Vienna, Austria; ²Physics Dept., NTNU, Trondheim, Norway; ³P.N. Lebedev Physical Inst., Moscow, Russian Federation. We report spectroscopic and laser study of Cr²⁺:CdS laser - an attractive material for 3 μm room-temperature operation. 1.8 W of output power, continuously tunable over 1000 nm from 2240 nm to 3285 nm was demonstrated.

ATuA3 • 8.45

Femtosecond Tm:Ho codoped double tungstate lasers around 2060 nm, Alexander Lagatsky¹, Dolores Serrano², Concepción Cascales², Carlos Zaldo², Tom Brown¹, Wilson Sibbett¹; ¹Physics and Astronomy, Univ. of St Andrews, St Andrews, UK; ²Inst.o de Ciencia de Materiales de Madrid, Madrid, Spain. Femtosecond modelocking in Tm, Ho-codoped NaY(WO₄)₂ and KY(WO₄)₂ lasers is reported. Transform-limited 191-fs pulses are produced at 2060 nm at a repetition frequency of 144 MHz. Output power exceeds 200 mW during femtosecond pulse generation.

ATuA4 • 9.00

330 mJ, 2 μm, Single Frequency, Ho:YLF Slab Amplifier, Hencharl J. Strauss¹, D. Preussler¹, O. J. Collett¹, M. J. Esser¹, C. Jacobs¹, C. Bollig¹, W. Koen¹, K. Nyangaza¹; ¹National Laser Ctr., CSIR, Pretoria, South Africa. A single-frequency double pass Ho:YLF slab amplifier delivering pulses up to 330 mJ at 2064 nm was demonstrated. It was end-pumped with a Tm:YLF slab laser and seeded with 57 mJ of single frequency pulses.

ATuA5 • 9.15

Long Wavelength Laser Operation of Tm:Sc₂O₃ at 2116 nm and Beyond, Philipp Koopmann^{1,2}, Samir Lamrini², Karsten Scholle², Peter Fuhrberg², Klaus Petermann¹, Günter Huber¹; ¹Inst. of Laser-Physics,

Hamburg, Germany; ²LISA laser products, Katlenburg-Lindau, Germany. We report on the high power laser operation of Tm:Sc₂O₃ with a slope efficiency of 41 % and an output power of 26 W at 2116 nm. A tunability from 1975 nm to 2168 nm is presented.

ATuA6 • 9.30

Generation and Stability Characterization of Fiber-Based Difference Frequency Generation Tuned Through Controlled Soliton Self-Frequency-Shifting, David Winters¹, Philip Schlup¹, Randy Bartels¹; ¹Colorado State Univ., Fort Collins, CO, USA. We present a soliton-tuned source of mid-infrared (MIR) ultrafast laser pulses. Characterization of the source stability is presented through measurements of intensity noise and timing jitter of the pulses used for frequency conversion.

ATuA7 • 9.45

Yb-fiber MOPA Pumped Optical Parametric Oscillator for Frequency-Swept Broadband Mid-Infrared Spectroscopy, Alissa Silva^{1,2}, Ian Lindsay^{1,2}; ¹Univ. of Bristol, Bristol, UK; ²Ctr. for Nanoscience and Quantum Information, Bristol, UK. A Ytterbium-fiber-pumped continuous wave optical parametric oscillator rapidly tunable in the 2.73-4.02 μm region is described. The system is well-suited to applications requiring a high-brightness source for spectroscopy of solid and liquid samples.

Dolmabahce Foyer, R Floor

10.00–10.30

Coffee Break

Dolmabahce Ballroom, R Floor

10.00–16.45

Exhibits Open

ATuB • ASSP Poster Session I

Dolmabahce Foyer, R Floor

10.00–11.30

ATuB01

Novel Actively Cooled Split-Disk Nd:glass Laser Amplifier for High-Energy Applications with Improved Repetition Rate, Jonathan Zuegel¹, Milton J. Shoup¹, John H. Kelly¹, Curt Frederickson²; ¹Univ. of Rochester/Lab for Laser Energetics, Rochester, NY, USA; ²Continuum, Inc., Santa Clara, CA, USA. Design details and laser-performance simulations for a novel water-cooled, split-disk laser-amplifier concept are presented. The amplifier will produce high-energy laser pulses (>500 J) with shot rates faster than one shot per minute.

ATuB02

Ultrafast nonlinear refractivity of Lead Lanthanum Zirconate Titanate Ceramics, Atsushi Sugita¹, Yasumasa Kawata¹, Naoki Wakiya¹, Hisao Suzuki¹; ¹Shizuoka Univ., Hamamatsu, Japan. Here we will report that nonlinear refractivity and its temporal response of Lead Lanthanum Zirconate Titanate ceramics were almost comparable to those of

SrTiO₃ single crystal, one of the most excellent solid-state optical Kerr materials.

ATuB03

Enhanced Detection of a Longitudinal Electric Field for a Linearly Polarized Gaussian Beam, Yuichi Kozawa¹, Shunichi Sato¹; ¹Inst. of Multidisciplinary Res. for Advanced Materials, Tohoku Univ., Sendai, Japan. Enhanced detection of a weak longitudinal electric field produced by focused linearly and circularly polarized Gaussian beams through a second harmonic generation process is demonstrated by effectively utilizing a strong transverse electric field.

ATuB04

Spectroscopic properties and 2 μm laser operation of Ho:BaYLuF₈ crystal, Yingxin Bai¹, Jirong Yu², Brian Walsh², Songsheng Chen², Mulugeta Petros³, Norman Barnes², Upendra Singh², Arlete Cassanho⁴, Hans Jessen⁴; ¹Science and Systems Applications, Incorporation, Hampton, VA, USA; ²NASA Langley Res. Ctr., Hampton, VA, USA; ³STC, Hampton, VA, USA; ⁴AC material, Tarpon Springs, FL, USA. A novel 2μm laser crystal, Ho:BaYLuF₈, has been grown. Spectra for the transition between ⁵I₇ and ⁵I₈ of this crystal are measured. Laser operations in both linear and ring cavity configuration are demonstrated.

ATuB05

Yb-free Er-doped 976 nm Pumped Large Mode Area Fiber Amplifier with 67 W of Output Power, Vincent Kuhn^{1,2}, Dietmar Kracht^{1,2}, Jörg Neumann^{1,2}, Peter Wessels^{1,2}; ¹Laser Development Dept., Laser Zentrum Hannover e.V., Hannover, Germany; ²Ctr. for Quantum-Engineering and Space-Time Res. - QUEST, Hannover, Germany. We demonstrate for the first time the power-scaling of Yb-free Er-doped fiber amplifiers to levels of multiple 10W. The achieved output power of 67W is the highest value ever reported for an Yb-free Er-doped fiber-system.

ATuB06

2.5 mJ, sub-nanosecond pulses from single-crystal fiber amplifier in a kHz MOPA system, Igor Martial^{1,2}, François Balembois¹, Julien Didierjean², Patrick Georges¹; ¹Laboratoire Chalres Fabry de l'Inst. d'Optique, Palaiseau cedex, France; ²FiberCryst, Lyon, France. A Master Oscillator Power Amplifier configuration using a Nd:YAG single-crystal fiber to amplify a passively Q-switched microlaser is presented. We achieved the amplification of 80 μJ, sub-nanosecond pulses to the multi-millijoule regime.

ATuB07

Gain switched laser diode based all-fiber ps laser source emitting simultaneously at 8 different wavelengths in the NIR region, Hakan Sayinc^{1,2}, Sebastian Kanzelmeyer¹, Katharina Hausmann^{1,2}, Thomas Theeg¹, Jörg Neumann^{1,2}, Dietmar Kracht^{1,2}; ¹Laser Zentrum Hannover e.V., Hannover, Germany; ²Quantum Engineering and Space-Time Res. (QUEST), Hannover, Germany. In this contribution we demonstrate a gain switched laser diode based all-fiber ps laser source, capable of

emitting pulses simultaneously at 8 different wavelengths in the region between 1.06 μm and 1.59 μm.

ATuB08

Review and evaluation of the nonlinear capabilities of RECOB (RE = Y, Gd) oxyborate crystals for SHG, Pascal Loiseau^{1,2}, Takunori Taira², Gerard Aka¹; ¹LCMCP, ENSCP, Paris, France; ²Laser Res. Ctr., IMS, Okazaki, Japan. NLO oxyborate crystals exhibit some outstanding properties that this work critically reviews. 50% SHG conversion efficiency was obtained at 0.23 and 0.37 MW IR peak power for YCOB (15 mm) and LBO (10 mm) respectively.

ATuB09

All-fiber Yb-doped CW and pulsed laser sources operating near 980nm, Mathieu Laroche¹, Celia Bartolacci¹, Gilles Hervé¹, Girard Sylvain¹, Thierry Robin², Benoit Cadier²; ¹CIMAP, Caen, France; ²IXFIBER, Lannion, France. We present a CW/pulsed master oscillator-power amplifier (MOPA) fiber source operating near 980nm and based on an Yb-doped fiber pumped by a Nd-doped fiber laser at 930nm. Up to 2.1W was obtained in CW regime with a slope efficiency of 81%.

ATuB10

A 469 nm blue laser to pump Pr³⁺ doped fluoride crystals, Patrice Camy¹; ¹CIMAP, Caen, France. We report CW visible laser operation of Pr³⁺ doped LiLuY₄, LiYF₄ and KY₃F₁₀ crystals pumped with a compact, intracavity frequency-doubled diode-pumped Nd:YAG laser at 469.12 nm, thus opening another way for power scaling of Pr-lasers.

ATuB11

Mode-locked all-solid photonic bandgap fiber laser, Ammar Hideur¹, Caroline Lecaplain¹, Lovamamy Rasoloniaina¹, Olga Egorova², Evgeni Dianov², Sergei Semjonov², Jérémy Michaud¹; ¹CNRS UMR 6614 CORIA, Saint etienne du Rouvray, France; ²Fiber Optics Res. Ctr., Moscow, Russian Federation. We report on a mode-locked Yb-doped solid photonic bandgap fiber operating in the all-normal dispersion regime. The laser delivers 4ps pulses with 21 nJ energy. These pulses are extra-cavity compressed down to 230 fs.

ATuB12

8 W Actively Mode-Locked Ytterbium Doped Fiber Laser Delivering 10 ps pulses at 40 MHz, Pierre Deslandes^{1,2}, Damien Sangla², Julien Saby¹, Francois Salin¹, Eric Freysz²; ¹Eolite Systems, Pessac, France; ²Univ. de Bordeaux, CNRS, CPMOH, UMR 5798, Talence, France. We present an actively mode-locked laser based on an ytterbium doped single-mode double-clad photonic crystal fiber of 30-μm core diameter pumped with 13.5-W at 976-nm generating 8-W of average power and 10-ps pulses at 40-MHz.

ATuB13

Analysis of a high-energy, diode-pumped Yb:CaF₂ disk laser, Markus Loeser¹, Mathias Siebold¹, Franziska Kroll¹, Fabian Roeser¹, Joerg Koerner², Joachim Hein², Ulrich Schramm¹; ¹Res. Ctr. Dresden-Rossendorf,

Dresden, Germany; ²Inst. of Optics and Quantum Electronics, Jena, Germany. We present gain measurements and a time-resolved thermal lens analysis of a diode-pumped Yb:CaF₂ disk laser. A lens power of 0.05dpt and small-signal gain of 5.2 amplifier were achieved at full pump power.

ATuB14

Diode-pumped Tm:Lu₂O₃ thin disk laser, Martin Schellhorn¹, Philipp Koopmann^{2,3}, Karsten Scholle², Peter Fuhrberg², Klaus Petermann³, Günter Huber³; ¹ISL, French German Res. Inst., Saint-Louis, France; ²LISA laser products, Katlenburg-Lindau, Germany; ³ILP, Univ. of Hamburg, Hamburg, Germany. We report the first diode-pumped Tm:Lu₂O₃ laser operation in thin disk design. Average output powers of 1.4 W and slope efficiencies of 32 % with respect to incident pump power were achieved in quasi-CW pumping.

ATuB15

Sum Frequency Generation of High Energy, Low Divergence UV pulses, Oystein Farsund¹, Gunnar Arisholm¹, Gunnar Rustad¹; ¹FFI (Norwegian Defence Res. Establishment), Kjeller, Norway. A 295 nm nanosecond source with pulse energy exceeding 30 mJ and beam quality ~1 mm•mrad is demonstrated. A 1064 nm laser pumps an OPO whose signal beam is mixed with the laser's third harmonic in a compact setup.

ATuB16

Multi-Watt Average Power Nanosecond Microchip Laser and Power Scalability Estimates, Oleg Konoplev¹, Aleksey A. Vasilyev¹, Antonios A. Seas², Anthony W. Yu², Steven X. Li², George B. Shaw², Mark A. Stephen², Michael A. Krainak²; ¹Sigma Space Corporation, Lanham, MD, USA; ²NASA GSFC, Greenbelt, MD, USA. We demonstrated up to 2 W average power, CW-pumped, passively- Q-switched, 1.5 ns monolithic microchip laser with single-longitudinal mode-operation. We discuss various design approaches to bring the average power to 10W and beyond.

ATuB17

Tm³⁺-doped CW fiber laser based on a highly GeO₂-doped dispersion shifted fiber, Vladislav Dvoynin¹, Irina Sorokina¹, Vladimir Kalashnikov², Valery Mashinsky³, L. Ischakova³, Evgeni Dianov³, V. F. Khopin⁴, A. N. Guryanov⁴; ¹Norwegian Univ. of Science & Technology, Trondheim, Norway; ²Inst. für Photonik, TU Wien, Vienna, Austria; ³Fiber Optics Res. Ctr., Russian Acad. of Sciences, Moscow, Russian Federation; ⁴Inst. of Chemistry of High-Purity Substances, Russian Acad. of Sciences, Nizhny Novgorod, Russian Federation. All-fiber Tm-laser with 55GeO₂-45SiO₂ core, pumped at 1560 nm with 37% slope efficiency was demonstrated at 1862 nm. Four-wave mixing owing to a high nonlinearity and shifted to 1.87 μm zero-dispersion-wavelength has been observed.

ATuB18

Dysprosium lead thiogallate crystal resonantly pumped by Er:YLF laser radiation, Helena Jelinkova¹, Maxim Doroschenko², Michal Jelinek¹, Jan Šulc¹, Tasoltan Basiev², Valerii V. Badikov³, Dmitrii V.

Badikov³; ¹Faculty of Nuclear Sciences and Physical Engineering, Czech Technical Univ. in Prague, Prague 1, Czech Republic; ²General Physics Inst., Moscow, Russian Federation; ³Kuban State Univ., Krasnodar, Russian Federation. The characteristics of room temperature Dy³⁺:PbGa₂S₄ resonantly pumped by the 1.74 μm Er:YLF laser radiation was investigated. The stable output energy and slope efficiency obtained at 4.3 μm was 3.1 mJ and 8%, respectively.

ATuB19

Tunable erbium fiber laser using a low-cost, all-fiber multimode interference filter, Till Walbaum¹, Tim Hellwig¹, Martin Schäferling¹, Carsten Fallnich¹; ¹Inst. of Applied Physics, Univ. of Muenster, Muenster, Germany. A low-cost tunable all-fiber filter in the telecommunication spectral region, based on multimode interference, is realized. We present a fiber laser with this filter that can be tuned by more than 15nm in operation.

ATuB20

Automated characterization of polarization within a passively mode-locked erbium-doped all-fiber laser, Tim Hellwig¹, Till Walbaum¹, Petra Gross¹, Carsten Fallnich¹; ¹Inst. of Applied Physics, Univ. of Muenster, Muenster, Germany. Automated characterization and alignment of fiber lasers based on nonlinear polarization rotation is presented. The obtained mode-locking maps allow reproducible selection of pulses with different characteristics by computerized polarization control.

ATuB21

Continuous-wave of Yb:CaGdAlO₄ thin disk laser, Sandrine Ricaud^{1,4}, Bruno Viana², Philippe Goldner², Marwan Abdhou-Ahmed³, Birgit Weichelt³, Eric Mottay⁴, Patrick Georges¹, Frédéric Druon¹; ¹Laboratoire Charles Fabry de l'Inst. d'Optique, Palaiseau, France; ²Laboratoire de Chimie Appliquée de l'Ecole nationale Supérieure de Chimie de Paris, Paris, France; ³Inst. für Strahlwerkzeuge, Stuttgart, Germany; ⁴Amplitude Systemes, Pessac, France. We report a continuous-wave Yb :CaGdAlO₄ thin disk laser, generating 18W of output power with a slope efficiency of 25% and an optical-to-optical efficiency of 20%.

ATuB22

Q-switching of a mode-controlled, diode-side-pumped Nd³⁺:YLiF₄ laser at 1053 nm with high efficiency and diffraction limited beam quality, Niklaus Wetter¹, Marco A. Ferrari¹, Eduardo C. Sousa¹, Izilda M. Ranieri¹, Sonia L. Baldochi¹; ¹CLA-IPEN/SP_CNEN, São Paulo, Brazil. In this work we present passively Q-switched operation of a Nd³⁺:YLiF₄ slab laser that achieves 3.2 mJ per pulse and 500Hz rep rate with diffraction limited beam quality by mode-controlling in a simple, compact cavity.

ATuB23

Push contrast ratio to 10¹⁰ in femtosecond Ti:sapphire amplifier with a non-collinear optical parametric amplifier, Cheng Liu¹, Zhaohua Wang¹, Weichang Liu¹, Qing Zhang¹, Zhiyi Wei¹; ¹Lab of Optical Physics, Inst. of Physics, Beijing, China. We demonstrated a new

scheme to promise high contrast ratio in femtosecond Ti:sapphire amplifier. With a non-collinear optical parametric amplifier, contrast ratio up to 10^{10} was realized within the time scale of hundreds of picoseconds.

ATuB24

Application of Frequency Stabilized Lasers for Precision Length Measurements, Ramiz Hamid^{1,2}, Damla Sendogdu^{1,2}, Cihangir Erdogan^{1,3}; ¹National Metrology Inst. (UIME), Gebze-Kocaeli, Turkey; ²National Metrology Inst. (UIME), Gebze, Turkey; ³National Metrology Inst. (UIME), Gebze, Turkey. 200-1000 nm lengths measured with 50-200 nm uncertainty using developed Köster's interferometer and three frequency stabilized lasers. Absolute frequency of used stabilized He-Ne/Iz, Nd:YAG/Iz, ECDL/Cs are measured using Ti:Sa fs Comb.

ATuB25

Fiber amplification of pulse bursts at low repetition rates via synchronous pulsed pumping, Hamit Kalaycioglu¹, F Oemer Ilday¹, Koray Eken², Seydi Yavas¹; ¹Bilkent Univ., Ankara, Turkey; ²Fiberlast Ltd., Ankara, Turkey. We report, for the first time, amplification of pulse-bursts in Yb-doped fiber at repetition rates as low as 200 Hz for applications to accelerators and material processing. Synchronous pulsed pumping allows suppression of ASE generation.

ATuB26

Long-period gratings in photonic crystal fibers and their applications on Ytterbium-doped fiber lasers, Daniel E. Ceballos-Herrera¹, Alejandro Martinez-Rios², Oracio Barbosa-Garcia²; ¹Universidad Politecnica de Valencia, Valencia, Spain; ²Centro de Investigaciones en Optica (CIO), Leon, Mexico. We present the resonance splitting of long-period fiber gratings induced mechanically in twisted photonic crystal fibers and their applications on the performance of tunable and switchable multiwavelength double-clad Ytterbium-doped fiber lasers.

ATuB27

Crystalline-orientation dependent laser performance of Yb:YAG microchip lasers, Jian Ma¹, Jun Dong¹; ¹Dept. of Electronics Engineering, Xiamen Univ., Xiamen, China. Manipulated polarized lasers were achieved in laser-diode pumped Yb:YAG microchip laser by controlling the crystalline-orientations in <111> Yb:YAG crystal. Effect of pump source on laser polarization states of Yb:YAG microchip lasers was addressed.

ATuB28

Lamp-pumped and diode-pumped YAG:Nd³⁺ laser systems with gain-grating phase conjugation and interchannel phase locking control by a passive LiF:F₂- Q-switch, Tasoltan T. Basiev¹, Alexander V. Fedin², Andrey V. Gavrilov², Sergey N. Smetanin², Anatoly S. Boreysho³, Vyacheslav F. Lebedev³; ¹Laser Materials and Technology Res. Ctr., A.M. Prokhorov General Physics Inst., Moscow, Russian Federation; ²Laser Physics, Kovrov State Technological Acad., Kovrov, Russian Federation; ³Laser Systems LTD, St. Petersburg, Russian

Federation. New lamp-pumped and diode-pumped YAG:Nd-laser systems with phase conjugation and interchannel phase locking are studied, in which only one laser channel has a LiF:F₂- Q-switch, but it results in phase-locked oscillation of all the laser system.

ATuB29

Pr:YAlO₃ microchip laser at 662 nm, Martin Fibrich¹, Helena Jelínková¹, Jan Šulc¹, Karel Nejezchleb², Václav Škoda²; ¹Czech Technical Univ. in Prague, FNSPE, Prague, Czech Republic; ²Crytur Ltd., Turnov, Czech Republic. A continuous-wave Pr:YAlO₃ microchip laser operation at 662 nm is reported. Microchip resonator was formed by dielectric mirrors directly coated on the Pr:YAlO₃ crystal surfaces. As a pumping source, 1-W GaN laser-diode was used.

ATuC • Ultrafast Oscillators

Bosphorus, P Floor

11.30–13.00

James Kafka; Newport Corp., USA, Presider

ATuC1 • 11.30

Invited

Power-Scaling of Femtosecond Thin Disk Lasers, Thomas Südmeyer¹, Cyrill Roman Emmanuel Baer¹, Christian Kränkel^{1,2}, Clara J. Saraceno¹, Oliver H. Heckl¹, Matthias Golling¹, Rigo Peters², Klaus Petermann², Günter Huber², Ursula Keller¹; ¹Dept. of Physics, ETH Zurich, Zurich, Switzerland; ²Inst. of Laser-Physics, Univ. of Hamburg, Hamburg, Germany. Ultrafast thin disk lasers generate higher average powers (>140W) and pulse energies (>25μJ) than any other ultrafast oscillator technology. In this presentation, we discuss the current state-of-the-art and their potential for further power-scaling.

ATuC2 • 12.00

Energies above 30 μJ and average power beyond 100 W directly from a mode-locked thin-disk oscillator, Dominik Bauer^{1,2}, Farina Schättiger¹, Jochen Kleinbauer², Dirk H. Sutter², Alexander Killi², Thomas Dekorsy¹; ¹Dept. of Physics and Ctr. of Applied Photonics, Univ. of Konstanz, Konstanz, Germany; ²TRUMPF-Laser GmbH + Co. KG, Schramberg, Germany. We demonstrate pulses containing more than 30 μJ with a pulse length of 1040 fs directly out of a thin-disk laser in ambient atmosphere. The laser was operated at 3.5 MHz repetition rate and 108 W output power.

ATuC3 • 12.15

Energy scalability of mode-locked oscillators: comparative analysis, Vladimir Kalashnikov¹, Alexander Apolonski²; ¹Inst. fuer Photonik, TU Wien, Vienna, Austria; ²Dept. fuer Physik, Ludwig-Maximilians-Univ. Muenchen, Munich, Germany. A theory of energy scalability of modelocked oscillators is developed. An oscillator is characterized by a two-dimensional master diagram and by a simple scaling rule, which justifies sub-mJ femtosecond pulses feasible directly from an oscillator.

ATuC4 • 12.30

22 Watt Average Power Multi-MW fiber oscillator, Martin Baumgartl¹, Florian Jansen¹, Fabian Stutzki¹, Cesar Jauregui¹, Jens Limpert¹, Andreas Tünnermann^{1,2}; ¹Friedrich-Schiller-Univ., Jena, Germany; ²Fraunhofer Inst. for Applied Optics and Precision Engineering, Jena, Germany. We report on the realization of a mode-locked fiber laser emitting 27 W of average power. Pulses are compressed to sub-100 fs (80% compressor efficiency) corresponding to 3.2 MW of peak power.

ATuC5 • 12.45

High-energy chirally-coupled-core Yb-fiber laser with high-dispersion mirror compressor to achieve 1W-level, sub-100fs pulses with diffraction-limited beam quality, Hung-Wen Chen¹, Tom Sosnowski², Chi-Hung Liu³, Li-Jin Chen¹, Jonathan Birge¹, Almantas Galvanauskas³, Franz Kärtner¹, Guoqing Chang¹; ¹Dept. of Electrical Engineering and Computer Science and Res. Lab of Electronics, MIT, Cambridge, MA, USA; ²Arbor Photonics, Inc., Ann Arbor, MI, USA; ³Dept. of Electrical Engineering and Computer Science, the Univ. of Michigan, Ann Arbor, MI, USA. We demonstrate a high-energy femtosecond laser system with two rapidly advancing technologies: 3C LMA fiber to ensure single-mode operation and high-dispersion mirror to enable loss-free pulse compression with the diffraction-limited beam quality.

13.00–14.30

Lunch Break (on your own)

ATuD • Fiber and Waveguide Lasers

Bosphorus, P Floor

14.30–16.15

Thomas Schreiber; Fraunhofer IOF, Germany, Presider

ATuD1 • 14.30

Inversion Grating Assisted Beam Quality Degradation in High Power Fiber Laser Systems, Cesar Jauregui¹, Tino Eidam¹, Jens Limpert¹, Andreas Tünnermann^{1,2}; ¹Friedrich-Schiller Univ., Jena, Jena, Germany; ²IOF, Fraunhofer Inst. for Applied Optics and Precision Engineering, Jena, Germany. Modal interference along a LMA fiber creates an inversion grating with the right period to provide energy transfer between the interfering modes. This effect can lead to a substantial degradation of the beam quality.

ATuD2 • 14.45

Record-Efficient Resonantly Cladding-Pumped Yb-free Er-doped LMA Fiber Laser, Jun Zhang¹, Viktor Fromzel¹, Mark Dubinskii¹; ¹US Army Res. Lab, Adelphi, MD, USA. Further power scaling of resonantly cladding-pumped Er-doped LMA fiber laser is reported. Over 88 W of single transverse mode power at 1590 nm was achieved. Maximum observed optical-to-optical efficiency was 69%.

ATuD3 • 15.00

Fiber CPA System delivering 2.2 mJ, sub 500 fs pulses with 3.8 GW Peak Power, Tino Eidam^{1,2}, Jan Rothhardt^{1,2}, Fabian Stutzki¹, Florian

Jansen¹, Steffen Hädrich^{1,2}, Henning Carstens¹, Jens Limpert^{1,2}, Andreas Tünnermann^{1,2}; ¹Inst. of Applied Physics, Friedrich-Schiller-Univ. Jena, Jena, Germany; ²Helmholtz-Inst. Jena, Jena, Germany. We report on an ultrashort pulse fiber CPA system that delivers clean pulses with 2.2 mJ pulse energy, sub 500fs and 3.8GW peak power. The main amplifier of the system is a 108µm core diameter Large Pitch Fiber.

ATuD4 • 15.15

All Thulium Fiber CPA System with 107 fs Pulse Duration and 42 nm Bandwidth, Robert Sims¹, Pankaj Kadwani¹, Lawrence Shah¹, Martin Richardson¹; ¹CREOL/The College of Optics and Photonics, Orlando, FL, USA. 107 fs pulses were generated in a tunable Raman amplifier with energies up to 8.5 nJ at 70 MHz. Pulses were temporal stretched and amplified to 120 nJ with a spectral width of 42 nm.

ATuD5 • 15.30

High Pulse Energy Sub-10 ps Pulses from Compressed Passively Q-Switched Laser, Alexander Steinmetz¹, Dirk Nodop¹, Tino Eidam¹, Jens Limpert¹, Andreas Tünnermann^{1,2}; ¹Friedrich-Schiller-Univ. Jena, Inst. of Applied Physics, Jena, Germany; ²Fraunhofer Inst. for Applied Optics and Precision Engineering, Jena, Germany. We report on nonlinear compression of passively Q-Switched microchip-laser pulses. Initial 100-ps pulses are fiber-amplified, thereby SPM-spectrally broadened and compressed to 6-ps with pulse energies of 13-µJ at repetition rates of several 100-kHz.

ATuD6 • 15.45

High-power, broadly tunable, and low-quantum-defect Yb³⁺-doped double tungstate channel waveguide lasers, Dimitri Geskus¹, Shanmugam Aravazhi¹, Kerstin Wörhoff¹, Markus Pollnau¹; ¹IOMS, Univ. of Twente, Enschede, Netherlands. KGd1-xLux(WO)₂:Yb³⁺ channel waveguides delivered 418 mW of output power at 1023 nm with a slope efficiency of 71%. Grating tuning from 980 nm to 1045 nm and a record- low quantum defect of 0.8% was achieved.

ATuD7 • 16.00

Highly Efficient Distributed Feedback Waveguide Laser in Al₂O₃:Yb³⁺ on Silicon, Edward H. Bernhardt¹, Kerstin Wörhoff¹, René M. de Ridder¹, Markus Pollnau¹; ¹Integrated Optical MicroSystems Group, Univ. of Twente, ENSCHEDE, Netherlands. An ytterbium-doped aluminum oxide distributed feedback channel waveguide laser is reported. The laser has a 5 mW threshold and emits 34 mW in single-frequency operation at 1022.2 nm wavelength with a slope efficiency of 67%.

Dolmabahce Foyer, R Floor

16.15–16.45

Coffee Break

ATuE • Near Infrared Lasers

Bosphorus, P Floor

16.45–18.15

Jennifer Hastie, Univ. of Strathclyde, UK, Presider

ATuE1 • 16.45**Invited****Anisotropic Laser Ceramics toward Giant Micro-photonics,**

Takunori Taira¹; ¹Laser Res. Ctr. for Molecular Science, Inst. for Molecular Science, Japan. Transparent laser ceramics have been demonstrated to offer tremendous processing and design advantages. After progress review for giant micro-photonics, we'd like to discuss the next generation of high brightness lasers based on the anisotropic ceramics.

ATuE2 • 17.15**High Efficiency Nanosecond Pulse Amplification Based on Diode-Pumped Cryogenic-Cooled Yb:YAG,**

Joerg Koerner¹, Joachim Hein¹, Martin Kahle¹, Hartmut Liebetrau¹, Malte Kaluza¹, Mathias Siebold²; ¹Institute of Optics and Quantum Electronics, Jena, Germany; ²Forschungszentrum Dresden Rossendorf, Dresden, Germany.

An output energy of 1.1 J of amplified nanosecond pulses was obtained by utilizing a diode-pumped Yb:YAG laser amplifier with the crystal cooled to 125 K. We achieved an unrivaled high total amplifier efficiency of 45 %.

ATuE3 • 17.30**High power Yb:CaF₂ laser at cryogenic temperature,**

Frédéric Druon¹, Sandrine Ricaud^{1,4}, Dimitris N. Papadopoulos², Patrick Georges¹, Patrice Camy³, Jean-Louis Doualan³, Richard Moncorge³, Antoine Courjaud⁴, Eric Mottay⁴; ¹Laboratoire Charles Fabry de l'Inst. d'Optique, Palaiseau, France; ²Inst. de la Lumière Extrême, Palaiseau, France; ³Centre de recherche sur les Ions, les Matériaux et la Photonique, Caen, France; ⁴Amplitude Systèmes, Pessac, France. A high-power diode-pumped Yb:CaF₂ laser operating at cryogenic temperature is presented with an extracted output power of 97 W at 1034 nm. We also demonstrate 992-nm laser operation (1.1 % quantum defect).

ATuE4 • 17.45**6.6 J / 2 Hz Yb:YAG Diode-Pumped Laser Chain Activation,**

Jean-Christophe Chanteloup¹, Daniel Albach¹, Antonio Lucianetti¹, Thierry Novo¹, Bernard Vincent¹; ¹CNRS, Palaiseau, France. With careful Amplified Spontaneous Emission and thermal management, 6.6 Joules 7 ns pulses were extracted at 2 Hz in four passes from Lucia active mirror Yb:YAG Diode Pumped Laser amplifier. 15% optical to optical efficiency was achieved.

ATuE5 • 18.00**Efficient σ -polarized Resonantly-Pumped Er³⁺:YVO₄ Laser at**

1593.5 nm, Nikolay Ter-Gabrielyan¹, Viktor Fromzel¹, Tadeusz Lukasiewicz³, Witold Ryba-Romanowski², Mark Dubinskii¹; ¹US Army Res. Lab, Adelphi, MD, USA; ²Inst. of Low Temperature and Structure Res., Wrocław, Poland; ³Inst. of Electronic Materials Technology and Structure Res., Warsaw, Poland. Laser operation of a resonantly-

pumped Er³⁺:YVO₄ laser at 1593.5 nm is demonstrated for the first time. Maximum slope efficiency of ~70% and maximum quasi-CW power of 59.8 W were achieved with spectrally-narrowed diode pumping at 1534 nm.

NOTES

Bosphorus, P Floor**Anadolu, P Floor****Citronelle, N Floor**

• Wednesday, 16 February 2011 •

7.00–18.00

Registration Open

8.00–8.15

FILAS Opening Remarks

8.00–8.15

AIOM Opening Remarks

8.00–8.15

HILAS Opening Remarks

JWA • Joint ASSP/FILAS Session**AIWA • Transparent Ceramics and Laser Crystals I****HWA • High-Intensity Fiber and Hollow Waveguide Sources**

8.15–10.00

Farzin Amzajerdian; NASA Langley Res. Ctr., USA, *Presider*

8.15–10.00

Peter Moulton; Q-Peak, Inc., USA, *Presider*

8.15–10.00

Mauro Nisoli; Politecnico di Milano, Italy *Italy*.

JWA1 • 8.15

Invited

Advanced Specialty Fibers for Applications in Fiber Lasers, Liang Dong; *Clemson Univ. USA*. Progress in specialty fibers is the foundation to further breakthroughs in fiber lasers. We review our efforts in leakage-channel-fibers, wide band air-core photonic-bandgap-fibers, and SBS simulation in optical fibers by incorporating leaky acoustic modes.

AIWA1 • 8.15

Invited

Fabrication of Transparent Ceramics Using Spark Plasma Sintering, Byungnam Kim¹; ¹National Inst. for Materials Science, Tsukuba, Japan. Transparent Al₂O₃, MgAl₂O₄ and ZrO₂ ceramics with fine microstructures were fabricated by controlling the heating rate and pressure during spark plasma sintering. The scattering theory for Al₂O₃ ceramics was evaluated with the measured properties.

HWA1 • 8.15

Invited

Technologies for Integrated High Power Ultrashort-Pulse Fiber Lasers, Almantas Galvanauskas; *Univ. of Michigan, USA*. Abstract not available.

JWA2 • 8.45

Mode-Locked Yb-Fiber Laser for Rapid Dual Pulse Scanning Applications, Albert Romann¹, Christian Mohr¹, Axel Ruehl², Ingmar Hartl¹, Martin E. Fermann¹; ¹IMRA America, Inc., Ann Arbor, MI, USA; ²Inst. for Lasers, Life and Biophotonics, Vrije Univ.it Amsterdam, Amsterdam, Netherlands. We demonstrate a mode-locked Yb fiber soliton oscillator for the generation of pulse pairs with rapidly scanning pulse separations at interferometric precision.

AIWA2 • 8.45

Development of Submicrometer-Grained Highly Transparent Sesquioxide Ceramics, John Ballato¹, Karn Serivalsatit¹; ¹Materials Science and Engineering, Clemson Univ., Anderson, SC, USA. This paper discusses rare earth doped transparent sesquioxide ceramics with average grain size of 0.3 μm using a two-step sintering approach followed by hot isostatic pressing as well as properties of these ceramics.

HWA2 • 8.45

Fiber Laser Based High Harmonic Generation at High Repetition Rate and Average Power, Manuel Krebs¹, Steffen Hädrich^{1,2}, Jens Limpert^{1,2}, Andreas Tünnermann^{1,3}; ¹Inst. of Applied Physics, Friedrich-Schiller-Univ. Jena, Jena, Germany; ²Helmholtz-Inst. Jena, Jena, Germany; ³Fraunhofer Inst. for Applied Optics and Precision Engineering, Jena, Germany. The average power of high harmonics driven by a fiber chirped pulse amplification system is measured to be ~30nW in the 35-50 nm range. We prove that this is a promising source for processes requiring high photon flux such as photoemission spectroscopy.

JWA3 • 9.00

Sub-5 fs pulses with 12 GW peak power from high repetition rate OPCPA, Jan Rothhardt^{1,2}, Steffen Hädrich^{1,2}, Stefan Demmler¹, Christoph Joher¹, Jens Limpert^{1,2}, Andreas Tünnermann^{1,3}; ¹Friedrich-Schiller-Univ. Jena,

AIWA3 • 9.00

Fabrication of Rare-Earth Patterned Laser Ceramics by use of Gradient Magnetic Field, Jun Akiyama¹, Takunori Taira¹; ¹IMS, Okazaki, Japan. New micro-domain orientation controlling and patterning process for

HWA3 • 9.00

Highly efficient hollow fiber compression scheme for generating multi-mJ, carrier-envelope phase stable, sub-5fs pulses, Xiaowei Chen¹; ¹Laboratoire d'Optique Appliquée, Palaiseau Cedex, France. We present a simple technique

Bosphorus, P Floor

Jena, Germany; ²Helmholtz-Inst., Jena, Germany; ³Fraunhofer Inst. for Applied Optics and Precision Engineering, Jena, Germany. We report on an OPCPA system delivering sub-5 fs pulses with more than 12 GW peak power at high repetition rates. Target peak intensities as high as 1018 W/cm² appear feasible assuming diffraction-limited focusing.

JWA4 • 9.15**Invited**

Compact, Highly Coherent Fiber Lasers and Amplifiers for Sensing and Oil and Gas Exploration, Arturo Chavez-Pirson¹; ¹NP Photonics, Inc., Tucson, AZ, USA. We have developed single frequency fiber lasers based on highly doped erbium/ytterbium phosphate glass fibers, which have extremely narrow linewidths (< 500 Hz), low relative intensity noise (-170 dB/Hz), low phase noise, and high power (> 125mW).

Anadolu, P Floor

anisotropic laser ceramics has been developed. We have successfully obtained Nd:FAP core-clad composite structure by imposition of 10T gradient magnetic field during slip casting.

AIWA4 • 9.15

Thermally Induced Depolarization in Sesquioxide Crystals of m3 Symmetry Class, Anton G. Vyatkin¹, Efim Khazanov¹; ¹Inst. of Applied Physics of the Russian Acad. of Sciences, Nizhny Novgorod, Russian Federation. Thermally induced depolarization degree in cubic crystals of classes 23 and m3 as a function of crystal orientation was investigated. Three new specific orientations were defined. The best and the worst orientations were determined.

AIWA5 • 9.30

Ti-doped sapphire single crystals grown by Kyropoulos technique (KT) and characterizations, Abdeldjelil Nehari¹, Kheirredine Lebbou¹, Alain Brenier¹, Gérard Panczer¹, Jean Godfroy², Serge Labor², Hervé Legal², Gilles Chériaux³, Jean-Paul Chambaret⁴, Richard Moncorgé⁵; ¹Univ. de Lyon 1, LPCML, Lyon, France; ²RSA, Le Rubis SA, Jarrie-Grenoble, France; ³Ecole Polytechnique, LOA-ENSTA, Palaiseau, France; ⁴CNRS, ILE, Palaiseau, France; ⁵Univ. de Caen, CIMAP, Caen, France. High optical quality (FOM over 100), highly-doped (up to 0.45%Ti) and large size (100 mm diameter) Ti-sapphire (Ti³⁺-doped Al₂O₃) crystals have been grown by using the Kyropoulos technique. Very encouraging laser results are obtained.

Citronelle, N Floor

for increasing the throughput of static hollow fiber compressors by up to 60%. By seeding the fiber with positively chirped, circularly polarized pulses, we obtain CEP-stable, 1.6mJ, sub-5fs pulses.

HWA4 • 9.15

Towards few-cycle pulses with relativistic intensities, using pulse compression in planar waveguides, Selcuk Akturk^{1,2}, Cord Arnold², Bing Zhou², Shichua Chen², Arnaud Couaïron³, Andre Mysyrowicz²; ¹Dept. of Physics, Istanbul Technical Univ., Istanbul, Turkey; ²Laboratoire d'Optique Appliquée, École Nationale Supérieure des Techniques Avancées, Palaiseau, France; ³Centre de Physique Théorique, École Polytechnique, Palaiseau, France. We show that planar hollow waveguides can be used to compress pulses to few-cycles, in energy up-scalable manner. Controlling the beam size in the free direction allows stable compression without compromising the spatial mode quality.

HWA5 • 9.30

Pulse Compression of 6mJ, 200-fs Pulses From a cw-Diode-Pumped Single-Stage Yb:CaF₂ MOPA in Hollow-Core Fiber, Daniil Kartashov¹, Giedrius Andriukaitis¹, Dusan Lorenc¹, Audrius Pugzlys¹, Andrius Baltuska¹, Linas Giniunas², Romualdas Danielius², Jens Limpert³; ¹Photonics Inst. Vienna Univ. of Technology, Vienna, Austria; ²Light Conversion Ltd, Vilnius, Lithuania; ³Inst. of Applied Physics, Friedrich Schiller Univ., Jena, Germany. 200-fs 6mJ pulses from a cw-diode-pumped Yb:CaF₂ MOPA are spectrally broadened in an Ar- or Ne-filled hollow-core fiber and recompressed to 20 fs (Ar) and 40 fs (Ne) using a prism pair.

Bosphorus, P Floor**Anadolu, P Floor****Citronelle, N Floor****JWA5 • 9.45****All Fibre High repetition rate, High Power Picosecond Laser and UV generation,**

Simonette Pierrot¹, Flavien Liegeois², Julien Saby¹, Benjamin Cocquelin¹, Yves Hernandez², Francois Salin¹, Domenico Giannone²; ¹Eolite Systems, Pessac, France; ²Multitel, Mons, Belgium. We report on a 93W, 1.1μJ, 83MHz, 35ps MOPA fibre laser based on an Yb mode-locked fibre oscillator and a rod-type LMA amplifier. This configuration can generate up to 20W at 343nm and we demonstrated over 2W at 257nm.

AIWA6 • 9.45**Influence of point defects on the laser efficiency of Tm-doped sodium double molybdate crystals,**

M. Rico¹, X. Han¹, José María Cano-Torres¹, Dolores Serrano¹, C. Zaldo¹; ¹Inst.o de Ciencia de Materiales de Madrid. CSIC., Madrid, Spain. The Tm³⁺ laser efficiency of NaGd(MoO₄)₂ crystals (η=50.8%, Pout=641mW) grown in Na₂MoO₄/Na₂Mo₂O₇ flux is larger than that obtained in similar Czochralski-grown crystals annealed to eliminate color centers.

HWA6 • 9.45**High energy and efficient cross polarized wave generation for high contrast ultrashort laser sources,**

Lourdes Patricia Ramirez¹, Dimitris N. Papadopoulos^{1,2}, Alain Pellegrina^{1,2}, Pascal Monot³, Aurelien Ricci^{4,5}, Aurelie Jullien⁴, Xiaowei Chen^{2,4}, Jean-Philippe Rousseau⁴, Rodrigo Lopez-Martens⁴, Patrick Georges¹, Frédéric Druon¹; ¹Inst. d'Optique, Palaiseau, France; ²Inst. de la Lumière Extrême, Palaiseau, France; ³CEA, IRAMIS, Gif-sur-Yvette, France; ⁴Laboratoire d'Optique Appliquée, Palaiseau, France; ⁵Thales Optronique SA, Elancourt, France. We present a compact and energy-scalable ultrashort laser setup based on waveguide filtering and cross polarized wave generation. A 650 μJ, 15.5 fs, 10-10 contrast ratio XPW pulse is produced with 3.3 mJ, 25 fs input pulses

Dolmabahce Foyer, R Floor

10.00–10.30

Coffee Break

Dolmabahce Ballroom, R Floor

10.00–16.30

Exhibits Open

NOTES

10.00–11.30

AWA01

Background suppression using a fiber stretcher for optimally chirped CARS microscopy, Petra Gross¹, Lisa Kleinschmidt¹, Carsten Cleff², Carsten Fallnich¹; ¹Inst. of Applied Physics, Univ. of Muenster, Muenster, Germany. CARS microscopy is performed using a light source based on a single femtosecond laser oscillator and soliton self-frequency shift in microstructured fiber. A fiber stretcher for optimally chirped pulses results in considerable background suppression.

AWA02

Cryogenic Laser Properties of Er:YAG and Er:Sc₂O₃ - A Comparison, Larry Merkle¹, Nikolay Ter-Gabrielyan¹, Viktor Fromzel¹; ¹Army Res. Lab, Adelphi, MD, USA. At cryogenic temperatures, Er:Sc₂O₃ offers spectroscopic properties that can make it a more attractive laser material than Er:YAG when a very small quantum defect is desired. We discuss these properties, and representative laser results.

AWA03

Mode-locked tuning of diode-pumped femtosecond Cr:LiSAF and Cr:LiCAF lasers using AlGaAs-based saturable Bragg reflectors, Umit Demirbas¹, Gale S. Petrich¹, Duo Li¹, Jing Wang¹, Sheila Nabanja¹, Jonathan Birge¹, Peter Fendel¹, Alphan Sennaroglu¹, Leslie A. Kolodziejski¹, Franz Kärtner¹, James G. Fujimoto¹; ¹Dept. of Electrical Engineering and Computer Science and Res. Lab of Electronics, MIT, Cambridge, MA, USA. We obtained femtosecond tuning-ranges of 803-831 nm (28-nm), 828-873 nm (45-nm) and 890-923 nm (33-nm) with Cr:LiSAF, and of 767-817 nm (50-nm) with Cr:LiCAF gain media using AlGaAs-based saturable Bragg reflectors and a birefringent tuning-plate.

AWA04

Er:YAG single-crystal fiber laser in Q-switched operation, Igor Martial^{1,2}, Julien Didierjean², François Balembois¹, Patrick Georges¹; ¹Laboratoire Chalres Fabry de l'Inst. d'Optique, Palaiseau cedex, France; ²Fibercryst, Lyon, France. We describe an efficient Q-switched laser emission from a directly grown Er³⁺:YAG single-crystal fiber resonantly pumped by a laser diode in an off-axis configuration. The laser produces 2 mJ, 38 ns pulses at 1 kHz.

AWA05

High-power high repetition rate mid-infrared flash-pumped Q-switched Er:YAG laser, Marek Skorczakowski¹, Jacek Swiderski¹, Wieslaw Pichola¹, Jacek Kwiatkowski¹, Maria Maciejewska¹, Lukasz Galecki¹; ¹Inst. of Optoelectronics, Military Univ. of Technology, Warsaw, Poland. The mechanically Q-switched 2.94mm Er:YAG laser was developed. The laser operated at 25Hz repetition rate generating

pulses of 30 mJ energy and duration below 290ns which corresponds to over 100kW peak power.

AWA06

Conceptual design for sub-100 kW laser system based on total-reflection active-mirror geometry, Hiroaki Furuse¹, Junji Kawanaka², Noriaki Miyanaga², Haik Chosrovjan¹, Masayuki Fujita¹, Shinya Ishii³, Kazuo Imasaki¹, Kenji Takeshita³, Yasukazu Izawa¹; ¹Inst. for Laser Technology, Osaka, Japan; ²Inst. of Laser Engineering, Osaka Univ., Osaka, Japan; ³Mitsubishi Heavy Industries, Tokyo, Japan. We propose a new concept for a sub-100-kW laser system based on a cryogenic Yb:YAG multiple total-reflection active-mirror design. By adjusting the thickness and doping concentrations of Yb:YAG layers, we will obtain an ideal source.

AWA07

Transverse Mode Control by a Crossing Pair of Linearly Pumped Regions in a Yb:YAG Ceramic Thin Disk, Koki Shimohira¹, Yuichi Kozawa¹, Shunichi Sato¹; ¹Inst. of Multidisciplinary Res. for Advanced Materials, Tohoku Univ., Sendai, Japan. We demonstrated that a pair of linearly pumped regions was created in a Yb:YAG ceramic thin disk. This enabled us to readily select Laguerre-Gaussian and Hermite-Gaussian beams of higher transverse mode without mechanical manipulation.

AWA08

A comparison of resonantly pumped Ho:YLF and Ho:LLF lasers in CW and Q-switched operation, Martin Schellhorn¹; ¹ISL, French German Res. Inst., Saint-Louis, France. Ho:YLF and Ho:LLF are studied under identical pump conditions. Ho:LLF shows lower threshold and in CW operation higher slope efficiencies. 37 and 38.5 mJ were achieved at 100 Hz with Ho:LLF and Ho:YLF, respectively.

AWA09

Enhancement of Third Harmonic Generation with Double-Layer Structure of Nonlinear Organic Material, Myoungsik Cha¹, Hee Joo Choi¹; ¹Dept. of Physics, Pusan National Univ., Busan, Republic of Korea. We designed and fabricated a double-sided organic film device that could enhance the optical third-harmonic generation (THG) at 420 nm. The possibility of quasi-phase-matching THG is experimentally demonstrated.

AWA10

Femtosecond Microjoule-Class Ytterbium Fiber Lasers, Ammar Hideur¹, Caroline Lecaplain¹, Büleend Ortaç², Guillaume Machinet³, Johan Bouillet³, Eric Cormier³, Martin Baumgartl⁴, Thomas Schreiber⁵; ¹CNRS UMR 6614 CORIA, Saint etienne du Rouvray, France; ²UNAM-Inst. of Materials Science and Nanotechnology, Ankara, Turkey; ³Univ. de Bordeaux -CNRS-CEA CELIA, Bordeaux, France; ⁴Inst. for Applied Physics, Jena, Germany; ⁵Fraunhofer Inst. for Applied Optics and Precision Engineering, Jena, Germany. We report the generation of 830 nJ energy from a mode-locked all-normal dispersion fiber laser featuring large-

mode-area photonic crystal fibers. After external compression, 550 fs pulses with 1.2 MW peak power are demonstrated.

AWA11

All-fiber design for linearly polarized CW Yb-doped tunable fiber laser, *Chu Perng Seah¹, Tze Yang Ng¹, Rui Fen Wu¹; ¹DSO National Laboratories, Singapore, Singapore.* We report on our results of a stable CW, linearly polarized all-fiber tunable fiber laser. Tunability was achieved from 1052nm to 1080nm, with linewidth of 0.3nm. Output power was tested to 60W.

AWA12

Path Length Sensitivity in Coherent Laser Beam Combining: Comparison between Architectures, *James R. Leger¹, Bradley Tiffany¹, Chenhao Wan¹; ¹Electrical and Computer Engineering, Univ. of Minnesota, Minneapolis, MN, USA.* The effect of path length errors on coherent beam combining performance is analyzed and measured for several combining architectures. Cavity loss and coherence characteristics are highly dependent on design, and can often be optimized.

AWA13

Laser operation near 2 μm of Tm-doped $\text{Li}_3\text{Lu}_3\text{Ba}_2(\text{MoO}_4)_8$ single crystal, *M. Rico¹, X. Han¹, Concepción Cascales¹, C. Zaldo¹; ¹Inst.o de Ciencia de Materiales de Madrid. CSIC., Madrid, Spain.* Tm-doped $\text{Li}_3\text{Lu}_3\text{Ba}_2(\text{MoO}_4)_8$ monoclinic crystals were grown by TSSG-method. Laser operation is shown at $\lambda=1940$ nm with 62% of slope efficiency. The disordered crystal structure confers potential applications for mode-locked sub-200 fs laser pulses.

AWA14

Nd:LuVO₄ Laser Passively Mode-Locked by $\chi(2)$ -Lens Formation in Periodically-Poled Stoichiometric Lithium Tantalate, *Hristo Iliev¹, Ivan Buchvarov¹, Sunao Kurimura², Huaijin Zhang³, Jiyang Wang³, Junhai Liu⁴, Valentin Petrov⁵; ¹Physics, Sofia Univ., Sofia, Bulgaria; ²Advanced Materials Lab, National Inst. for Materials Science, Tsukuba, Japan; ³National Lab of Crystal Materials, Jinan, China; ⁴College of Physics, Qingdao Univ., Qingdao, China; ⁵Max-Born-Inst. for Nonlinear Optics and Ultrafast Spectroscopy, Berlin, Germany.* Stable mode-locking of a Nd:LuVO₄ laser by intracavity second harmonic generation in PPMgSLT nonlinear crystal is demonstrated with maximum achieved average powers of 1.7 W and pulse durations as short as 3.4 ps.

AWA15

Micromachining with square-shaped 1 ns-long pulses from an all-fiber Yb-doped laser-amplifier system, *Kivanc Ozgoren¹, Bulent Oktem¹, F Oemer Ilday², Ece Pasin³, Koray Eken³; ¹Material Science and Nanotechnology Graduate Program, Bilkent Univ., Ankara, Turkey; ²Dept. of Physics, Bilkent Univ., Ankara, Turkey; ³FiberLAST, Ltd, Ankara, Turkey.* We demonstrate micromachining with 1ns-long pulses from an all-fiber laser. Fiber lasers generating incompressible long pulses

have been ignored as undesired modes, however their robust, low-repetition-rate operation is well suited to micromachining.

AWA16

1.34- μm Nd:YVO₄ Laser Mode-Locking by Chi-2 Lensing in Periodically Poled Stoichiometric Lithium Tantalate, *Ivan Buchvarov¹, Sunao Kurimura², Valentin Petrov³; ¹Physics, Sofia Univ., Sofia, Bulgaria; ²National Inst. for Materials Science, Tsukuba, Japan; ³Max-Born-Inst. for Nonlinear Optics and Ultrafast Spectroscopy, Berlin, Germany.* Self-starting Chi-2 lens mode-locking of a 1.34- μm Nd:YVO₄ laser using second harmonic generation in PPMgSLT is demonstrated. A train of 5.9 ps pulses with ~1 W average output power at 102 MHz is achieved.

AWA17

Compact All-Solid-State Continuous-Wave Single-Frequency UV Source for Laser Cooling of Beryllium Ions, *Sergey Vasilyev¹, Alexander Nevsky¹, Ingo Ernsting¹, Michael Hansen¹, Jianwei Shen¹, Stephan Schiller¹; ¹Inst. für Experimentalphysik, Düsseldorf, Germany.* A compact setup for generation, absolute frequency stabilization, and precision tuning of the UV laser radiation at 313 nm was developed and tested. The maximum output power of the source is 100 mW.

AWA18

Femtosecond Nd:glass Lasers Mode-Locked with Carbon Nanotube Saturable Absorber Mirror, *Antonio Agnesi¹, Alessandro Greborio¹, Federico Pirzio¹, Giancarlo Reali¹, Elena Ugolotti¹, Sun Young Choi², Fabian Rotermund², Uwe Griebner³, Valentin Petrov³; ¹Electronics Dept., Univ. of Pavia, Pavia, Italy; ²Division of Energy Systems Res., Ajou Univ., Suwon, Republic of Korea; ³Max-Born-Inst. for Nonlinear Optics and Ultrafast Spectroscopy, Berlin, Germany.* We present femtosecond Nd:glass lasers pumped by single-mode 200-mW diodes, mode-locked by single-walled carbon nanotube saturable absorbers. We obtained sub-150-fs and sub-100-fs stable pulse trains with phosphate and silicate glasses, respectively.

AWA19

Concept and realization of collinearly pumped multiple thin disk active medium, *Aidas Aleknavičius¹, Rokas Smilingis¹, Mikhail Grishin¹, Andrejus Michailovas¹, Kirilas Michailovas¹, Jurgis Plipavičius², Valdas Girdauskas³; ¹Inst. of physics, Ctr. for Physical Sciences and Technology, Vilnius, Lithuania; ²Faculty of Chemistry, Vilnius Univ., Vilnius, Lithuania; ³Faculty of Natural Sciences, Vytautas Magnus Univ., Kaunas, Lithuania.* Two approaches for multiple thin disk active elements configurations are presented. Preliminary lasing experiments and numerical calculations for temperature distribution inside medium are presented.

AWA20

Improved pulse control by all-optical synchronization of fiber lasers, *Till Walbaum¹, Petra Gross¹, Carsten Fallnich¹; ¹Inst. of Applied Physics, Univ. of Muenster, Muenster, Germany.* We show repetition

frequency stability transfer between mode-locked fiber lasers synchronized by all-optical means and investigate the influences on the locking range, output pulse and a potential carrier envelope offset frequency control.

AWA21

High duty cycle and long pulse operation of Dy:PbGa₂S₄ laser excited by diode pumped Nd:YAG, Jan Šulc¹, Helena Jelinkova¹, Maxim E. Doroshenko², Tasoltan T. Basiev², Vyacheslav V. Osiko², Valerii V. Badikov³, Dmitrii V. Badikov³; ¹Faculty of Nuclear Sciences and Physical Engineering, Czech Technical Univ. in Prague, Prague 1, Czech Republic; ²Laser Materials and Technology Res. Ctr., General Physics Inst., Moscow, Russian Federation; ³Kuban State Univ., Krasnodar, Russian Federation. The room temperature operating Dy:PbGa₂S₄ laser, excited at 1318 nm by diode pumped Nd:YAG was realized and mean power 18.4 mW with slope efficiency 3.8 % was obtained at 4.3 μm (pulse length 10 ms, rep. rate 50 Hz).

AWA22

PbS-Quantum-Dot Saturable Absorber Q-switched Tm:KYW Mini-Laser with 9 ns/40 μJ Pulses, Maxim Gaponenko¹, Victor Kisel¹, Alexander Malyarevich¹, Konstantin Yumashev¹, Nikolai Kuleshov¹, Alexei Onushchenko²; ¹Ctr. for Optical Materials and Technologies, Belarusian National Technical Univ., Minsk, Belarus; ²Res. and Technological Inst. of Optical Materials Science, St. Petersburg, Russian Federation. A compact Tm:KYW diode-pumped laser with cavity length of 8 mm passively Q-switched with PbS-quantum-dot saturable absorber is demonstrated. The laser produces pulses with duration of 9 ns and energy of 40 μJ.

AWA23

Directly diode pumped mid-IR laser based on PbGa₂S₄:Dy³⁺ crystal, Maxim E. Doroshenko¹, Tasoltan T. Basiev¹, Vyacheslav V. Osiko¹, Valerii V. Badikov², Dmitrii V. Badikov²; ¹General Physics Inst. RAS, Moscow, Russian Federation; ²Kuban State Univ., Krasnodar, Russian Federation. Direct diode pumped mid-IR oscillations of PbGa₂S₄:Dy³⁺ crystal were obtained with slope efficiency up to 1%. "Long" output pulses were obtained and the mechanism of lower laser level depopulation is suggested.

AWA24

2 μm Ho:YAG Thin Disk Laser, Günther Renz¹, Peter Mahnke¹, Jochen Speiser¹, Adolf Giesen¹; ¹Inst. of Technical Physics, German Aerospace Ctr., Stuttgart, Germany. A Thulium fiber laser pumped Ho:YAG thin disk laser with 15W (cw) or several mJ (pulsed) operation will be presented. Additionally, a narrow (<0.5nm), tunable (30nm) cw operation near 2.09 μm, will be shown.

AWA25

Optical Parametric Oscillators with Idler Absorption, Gunnar Rustad¹, Oystein Farsund¹, Gunnar Arisholm¹; ¹FFI (Norwegian Defence Res. Establishment), Kjeller, Norway. We show by simulations that

idler absorption may improve the performance of pulsed high energy OPOs, and obtain high signal conversion efficiency and signal beam quality with idler absorption coefficients above 3 cm⁻¹.

AWA26

Few-cycle pulse characterisation with an acousto-optic pulse shaper, Seth Cousin¹, Nicolas Forget², Philip K. Bates¹, Jens Biegert¹, Alexander Gruen¹; ¹ICFO - the Inst. of Photonic Sciences, Castelldefels (Barcelona), Spain; ²FASTLITE, Ctr. Scientifique d'Orsay, Orsay, France. An acousto-optic pulse shaper has been used to characterise an 8.2 fs pulse generated in a hollow-core fibre. A grism-pair compressor has been used to overcome a dispersion related bandwidth limit of the acousto-optic crystal.

AWA27

Frequency tripling for next generation high energy lasers, Gabriel Mennerat¹; ¹Direction des Applications Militaires, Commissariat à l'Energie Atomique, Le Barp, France. Societal applications of high energy lasers require operating at high repetition rate. Merits of frequency triplers at high-average power are discussed. Performances of LBO are demonstrated by generating 360J of ultraviolet with 80% efficiency.

AWA28

Pulsed, Single-Frequency, Ring Laser With A Holographic Output Coupler, Alex Dergachev¹; ¹Q-Peak, Inc., Bedford, MA, USA. A ring laser with reflective thick holographic grating as an output coupler is demonstrated. Unidirectional, passively Q-switched, 2.05-μm Ho:YLF ring laser provides single-frequency, 100-200-ns-long pulses at kHz rate.

AWA29

High Energy Mode-Locked Fiber Laser at 976nm, Guillaume Machinet¹, Jerome Lhermite¹, Caroline Lecaplain², Johan Boulet^{1,3}, Ammar Hideur², Nicholas Traynor^{3,4}, Eric Cormier¹; ¹Celia, Talence, France; ²Coria, Rouen, France; ³Alphanov, Talence, France; ⁴Azur light system, Talence, France. We report on a passively mode-locked fiber laser emitting around 976nm. The laser emits chirped pulses with a duration of 1.02ps and 12nJ at 40,7MHz. External compression leads to pulses as short as 286fs.

Bosphorus, P Floor**Anadolu, P Floor****Marmara, P Floor****JWB • Joint ASSP/AIOM Session****11.30–13.00***Kathleen Schaffers; Lawrence Livermore Natl. Lab, USA, Presider***JWB1 • 11.30****5 mm Thick Periodically Poled****Rb:KTiOPO₄ for High Power Optical**

Frequency Conversion, *Andrius Zukauskas¹, Nicky Thilmann¹, Valdas Pasiskevicius¹, Fredrik Laurell¹, Carlota Canalias¹; ¹Laser Physics, KTH (Royal Inst. of Technology), Stockholm, Sweden. A periodically poled bulk Rb-doped KTiOPO₄ crystal with 5 mm aperture was fabricated at room temperature. The ferroelectric domain structure is shown to be homogeneous across the whole aperture with a deff of 11 pm/V.*

JWB2 • 11.45 **Invited**

Yb-Doped Laser Materials: Advances and Challenges, *Günter Huber¹, Kolja Beil¹, Thomas Calmano¹, Susanne T. Fredrich-Thornton¹, Uwe Kelling¹, Christian Kränkel¹, Henning Kühn¹, Jörg Siebenmorgen¹, Ulrike Wolters¹, Klaus Petermann¹; ¹Inst. for Laser-Physik, Hamburg, Germany. We review the progress in performance of Yb:YAG, Yb:LuAG, and Yb:Lu₂O₃ for ultrahigh power generation. Future challenges are the prevention of losses at high Yb inversion densities, further power scaling of thin disk and crystalline waveguide lasers.*

FWA • Fiber Lasers and Applications I**11.00–13.00***Farzin Amzajerian; NASA Langley Res. Ctr., USA, Presider***FWA1 • 11.00** **Keynote**

Title to Be Announced, *David Payne, Univ. of Southampton, UK. Abstract not available.*

FWA2 • 11.45

Fourier Transform Spectrometry Using a Single Cavity Length Modulated Mode-Locked Fiber Laser, *Christian Mohr¹, Albert Romann¹, Axel Rühl², Ingmar Hartl¹, Martin E. Fermann¹; ¹IMRA America, Inc., Ann Arbor, MI, USA; ²Inst. for Lasers, Life and Biophotonics, Vrije Univ.it Amsterdam, Amsterdam, Netherlands. We present a Fourier transform spectrometer based on a single repetition rate modulated mode locked Yb-fiber laser configured as a coherent scanning delay line using an imbalanced Mach-Zehnder interferometer. Effective mirror scan rate is 7.5 m/s.*

FWA3 • 12.00 **Invited**

Ultrabroadband Er: fiber Lasers for Applications in Nanophotonics and Confocal Microscopy, *Alfred Leitenstorfer¹; ¹Fachbereich Physik, Universitaet Konstanz Germany, Constance, Germany. An Er: fiber technology is presented delivering output tunable from visible to infrared, at pulse durations down to 4 fs. Applications in ultrafast quantum optics with solid-state nanostructures and confocal microscopy of live systems are featured.*

HWB • Strong-field Atomic Physics**11.30–13.00***Jens Biegert; ICFO, Spain, Presider***HWB1 • 11.30** **Invited**

Scaling of Strong-Field Atomic Physics, *Lou DiMauro¹; Ohio State Univ., USA. Abstract not available.*

HWB2 • 12.00

Attosecond Depletion of Resonant Auger Decay in Krypton, *Aart J. Verhoeft, Alexander V. Mitrofanov¹, Maria Krikunova², Nikolay Kabachnik², Armin Scrinzi³, Markus Drescher², Andrius Baltuska¹; ¹Inst. für Photonik, TU Wien, Wien, Austria; ²Inst. für Experimentalphysik, Univ. Hamburg, Hamburg, Germany; ³Computational & Plasma Physics, LMU München, München, Germany. Changes in the spectral width of Auger emission reveal*

JWB3 • 12.15

Invited

Yb doped Fluorides for High Power and Short-Pulse Laser Applications, *Frédéric*

Druon¹, Sandrine Ricaud^{1,4}, Dimitris N. Papadopoulos^{1,2}, Alain Pellegrina^{1,2}, Marc Hanna¹, Patrice Camy³, Jean-Louis Doualan³, Richard Moncorgé², Antoine Courjaud⁴, Patrick Georges¹; ¹LCF IO, Palaiseau, France; ²ILE, Palaiseau, France; ³CIMAP, Caen, France; ⁴Amplitude Systemes, Pessac, France. We present an overview of laser results we obtained with Yb-doped calcium-fluoride. Spectral and thermal properties will be discussed, and experimental demonstration on high-power and ultrashort pulse oscillators and amplifiers will be presented.

transient depletion of excited states prepared using attosecond XUV pulses by strong phase-stable few-cycle pulses. Additionally, interference of photoelectrons and Auger electrons is observed.

HWB3 • 12.15

Benchmarking attosecond physics with atomic hydrogen, *Michael G. Pullen^{1,2}, William*

Wallace^{1,2}, Dane Laban^{1,2}, Adam Palmer^{1,2}, Friedrich Hanne³, Alexei Grum-Grzhimailo^{4,5}, Brant Abeln⁴, Klaus Bartschat⁴, Daniel Weflen⁴, Igor Ivanov⁶, Anatoli Kheifets⁶, Harry Quiney⁷, Igor Litvinyuk^{1,2}, Robert Sang^{1,2}, Dave Kielpinski^{1,2}; ¹ARC Ctr. of Excellence for Coherent X-Ray Science, Griffith Univ., Nathan, QLD, Australia; ²Australian Attosecond Science Facility and Ctr. for Quantum Dynamics, Griffith Univ., Nathan, QLD, Australia; ³Atomic and Electronics Physics Group, Westfälische Wilhelms-Univ., Münster, Germany; ⁴Dept. of Physics and Astronomy, Drake Univ., Des Moines, IA, USA; ⁵Inst. of Nuclear Physics, Moscow State Univ., Moscow, Russian Federation; ⁶Res. School of Physical Sciences, The Australian National Univ., Canberra, ACT, Australia; ⁷ARC Ctr. of Excellence for Coherent X-Ray Science, Univ. of Melbourne, Melbourne, VIC, Australia. We have performed the first experiment on the interaction of intense few-cycle laser pulses with atomic hydrogen. Experimental data is compared with an advanced ab initio simulation and agrees quantitatively with simulations at the 10% level.

FWA4 • 12.30

Invited

High Power Thulium Fiber Lasers, *Lawrence*

Shah, R. Andrew Sims, Christina C.C. Willis, Pankaj Kadwani, Joshua Bradford, Martin Richardson; Univ. of Central Florida, USA. Tm fiber-lasers at 2 μ m wavelength are following a similar development path to Yb fiber-lasers. We review recent progress exploiting the unique characteristics of these lasers in the high power, spectral and temporal domains.

HWB4 • 12.30

Nearly bandwidth-limited attosecond pulses via periodic resonance interaction with

hydrogen-like atoms, *Vladimir A. Polovinkin¹, Yevgeny V. Radeonychev¹, Olga A. Kocharovskaya^{2,1}; ¹Inst. of Applied Physics of the Russian Acad. of Science, Nizhny Novgorod, Russian Federation; ²Dept. of Physics, Texas A&M Univ., College Station, TX, USA. We show the possibility to produce few-cycle attosecond pulses via periodic-resonance interaction of radiation with the bound atomic states. Periodic resonance is provided by adiabatic Stark splitting and tunnel ionization from excited energy levels.*

JWB4 • 12.45

Phase-Matching Properties of BaGa₄S₇ and BaGa₄Se₇: Wide-Bandgap Nonlinear Crystals for the Mid-Infrared, *Valerii V. Badikov², Dmitrii V. Badikov², Galina Shevyrdyaeva², Aleksey Tyazhev¹, Georgi Marchev¹, Vladimir Panyutin¹, Valentin Petrov¹, Albert Kwasniewski³; ¹A3, Max-Born-Inst., Berlin, Germany; ²High Technologies Lab, Kuban State Univ., Krasnodar, Russian Federation; ³Inst. for Crystal Growth, Berlin, Germany.* Biaxial BaGa₄S₇ and BaGa₄Se₇ crystals have been grown by the Bridgman-Stockbarger technique in sufficiently large sizes and with good optical quality to measure the refractive indices and analyze the phase-matching configurations.

HWB5 • 12.45

On The Challenge Of Attosecond Pulse Metrology, *Charalambidis Dimitrios^{1,2}, Jan Kruse^{1,2}, Paraskevas Tzallas¹, Emmanouel Skantzakis^{1,2}, George Tsakiris³; ¹IESL, FORTH, Heraklion, Greece; ²Physics Dept, Univ. of Crete, Heraklion, Greece; ³MPQ, Garching, Germany.* We report a comparative experimental study, showing severe inconsistencies between two main attosecond pulse metrology methodologies, namely the 2nd order IVAC and the RABITT techniques [Phys. Rev. A 82, 021402(R) (2010)] and their derivatives.

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13.00–14.30

Lunch Break (on your own)**JWC • Joint ASSP/HILAS Session**

14.30–16.00

*Giulio Cerullo; Politecnico di Milano, Italy, Presider***JWC1 • 14.30****Approaching the Full Octave: Noncollinear Optical Parametric Chirped Pulse Amplification with Two-Color Pumping,**

Daniel Herrmann^{1,2}, Christian Homann¹, Raphael Tautz^{2,3}, Ferenc Krausz^{2,4}, Eberhard Riedle¹, Laszlo Veisz²; ¹LS für BioMolekulare Optik, Ludwig-Maximilians-Univ. München, München, Germany; ²Max-Planck-Inst. für Quantenoptik, Garching, Germany; ³LS für Photonik und Optoelektronik, Ludwig-Maximilians-Univ. München, München, Germany; ⁴LS für Laserphysik, Ludwig-Maximilians-Univ. München, Garching, Germany. We amplify ultrabroadband spectra to mJ energies: 575-1050nm by two-color-pumping and 675-1000nm by two-beam-pumping. We demonstrate the compressibility of these spectra and reveal the significance of a parametric phase imprinted on the signal.

JWC2 • 14.45**Temporal Contrast Measurements of a Noncollinear Optical Parametric Amplifier Seeded by White-Light Continuum,**

Jake Bromage¹, Christophe Dorrer¹, Jonathan Zuegel¹; ¹Lab for Laser Energetics, Univ. of Rochester, Rochester, NY, USA. Temporal cross-correlation measurements of a white-light-seeded noncollinear optical parametric amplifier (NOPA) show that its prepulse contrast exceeds the 105-dB dynamic range of the broadband NOPA-based cross-correlator.

JWC3 • 15.00**Invited**

Progress Toward an Exawatt Laser, *Todd Ditmire; Univ. of Texas at Austin, USA.* Abstract not available.

AIWB • Crystal and Glass Fibers I

14.30–16.00

*Richard Moncorgé, Univ. de Caen, France, Presider***AIWB1 • 14.30****Invited****Photo darkening in rare earth doped silica: Model and Experiment,**

Kent E. Mattsson¹; ¹DTU Fotonik, Technical Univ. of Denmark, Kgs. Lyngby, Denmark. A model for photo darkening based on chemical bond formation is presented. The formation process, color center spectral response and bleaching is discussed and model predictions is found to follow high power fiber laser operation.

AIWB2 • 15.00

Single-mode Low-loss Optical Fibers for Long-wave Infrared Transmission, *Shibin Jiang¹; ¹AdValue Photonics, Inc., Tucson, AZ, USA.* We report the synthesis of single-mode fibers made of chalcogenide glasses with low-loss in the 5-12 μm range. The resulting single mode fibers exhibited losses of $\sim 6\text{dB/m}$ at 10.6

FWB • Fiber Laser Frequency Combs

14.30–16.00

*Axel Schulzgen; Univ. of Central Florida, USA, Presider***FWB1 • 14.30****Invited****Optics to Microwave Synchronisation at sub-**

100 Attoseconds Stability Level, *Yann Le Coq¹, Wei Zhang¹, Zhenyu Xu², Jacques Millo², Rodolphe Boudot², Michel Lours¹, Pierre-Yves Bourgeois², Andre Luiten³, Yann Kersalé², Giorgio Santarelli¹; ¹LNE-SYRTE - Observatoire de Paris, CNRS, UPMC, Paris, France; ²FEMTO-ST Inst., CNRS, ENSMM, Besancon, France; ³Univ. of Western Australia, Crawley, WA, WA, Australia.* We will present our results on low phase noise and high stability synchronization of a microwave signal with an optical ultra-stable reference. We apply noise reduction strategies which provide timing stability substantially below 100 attoseconds.

FWB2 • 15.00**Phase Locking and Spectral Combining of Fiber Lasers by Volume Bragg Gratings,**

Vadim Smirnov¹, Leonid Glebov², Derrek Drachenberg², Apurva Jain², Ivan Dioliensky², George Venus², Christina Spiegelberg¹; ¹OptiGrate, Orlando, FL, USA; ²CREOL/ The College of Optics and Photonics, Univ. of Central Florida, Orlando,

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μm and 3-4 dB/m in the 6-10 μm range.

AIWB3 • 15.15

$\sim 2 \mu\text{m}$ laser output in short length highly Tm³⁺-doped tungsten tellurite glass double cladding fiber, Kefeng Li^{1,2}, Lili Hu¹, Guang Zhang^{1,2}, Danping Chen¹; ¹Shanghai Inst. of Optics and Fine Mechanics, Chinese Acad. of Sciences, Shanghai, China; ²Graduate School of Chinese Acad. of Sciences, Beijing, China. Highly Tm³⁺-doped tungsten tellurite glass double cladding fibers were prepared by using rod-in-tube method. A 306 mW laser output at $\sim 2 \mu\text{m}$ was demonstrated from a 8.9 cm length of this fiber.

AIWB4 • 15.30

Crystalline Semiconductor Core Optical Fibers, John Ballato¹, Thomas Hawkins¹, Paul Foy¹, Colin McMillen¹, Roger Stolen¹, Robert Rice²; ¹Materials Science and Engineering, Clemson Univ., Anderson, SC, USA; ²Northrop Grumman Space Technology, Redondo Beach, CA, USA. Silicon and germanium core optical fibers are discussed. Losses of 4 dB/m have been achieved at 3 μm and suggest that such semiconductor optical fibers could be of practical value for nonlinear and infrared applications.

AIWB5 • 15.45

Spectroscopic investigation of Tm³⁺:TeO₂-K₂O-Nb₂O₅ glasses at different doping levels for 2 μm laser applications, Adil T. Gorgulu¹, Huseyin Cankaya¹, Adnan Kurt², Adolfo Speghini³, Marco Bettinelli³, Alphan Sennaroglu¹; ¹Koc Univ., Istanbul, Turkey; ²Teknofil, Inc., Istanbul, Turkey; ³Univ. of Verona and INSTM, Verona, Italy. Spectroscopic measurements performed

FL, USA. Scaling of fiber lasers to high power while conserving low divergence by means of single and multiplexed volume Bragg gratings for phase and spectral locking of multichannel fiber resonators followed by spectral beam combining.

FWB3 • 15.15

Atmospheric Propagation Testing Using Broadband Thulium Fiber Systems, Pankaj Kadwani¹, Robert Sims¹, Jeffery Chia², Faleh Altat³, Lawrence Shah¹, Martin Richardson¹; ¹Townes Laser Inst., CREOL College of Optics and Photonics, The Univ. of Central Florida, Orlando, FL, USA; ²College of Optical Sciences, The Univ. of Arizona, Tucson, AZ, USA; ³Masdar Inst. of Science and Technology, Abu Dhabi, United Arab Emirates. Broadband ultrashort pulse and amplified spontaneous emission thulium fiber systems are utilized for atmospheric propagation testing. These systems enable precise characterization of H₂O and CO₂ absorption in the 2 μm wavelength regime.

FWB4 • 15.30

High Power Fiber Laser Frequency Combs for XUV Spectroscopy, Axel Ruehl¹, Martin E. Fermann¹, Ingmar Hartl¹, A. Cingöz², Dylan C. Yost², Jun Ye²; ¹IMRA America Inc, Ann Arbor, MI, USA, ²Department of Physics, JILA, National Institute of Standards and Technology and University of Colorado, Boulder, CO, USA. A Yb-fiber frequency comb with 120 fs pulse duration, 154 MHz repetition rate, and 80 W average power is used for cavity-enhanced high harmonic generations. Plateau harmonics beyond the microwatt level have been demonstrated.

Invited**JWC4 • 15.30**

Scalable High-Energy Sub-Cycle Waveform Synthesis for High-Field Physics, Shu-Wei Huang¹, Giovanni Cirmi¹, Kyung-Han Hong¹, Jeffrey Moses¹, Jonathan Birge¹, Siddharth Bhardwaj¹, Vasileios-Marios Gkortsas¹, Andrew Benedick¹, Li-Jin Chen¹, Enbang Li², Benjamin Eggleton², Giulio Cerullo³, Franz Kärtner¹; ¹RLE, MIT, Cambridge, MA, USA; ²CUDOS ARC, Univ. of Sydney, Sydney, NSW, Australia; ³Dipartimento di Fisica, Politecnico di Milano, Milano, Italy. We demonstrate coherent pulse synthesis from two few-cycle phase-stable OPCAs, enabling scalable, high-energy arbitrary optical waveform generation on sub-cycle time scales, suitable for attosecond control of high-field physics experiments.

JWC5 • 15.45

Mid-IR Multimillijoule 100-fs Chirped-Pulse Parametric Amplifier, Gedrius Andriukaitis¹, Tadas Balciunas¹, Alexey Andrianov^{1,2}, Oliver D. Mücke¹, Igor Diomin¹, Linas Giniunas³, Romas Danielius³, Andrius Baltuska¹, Audrius Pugzlys¹; ¹Inst. of photonics, Vienna Univ. of Technology, Vienna, Austria; ²Inst. of Applied Physics, Russian Acad. of Sciences, Nizhny

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Novgorod, Russian Federation; ³Light Conversion Ltd., Vilnius, Lithuania. We demonstrate a 20-Hz-repetition-rate mid-IR OPCPA based on inversed stretching technique delivering 300-nm FWHM 7.5 mJ pulses centered at 3600 nm. 3-mJ 100-fs pulses obtained after compression are suitable for a variety of high-field applications.

with $\text{Tm}^{3+}:\text{TeO}_2\text{-K}_2\text{O-Nb}_2\text{O}_5$ glass at different concentrations show a high emission cross section ($6.22 \times 10^{-21} \text{cm}^2$) for the 1860-nm band, making the material potentially important for 2- μm laser development.

Dolmabahce Foyer, R Floor

16.00–16.30

Coffee Break

NOTES

AIWC • Nonlinear Crystals and Processes I

16.30–18.00

Martin Fejer; Stanford Univ., USA, Presider

AIWC1 • 16.30

Invited

Growth of Large GaN Single Crystals, Sylwester Porowski, Izabella Grzegory; *Inst. of High Pressure Physics, Polish Acad. of Sciences, Poland.* The state of art results achieved in bulk GaN crystallization by most relevant techniques are reviewed. A special role of HVPE and ammonothermal methods in development of laser quality quasi-bulk GaN substrates and bulk GaN crystals is emphasized. The High Nitrogen Pressure Solution method is presented in more details.

AIWC2 • 17.00

Invited

Bulk PPKTP by crystal growth, Benoit Boulanger¹; *¹Univ. Joseph Fourier, Grenoble, France.* We performed the first growth of a 39.86 μm -periodicity PPKTP crystal of good optical quality over a thickness of 800 μm onto a (001) face of a PPKTP substrate previously obtained by electric field poling.

AWB • Ultrafast Sources II

16.30–17.45

Akira Shirakawa; Univ. of Electro-Communications, Japan, Presider

AWB1 • 16.30

Diode-Pumped Mode-Locked Yb³⁺:YCa₄O(BO₃)₃ Laser Generating 35 fs Pulses, Uwe Griebner¹, Akira Yoshida^{2,1}, Andreas Schmidt¹, Valentin Petrov¹, Huaijin Zhang³, Jiyang Wang³, Junhai Liu⁴, Christian Fiebig⁵, Katrin Paschke⁵, Götz Erbert⁵; *¹Max Born Inst., Berlin, Germany; ²Inst. of Laser Engineering, Osaka Univ., Osaka, Japan; ³Shandong Univ., Jinan, China; ⁴Qingdao Univ., Qingdao, China; ⁵Ferdinand-Braun-Inst., Berlin, Germany.* A mode-locked Yb:Ca₄YO(BO₃)₃ laser delivering pulses as short as 35 fs at 1055 nm is demonstrated. The oscillator is pumped by a two-section distributed Bragg-reflector tapered diode-laser and mode-locked by a semiconductor saturable absorber mirror.

AWB2 • 16.45

Sub-200-fs Pulses at 92 GHz Repetition Rate from a Harmonically Mode-locked Semiconductor Disk Laser, Uwe Griebner¹, Peter Klopp¹, Martin Zorn², Markus Weyers²; *¹Max Born Inst., Berlin, Germany; ²Ferdinand-Braun-Inst., Berlin, Germany.* Ultrashort-pulse semiconductor disk lasers emitting around 1025 nm are presented. Pulse durations of 198 fs at 92 GHz and 107 fs at 5.1 GHz repetition rate were achieved by harmonic and fundamental mode-locking, respectively.

AWB3 • 17.00

High peak power from a mode-locked two-crystal Yb:KYW oscillator with cavity-dumping, Guido Palmer¹, Moritz Emons¹, Marcel Schultze¹, Uwe Morgner^{1,2}; *¹Leibniz Univ. Hannover, Inst. für Quantenoptik, Hannover, Germany; ²Laser Zentrum Hannover, Hannover, Germany.* We report on a chirped-pulse two-crystal Yb:KYW oscillator with cavity-dumping which generates 12 MW of peak power. Pulse energies of 7 μJ and 416 fs short pulses have been obtained at 1 MHz repetition

FWC • Fiber Lasers in LIDAR and Space

16.30–18.00

Arturo Chavez-Pirson; NP Photonics, Inc., USA, Presider

FWC1 • 16.30

Invited

Fiber-Based Coherent Doppler Lidar for Precision Landing on the Moon and Mars, Farzin Amzajerian¹, Larry Petway¹, Bruce Barnes¹, Glenn Hines¹, Diego Pierrotte², George Lockard²; *¹NASA, Hampton, VA, USA; ²Coherent Applications, Inc., Hampton, VA, USA.* A coherent Doppler lidar capable of providing highly accurate vector velocity and altitude data is being developed for enabling precision navigation of landing vehicles to the designated safe landing site.

FWC2 • 17.00

Narrow Linewidth Continuous Wave Fiber Raman Amplifier for Remote Sensing of Atmospheric O₂ at 1.27 μm , James A. Nagel¹, Valery Temyanko¹, Jeremy Dobler², Evgeni Dianov³, Alexej Sysoliatin³, Alexander Biriukov³, Robert Norwood¹, Nasser Peyghambarian¹; *¹College of Optical Sciences, Univ. of Arizona, Tucson, AZ, USA; ²ITT Geospatial Systems, Fort Wayne, IN, USA; ³Fiber Optic Res. Ctr., Russian Acad. of Sciences, Moscow, Russian Federation.* We report

rate.

AWB4 • 17.15

Octave Spanning Ultra-Broadband Carbon Nanotube Saturable Absorber for Bulk Solid-State Lasers, Sun Young Choi¹, Won Bae Cho¹, Dong-Il Yeom¹, Kihong Kim¹, Fabian Rotermund¹, Ji-Hee Kim², Ki-Ju Yee², Andreas Schmidt³, Günter Steinmeyer³, Benjamin Wolter³, Valentin Petrov³, Uwe Griebner³; ¹Division of Energy Systems Res., Ajou Univ., Suwon, Republic of Korea; ²Dept. of Physics, Chungnam National Univ., Daejeon, Republic of Korea; ³Max Born Institute Inst. for Nonlinear Optics and Short Pulse Spectroscopy, Berlin, Germany. Octave spanning saturable absorber possessing operation bandwidth of ~1000 nm is fabricated on the basis of single-walled carbon nanotubes and applied for mode-locking of different bulk lasers in the 1 and 2 μm spectral range.

on the development of a continuous wave narrow linewidth fiber Raman amplifier for remote sensing of atmospheric oxygen at 1.27 μm with a total combined peak power of 3W for online and offline channels.

FWC3 • 17.15

Tm:Fiber Laser Resonantly-Pumped Ho:YLF Laser for air/space borne lidar application, Yingxin Bai¹, Jirong Yu², Songsheng Chen², Mulugeta Petros³, Paul Petzar², Upendra N. Singh²; ¹Science and Systems Applications, Incorporation, Hampton, VA, USA; ²NASA Langley, Hampton, VA, USA; ³Science and Technology Corporation, Hampton, VA, USA. Tm: fiber laser pumped Ho:YLF laser enables efficient operation at high repetition rate. Corresponding injection seeding technique has been developed. Its significant application is a transmitter of air/space borne CO₂ differential absorption lidar.

AIWC3 • 17.30

Two-dimensional domain engineering in LiNbO₃ via a hybrid patterning technique, Michele Manzo¹, Fredrik Laurell¹, Valdas Pasiskevicius¹, Katia Gallo¹; ¹Laser Physics, Applied Physics, KTH, Stockholm, Sweden. We propose a novel electric field poling technique employing selective proton exchange and resist patterning to fabricate nonlinear photonic crystals in LiNbO₃. We demonstrate 2D tetragonal bulk lattices with 8x6.78 μm^2 periodicity in 0.5mm substrates.

AIWC4 • 17.45

Direct Bonding of Periodically-Poled Lithium Niobate Crystals for Broadly Tunable Quasi-Phase Matching, Myoungsik Cha¹; ¹Pusan National Univ., Busan, Republic of Korea. We fabricated a 2 mm-thick periodically-poled lithium niobate (PPLN) by direct bonding of two 1 mm-thick PPLNs. A broad spectral range of quasi-phase matched second-harmonic generation was demonstrated by angular tuning.

AWB5 • 17.30

Toward Efficient Femtosecond Solid State Yb Amplifiers Pumped by a 976-nm YDFA, Audrius Pugzlys¹, Giedrius Andriukaitis¹, Daniel Adam¹, Andrius Baltuska¹, Guillaume Machinet², Jerome Lhermite², Dominique Descamps², Eric Cormier², Ronald Holzwarth³; ¹Photonics Inst., Vienna Univ. of Technology, Vienna, Austria; ²Cent. Lasers Intenses et Applications, Univ. de Bordeaux-CNRS-CEA, Talence, France; ³Menlo Systems GmbH, Martinsried, Germany. We demonstrate high-gain broadband amplification in Yb:CaF₂ crystal pumped with a bright source based on an ultra-large-core PCF-rod. 3-fold single-pass gain was obtained in a 10-mm Yb:CaF₂, which significantly outperforms any cw-diode-pumped scheme.

FWC4 • 17.30

Invited

Tm:Fiber Pumped Solid-State Ho:YLF 2- μm Coherent Laser Transmitter for Air and Space-based CO₂ Measurements, Upendra Singh¹, Yingxin Bai², Jirong Yu¹; ¹NASA Langley Res. Ctr., Hampton, VA, USA; ²Science Systems and Applications, Inc., Hampton, VA, USA. Researchers at NASA Langley Research Center has developed an efficient, high repetition rate, Tm: fiber pumped Ho:YLF 2- μm coherent laser transmitter to measure atmospheric CO₂ profiles and column concentration from an airborne and space-borne platform.

16.30–18.00

HWC1

Mapping the Coulomb Potential's Influence on the Motion of Electronic Wave Packets in Strong Laser Fields, *Xinhua Xie¹, Stefan Roither¹, Daniil Kartashov¹, Emil Persson², Li Zhang¹, Stefanie Gräfe², Markus Schöffler^{1,3}, Matthias Lezius⁴, Reinhard Dörner³, Joachim Burgdörfer², Andrius Baltuska¹, Markus Kitzler¹*; ¹Photonics Inst., Vienna Univ. of Technology, Vienna, Austria; ²Inst. for Theoretical Physics, Vienna Univ. of Technology, Vienna, Austria; ³Inst. für Kernphysik, J.W. Goethe Univ., Frankfurt/Main, Germany; ⁴Max-Planck Inst. for Quantum Optics, Garching, Germany. We manipulate the trajectories of field-ionizing electron wave packets using two-color laser pulses for controlling the Coulomb potential's influence on their three-dimensional momentum distributions.

HWC2

Attosecond Ionization Dynamics in Transparent Solids, *Alexander V. Mitrofanov¹, Aart J. Verhoeft¹, Evgenii E. Serebryannikov², Julien Lumeau³, Leonid Glebov³, Alexey M. Zheltikov², Andrius Baltuska¹*; ¹Photonics Inst., TU Wien, Vienna, Austria; ²International Laser Ctr., Moscow State Univ., Moscow, Russian Federation; ³CREOL, Univ. of Central Florida, Orlando, FL, USA. We observe an optical signature induced by sub-cycle modulation of the free carrier density in several transparent dielectrics, quasi-periodically ionized on an attosecond time scale by electric field peaks of a focused few-cycle laser pulse.

HWC3

Tunable THz generation with a CEP-stable multicolor OPA, *Tadas Balciunas¹, Dusan Lorenc¹, Misha Ivanov², Olga Smirnova³, Audrius Pugzlys¹, Alexey M. Zheltikov⁴, Daniel Dietze¹, Juraj Darmo¹, Karl Unterrainer¹, Tim Rathje⁵, Gerhard G. Paulus⁵, Andrius Baltuska¹*; ¹Inst. of photonics, Vienna Univ. of Technology, Vienna, Austria; ²Dept. of Physics, Imperial College London, London, UK; ³Max Born Inst., Berlin, Germany; ⁴Dept. of Physics, M.V. Lomonosov Moscow State Univ., Moscow, Russian Federation; ⁵Inst. of Optics and Quantum Electronics, Friedrich-Schiller-Univ. Jena, Jena, Germany. THz emission tunability is demonstrated in a plasma driven by a field synthesized with a multicolor CEP stable OPA. Sub-cycle field ionization followed by continuum-continuum electron transitions are responsible for tunable low frequency emission.

HWC4

Using the Classical Ensemble Method in Strong-Field Atomic Physics, *Xu Wang¹, Joseph H. Eberly¹*; ¹Physics & Astronomy, Univ. of Rochester, Rochester, NY, USA. The classical ensemble method gives a unified picture to strong-field ionization problems. Recently it has been extended to include ellipticity in laser polarization. New effects are predicted for both sequential and nonsequential double

ionization.

HWC5

Development of a Novel Large Bandwidth Front-end System for High Peak Power OPCPA Systems, *Andrey Lyachev¹, Oleg Chekhlov¹, John Collier¹, Marco Galimberti¹, Cristina Hernandez-Gomez¹, Pavel Matousek¹, Ian Musgrave¹, Ian Ross¹, Yunxin Tang¹*; ¹Central Laser Facility, Science and Technology Facilities Council, Didcot, UK. We present the development of a novel large bandwidth front-end that is capable of supporting sub 30fs pulses, with 0.4J of energy at a 2Hz repetition rate that is centered at 910nm.

HWC6

Small-Scale Self-Focusing Suppression at Intense Laser Beams in Mediums with Quadratic and Cubic Nonlinearity, *Sergey Mironov¹, Efim Khazanov¹, Vladimir Lozhkarev¹, Vladislav Ginzburg¹, Gerard Mourou²*; ¹Inst. of Applied Physics of RAS, Nizhny Novgorod, Russian Federation; ²Inst. de la Lumière Extrême, Palaiseau, France. Method of small-scale self-focusing suppression at intense laser beams ($1\div 4\text{TW}/\text{cm}^2$) was developed and verified in experiments successfully. The theoretical model of plane wave instability in mediums with quadratic and cubic nonlinearity was created.

HWC7

Spatio-Temporal Chirped Amplification for avoiding spectral modifications in ultra-short Petawatt lasers Pulse, *Gilles Chériaux¹, Christophe Radier^{2,1}, Fabio Giambruno¹, Christophe Simon-Boisson², Vincent Moro²*; ¹LOA, Palaiseau, France; ²TOSA USL, Elancourt, France. Amplification of large bandwidth pulses in a spatio-temporal configuration is demonstrated at 28 mJ for avoiding spectral shifting in high energy power amplifiers in CPA laser chain. Application to hundreds joules pulses will be discussed.

HWC8

Influence of asymmetry and nodal planes on high-harmonic generation in heteronuclear molecules, *Bradley B. Augstein¹, Carla Figueira de Morisson Faria¹*; ¹Physics and Astronomy, Univ. College London, London, UK. We investigate the connection between high-harmonic spectra and the geometry of heteronuclear and homonuclear isoelectronic molecules. Two distinct behaviors of the nodal planes are identified, and the physics behind them discussed.

HWC9

Independent Control of Arbitrary Dispersion Order of High Intensity Laser Pulses, *Borzsonyi Adam^{1,2}, Peter Jojart^{1,2}, Mate Kovacs¹, Mihaly Gorbe^{3,2}, Karoly Osvay¹*; ¹Optics and Quantum Electronics, Univ. of Szeged, Szeged, Hungary; ²CE Optics, Szeged, Hungary; ³Faculty of Mechanical Engineering and Automation, Kecskemet College, Kecskemet, Hungary. We report on wedge pairs made of different materials, which are capable of tuning exclusively one dispersion coefficient of laser pulses. Contrary to conventional dispersion controlling devices, these wedges can be used with high intensities.

HWC10

Generation of White-Light Supercontinuum with Axially Symmetric Polarization, Shunichi Sato¹, Yuichi Kozawa¹, Takahiro Nakamura¹; ¹*Inst. of Multidisciplinary Res. for Advanced Materials, Tohoku Univ., Sendai, Japan*. The generation of white-light supercontinuum with axially symmetric polarization was demonstrated by transmitting a Ti:sapphire vector beam through water based on the polarization preservation in a white light generation process.

HWC11

Quantum Control of Strong-Field Ladder Climbing in Atomic Sodium, Sangkyung Lee¹, Jongseok Lim¹, Jaewook Ahn¹; ¹*Dept. of Physics, KAIST, Daejeon, Republic of Korea*. We demonstrate quantum control of energy-level ladder climbing in Sodium 4s and 7p states in the strong-field regime, by spectro-temporal ultrafast pulse shaping. Dressed state picture model calculations show good agreements with the experiment.

HWC12

Recent Advancements in Compact Laser Plasma EUV Sources based on a Gas Puff Target, Henryk Fiedorowicz¹, Andrzej Bartnik¹, Roman Jarocki¹, Jerzy Kostecki¹, Mirosław Szczurek¹, Przemysław Wachulak¹; ¹*Inst. of Optoelectronics, Military Univ. of Technology, Warsaw, Poland*. In this paper the recent advancements in technology of compact laser plasma EUV sources based on a gas puff target are presented. These sources have been used in nanoimaging and micro- and nanoprocessing polymers.

HWC13

Multiphoton Population of Rydberg States and Strong-Field Interference Stabilization in Low-Frequency Laser Fields, Alexander Popov¹, Olga Tikhonova¹, Ekaterina Volkova¹; ¹*Inst. of Nuclear Physics, Moscow State Univ., Moscow, Russian Federation*. The set of new phenomena corresponding to the strong field regime of atomic photoionization and stabilization in IR laser field is analyzed by direct numerical integration of non-stationary Schrodinger equation for the model atom in a laser field.

HWC14

High Order Harmonic Generation in the Presence of a Resonance, Maria Tudorovskaya^{1,2}, Manfred Leim¹; ¹*Inst. für Theoretische Physik and Ctr. for Quantum Engineering and Space-Time Res. (QUEST), Leibniz Univ. Hannover, Hanover, Germany*; ²*Inst. für Physik, Univ. Kassel, Kassel, Germany*. High-harmonic generation and its time-frequency analysis are studied numerically for a system with a shape resonance. Resonant enhancement occurs for long or short laser pulses. In a gas the resonance remains significant after intensity averaging.

HWC15

Strong-field dynamics of atoms in low-frequency ultrashort laser pulses, Olga Tikhonova¹, Alexander Popov¹, Ekaterina Volkova¹; ¹*Inst. of Nuclear Physics, Moscow State Univ., Moscow, Russian Federation*. New features of ionization dynamics of a Hydrogen atom and rescattering process in strong ultra-short low-frequency laser field are demonstrated.

HWC16

Investigation of Contrast of Astra-Gemini Laser, Yunxin Tang¹, Chris Hooker¹, Oleg Chekhlov¹, Steve Hawkes¹, Klaus Ertel¹, Rajeev Pattathil¹, John Collier¹; ¹*Central Laser Facility, Rutherford Appleton Lab., Oxfordshire, UK*. We report an investigation of the temporal contrast of the Astra-Gemini high power laser. Enhanced contrast by nearly an order of magnitude has been achieved by upgrading the commercial front-end to provide cleaner seed pulses.

HWC17

Relativistic birefringence induced by high-intensity laser field in plasma, Gin-yih Tsaur¹; ¹*Mathematics, Tunghai Univ., Taichung, Taiwan*. An analytical expression for relativistic birefringence induced by high-intensity laser field in plasma is derived. Its dependence on intensity, wavelength, and density is clearly displayed. The theory is verified by particle-in-cell simulation.

HWC18

Single- and two-color pump-induced high-order harmonic generation in fullerene-containing plasma plumes, Rashid Ganeev¹; ¹*Institute of Electronics, Tashkent, Uzbekistan*. The results of systematic studies of single- and two-color pump-induced high-order harmonic generation in fullerene-rich laser-produced plasma under various plasma conditions and laser parameters are presented.

HWC19

Nonlinear refractive index effects in a Petawatt class OPCPA, Alexandre Thai¹, Christoph Skrobol^{2,3}, Philip K. Bates¹, Gunnar Arisholm⁴, Zsuzsanna Major^{2,3}, Ferenc Krausz^{2,3}, Stefan Karsch^{2,3}, Jens Biegert^{1,5}; ¹*ICFO, Castelldefels (Barcelona), Spain*; ²*Max-Planck-Inst. für Quantenoptik, Garching, Germany*; ³*Ludwig-Maximilians-Univ. München, Garching, Germany*; ⁴*Forsvarets ForskningsInst.t (Norwegian Defence Res. Establishment), Kjeller, Norway*; ⁵*ICREA-Institucio Catalana de Recerca i Estudis Avançats, Barcelona, Spain*. We present 3D OPCPA simulations including nonlinear refractive index for a PW system with 3.67 J, 4 fs transform limited pulses. Those effects reduce the energy by ~11% and increase the Fourier limit by ~17.5%.

HWC20

Low-energy structure of photoelectron spectra in mid-infrared strong laser fields: classical description, Chengpu Liu¹, Karen Z Hatsagortsyan¹; ¹*Max Planck Inst. for Nuclear Physics, Heidelberg, Germany*. Using a semiclassical model incorporating tunneling and Coulomb field effects, the origin of the unexpected low-energy

structure in above-threshold ionization spectrum, revealed in recent experiments with mid-infrared laser pulses, is clarified.

HWC21

Tracking electron motion at the 1fs temporal scale, Charalambidis Dimitrios^{1,2}, Emmanouel Skantzakis^{1,2}, Paraskevas Tzallas¹, Jan Kruse^{1,2}, Faucher Olivier³, George Tsakiris⁴; ¹IESL and Physics Dept, FORTH and Univ. of Crete, Heraklion, Greece; ²Physics Dept, Univ. of Crete, Heraklion, Greece; ³Univ. of Bourgogne, Dijon, France; ⁴MPQ, Garching, Germany. We report on ultra-broadband XUV Fourier Transform spectroscopy, implemented through XUV time resolve spectroscopy of an autoionizing electron wave-packet, i.e. a coherent superposition of doubly excited and Auger decaying inner-shell excited states.

18.30–21.00

Joint Conference Banquet

Banquet Speaker

Title to Be Announced, David Payne, Univ. of Southampton, UK.
Abstract not available.

NOTES

• Thursday, 17 February 2011 •

7.30–17.30

Registration Open

AIThA • Transparent Ceramics and Laser Crystals II

8.00–10.00

Takunori Taira; IMS, Japan, Presider

AIThA1 • 8.00

Invited

Fabrication and characterisation of transparent ceramics with new optical properties, *Yvonne Menke; Schott AG, Germany*. In this paper new developments in the fabrication of high refractive index materials with cubic crystal structure as possible matrix material for rare-earth activated compounds are described. Key challenges for the development of such high end materials are presented and related applications in both optical and fluorescence application fields are illustrated.

AIThA2 • 8.30

Thermally Induced Light Scattering in Laser Ceramics with Arbitrary Sized Grains, *Anton G. Vyatkin¹, Efim Khazanov¹; ¹Inst. of Applied Physics of the Russian Acad. of Sciences, Nizhny Novgorod, Russian Federation*. Thermally induced beam distortions in laser ceramics with arbitrary grain size were investigated. The average scattered power was defined and compared with the corresponding value obtained in the geometrical optics approximation.

AIThA3 • 8.45

Invited

Nd³⁺ and Yb³⁺ doped fluoride laser ceramics, *Tasoltan T. Basiev¹, Maxim E. Doroshenko¹, Vasilii A. Konyushkin¹; ¹Russian Acad of Sciences, Moscow, Russian Federation*. Fluoride laser ceramics of high optical quality doped with Yb³⁺ and Nd³⁺ ions was prepared and its optical and laser properties investigated. Different optical centers were observed and efficient laser oscillation were obtained.

FThA • Fiber Lasers and their Applications

8.00–10.00

Andreas Tünnermann; Friedrich Schiller Univ. Jena, Germany, Presider

FThA1 • 8.00

Keynote

Title to Be Announced, *Valentin Gapontsev¹; ¹IPG Photonics Corp., Oxford, MA, USA*. Abstract not available.

FThA2 • 8.45

Mid-IR Fiber Supercontinuum Source for Hyperspectral Image Projector, *Brandon Shaw¹, Rafael Gattass¹, Jas Sanghera¹, Ishwar Aggarwal¹, Joseph Rice²; ¹Naval Res. Lab, Washington, DC, USA; ²National Inst. of Standards and Technology, Gaithersburg, MD, USA*. We describe a broadband all fiber mid-IR fiber supercontinuum source for illumination of the Hyperspectral Image Projector (HIP) system currently under development at NIST. The source spectral range is 1.5 μm to 5 μm .

HThA • Particles in Intense Fields

8.00–10.00

Gerard Mourou; ENSTA, France, Presider

HThA1 • 8.00

Keynote

Laser Compton Light Sources: From Atomic to Nuclear Photonics, *Christopher P. Barty¹; ¹MS L-470, Lawrence Livermore National Lab, Livermore, CA, USA*. Abstract not available.

HThA2 • 8.45

Invited

High Current Electron Beam Produced with Laser Plasma Accelerators, *Victor Malka¹; ¹LOA, CNRS/ENSTA/Polytechnique, Palaiseau, France*. Ultra-high peak current (few kA) and ultra-short duration (few fs) electron beams have been produced using the colliding laser pulses scheme.

FThA3 • 9.00**Experimental Test of a Fiber Laser**

Hydrophone Array, Enrico Maccioni¹, Nicolò Beverini¹, Stefano Firpi¹, Mauro Morganti¹, Fabio Stefani¹, Cosimo Trono², Piero Guerrini³, Alain Maguer³; ¹Dipartimento di Fisica, Università di Pisa, Largo Pontecorvo 3, Pisa, Italy; ²CNR-Istituto di Fisica Applicata "Nello Carrara", Polo Scientifico, Sesto Fiorentino (FI), Italy; ³Nato Undersea Res. Ctr., Viale san Bartolomeo, 400, La Spezia, Italy. A fiber laser hydrophone array is described. Acoustic waves produce a strain on the fiber laser with a consequent modulation of the wavelength. The sensitivity is of few mPa/(Hz)^{1/2} in the 0.5-5 kHz frequency band.

AIThA4 • 9.15

Yb:CaF₂ grown by Liquid Phase Epitaxy, Patrice Camy¹; ¹CIMAP, Caen, France. Ytterbium doped CaF₂ crystalline layers were grown for the first time by using the liquid phase epitaxy technique. Structural and spectroscopic properties show that the obtained layers are very close to the Yb³⁺:CaF₂ bulk crystals.

AIThA5 • 9.30

Simultaneous Dual-Wavelength Laser Operation in Co-Doped (Ho,Tm):KLu(WO₄)₂ Crystal, Xavier Mateos¹, Venkatesan Jambunathan¹, Maria Cinta Pujol¹, Joan Josep Carvajal¹, Magdalena Aguiló¹, Francesc Díaz¹, Andreas Schmidt², Uwe Griebner², Valentin Petrov²; ¹Univ. Rovira i Virgili, Tarragona, Spain; ²Max-Born Inst., Berlin, Germany. Simultaneous lasing of Ho³⁺ at 2061 nm and Tm³⁺ at 1937 or 1919 nm is observed in co-doped monoclinic (Ho,Tm):KLu(WO₄)₂ at room temperature with output power and slope efficiency reaching 218 mW and 27%, respectively.

FThA4 • 9.15

Fiber Amplifiers of Radially or Azimuthally Polarized Light, Micha Nixon¹, Moti Fridman¹, Asher A. Friesem¹, Nir Davidson¹; ¹Weizmann Inst. of Science, Rehovot, Israel. A novel configuration for amplifying radial or azimuthal polarized light with fiber amplifier is presented. We obtained 40dB amplification with more than 85% polarization purity and efficient conversion to linear polarization.

FThA5 • 9.30

Distributed Feedback Lasers in Phosphate Glass Active Fiber, Axel Schulzgen¹, Peter Hofmann^{1,2}, Li Li², Nasser Peyghambarian², Lingyun Xiong³, Albane Laronche³, Jacques Albert³; ¹CREOL, College of Optics and Photonics, Univ. of Central Florida, Orlando, FL, USA; ²College of Optical Sciences, Univ. of Arizona, Tucson, AZ, USA; ³Dept. of Electronics, Carleton Univ., Ottawa, ON, Canada. Writing grating structures directly into the highly-doped core of phosphate glass fibers enables the fabrication of distributed feedback lasers. Efficient pump absorption allows for novel cladding pumped distributed feedback fiber lasers.

HThA3 • 9.15

LWFA Experiments at PEARL Facility, Alexander Soloviev¹, Konstantin Burdonov¹, Vladislav Ginzburg¹, Eugeny Katin¹, Efim Khazanov¹, Alex Kirsanov¹, Vladimir Lozhkarev¹, Grigory Luchinin¹, Anatoly Mal'shakov¹, Mikhail A. Martyanov¹, Oleg Palashov¹, Anatoly K. Poteomkin¹, Alexander Sergeev¹, Andrey Shaykin¹, Mikhail Starodubtsev¹, Ivan Yakovlev¹; ¹The Inst. of Applied Physics of the Russian Acad. of Sciences, Nizhny Novgorod, Russian Federation. The results of laser wakefield acceleration experimental series carried out at PEARL (PEtawatt pArametrical Laser) system are discussed in the paper. The electron beams with energies up to 300 MeV were observed.

HThA4 • 9.30

Highly-Efficient Ion Acceleration in Laser Plasma via Interaction of Intense Laser Pulse with Cluster-Gas Target, Yuji Fukuda¹, Motonobu Tampo¹, Masaki Kando¹, Yukio Hayashi¹, Keigo Kawase¹, Anatoly Y. Faenov^{1,2}, Tatiana A. Pikuz^{1,2}, Tatsufumi Nakamura¹, Hironao Sakaki¹, Alexander Pirozhkov¹, Takuya Shimomura¹, Hiromitsu Kiriya¹, Masato Kanasaki^{1,3}, Tomoya Yamauchi³, Ryosuke Kodama⁴, Kiminori Kondo¹, Sergei V. Bulanov^{1,5}; ¹Kansai Photon Science Inst., Japan Atomic Energy Agency, Kizugawa, Japan; ²Joint Inst. of High Temperatures, Russian Acad. of Sciences, Moscow, Russian Federation; ³Graduate School of Maritime Sciences, Kobe Univ., Hyogo, Japan; ⁴Graduate School of Engineering, Osaka Univ., Osaka,

Japan; ⁵A.M. Prokhorov Inst. of General Physics, Russian Acad. of Sciences, Moscow, Russian Federation. We present substantial enhancement of accelerated ion energies up to 20 MeV/u by utilizing a cluster-gas target irradiated with 150-mJ laser pulse, corresponding to approximately tenfold increase in ion energies compared to previous experiments.

HThA5 • 9.45

Efficient generation of DD fusion by all diode-pumped solid-state laser, Takashi Sekine¹, Toshiyuki Kawashima¹, Nakahiro Sato¹, Masaru Takagi¹, Hirofumi Kan¹, Yoneyoshi Kitagawa², Yoshitaka Mori², Ryohei Hanayama², Shimichiro Okihara², Kazuhisa Fujita², Katsuhiro Ishii², Naoki Nakamura³, Yasushi Miyamoto³, Hirozumi Azuma⁴, Tomoyoshi Motohiro⁴, Tatsumi Hioki⁴; ¹Development bureau, Hamamatsu Photonics K. K., Shizuoka, Japan; ²The Graduate School for the Creation of New Photonics Industries, Shizuoka, Japan; ³Advanced Material Engineering Division, TOYOTA Motor Corporation, Shizuoka, Japan; ⁴TOYOTA Central Res. and Development Laboratories, Inc., Aichi, Japan. We have started a new project of inertial fusion driven by all diode-pumped solid-state laser (DPSSL). 105 DD fusion neutron yield from a 500- μ m-thick deuterated polystyrene film has preliminarily demonstrated by 10 TW HAMA laser.

AITHA6 • 9.45

Influence of Nd³⁺-concentration on laser transitions in Nd:YAG, Yoichi Sato¹, Takunori Taira¹; ¹Laser Res. Ctr. for Molecular Science, Inst. for Molecular Science, Okazaki, Japan. We found 30.9% difference in stimulated emission cross section at 1319 nm between 0.4at.% and 5.4at.% Nd:YAG ceramics by fine spectroscopy. It was also revealed that Stark splitting of Nd:YAG depended on Nd³⁺-concentration and fabrication processes.

Dolmabahce Foyer, R Floor

10.00–10.30

Coffee Break

Dolmabahce Ballroom, R Floor

10.00–16.30

Exhibits Open

10.30–11.30

AITHB01

(Yb³⁺, Er³⁺) and (Yb³⁺, Tm³⁺)-codoped Lu₂O₃ nanorods:

Hydrothermal synthesis and visible emissions, *E. William Barrera Bello¹, Maria Cinta Pujol¹, Concepción Cascales³, Fabian Rotermund², Francesc Díaz¹; ¹Física i Cristal·lografia de Materials i nanomaterials (FiCMA-FiCNA), Universitat Rovira i Virgili, Tarragona, Spain; ²Division of Energy Systems Res., Ajou Univ., Suwon, Republic of Korea; ³Inst.o de Ciencia de Materiales de Madrid, Madrid, Spain.* Yb³⁺,Er³⁺ and Yb³⁺,Tm³⁺ codoped Lu₂O₃ nanorods have been prepared by low temperature hydrothermal procedure. Room temperature upconversion under excitation at 980 nm and cathodoluminescence spectra were studied in function of the Yb³⁺ concentration.

AITHB02

Growth and Optical Properties of ZnO Nanorod Gratings, *GeonJoon Lee¹, Hyun Jung Nam², Chang Kwon Hwangbo², Hyunjin Lim³, Hyeonsik Cheong³, Hee Soo Kim⁴, Chong Seung Yoon⁴, Sun-Ki Min⁵, Sung-Hwan Han⁵, YoungPak Lee¹; ¹Quantum Photonic Science Res. Ctr., Hanyang Univ., Seoul, Republic of Korea; ²Dept. of Physics, Inha Univ., Incheon, Republic of Korea; ³Dept. of Physics, Sogang Univ., Seoul, Republic of Korea; ⁴Dept. of Materials Science and Engineering, Hanyang Univ., Seoul, Republic of Korea; ⁵Dept. of Chemistry, Hanyang Univ., Seoul, Republic of Korea.*

We investigated the optical and structural properties of ZnO nanorods, and fabricated the ZnO-nanorod grating by applying femtosecond-laser modification of the seed layer to the chemical bath deposition method.

AITHB03

New technique of activator ions photoionization spectra

investigation in doped crystals, *Vitaly V. Pavlov¹, Mikhail Marisov¹, Vadim Semashko¹, Alexander Naumov¹, Stella Korableva¹, Alexey Nizamutdinov¹; ¹Physics, Kazan (Volga Region) Federal Univ., Kazan, Russian Federation.* The new technique of excited-state photoionization spectra studying of activator ions in dielectric hosts is proposed. It is based on analysis of fluorescence kinetics dependencies on excitation wavelength.

AITHB04

Kinetics Of Middle-IR Transitions In Dy³⁺ Ions Doped In Silver

Halade Fibers, *Andrey Okhrimchuk¹, Leonid Butvina¹, Ninel Lichkova², Vladimir Zagorodnev², Evgeni Dianov¹; ¹Fiber Optics Res. Ctr. of RAS, Moscow, Russian Federation; ²Inst. of Microelectronics Technology of RAS, Chernogolovka, Russian Federation.* Middle-IR luminescence of AgHal:Dy³⁺ crystal was investigated. Detrimental influence of clusterization on efficiency of the middle-IR transitions was found.

AITHB05

Low-Phonon BaF₂: Ho³⁺: Tm³⁺ Doped Crystals for 3.5 - 4 μm Lasing,

Yurii V. Orlovskii¹, Olim Alimov¹, Tasoltan T. Basiev¹; ¹Laser Materials and Technology Res. Ctr., General Physics Inst., Moscow, Russian Federation. New pumping and sensitization scheme of 3.9 μm laser transition of Ho³⁺ in low-phonon the BaF₂:Ho³⁺:Tm³⁺ crystals is studied. Energy transfer from Tm³⁺ to Ho³⁺ and back transfer from Ho³⁺ to Tm³⁺ are analyzed.

AITHB06

Heat Generation and Flow and Thermal Effects on Optical Spectra in Laser Diode Pumped Thulium-doped Vanadate Crystals,

Radoslaw Lisiecki¹, Piotr Stachowiak¹, Andrzej Jezowski¹, Piotr Solarz¹, Grazyna Dominiak-Dzik¹, Witold Ryba-Romanowski¹, Tadeusz Lukaszewicz²; ¹Inst. of Low Temperature and Structure Res., Polish Acad. of Sciences, Wroclaw, Poland; ²Inst. of Electronic Materials Technology, Warsaw, Poland. Optical spectra, excited state relaxation dynamics and thermal conductivity in a wide temperature region for thulium-doped YVO₄, GdVO₄ and LuVO₄ have been measured and analyzed to assess thermal effects in laser-diode-pumped Tm:vanadate lasers.

AITHB07

Thermoluminescent detectors based on YAP:Mn crystals, *Yaroslav Zhydachevski³, Andrzej Suchocki^{1,2}, Marek Berkowski¹; ¹Inst. of Physics Polish Acad. of Sciences, Warsaw, Poland; ²Inst. of Physics, Kazimierz Wielki Univ., Bydgoszcz, Poland; ³Lviv Polytechnic National Univ., Lviv, Ukraine.*

The work presents results of the experimental study of thermoluminescent (TL) properties of the high-temperature TL peak at 570 K observed in YAlO₃:Mn crystals at low concentrations of manganese ions.

AITHB08

MeV He Ion-Implanted Planar Waveguide in RTP Crystal, *Gang Fu¹; ¹School of Science, Shandong Jianzhu Univ., Jinan, China.*

A planar optical waveguide was formed in RbTiOPO₄(RTP) crystal by 3.0-MeV He-ion implantation with a dose of 1.0×10¹⁶ions/cm² at room temperature. The annealing process effectively removed the color centers and reduced the loss of waveguide.

AITHB09

Measurement Of Up Conversion In Er:YAG And Comparison With

Laser Performance, *Norman Barnes¹, Farzin Amzajerdian¹, Brian Walsh¹, Donald Reichle¹, George Busch², William Carrion²; ¹NASA Langley Res. Ctr., Hampton, VA, USA; ²NASA Langley Res. Ctr., Hampton, VA, USA.* Up conversion significantly affects Er:YAG lasers. Measurements done here for low Er concentration are significantly smaller than reported high Er results. Results are used to predict laser performance and results are compared with experiment.

AIThB10

Structural Peculiarities, Energy Transfer and the Visible Emission in Gd₂SiO₅ Single Crystal Doped with Pr³⁺, Sm³⁺ and Dy³⁺, *Grazyna Dominiak-Dzik¹, Witold Ryba-Romanowski¹, Radoslaw Lisiecki¹, Piotr Solarz¹, Boguslaw Macalik¹, Marek Berkowski²; ¹Inst. of Low Tem. and Structure Res. PAS, Wroclaw, Poland; ²Inst. of Physics, Polish Acad. of Sciences, Warsaw, Poland.* Analysis of optical spectra and luminescence decay curves with reference to host structural peculiarities revealed mechanisms involved in excitation and relaxation processes leading to the visible emission of Pr³⁺, Sm³⁺ and Dy³⁺ in Gd₂SiO₅ crystals.

AIThB11

Paper Withdrawn

AIThB12

Bistable Switching based on Pseudo Resonant States in Nonlinear Fractal Photonic Crystals, *Mohammad Hosain Teimourpour¹; ¹Optics and Laser Engineering, Kermanshah Univ. of Technology, Kermanshah, Islamic Republic of Iran.* All optical switching based on Kerr bistability in fractal photonic crystal without any defects is investigated. Finite element analysis is used to investigate bistable switching with low threshold (6.12 W/cm²).

AIThB13

Switching dynamics and thickness effect of an intensity modulator based on a novel nematic liquid crystal mixture, *Habib Khoshshima¹, Babak Olyaeefar¹; ¹Photonics, Res. Inst. for Applied Physics, Tabriz, Islamic Republic of Iran.* In this experimental work, the latest results for the dynamic behavior of a novel nematic liquid crystal mixture are presented. The free relaxation time and viscoelastic coefficient of samples in three different thicknesses are calculated.

AIThB14

Simulation of Transmission Behaviors of Photonic Crystal Structures Etched into an Ion-implanted LN Waveguide, *Qing Huang¹, Jin-Hua Zhao¹, Peng Liu¹, Jing Guan¹, Xue-Lin Wang¹; ¹School of Physics, Shandong Univ., Jinan, China.* The transmission behaviors of one and two-dimensional photonic crystal structures etched into an oxygen-ion-implanted LN waveguide were simulated by FDTD method. The cavity formed in one-dimensional photonic crystal structure works well as a filter.

AIThB15

Photoluminescence, afterglow and color properties in nanocrystalline SrMgAl₂SiO₇:Eu²⁺, Dy³⁺ phosphor, *Hassan Sameie¹, Reza Salimi¹, Ali A. Sabbagh², Ali A. Sarabi¹, Mohammadreza Tahriri³, Mohammad A. Mokhtari Farsi¹; ¹Dept. of Polymer Engineering & Color Technology, Amirkabir Univ. of Technology, Tehran, Islamic Republic of Iran; ²Color and Polymer Res. Ctr. (CPRC), Amirkabir Univ. of Technology, Tehran, Islamic Republic of Iran; ³Biomaterials Group, Faculty of Biomedical Engineering, Amirkabir Univ. of Technology, Tehran, Islamic*

Republic of Iran. The phase-condition, morphology and optical properties for sol-gel derived phosphor, SrMgAl₂SiO₇:Eu²⁺, Dy³⁺ were studied. Results showed that although Dy decreases the emission intensity, but can obviously improve the afterglow characteristic.

AIThB16

Site-Selective Spectroscopy of Garnets Doped with Chromium and Praseodymium Ions, *Humeyra Orucu², Ozen Gonul², Baldassare Di Bartolo², John Collins¹; ¹Physics and Astronomy, Wheaton College, Norton, MA, USA; ²Physics, Boston College, Chestnut Hill, MA, USA.* In this paper we present various techniques that can be used for site-selective spectroscopic studies and we follow with a study of some garnet crystals doped with chromium and praseodymium ions.

AIThB17

PbS Quantum Dots Formation in Glasses Controlled by Ag Nanoclusters, *Kai Xu¹, Jong Heo¹; ¹Dept. of Materials Science & Engineering, Pohang Univ. of Science and Technology (POSTECH), Pohang, Republic of Korea.* Control of the formation of PbS quantum dots in glasses was attempted by precipitating Ag nanoclusters. Heat-treatment and ion-exchange processes were used to form Ag nanoclusters. Ag nanoclusters significantly enhanced the formation of quantum dots.

AIThB18

Chemical synthesis, crystal growth and mid-IR Difference Frequency Generation in ZnGeP₂ and AgGaS₂, *Johan Petit¹, Antoine Godard², Myriam Raybaut², Jean-Michel Melkonian², Michel Lefebvre²; ¹DMSC, ONERA, Chatillon, France; ²DMPH, ONERA, Palaiseau, France.* Chalcopyrite as ZnGeP₂ and AgGaS₂ are very promising non linear materials for the 3-12 μm laser sources. Their elaboration process is presented before first DFG experiments in the mid-IR.

AIThB19

Integrated chalcogenide waveguide resonators for mid-IR sensing: Leveraging material properties to meet fabrication challenges, *Kathleen Richardson¹, Nathan Carlie¹, J. David Musgraves¹, Bogdan Zdyrko¹, Igor Luzinov¹, Juejun Hu², Vivek Singh², Anu Agarwal², Lionel C. Kimerling², Antonio Canciamilla³, Francesco Morichetti³, Andrea Melloni³; ¹Materials Science and Engineering, COMSET, Clemson Univ., Clemson, SC, USA; ²Microphotonics Lab, MSE, MIT, Cambridge, MA, USA; ³Electronics and Information, Polytechnique Milano, Milano, Italy.* Efforts to reduce loss and tailor optical characteristics of planar chalcogenide devices are discussed and results of trimming experiments to correct fabrication errors, presented.

Marmara, P Floor**Citronelle, N Floor****Anadolu, P Floor****FThB • Short Pulse Fiber Lasers****10.30–12.30***Valentin Gapontsev; IPG Photonics Corp. USA, Presider***FThB1 • 10.30****Invited**

Recent Progress on the ALPINE (Advanced Lasers for Photovoltaic INDUSTRIAL processing Enhancement) FP7 Integrated Project, *Yves Hernandez¹, Anthony Bertrand¹, Stefano Selleri², Francois Salin³, Lasse Leick⁴, Marc Hueske⁵, Rok Petkovsek⁶, Fabio Ferrario⁷, Norbert Lichtenstein⁸; ¹Multitel, Mons, Belgium, ²Univ. of Parma, Parma, Italy, ³EOLITE Systems, PESSAC, France, ⁴NKT Photonics, Birkerød, Denmark, ⁵LPKF SolarEquipment GmbH, Garbsen, Germany, ⁶Univ. of Ljubljana, Ljubljana, Slovenia, ⁷Quanta System S.p.A., Solbiate Olona (VA), Italy, ⁸Oclaro Zurich, Zurich, Switzerland. We present the recent advances on the ALPINE project dedicated to developing innovative fibre lasers for scribing thin film CIGS and CdTe solar cells. The project started in September 2009 and involves 15 European partners.*

FThB2 • 11.00

High average power femtosecond pulses at 520 nm via second harmonic generation of a fiber chirped pulse amplification system, *Tino Eidam^{1,2}, Steffen Hädrich^{1,2}, Jan Rothhardt^{1,2}, Fabian Stutzki¹, Florian Jansen¹, Thomas Gottschall¹, Thomas V. Andersen³, Jens Limpert^{1,2}, Andreas Tünnermann^{1,2}; ¹Inst. of Applied Physics, Friedrich-Schiller-Univ. Jena, Jena, Germany; ²Helmholtz-Inst. Jena, Jena, Germany; ³NKT Photonics, Birkerød, Denmark. We present efficient second harmonic generation of a femtosecond fiber chirped pulse amplification system. At a record average power of 135W and a repetition rate of 5.25MHz we measured a M² value <1.2.*

FThB3 • 11.15

High Efficiency Chirped Bragg Gratings for Pulse Stretching and Compression, *Vadim Smirnov¹, Eugeniu Rotari¹, Ion Cohanoshi¹, Almantas Galvanauskas², Leonid Glebov³; ¹OptiGrate, Orlando, FL, USA; ²EECS Dept., Univ. of Michigan, Ann Arbor, MI, USA; ³CREOL/ The College of optics and Photonics, Univ. of Central Florida, Orlando, FL, USA. This paper report on the advances in the*

HThB • Enhanced Higher-Order Harmonic Generation**10.30–12.30***Presider to Be Announced***HThB1 • 10.30****Invited**

Generalized Double Optical Gating, a Route to High Power Isolated Attosecond Sources, *Zenghu Chang; Kansas State Univ., USA. Abstract not available.*

HThB2 • 11.00**Invited**

High-Energy Isolated Attosecond Pulses and Applications to Molecular Physics, *Francesca Calegari¹, Federico Ferrari¹, Matteo Lucchini¹, Caterina Vozzi¹, Salvatore Stagira¹, Giuseppe Sansone¹, Mauro Nisoli¹; ¹Dept. of Physics, Politecnico di Milano, Milano, Italy. We report on the generation of isolated 155-as pulses with a pulse energy on-target of a few nanojoules, by using 5-fs driving pulses with stable carrier-envelope phase and peak intensity beyond the gas saturation intensity.*

AIThC • Specific Applications**11.30–13.00***Shibin Jiang; AdValue Photonics, Inc. USA, Presider*

large-aperture linearly chirped Bragg grating stretcher/compressor, which enables efficient compact and robust chirped pulse amplification systems for high peak and high average power ultrashort pulses.

FThB4 • 11.30**Invited**

ns and fs Fiber Lasers, Jian Liu¹, Peng Wan¹, Lihmei Yang¹, Farzin Amzajerdian²; ¹PolarOnyx Inc., Sunnydale, CA, USA; ²NASA Langley Res. Ctr., Hampton, VA, USA. Pulse shaping technology is present to mitigate pulse narrowing and SBS effects in high energy/power ns fiber lasers and to balance SPM and gain narrowing in high energy/power fs fiber lasers.

HThB3 • 11.30

High-Order Harmonics Tunable Enhancement by a DC-Electric Field, Carles Serrat^{1,2}, Jens Biegert^{2,3}; ¹UPC - Universitat Politècnica de Catalunya, Terrassa, Spain; ²ICFO, Castelldefels (Barcelona), Spain; ³ICREA, Barcelona, Spain. A static electric field periodically distributed in space controls and enhances the yield in high harmonic generation. The method is relatively simple to implement and allows tuning from the extreme-ultraviolet to soft x-ray.

HThB4 • 11.45

Angle-frequency analysis of high-order harmonic generation, Philip K. Bates¹, Stephan Teichmann¹, Seth Cousin¹, Alexander Gruen¹, Jens Biegert^{1,4}, Arnaud Couairon², Matteo Clerici³, Antonio Lotti³, Daniele Faccio³, Paolo DiTrapani³; ¹Attoscience and Ultrafast Optics, ICFO-Inst. de Ciències Fotòniques, Castelldefels (Barcelona), Spain; ²Ctr. de Physique Theorique, Ecole Polytechnique, Palaiseau, France; ³CNISM & Dept. of Mathematics and Physics, Università dell'Insubria, Como, Italy; ⁴ICREA, Institutio Catalana de Recerca i Estudis Avancats, Barcelona, Spain. We measure the far-field (angle-wavelength) spectrum of high order harmonics from a semi-infinite gas cell. Individual harmonics exhibit ring structures in space-time, which are attributed to the different quantum paths.

FThB5 • 12.00**Invited**

Photovoltaics Applications of High Power Green and UV Fiber Lasers, Julien Saby, Benjamin Cocquelin, Francois Salin, Nicolas Falletto; Eolite Systems, Pessac, France. We present industrial laser products delivering 200W at 1030nm, 60W at 515nm and 20W at 343nm with pulse duration down to 10ns and M²<1.3 with a very simple MOPA architecture based on rod-type fiber laser. Photovoltaics applications are then presented on both silicon and thin film wafers.

HThB5 • 12.00**Invited**

Bright Coherent Ultrafast X-rays from mid-IR Lasers, Tenio Popmintchev¹, Ming-Chang Chen¹, Paul Arpin¹, Michael Gerrity¹, Matthew Seaberg¹, Bosheng Zhang¹, Dimitar Popmintchev¹, Giedrius Andriukaitis², Tadas Balciunas², Oliver D. Mücke², Audrius Pugzlys², Andrius Baltuska², Margaret Murnane¹, Henry Kapteyn¹; ¹JILA and Univ. of Colorado at Boulder, Boulder, CO, USA; ²Photonics Inst., Vienna Univ. of Technology, Vienna, Austria. We combine the attosecond physics of high harmonic generation with phase-matching in extreme nonlinear optics to demonstrate bright

AIThC1 • 11.30**Invited**

Sintered Ceramics for Lighting and Computerized Tomography (CT) Scanners, Anant Setlur; GE Global Res., Niskayuna, NY, USA. Abstract not available.

AIThC2 • 12.00

Photo-Thermo-Refractive glass - Properties and Applications, Larissa Glebova¹, Karima Chamma¹, Julien Lumeau¹, Leonid Glebov¹; ¹Univ. of Central Florida, CREOL, Orlando, FL, USA. Mechanisms of photo-thermo-induced refractive index change, advances in glass properties and applications for holographic optical elements, laser beam profilers, volume phase masks, and monolithic solid state lasers are discussed.

coherent upconversion into the X-ray spectral region using longer wavelength mid-IR lasers.

AIThC3 • 12.15

Visible to infrared down conversion in rare-earth doped fluorides for luminescent solar converters, Diana Serrano¹, Alain Braud¹; ¹CIMAP-ENSICAEN, Caen, France.

KY₃F₁₀ and CaF₂ fluoride crystals co-doped with Pr³⁺ and Yb³⁺ ions are investigated as possible quantum cutting systems to enhance solar cells efficiency. More than 95% Pr³⁺ to Yb³⁺ energy transfer efficiencies are obtained.

AIThC4 • 12.30

Crystal growth and Spectroscopy of Cerium doped CaSc₂O₄, Matthias Fechner¹, Fabian Reichert¹, Klaus Petermann¹, Günter Huber¹; ¹Inst. für Laser-Physik, Hamburg, Germany. Within cerium doped CaSc₂O₄ single crystals a ligand to metal Ce⁴⁺ - Ce³⁺ charge transfer absorption band is identified. Crystal growth and its influence on the incorporation of different charged Cerium ions are discussed.

AIThC5 • 12.45

Effect of Ho³⁺ in (Tm³⁺,Yb³⁺):

KLu(WO₄)₂ nanocrystals for RGB light

generation, E. William Barrera Bello¹, María Cinta Pujol¹, Joan Josep Carvajal¹, Xavier Mateos¹, Magdalena Aguiló¹, Francesc Díaz¹, Concepción Cascales²; ¹Universitat Rovira i Virgili, Tarragona, Spain; ²Inst.o de Ciencia de Materiales de Madrid, Madrid, Spain. Nanocrystalline powder of Ho³⁺,Tm³⁺,Yb³⁺:KLu(WO₄)₂ was synthesized by modified Pechini method. Under 930 nm, RGB emissions were observed. The decay times were studied to describe the luminescence dynamics. The CIE chromaticity was evaluated.

13.00–14.30

Lunch Break (on your own)

Marmara, P Floor	Citronelle, N Floor	Anadolu, P Floor
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FThC • Fiber Lasers and Applications II
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14.00–16.00

Ulrich Hefter; Rofin-Sinar, Germany, USA

FThC1 • 14.00	Invited
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High Repetition Rate Ultrashort Pulse Micromachining with Fiber Lasers, *Stefan Nolte^{1,2}, Sven Döring¹, Antonio Ancona³, Jens Limpert^{1,2}, Andreas Tünnermann^{1,2}; ¹Inst. of Applied Physics, Friedrich-Schiller-Univ. Jena, Jena, Germany, ²Fraunhofer Inst. for Applied Optics and Precision Engineering, Jena, Germany, ³CNR-INFM Dipartimento di Fisica, Bari, Italy.*

Despite its advantages with respect to precision, ultrashort pulse micromachining often suffers from a low processing speed. We will discuss the opportunities for high repetition rate and high average power ultrafast fiber lasers to overcome these problems.

FThC2 • 14.30

High Power all fiber Picosecond Laser and Application to Photovoltaic Thin Films Scribing, *Simonette Pierrot¹, Benjamin Cocquelin¹, Julien Saby¹, Nicolas Falletto¹, Francois Salin¹; ¹Eolite Systems, Pessac, France.* We demonstrate an all-fiber source producing 30ps pulses with energy up to 30μJ and average power up to 45W. 50% conversion efficiency to the UV and application to CIGS thin film scribing is demonstrated.

FThC3 • 14.45

Ultra-short pulse fibre laser parameters optimisation for CdTe thin film solar cells processing and fibre laser design, *Yves Hernandez¹; ¹Multitel, Mons, Belgium.* We present the results of an optimization study of ultra-short pulse laser scribing of thin film CdTe solar cells. Thereafter, a fibre laser source has been designed and the first results are also included here.

HThC • Plasma Interactions

14.30–16.00

Victor Malka; CNRS, France, Presider

HThC1 • 14.30	Invited
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Driving Laser-plasma Interactions with Few-cycle Pulses, *Rodrigo Lopez Martenz; LOA, France.* Abstract not available.

AIThD • Crystal and Glass Fibers II
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14.30–16.00

Presider to Be Announced

AIThD1 • 14.30	Invited
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Mid-Infrared Glasses and Fibers, *Jean-Luc Adam¹; ¹Univ. de Rennes 1, Rennes, France.* This paper deals with the latest results in the field of chalcogenide glasses and fibers for infrared photonics, including light sources, photonic crystal fibers, and biosensors.

FThC4 • 15.00

Invited

Influence of Peak Power and ns Pulse**Duration on Micromachining, Sami**

Hendow¹; ¹Multiwave Photonics, San Jose, Portugal. Experimental and modeling results are presented for 10 to 200 ns pulsed fiber laser at 1064nm, showing peak power and pulse duration affecting ablation depth and HAZ, and produce heavy surface oxidation of stainless steel.

FThC5 • 15.30

Invited

Visible and Infrared Sources based on Three-Level Ytterbium-doped Fiber Lasers, J.

Boullet¹, R. Bello-Doua², R. Dubrasquet², Nicholas Traynor¹, Caroline Lecaplain⁴, Ammar Hideur⁴, Jerome Lhermite³, Guillaume Machinet³, C. Médina³, Eric Cormier³; ¹Azur Light Systems, Talence, France, ²Alphanov, Centre Technologique Optique et Lasers, Talence, France, ³Centre Lasers Intenses et Applications, Univ. de Bordeaux, Bordeaux, France, ⁴Univ. de Rouen-CNRS UMR, Saint Etienne du Rouvray, France. We present recent work on a variety of Yb-doped fiber laser systems operating on the three-level transition at 976 nm, both CW and pulsed, and subsequent frequency doubling.

HThC2 • 15.00**Generation of intense ultrashort mid-infrared pulses by laser-plasma interaction in the bubble regime, Jyhpyng Wang¹;**

¹Inst. of Atomic and Molecular Sciences, Academia Sinica, Taipei, Taiwan. Generation of intense mid-infrared pulses by laser-plasma interaction in the bubble regime is demonstrated experimentally. Nonlinear phase modulation is shown to be the conversion mechanism by theoretical analysis and numerical simulation.

HThC3 • 15.15**Spatiotemporal Model of Passively Mode-locked Few-cycle Ti:sapphire Lasers: The Role of Plasma Formation, Li-Jin Chen¹, Chien-Jen Lai¹, Franz Kärtner¹;**

¹MIT, Cambridge, MA, USA. A spatiotemporal model for Kerr-lens mode-locked few-cycle Ti:sapphire lasers is developed. The ultra-high intensity leads to significant plasma formation in the crystal which dominates the beam propagation in agreement with experimental observation.

HThC4 • 15.30**Plasma Defocusing in High Harmonic Generation with Long-Wavelength Driver Pulses, Chien-Jen Lai¹, Franz Kärtner¹;**

¹EECS, MIT, Cambridge, MA, USA. Plasma defocusing in gas media and its impact on high-order harmonic generation (HHG) is discussed. It confines HHG with long-wavelength driver pulses to short propagation lengths significantly diminishing the HHG yield from high density media.

HThC5 • 15.45**Routes towards Single Intense Attosecond Pulses, George Tsakiris¹;**

¹Attophysics, Max-Planck Inst. for Quantum Optics, 85748 Garching, Germany. The plasma medium converts laser light into higher harmonics more efficiently than gaseous media without inherent limitation on the laser intensity. This opens the prospect of generating brilliant, single attosecond pulses for applications.

AITHD2 • 15.00**Chalcogenide Square Registered IR Imaging Bundles, Brandon Shaw¹, Dan Gibson¹, Vinh Nguyen¹, Rafael Gattass¹, Jas Sanghera¹, Ishwar Aggarwal¹, Gabrielle Farrar²;**

¹Naval Res. Lab, Washington, DC, USA; ²Univ. Res. Foundation, Greenbelt, MD, USA. We report on development and characterization of square registered infrared imaging bundles fabricated from As₂S₃ fiber. Bundle cross-talk measurements are presented.

AITHD3 • 15.15**Dy(Pr³⁺)doped GaGeSbS(Se) fibers for CO₂ sensing at 4.35μm, Jean-Louis Doualan¹;**

¹CIMAP, Caen, France. Dy³⁺ and Pr³⁺ doped GaGeSbS(Se) glasses provide good emission efficiencies in the mid IR. By using the 4.5μm emission of a Dy³⁺ doped GaGeSbS fiber, the CO₂ gas concentration measurement is carried out successfully.

AITHD4 • 15.30**Low loss micro and nano structured single mode crystalline fibers for 5-15 μm, Leonid N. Butova¹, Alexey L. Butova¹, Andrey Okhrimchuk¹, Ninel Lichkova², Vladimir Zagorodnev², Evgeni Dianov¹;**

¹Fiber optic, FORC RAS, Moscow, Russian Federation; ²High purity materials, IPTM RAS, Chernogolovka, Russian Federation. Low loss multi component photonic micro- and nano-structured metal halides crystalline fibers for 5-15 μm are extruded. Fibers of different type from silver and metal halides are singlemode for 10 μm

AITHD5 • 15.45**Theoretical and experimental study of microstructured chalcogenide As₂S₃ fibers for frequency conversion, Claire Alhenc-Gelas¹, Pierre Bourdon¹, Guillaume Canat¹, Frédéric Druon², Anne Durecu¹;**

¹DOTA-SLS, ONERA, Palaiseau, France; ²Laboratoire Charles Fabry de l'Inst. d'Optique, CNRS, Palaiseau, France. The potential of mid-IR frequency conversion in As₂S₃ microstructured fibers is assessed using an effective index method. The dispersion measurement setup used to validate the model on real chalcogenide fibers is also presented.

Dolmabahce Foyer, R Floor

16.00–16.30

Coffee Break

AIThE • Nonlinear Crystals and Processes II

16.30–18.00

Peter Schunemann; BAE Systems, Inc., USA, Presider

AIThE1 • 16.30

Invited

Large nonlinear LBO crystals for high power laser chains, Alexandr E. Kokh¹, Nadezda Kononova¹, Vasily Vlezko¹, Konstantin Kokh¹, Philippe Villval², Dominique Lupinski², Stephane Durst²; ¹Inst. of Geology and Mineralogy, Novosibirsk, Russian Federation; ²Cristal Laser, Nancy, France. In order to improve the quality and dimensions of LBO crystal we have performed the growth under nonuniform rotating heat field. Currently Ø 65 mm NLO elements for 2nd and 3rd harmonic generation of 1053 nm were produced.

AIThE2 • 17.00

Crystal growth and optical properties of LYSB, Alain Maillard¹, Regine Maillard¹, Gerard Aka³, Philippe Villval²; ¹Physics, Univ. Metz, Metz, France; ²Cristal Laser, Messein, France; ³LCMCP UMR CNRS 7574, Paris, France. Borate crystal LYSB is successfully grown in large dimensions. This non hygroscopic crystal presents large transparency and good non linear optical properties. Diffraction by non homogeneities grating is studied in relation with crystal parameters.

AIThE3 • 17.15

Optical loss mechanisms in magnesium-doped lithium niobate crystals in the 300 to 2950 nm wavelength range, Judith R. Schwesyg^{1,2}, Ashot Markosyan¹, Maria Claudia C. Kajiyama³, Matthias Falk³, Dieter H. Jundt³, Karsten Buse², Martin M. Fejer¹; ¹E. L. Ginzton Lab, Stanford Univ., Stanford, CA, USA; ²Inst. of Physics, Univ. of Bonn, Bonn, Germany; ³Crystal Technology, Inc., Palo Alto, CA, USA. Absorption measurements in 5 mol. % MgO-doped lithium niobate crystals (optical grade) are presented. Measurements reveal that optical losses in these crystals are mainly caused by H, Fe, Cu, Ni, Cr, and Mn impurities.

HThD • CEP-controlled High-field Optical Parametric Sources

16.30–18.00

Franz Kärtner; MIT, USA, Presider

HThD1 • 16.30

Invited

High Repetition Rate mJ-level Few-Cycle Pulse Laser Amplifier for XUV-FEL seeding, Franz Tavella¹, Daryl Adams⁵, Valeri Ayvazyan², Nicoleta-Ionela Baboi², J. Bahr³, Efthimos Bakarezos⁶, Vladimir Balandin², Winfried Decking², Brendan Dromey⁵, Thomas Dzelainis⁵, Stefan Düsterer^{1,2}, Markus Drescher⁴, Hans-Jörg Eckold², Bart Faatz², Josef Feldhaus², Rolf Follath³, Michael Gensch³, Nina Golubeva², Karsten Holldack³, Christos Kamperidis⁶, Markus Körfer², Tim Laarmann², Albrecht Leuschner², Lutz Lilje², Torsten Limberg², Atoosa Meseck³, Velizar Miltchev⁴, Rolf Mitzner³, Dirk Nölle², Nektarios Papadogiannis⁶, Alexander Petrov², Kay Rehlich², Robert Riedel¹, Jörg Rossbach⁴, Holger Schlarb², Bernhard Schmidt², Michael Schmitz², Siegfried Schreiber², Juliane Rönsch⁴, Horst Schulte-Schrepping², Michael Schulz^{1,2}, Joachim Spengler², Martin Staack², Michael Tatarakis⁶, Kai Tiedtke², Markus Tischer², Rolf Treusch², Arik Willner^{1,2}, Mark Yeung⁵, Matthew Zepf⁵; ¹Helmholtz Inst. Jena, Hamburg, Germany; ²Deutsches Elektronensynchrotron, Hamburg, Germany; ³Helmholtz Zentrum Berlin, Berlin, Germany; ⁴Univ. Hamburg, Hamburg, Germany; ⁵Queens Univ. Belfast, Belfast, Germany; ⁶Ctr. for Plasma Physics and Lasers, Rethymno, Greece. We present an operationally stable OPCPA prototype for XUV-seeding at the FLASH free electron laser. The envisioned key parameters are >1 mJ pulse energy and <7 fs pulse duration at a 100 kHz burst repetition rate.

HThD2 • 17.00

Carrier-Envelope Phase stability of a mid-IR 100 kHz OPCPA source for strong-field physics, Alexandre Thai¹, Olivier Chalus¹, Philip K. Bates¹, Jens Biegert^{1,2}; ¹Attoscience and Ultrafast Optics, ICFO-Inst. de Ciències Fotoniques, Castelldefels (Barcelona), Spain; ²ICREA, ICREA, Barcelona, Spain. We present CEP measurements for a 100 kHz optical parametric chirped pulse amplification source in the mid-IR at 3.2 microns. The source is passively CEP stabilised to <100 mrad RMS over 1 million pulses.

HThD3 • 17.15

Carrier-envelope phase stabilized 9.3 fs, 0.54 mJ pulses at 1.8 µm, Ding Wang¹, Canhua Xu¹, Liwei Song¹, Chuang Li¹, Chunmei Zhang¹, Yansui Huang¹, Xiaowei Chen^{1,2}, Yuxin Leng¹, Ruxin Li¹, Zhizhan Xu¹; ¹State Key Lab of High Field Laser Physics, Shanghai Inst. of Optics and fine Mechanics, Chinese Acad. of Sciences, Shanghai, China; ²Laboratoire d'Optique Appliquée, ENSTA ParisTech, Ecole Polytechnique, Palaiseau, France. Generation of carrier-envelope phase stabilized 0.54 mJ, 9.3 fs pulses at 1.8 µm is demonstrated. The input pulse is spectrally broadened in an argon-filled hollow-core fiber, subsequently compressed in glass plates with anomalous dispersion.

AIThE4 • 17.30

Second harmonic generation below 400 nm using potassium lithium niobate from laser-heated pedestal growth, Gisele Maxwell¹, Dylan Dalton², Alan B. Petersen¹; ¹*Spectra Physics, Santa Clara, CA, USA*; ²*Shasta Crystals, Anderson, CA, USA*.

Potassium lithium niobate, compositionally adjusted for noncritical phase-matching has been grown using the laser-heated pedestal growth method. Second harmonic generation has been observed in the blue wavelength region down to 385 nm.

AIThE5 • 17.45

Intensity-dependent photorefractivity of Zirconium-doped lithium niobate crystals, Paolo Minzioni¹, Giovanni Nava¹, Wenbo Yan¹, Ilaria Cristiani¹, Vittorio Degiorgio¹, Nicola Argiolas², Marco Bazzan², Maria V. Ciampolillo², Annamaria Zaltron², Cinzia Sada²; ¹*Electronics, Univ. of Pavia and CNISM, Pavia, Italy*; ²*Physics, Univ. of Padova and CNISM, Padova, Italy*. The pump intensity dependence of photorefractive effect in Zr-doped Lithium-Niobate crystals is investigated. Photorefractivity grows linearly with light intensity in the undoped crystal, whereas it saturates when doping concentration exceeds 2mol%.

HThD4 • 17.30

Multicolor optical parametric synthesizer for high-field science, Stefan Haessler¹, Tadas Balciunas¹, Giedrius Andriukaitis¹, Oliver D. Mücke¹, Audrius Pugzlys¹, Andrius Baltuska¹, Richard Squibb², Leslaw Frasin², Jon Marangos², John W. Tisch², Linas Giniunas³, Romas Danielius³, Ronald Holzwarth^{4,5}; ¹*Inst. of photonics, Vienna Univ. of Technology, Vienna, Austria*; ²*Dept. of Physics, Imperial College London, London, UK*; ³*Light Conversion Ltd., Vilnius, Lithuania*; ⁴*Max-Planck Inst. of Quantum Optics, Garching, Germany*; ⁵*Menlo Systems GmbH, Munich, Germany*. We discuss promising high-field applications of a CEP-stable parametric wave synthesizer producing three-color phase-locked tunable frequency pulses. The asymmetric waveform reproducibility is confirmed in the measurements of ATI and THz transients.

HThD5 • 17.45

A simple linear optical measurement of carrier envelope phase shift, Peter Jojart^{1,2}, Borzsonyi Adam^{1,2}, Sebastian Koke³, Mihaly Gorbe^{4,2}, Karoly Osvay¹; ¹*Optics and Quantum Electronics, Univ. of Szeged, Szeged, Hungary*; ²*CE Optics, Szeged, Hungary*; ³*Max-Born-Inst. für Nichtlineare Optik und Ultrakurzzeitspektroskopie, Berlin, Germany*; ⁴*Faculty of Mechanical Engineering and Automation, Kecskemet College, Kecskemet, Hungary*. A robust all-linear method based on spectral interferometry for measuring the carrier-envelope offset phase of ultrashort laser pulses is demonstrated. The performance has been proved with cross-calibration with a conventional f-to-2f interferometer.

16.30–18.00

FThE1

Paper Withdrawn

FThE2

Phase Locking Fluctuations of 25 Coupled Fiber Lasers, *Micha Nixon¹, Moti Fridman¹, Rami Pugatch¹, Nir Davidson¹, Asher A. Friesem¹*; ¹Weizmann Inst. of Science, Rehovot, Israel. Experimental results on phase locking 25 lasers are presented. The results reveal that phase locking fluctuations are distributed in accordance to a Gumbel distribution that predicts the likelihood of rare events such as catastrophic floods.

FThE3

Single-polarization all-normal-dispersion Yb fiber femtosecond laser with semiconductor saturable absorber mirror operating in two-photon absorption regime, *Tai Hyun Yoon¹, Gwang Hoon Jang¹, Jin Ho Kim¹*; ¹Dept. of Physics, Korea Univ., Seoul, Republic of Korea. We present a high repetition-rate all-normal-dispersion Yb fiber laser operating in two-photon absorption regime of a SESAM. Ultra-stable pulses with 1 nJ energy, compressed pulse-width of 115.9 fs, and spectral-width of 26 nm are generated.

FThE4

Experimental study and optimisation of pump laser parameters for supercontinuum generation, *Yves Hernandez¹*; ¹Multitel, Mons, Belgium. In this paper we present a study of the impact of pulse duration and peak power on supercontinuum generation. Then we introduce a short pulse all-in-fibre laser and amplifier configuration developed for supercontinuum applications.

FThE5

Polarization Maintaining Femtosecond All-In-Fiber Laser Based On Chirped Pulse Amplification for TeraHertz Spectroscopy, *Jean-Bernard Lecourt¹, Charles Duterte¹, Yves Hernandez¹, Domenico Giannone¹*; ¹Applied Photonics Dept., Multitel, Mons, Belgium. We present a polarization maintaining all-in-fiber femtosecond laser based on chirped pulsed amplification. This laser operates at a central wavelength of 1550nm and it is suitable for TeraHertz generation with DAST/DSTMS organic antennas.

FThE6

Multifilament core fiber mode content and other properties using S² characterization, *Julien Le Gouët¹, Laurent Lombard¹, Guillaume Canat¹*; ¹DOTA, ONERA, Palaiseau, France. The recently developed multifilament core fiber is characterized using the spatially resolved spectral interference to determine the LP₁₁ modes group delay and fiber birefringence. Measurements confirm effective single mode propagation under bending.

FThE7

Signal Pulse Distortion in High Power Double-Clad Fiber Amplifiers Induced by Stimulated Raman Scattering, *Miguel R. Melo¹, Jose Salcedo¹, Martin O. Berendt¹, João M. Sousa¹*; ¹Multiwave Photonics, SA, Maia, Portugal. Evolution of stimulated Raman scattering in pulse amplification for an Yb-doped fiber amplifier is

experimentally investigated. The signal and Raman components are discriminated and their temporal evolution dependence on peak power is analyzed.

FThE8

1.9 micron Tm³⁺-doped germanate fiber laser source for Si-processing, *Vladislav V. Dvoyrin^{2,1}, Irina Sorokina², Oleg Okhotnikov³, Valery Mashinsky², L. Ischakova², Evgeni Dianov², Vladimir Khopin⁴, A. N. Guryanov⁴*; ¹FORC, Moscow, Russian Federation; ²Dept. of Physics, NTNU, Trondheim, Norway; ³Tampere Univ. of Technology, Tampere, Finland; ⁴Inst. of Chemistry of High-Purity Substances, Nizhny Novgorod, Russian Federation. We report development of a novel Tm³⁺-doped fiber laser source at 1.86 μm based on highly nonlinear 55GeO₂-45SiO₂ dispersion shifted fiber, applicable to 3D-volume microprocessing of Si.

FThE9

Tapered Double Clad Ytterbium Fiber Laser for Material Processing, *Jorma Vihinen¹, Jyrki Latokartano¹, Tero Kumpulainen¹, Valery Filippov¹, Juho Kerttula¹, Yuri Chamorovskii², Konstantin Golant², Oleg Okhotnikov¹*; ¹Tampere Univ. of Technology, Tampere, Finland; ²Inst. of Radio and Electronics of the Russian Acad. of Sciences, Moscow, Russian Federation. A novel tapered fiber laser has been evaluated for laser cutting applications of thin materials. High efficiency, small size and good beam quality of the tapered fiber laser makes it a interesting option for cutting applications.

FThE10

Nonlinear dispersion shifted germanate fiber for continuum generation around 2 μm, *Vladimir Kalashnikov¹, Irina Sorokina², Vladislav Dvoyrin^{2,3}*; ¹Inst. fuer Photonik, TU Wien, Vienna, Austria; ²Dept. of Physics, Norwegian Univ. of Science and Technology, Trondheim, Norway; ³Fiber Optics Res. Ctr., Russian Acad. of Sciences, Moscow, Russian Federation. We report feasibility of continuum generation from <1 cm of nonlinear dispersion-shifted GeO₂-doped SiO₂-fiber, opening way to development of a compact all-in-one Tm-fiber-laser continuum source for OCT and high-resolution frequency-comb spectroscopy.

FThE11

Frequency conversion of Continuous-Wave fiber lasers with periodically-poled non-linear crystals: RIN and efficiencies, *Mathieu Jacquemet¹, David Harnois¹, Alain Mugnier¹, David Pureur¹*; ¹Quantel, Lannion, France. This paper deals with SHG of CW fiber lasers with periodically-poled crystals. We compare SHG efficiencies obtained with single-frequency and with narrow linewidth longitudinally multimode fiber lasers, as well as intensity noises in the visible.

FThE12

Active Thermography for Reliability Assessment of High Power Fiber Laser FBG Reflectors, *Pierre Bernard¹, Judicael Bessard¹, Guillaume Brochu¹, Éric Lemaire¹*; ¹Teraxion, Quebec, QC, Canada. Surface temperature alone can be insufficient to predict reliability of FBG components used in fiber lasers. However, more sophisticated active thermography techniques can provide information on the size and temperature of subsurface defects.

FThE13

Energy scalability of 2 μm ultrashort pulsed Tm-laser based on germanate dispersion shifted fiber, Vladimir Kalashnikov¹, Irina Sorokina², Vladislav Dvoynin^{2,3}; ¹Inst. fuer Photonik, TU Wien, Vienna, Austria; ²Dept. of Physics, Norwegian Univ. of Science and Technology, Trondheim, Norway; ³Fiber Optics Res. Ctr., Russian Acad. of Sciences, Moscow, Russian Federation. Theoretical investigation of an all-normal-dispersion mode-locked Tm-laser based on dispersion shifted GeO₂-doped SiO₂-fiber, demonstrates its energy scalability opening a road for material processing applications.

FThE14

Multiwavelength Erbium-Doped Fiber Laser Employing A Dual-Pass Unbalanced In-Line Sagnac Interferometric Comb Filter, Hermann Lin¹; ¹Dept. of Optoelectronics and Communication Engineering, National Kaohsiung Normal Univ., Kaohsiung, Taiwan. A dual-pass unbalanced in-line Sagnac interferometric comb filter with both schemes of nonlinear polarization rotation and intensity dependent loss has been proposed for multiwavelength erbium-doped fiber lasers. The lasing SNR is improved to 60dB.

FThE15

Low Repetition Rate High Energy 1.5 μm Fiber Laser, Peng Wan¹, Jian Liu¹, Lihmei Yang¹, Farzin Amzajerdian²; ¹PolarOnyx, Inc., San Jose, CA, USA; ²NASA LaRC, Hampton, VA, USA. Ultra low repetition rate high energy ns pulsed fiber laser is realized. 100 μJ pulse energy was obtained at all fiber based 1550 nm laser at Hz level.

FThE16

Intracavity absorption spectroscopy with Er-doped fiber lasers, Peter Fjodorow¹, Valeri M. Baeov¹, Benjamin Löhden¹, Svetlana Kuznetsova¹, Sergey Cheskis²; ¹Physik, Univ. Hamburg, Hamburg, Germany; ²School of Chemistry, Tel-Aviv, Israel. Intracavity absorption spectroscopy with a broadband Er-doped fiber laser is applied to measure the concentration, temperature and chemical reactions of several gases in flames. Maximum sensitivity corresponds to an absorption path length of 2000 km.

NOTES

HThE • Joule-class High-field Facilities

18.30–20.00

*Todd Ditmire; Univ. of Texas at Austin, USA, Presider***HThE1 • 6:30 p.m.****Invited**

Towards Joule-scale few-cycle pulses - progress and challenges of short-pulse pumped OPCPA, *Zsuzsanna Major^{1,2}, Christoph Skrobel^{1,2}, Izhar Ahmad¹, Christoph Wandt¹, Sandro Klingebiel¹, Sergei A. Trushin¹, Ferenc Krausz^{1,2}, Stefan Karsch^{1,2}; ¹Max-Planck-Inst. für Quantenoptik, Garching, Germany; ²Dept. für Physik, Ludwig-Maximilians-Univ. München, Garching, Germany.* The Petawatt Field Synthesizer is based on short-pulse-pumped optical parametric amplification for generating few-cycle, Joule-scale pulses. Stabilizing the pump-seed timing to ~100fs allowed for the first OPA experiments, which are reported here.

HThE2 • 7:00 p.m.

The 10PW OPCPA Vulcan Laser Upgrade, *Andrey Lyachev¹, Oleg Chekhlov¹, John Collier¹, Rob Clarke¹, Marco Galimberti¹, Cristina Hernandez-Gomez¹, Pavel Matousek¹, Ian Musgrave¹, David Neely¹, Peter Norreys¹, Ian Ross¹, Yunxin Tang¹, Trevor Winstone¹, Brian Wyborn¹; ¹Central Laser Facility, Science and Technology Facilities Council, Didcot, UK.* We present progress made in developing the 10PW OPCPA capability for the Vulcan laser to produce pulses with focused intensities $> 10^{23} \text{Wcm}^{-2}$.

HThE3 • 7:15 p.m.

Performance Modelling of a 1 kJ DPSSL System, *Klaus Ertel¹, Saumyabrata Banerjee¹, Cristina Hernandez-Gomez¹, Paul D. Mason¹, Jonathan Phillips¹, John Collier¹; ¹Central Laser Facility, STFC Rutherford Appleton Lab, Didcot, UK.* We present modelling results for a 1 kJ diode-pumped laser system, based on cryogenic gas-cooled multi-slab Yb:YAG amplifiers.

HThE4 • 7:30 p.m.

Cryogenic disk laser with high peak and average power, *Ivan B. Mukhin¹, Evgeny Perevezentsev¹, Anton Vyatkin¹, Olga Vadimova¹, Oleg Palashov¹, Efim Khazanov¹; ¹Dept. of nonlinear and laser optics, Inst. of Applied Physics Russian Acad. of Science, Nizhny Novgorod, Russian Federation.* Spectral and thermo-optical properties, the stored energy and amplification in Yb:YAG disks are investigated at 77-300K temperature range. The current status of laser system development with 0.5J output energy at 1kHz repetition rate is presented.

HThE5 • 7:45 p.m.

Design and preliminary results for a sub-5-fs, 100 mJ-level, CEP-stabilized laser facility – PhaSTHEUS, *Andreas Vaupel¹, Nathan Bodnar¹, Benjamin Webb¹, Michaël Hemmer¹, Martin Richardson¹; ¹CREOL, The College for Optics and Photonics, Univ. of Central Florida, Orlando, FL, USA.* We report on the preliminary results and design of a new laser facility at the Townes Laser Inst. - PhaSTHEUS. This facility is a 5 fs, 100 mJ, CEP-stabilized laser source for highly nonlinear optical experiments.

AIThF • AIOM Postdeadline Session

18.30–20.00

Information available on-site.

• Friday, 18 February 2011 •

7.30–11.00

Registration Open

AIFA • Nonlinear Crystals and Processes III

8.00–9.45

Benoit Boulanger; Univ. de Grenoble, France, Presider

AIFA1 • 8.00

Invited

CdSiP₂ and OPGaAs: New Nonlinear Crystals for the Mid-Infrared, *Peter Schunemann¹; ¹BAE Systems, Inc., Nashua, NH, USA.* Two new materials have emerged with high nonlinear coefficients and thermal conductivities which extend the operating range of ZGP: CdSiP₂ allows for shorter wavelength 1064nm pumping and OPGaAs enables 8-12 micron generation.

AIFA2 • 8.30

Phase-matching properties and refined Sellmeier equations of the new nonlinear infrared crystal CdSiP₂, *Pierre Brand¹, Benoît Boulanger¹, Patricia Segonds¹, Vincent Kemlin¹, Peter G. Schunemann², Kevin T. Zawilski², Thomas M. Pollak², Bertrand Ménaert¹, Jérôme Debray¹, ¹Institut Néel CNRS/UJF, France, ²BAE Systems, USA* We directly measured the second harmonic generation and difference frequency generation phase-matching directions of the nonlinear crystals CdSiP₂ until 9.5 μm using the sphere method, from which we refined the Sellmeier equations of the crystal.

AIFA3 • 8.45

Invited

Optical, Thermal, Electrical, Damage, and Phase-Matching Properties of Lithium Selenoindate, *Jean-Jacques Zondy¹, Valentin Petrov², Ludmila Isaenko³, Olivier Bidault⁴; ¹Joint Lab of Metrology LNE-CNAM, La Plaine Saint Denis, France; ²Max-Born-Inst. for Nonlinear Optics and Ultrafast Spectroscopy, Berlin, Germany; ³Inst. of Geology and Mineralogy, SB RAS, Novosibirsk, Russian Federation; ⁴I.C.B., CNRS - Univ. de Bourgogne, Dijon, France.* LiInSe₂, a biaxial nonlinear crystal transparent from 0.54 to 10 μm, is successfully grown in large sizes with good optical quality. We summarize all characteristics and physical properties of LiInSe₂ essential for nonlinear frequency conversion.

HFA • Molecules in a Strong Field

8.00–10.00

Takao Fuji; IMS Okazaki, Japan, Presider

HFA1 • 8.00

Invited

Watching Ultrafast Motion: High Harmonic Spectroscopy of Electron Dynamics in Molecules, *Olga Smirnova; Max-Born-Inst., Germany.* Abstract not available.

HFA2 • 8.30

High-order Harmonics in Fragile Molecules, *Caterina Vozzi¹, Matteo Negro¹, Sandro De Silvestri¹, Salvatore Stagira¹, Ricardo Torres², Leonardo Brugnera², Thomas Siegel², Jon Marangos², Carlo Altucci³, Raffaele Velotta³, Fabio Frassetto⁴, Paolo Villoresi⁴, Luca Poletto⁴; ¹Dipartimento di Fisica, Politecnico di Milano, Milano, Italy; ²Blackett Lab, Imperial College London, London, UK; ³Università di Napoli Federico II, Napoli, Italy; ⁴Università di Padova & IFN-CNR, Padova, Italy.* Exploiting an ultrafast IR source, we produced extended harmonic spectra in several molecules with low ionization potentials. These results pave the way to the extension of high harmonic spectroscopy to complex species like biomolecules.

HFA3 • 8.45

Near-Threshold High-Order Harmonic Spectroscopy with Aligned Molecules, *Hadás Soifer¹, Barry D. Bruner¹, Pierre Botheron², Dror Shafir¹, Adi Diner¹, Oren Raz¹, Yann Mairesse², Bernard Pons², Nirit Dudovich¹; ¹Dept. of Physics of Complex Systems, Weizmann Inst. of Science, Rehovot, Israel; ²CELIA, Univ. de Bordeaux I-CNRS-CEA, Talence, France.* We study HHG close to the ionization threshold and identify two distinct contributions to the emitted harmonic signals. The observed near-threshold emission is shown to occur outside the realm of the standard strong field approximation.

HFA4 • 9.00

Concerted High-Energy Proton Emission in Laser-Induced Fragmentations of Polyatomic Molecules, *Stefan Roither¹, Xinhua Xie¹, Daniil Kartashov¹, Li Zhang¹, Huailiang Xu², Atsushi Iwasaki², Markus Schöffler^{1,3}, Reinhard Dörner³, Kaoru Yamanouchi², Andrius Baltuska¹, Markus Kitzler¹; ¹Photonics Inst., Vienna Univ. of Technology, Vienna, Austria; ²Dept. of Chemistry, School of Science, The Univ. of Tokyo, Tokyo, Japan; ³Inst. für Kernphysik, J.W. Goethe Univ., Frankfurt/Main, Germany.* Using multi-particle coincidence detection we are able to show that carbon-hydrogen molecules exposed to moderate laser-intensities can completely disintegrate from high charge states by a concerted emission of all protons with high kinetic energies.

AIFA4 • 9.15

Non-resonant pump-induced refractive index changes and non-degenerate two-wave mixing in Nd³⁺ and Yb³⁺ doped laser materials, Rémi Souillard^{1,2}, Andrey Zimoviev³, Arnaud Brignon², Jean-Louis Doualan¹, Oleg Antipov³, Jean-Pierre Huignard², Richard Moncorgé¹; ¹CIMAP, Univ. de Caen, Caen, France; ²TRT, Thales Res. & Technology, Palaiseau, France; ³Inst. of Applied Physics, RAS, Nizhny-Novgorod, Russian Federation. Modeling and experiments of two-wave mixing and energy-transfer based on accurate measurements of pump-induced refractive index variations were performed. Results indicate that energy transfer exceeding 50% is possible under high pumping conditions.

AIFA5 • 9.30

Optically-pump induced athermal and non-resonant refractive index changes in Cr-doped materials : still an opened question, Thomas Godin¹, Richard Moncorgé¹, Jean-Louis Doualan¹, Michael Fromager¹, Kamel Ait-Ameur¹, Tomaz Catunda²; ¹Univ. de Caen, CIMAP, Caen, France; ²USP Sao-Carlos, Inst.o de Fisica Sao-Carlos, Sao-Carlos, Brazil. More reliable ESA and Z-scan measurements have been performed in Cr:GSGG and ruby. The results indicate that the real origin of the purely dispersive refractive index changes observed in these materials needs to be reconsidered.

Dolmabahce Foyer, R Floor

10.00–10.30

Coffee Break

AIFB • Waveguides and Laser Patterning

10.30–12.30

Jean-Luc Adam; Univ. de Rennes 1, France, Presider

AIFB1 • 10.30

Invited

Femtosecond Laser Writing of Waveguides in Glass, Luke B. Fletcher¹, Jonathan J. Witcher¹, Neil Troy¹, Richard K. Brow², Denise Krol¹; ¹Univ. of California, Davis, Davis, CA, USA; ²Missouri Univ. of Science & Technology, Rolla, MO, USA. Femtosecond laser writing was used to fabricate waveguides in undoped and rare-earth doped polyphosphate glasses. The influence of glass composition and laser parameters on waveguide properties and structural changes in the glass will be discussed.

HFA5 • 9.15

Invited

Molecular-Alignment-Based Frequency-Resolved Optical Gating, Heping Zeng; East China Normal Univ., Shanghai, China. Abstract not available.

HFA6 • 9.45

Signatures of Continuum-Continuum transitions in High Harmonic Generation, Markus C. Kohler¹, Christian Ott¹, Philipp Raith¹, Robert Heck¹, Iris Schlegel¹, Christoph H. Keitel¹, Thomas Pfeifer¹; ¹MPI für Kernphysik, Heidelberg, Germany. High harmonic generation is investigated theoretically in the over-the-barrier ionization regime revealing that emission can be dominated by the interference between two distinct free wave packets of a single electron after ground-state depletion.

HFB • Emerging Techniques

10.30–12.30

Ronald Holzwarth; Menlo GmbH/MPQ, Germany, Presider

HFB1 • 10.30

Invited

Intense terahertz fields: electric and magnetic nonlinearities on the sub-cycle scale, Friederike Junginger¹, Alexander Sell¹, Olaf Schubert^{1,4}, Bernhard Mayer¹, Daniele Brida², Marco Marangoni², Giulio Cerullo², Tobias Kampfrath³, Martin Wolf³, Alfred Leitenstorfer¹, Rupert Huber^{1,4}; ¹Dept. of Physics and Ctr. for Applied Photonics, Univ. of Konstanz, Konstanz, Germany; ²IFN-CNR, Dipartimento di Fisica, Politecnico di Milano, Milano, Italy; ³Dept. of Physics, Freie Univ. Berlin, Berlin, Germany; ⁴Dept. of Physics, Univ. of Regensburg, Regensburg, Germany. High-intensity single- and few-cycle transients covering the mid and far infrared are generated and electro-optically monitored by a passively CEP-locked laser. These pulses drive strong nonlinearities via electric and magnetic field coupling.

AIFB2 • 11.00

Asymmetric orientational femtosecond laser writing detected in several properties in various glasses, Bertrand Pommellec¹, Matthieu Lancry¹; ¹ICMMO, CNRS-Univ. Paris Sud, Orsay, France. Asymmetric orientational writing is demonstrated clearly in various silica-based glasses. It occurs for a domain of laser parameters and is likely connected to a memory effect coupled to an asymmetry of the beam.

AIFB3 • 11.15

Laser Patterning of Oxyfluoride Glasses Containing Silver Nanoparticles, Chao Liu¹, Jong Heo¹; ¹Dept. of Materials Science and Engineering, Pohang Univ. of Science and Technology, Pohang, Republic of Korea. Irradiation of glasses containing silver nanoparticles with a continuous-wave laser was used to design the patterned glasses for advanced optical devices. Laser induced heating leads to the size reduction of Ag NPs in the glass.

AIFB4 • 11.30

Highly Efficient Waveguide Lasers in a Femtosecond Laser Inscribed Nd:YVO₄ Channel Waveguide, Yang Tan¹, Jing Guan¹, Feng Chen¹, Javier R. Vaquez de Aldana², G. A. Torchia³, Antonio Benayas⁴, Daniel Jaque⁴; ¹School of Physics, Shandong Univ., Jinan, China; ²Facultad de Ciencias, Universidad de Salamanca, Salamanca, Spain; ³Centro de Investigaciones Ópticas, CIC-Conicet, La Plata, Argentina; ⁴Departamento de Física de Materiales, Universidad Autónoma de Madrid, Madrid, Spain. Continuous-wave waveguide laser at 1064 nm was generated from a femtosecond laser inscribed Nd:YVO₄ channel waveguide. Single-mode laser oscillations have been observed with a low threshold power 34 mW and a high slope efficiency 65%.

AIFB5 • 11.45

Ultrafast Laser Inscription of Waveguide Structures in Cr²⁺:ZnSe, Patrick Berry¹, John MacDonald², Ajoy Kar², Kenneth Schepler¹; ¹Air Force Res. Lab, Wright-Patterson AFB, OH, USA; ²Heriot-Watt Univ., Edinburgh, UK. Waveguide structures were fabricated in chromium-doped zinc selenide (Cr²⁺:ZnSe) using ultrafast laser inscription. To achieve optimal results, the multi-scan fabrication technique was used.

AIFB6 • 12.00

Low Loss Silicon Waveguides Fabricated Using a Hydrogen Silsesquioxane Oxidation Mask, Maziar P. Nezhad¹, Olesya Bondarenko¹, Aleksandar Simic¹, Mercedesh Khajavikhan¹, Yeshaiahu Fainman¹; ¹UC San Diego, La Jolla, CA, USA. Low-loss silicon waveguides are fabricated without plasma etching via oxidation of e-beam patterned HSQ masks. Oxidation converts HSQ to a glassy compound and defines the waveguides. Losses of 0.8dB/cm and Q-factors of 450,000 were measured.

HFB2 • 11.00**Invited**

Visualization of Nuclear and Electron Motion by Ultrafast Electron Diffraction, Peter Baum¹; ¹LMU München, Garching, Germany. Ultrashort packets of single electrons allow to reach femtosecond and attosecond resolutions, when observing atomic and electronic motion within matter in four dimensions.

HFB3 • 11.30

A High-Harmonic Source for Time-Resolved ARPES, Georgi Dakovski^{1,2}; ¹CINT, LANL, Los Alamos, NM, USA; ²CMMS, LANL, Los Alamos, NM, USA. We present an apparatus for visible pump/XUV probe time- and angle-resolved photoemission spectroscopy utilizing high-harmonic generation. Wide-range tunability is achieved by using a time-delay compensated monochromator, preserving the XUV pulses.

HFB4 • 11.45

Towards MW Average Powers in Ultrafast High-Repetition-Rate Enhancement Cavities, Jan M. Kaster^{1,2}, Ioachim Pupeza^{1,2}, Tino Eidam³, Christoph Jocher³, Ernst Fill^{1,2}, Jens Limpert³, Ronald Holzwarth^{1,2}, Birgitta Bernhard^{1,2}, Thomas Udem^{1,2}, Theodor W. Hänsch^{1,2}, Andreas Tünnermann³, Ferenc Krausz^{1,2}; ¹Attosecond and Highfield Physics, Max Planck Inst. for Quantum Optics, Garching, Germany; ²Department of Physics, Ludwig-Maximilians-Univ., München, Germany; ³Inst. of Applied Physics, Friedrich-Schiller-Univ., Jena, Germany. We report on high-power, ultrafast enhancement cavity designs with enlarged laser spots on the mirrors. Together with a novel seeding Yb-fiber based CPA, MW-level intracavity average powers with sub-ps pulse durations come into reach.

HFB5 • 12.00

Intracavity high harmonic generation with fs frequency combs, Jason Jones¹; ¹College of Optical Sciences, Univ. of Arizona, Tucson, AZ, USA. We report on a high power Ti:sapphire based frequency comb generating harmonics down to 53nm, with average power up to 77 microwatts at 72 nm. Fundamental limitations due to intracavity plasma dynamics are modeled numerically.

AIFB7 • 12.15**All-telluride channel waveguides for mid-infrared applications,**

Caroline Vigreux¹, Marc Barillot², Eléonore Barthélémy¹, Lionel Bastard³, Jean-Emmanuel Broquin³, Volker Kirschner⁴, Stéphane Ménard², Gilles Parent⁵, Claire Poinso², Annie Pradel¹, Shaoqian Zhang⁶, Xianghua Zhang⁶; ¹ICGM, Montpellier, France; ²Thales Alenia Space, Cannes La Bocca, France; ³IMEP-LACH, Grenoble, France; ⁴ESA, Noordwijk, Netherlands; ⁵LEMTA, Nancy, France; ⁶LCV, Rennes, France. In this paper, the different steps of the fabrication of single-mode RIB waveguides for both [6-11 μ m] and [10-20 μ m] spectral bands are described and the first results in term of light guiding and modal filtering are presented.

HFB6 • 12.15**Single-shot Characterization of sub-15fs Pulses with 40dB Dynamic**

Range, Nicolas Forget¹, Antoine Moulet^{1,3}, Stéphanie Grabielle^{1,2}, Christian Cornaggia², Olivier Gobert², Thomas Oksenhendler¹; ¹Fastlite, Orsay, France; ²IRAMIS, Service Photons Atomes & Molécules, CEA, Gif-sur-Yvette, France; ³Lab for Attosecond Physics, Max Planck Inst. of Quantum Optics, Garching, Germany. We present an extended version of the self-referenced spectral interferometry technique. Sub-15fs pulses are characterized by SRSI and feedback experiments demonstrate a measurement dynamic range >40dB.

NOTES

Key to Authors and Presiders
(Presenting Author or Presider in **bold**)

A

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Berry, Patick-**AIFB5**
Bertrand, Anthony-FThB1
Bessard, Judicael-FThE12
Bettinelli, Marco-AIWB5
Beverini, Nicolò-FThA3
Bhardwaj, Siddharth-JWC4
Bidault, Olivier-AIFA3
Biegert, Jens-AMB02, AMD3, AWA26,
HThB3, HThB4, HThD2, HWB,
HWC19
Binhammer, Thomas-AMD2
Birge, Jonathan-ATuC5, AWA03, **JWC4**
Biriukov, Alexander-FWC2
Bodnar, Nathan-HThE5
Bollig, C.-ATuA4
Bondarenko, Olesya-AIFB6
Bonner, Gerald M-AMA5
Boreysho, Anatoly S-ATuB28
Botheron, Pierre-HFA3
Boudot, Rodolphe-FWB1
Boulanger, Benoit-**AIFA, AIFA2, AIWC2,**
AMC
Boullet, J.-FThC5
Boullet, Johan-AWA10, AWA29
Bourdet, Gilbert-AMB20
Bourdon, Pierre-AITHD5, **AMC2**
Bourgeois, Pierre-Yves-FWB1
Bradford, Joshua-AMB10, **FWA4**
Bradler, Maximilian-**AMD4**
Brand, Pierre-AIFA2
Brandt, Christian-**AMB15, AMB19**
Braud, Alain-**AITHC3**
Breitkopf, Sven-AMC1
Brenier, Alain-AIWA5
Brida, Daniele-AMD1, **HFB1**
Brignon, Arnaud-AIFA4
Brochu, Guillaume-FThE12
Bromage, Jake-**JWC2**

Broquin, Jean-Emmanuel-AIFB7
Brow, Richard K-AIFB1
Brown, Tom-ATuA3
Brugnera, Leonardo-HFA2
Bruner, Barry D-**AMD6, HFA3**
Buchvarov, Ivan-**AWA14, AWA16**
Budunoglu, Ibrahim L-AMB09
Bulanov, Sergei V-HThA4
Burdonov, Konstantin-HThA3
Burgdörfer, Joachim-HWC1
Burns, David-AMA4, **AMA5**
Busch, George-AITHB09
Buse, Karsten-AITHe3
Butvina, Alexey L-AITHD4
Butvina, Leonid-AITHB04
Butvina, Leonid N.-**AITHD4**

C

Cadier, Benoit-ATuB09
Cadoret, Malo-AMB04
Calegari, Francesca-HThB2
Calmano, Thomas-JWB2
Camy, Patrice-**AITHA4, ATuB10, ATuE3,**
JWB3
Canalias, Carlota-JWB1
Canat, Guillaume-AITHD5, FThE6
Canciamilla, Antonio-AITHB19
Cankaya, Huseyin-AIWB5, **AMB01**
Cano-Torres, José María-AIWA6
Cardinali, Vanessa-**AMB20**
Carlie, Nathan-AITHB19
Carrion, William-AITHB09
Carstens, Henning-AMD5, ATuD3
Carvajal, Joan Josep-AITHA5, AITHC5
Cascales, Concepción-AITHB01, AITHC5,
ATuA3, **AWA13**
Cassanho, Arlete-ATuB04
Catunda, Tomaz-AIFA5
Ceballos-Herrera, Daniel Enrique-**ATuB26**
Cerullo, Giulio-**AMD1, HFB1, JWC, JWC4**
Cha, Myoungsik-**AIWC4, AWA09**
Chalus, Olivier-AMD3, HThD2
Chambaret, Jean-Paul-AIWA5
Chamma, Karima-AITHe2
Chamorrovkii, Yuri-FThE9
Chang, Guoqing-AME5, ATuC5
Chang, Zenghu-**HThB1**
Chanteloup, Jean-Christophe-**ATuE4**
Chavez-Pirson, Arturo-**FWC, JWA4**
Chekhlov, Oleg-HThE2, **HWC16, HWC5**
Chen, Danping-AIWB3
Chen, Feng-**AIFB4**
Chen, Hung-Wen-**ATuC5**
Chen, Li-Jin-AME5, ATuC5, **HThC3, JWC4**
Chen, Ming-Chang-HThB5
Chen, Shichua-HWA4
Chen, Songsheng-ATuB04, **FWC3**
Chen, Xiaowei-HThD3, **HWA3, HWA6**
Cheong, Hyeonsik-AITHB02
Cheskis, Sergey-FThE16
Chia, Jeffery-FWB3
Chichkov, Nikolai-**AMB12**
Cho, Won Bae-AWB4
Choi, Hee Joo-AWA09
Choi, Sun Young-AWA18, **AWB4**
Chosrowjan, Haik-AWA06
Chériaux, Gilles-AIWA5, **HWC7**
Ciampolillo, Maria V-AITHe5
Cingoz, Arman-AME4
Cingöz, A.-FWB4
Cirni, Giovanni-JWC4

Cizmeciyani, Melisa Natali-**AMB01**
Clarke, Rob-HThE2
Cleff, Carsten-AWA01
Clerici, Matteo-HThB4
Cocquelin, Benjamin-FThB5, FThC2, JWA5
Coddington, Ian R.-**AME1**
Cohanoshi, Ion-FThB3
Collett, O. J-ATuA4
Collier, John-HThE2, HThE3, HWC16,
HWC5
Collins, John-**AITHB16**
Cormier, Eric-AWA10, AWA29, AWB5,
FThC5
Cornaggia, Christian-HFB6
Couairon, Arnaud-HThB4, HWA4
Courjaud, Antoine-ATuE3, JWB3
Cousin, Seth-AWA26, HThB4
Cristiani, Ilaria-AITHE5

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Dakovski, Georgi-**HFB3**
Dalton, Dylan-AITHe4
Daniault, Louis-**AMC2**
Danielius, Romas-HThD4, JWC5
Danielius, Romualdas-HWA5
Darmo, Juraj-HWC3
Davidson, Nir-AMB05, FThA4, FThE2
Dawson, Martin D-AMA4, AMA5
De Silvestri, Sandro-HFA2
Debray, Jérôme-AIFA2
Decking, Winfried-HThD1
Degiorgio, Vittorio-AITHe5
Dekorsy, Thomas-ATuC2
Demirbas, Umit-**AWA03**
Demmler, Stefan-JWA3
Dergachev, Alex-**AWA28**
Descamps, Dominique-AWB5
Deslandes, Pierre-**ATuB12**
de Ridder, René M-ATuD7
Di Bartolo, Baldassare-AITHB16
DiMauro, Lou-**HWB1**
DiTrapani, Paolo-HThB4
Dianov, Evgeni-AITHB04, AITHD4, ATuB11,
ATuB17, FThE8, FWC2
Didierjean, Julien-ATuB06, AWA04
Dietze, Daniel-HWC3
Dimitrios, Charalambidis-**HWB5, HWC21**
Diner, Adi-HFA3
Diomin, Igor-JWC5
Ditmire, Todd-**HThE, JWC3**
Divliansky, Ivan-FWB2
Dobler, Jeremy-FWC2
Dominiak-Dzik, Grazyna-AITHB06, **AITHB10**
Dong, Jun-**ATuB27**
Dong, Liang-**JWA1**
Doroschenko, Maxim-ATuB18
Doroshenko, Maxim E.-AITHA3, AWA21,
AWA23
Dorrer, Christophe-JWC2
Doualan, Jean-Louis-AIFA4, AIFA5,
AITHD3, ATuE3, JWB3
Drachenberg, Derrek-FWB2
Drescher, Markus-HThD1, HWB2
Dromey, Brendan-HThD1
Druon, Frédéric-AITHD5, AMC2, **ATuB21,**
ATuE3, HWA6, JWB3
Dubinskii, Mark-**ATuA, ATuD2, ATuE5**
Dubrasquet, R.-FThC5
Dudovich, Nirit-HFA3
Durecu, Anne-AITHD5
Durst, Stephane-AITHe1
Duterte, Charles-FThE5
Dvoyrin, Vladislav-**ATuB17, FThE10, FThE13**
Dvoyrin, Vladislav Vladimirovich-**FThE8**

Dzeltainis, Thomas-HThD1
Délen, Xavier-**AMB18**
Díaz, Francesc-AITHA5, AITHB01, AITHC5
Döring, Sven-FThC1
Dörner, Reinhard-HFA4, HWC1
Düsterer, Stefan-HThD1

E

Eberly, Joseph H-HWC4
Eckoldt, Hans-Jörg-HThD1
Eggleton, Benjamin-JWC4
Egorova, Olga-ATuB11
Eidam, Tino-AMB11, ATuD1, **ATuD3,**
ATuD5, FThB2, HFB4
Eken, Koray-ATuB25, AWA15
Emons, Moritz-AMD2, AWB3
Erbert, Götz-AWB1
Erdogan, Cihangir-AME3, ATuB24
Ernsting, Ingo-AWA17
Ertel, Klaus-**HThE3, HWC16**
Esser, M. J-ATuA4

F

Faatz, Bart-HThD1
Faccio, Daniele-HThB4
Faenov, Anatoly Y-HThA4
Fainman, Yeshaiahu-AIFB6
Falk, Matthias-AITHe3
Falletto, Nicolas-FThB5, FThC2
Fallnich, Carsten-ATuB19, ATuB20, AWA01,
AWA20
Farrar, Gabrielle-AITHD2
Farsund, Oystein-**ATuB15, AWA25**
Fechner, Matthias-**AITHC4, AMB19**
Fedin, Alexander V-ATuB28
Fejer, Martin M.-AITHe3, **AIWC, AMA1**
Feldhaus, Josef-HThD1
Fendel, Peter-AWA03
Fermann, Martin E-AME4, FWA2, FWB4,
JWA2
Ferrari, Federico-HThB2
Ferrari, Marco A-ATuB22
Ferrario, Fabio-FThB1
Fibrich, Martin-**ATuB29**
Fiebig, Christian-AWB1
Fiedorowicz, Henryk-**HWC12**
Figueira de Morisson Faria, Carla-HWC8
Filippov, Valery-FThE9
Fill, Ernst-HFB4
Firpi, Stefano-FThA3
Fjodorow, Peter-**FThE16**
Fletcher, Luke B-AIFB1
Follath, Rolf-HThD1
Forget, Nicolas-AWA26, **HFB6**
Foy, Paul-AIWB4
Frasinski, Leslaw-HThD4
Frassetto, Fabio-HFA2
Frederickson, Curt-ATuB01
Fredrich-Thornnton, Susanne T-JWB2
Freysz, Eric-ATuB12
Fridman, Moti-AMB05, FThA4, FThE2
Friesem, Asher A-AMB05, FThA4, FThE2
Frolov, Mikhail-ATuA2
Fromager, Michael-AIFA5
Fromzel, Viktor-ATuD2, ATuE5, AWA02
Fu, Gang-**AITHB08**
Fuhrberg, Peter-ATuA5, ATuB14
Fuji, Takao-**HFA**
Fujimoto, James G-AWA03
Fujita, Kazuhisa-HThA5
Fujita, Masayuki-AWA06
Fukuda, Yuji-**HThA4**
Furuse, Hiroaki-AMB14, **AWA06**

G

Galecki, Lukasz-AWA05
Galimberti, Marco-HThE2, HWC5
Gallo, Katia-AIWC3, **AMA2**
Galvanuskas, Almantas-AMC5, ATuC5,
FThB3, **HWA1**
Ganany-Padowicz, Ayelet-AMD6
Ganeev, Rashid-**HWC18**
Gaponenko, Maxim-**AWA22**
Gapontsev, Valentin-**FThA1, FThB**
Gattass, Rafael-AITHD2, FThA2
Gavrilov, Andrey V-ATuB28
Gawith, Corin B. E.-AMB03
Gensch, Michael-HThD1
Georges, Patrick-AMB18, AMC2, ATuB06,
ATuB21, ATuE3, AWA04,
HWA6, JWB3
Gerrity, Michael-HThB5
Geskus, Dimitri-**ATuD6**
Giambruno, Fabio-HWC7
Giannone, Domenico-FThE5, JWA5
Gibson, Dan-AITHD2
Giesen, Adolf-AWA24
Giniunas, Linas-HThD4, HWA5, JWC5
Ginzburg, Vladislav-HThA3, HWC6
Giorgetta, Fabrizio R-AME1
Girdauskas, Valdas-AWA19
Gkortsas, Vasileios-Marios-JWC4
Glebov, Leonid-**AITHC2, FThB3, FWB2,**
HWC2
Glebova, Larissa-AITHC2
Gobert, Olivier-HFB6
Godard, Antoine-AITHB18
Godfroy, Jean-AIWA5
Godin, Thomas-AIFA5
Golant, Konstantin-FThE9
Goldner, Philippe-ATuB21
Golling, Matthias-ATuC1
Golubeva, Nina-HThD1
Gonul, Ozen-AITHB16
Goodno, Gregory-**AMC4**
Gorbe, Mihaly-HThD5, HWC9
Gorgulu, Adil T.-**AIWB5**
Gottschall, Thomas-FThB2
Goular, Didier-AMC2
Grabielle, Stéphanie-HFB6
Greborio, Alessandro-AWA18
Griebner, Uwe-AITHA5, **AME, AWA18,**
AWB1, AWB2, AWB4
Grimm, Stephan-AMB16
Grishin, Mikhail-AWA19
Gross, Petra-ATuB20, **AWA01, AWA20**
Gruen, Alexander-AWA26, HThB4
Grum-Grzhimailo, Alexei-HWB3
Grzegory, Izabella-AIWC1
Gräfe, Stefanie-HWC1
Guan, Jing-AIFB4, AITHB14
Guerrini, Piero-FThA3
Gurel, Kutun-**AMB09**
Guryanov, A. N-ATuB17, FThE8

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Haessler, Stefan-HThD4
Hamid, Ramiz-AME3, **ATuB24**
Han, Sung-Hwan-AITHB02
Han, X.-AIWA6, AWA13
Hanayama, Ryohei-HThA5
Hanna, David C-AMB03
Hanna, Marc-AMC2, JWB3
Hanne, Friedrich-HWB3
Hansen, Michael-AWA17
Hapke, Christian-AMB12
Hara, Kenjiro-AMB22
Harada, Masaki-AMA3

Harnois, David-FThE11
Hartl, Ingmar-AME4, FWA2, **FWB4**, JWA2
Hastie, Jennifer E-**AMA4**, AMA5, **ATuE**
Hatsagortsyan, Karen Z-HWC20
Hausmann, Katharina-AMB12, ATuB07
Hawkes, Steve-HWC16
Hawkins, Thomas-AIWB4
Hayashi, Yukio-HThA4
Heck, Robert-HFA6
Heckl, Oliver H.-ATuC1
Hefter, Ulrich-FThC
Hein, Joachim-ATuB13, ATuE2
Hellwig, Tim-ATuB19, **ATuB20**
Hemmer, Michaël-HThE5
Hendow, Sami-FThC4
Heo, Jong-AIFB3, **AIThB17**
Hernandez, Yves-FThB1, FThC3, FThE4,
FThE5, JWA5
Hernandez-Gomez, Cristina-HThE2, HThE3,
HWC5
Herrmann, Daniel-JWC1
Hervé, Gilles-ATuB09
Hideur, Ammar-**ATuB11**, AWA10, AWA29,
FThC5
Hines, Glenn-FWC1
Hioki, Tatsumi-HThA5
Hofmann, Peter-FThA5
Hollmack, Karsten-HThD1
Holzwarth, Ronald-AWB5, **HFB**, HFB4,
HThD4
Homann, Christian-JWC1
Hong, Kyung-Han-JWC4
Hooker, Chris-HWC16
Hu, I-Ning-AMC5
Hu, Juejun-AIThB19
Hu, Lili-AIWB3
Huang, Qing-AIThB14
Huang, Shu-Wei-JWC4
Huang, Yansui-HThD3
Huber, Günter-AIThC4, AMB15, AMB19,
ATuA5, ATuB14, ATuC1, **JWB2**
Huber, Rupert-HFB1
Hueske, Marc-FThB1
Hui-gnard, Jean-Pierre-AIFA4
Hwangbo, Chang Kwon-AIThB02
Hädrich, Steffen-**AMD5**, ATuD3, FThB2,
HWA2, JWA3
Hänsch, Theodor W-HFB4

I

Ilday, F Oemer-AMB09, **AMD**, AME3,
ATuB25, AWA15
Iliev, Hristo-AWA14
Imasaki, Kazuo-AWA06
Imura, Ken-AMB22
Isaenko, Ludmila-AIFA3
Ischakova, L.-ATuB17, FThE8
Ishii, Katsuhiko-HThA5
Ishii, Shinya-AWA06
Ishikawa, Takuya-AMB22
Ivanov, Igor-HWB3
Ivanov, Misha-HWC3
Iwasaki, Atsushi-HFA4
Izawa, Yasukazu-AWA06

J

Jacobs, C.-ATuA4
Jacquemet, Mathieu-FThE11
Jain, Apurva-FWB2
Jambunathan, Venkatesan-AIThA5
Jang, Gwang Hoon-FThE3
Jansen, Florian-AMB08, AMB11, ATuC4,
ATuD3, FThB2
Jaque, Daniel-AIFB4

Jarocki, Roman-HWC12
Jauregui, Cesar-AMB08, AMB11, ATuC4,
ATuD1
Jelinek, Michal-ATuB18
Jelinkova, Helena-**ATuB18**, AWA21
Jelínková, Helena-ATuB29
Jessen, Hans-ATuB04
Jezowski, Andrzej-AIThB06
Jiang, Shibin-**AIThC**, **AIWB2**
Jocher, Christoph-HFB4, JWA3
Jojart, Peter-HThD5, HWC9
Jones, Jason-HFB5
Jullien, Aurelie-HWA6
Jundt, Dieter H-AIThE3
Junginger, Friederike-HFB1
Juwiler, Irit-AMD6

K

Kabachnik, Nikolay-HWB2
Kadwani, Pankaj-ATuD4, FWA4, FWB3
Kafka, James-**ATuC**
Kahle, Martin-ATuE2
Kajiyama, Maria Claudia C-AIThE3
Kalashnikov, Vladimir-ATuB17, **ATuC3**,
FThE10, **FThE13**
Kalaycioglu, Hamit-**ATuB25**
Kaluza, Malte-ATuE2
Kamperidis, Christos-HThD1
Kampfrath, Tobias-HFB1
Kan, Hirofumi-AMB14, HThA5
Kanasaki, Masato-HThA4
Kando, Masaki-HThA4
Kanzelmeyer, Sebastian-ATuB07
Kapteyn, Henry-HThB5
Kar, Ajoy-AIFB5
Kara, Oguzhan-AME3
Karsch, Stefan-AMB02, HThE1, HWC19
Kartashov, Daniil-HFA4, **HWA5**, HWC1
Kaster, Jan Mathis-HFB4
Katin, Eugeny-HThA3
Kawanaka, Junji-AMB14, AWA06
Kawase, Keigo-HThA4
Kawashima, Toshiyuki-AMB14, HThA5
Kawata, Yasumasa-ATuB02
Keitel, Christoph H-HFA6
Keller, Ursula-ATuC1
Kelling, Uwe-JWB2
Kelly, John H-ATuB01
Kemlin, Vincent-AIFA2
Kemp, Alan J-AMA4, AMA5
Kersalé, Yann-FWB1
Kerttula, Juho-FThE9
Khajavikhan, Mercedeh-AIFB6
Khazanov, Efim-AIThA2, AIWA4, HThA3,
HThE4, HWC6
Kheifets, Anatoli-HWB3
Khopin, V. F-ATuB17
Khopin, Vladimir-FThE8
Khoshsima, Habib-AIThB13
Kielpinski, Dave-HWB3
Kienle, Florian-**AMB03**
Killi, Alexander-ATuC2
Kim, Byungnam-**AIWA1**
Kim, Hee Soo-AIThB02
Kim, Ji-Hee-AWB4
Kim, Jin Ho-FThE3
Kim, Kihong-AWB4
Kimerling, Lionel C-AIThB19
Kirchhof, Johannes-AMB16
Kiryama, Hiromitsu-HThA4
Kirsanov, Alex-HThA3
Kirschner, Volker-AIFB7
Kisel, Victor-AWA22
Kitagawa, Yoneyoshi-HThA5

Kitzler, Markus-**HFA4**, **HWC1**
Kleinbauer, Jochen-ATuC2
Kleinschmidt, Lisa-AWA01
Klenke, Arno-AMC1
Klimentov, Dmitry-ATuA2
Klingebiel, Sandro-HThE1
Klopp, Peter-AWB2
Kobayashi, Tetsuya-AMC3
Kocharovskaya, Olga A-HWB4
Kodama, Ryosuke-HThA4
Koen, W.-ATuA4
Koerner, Joerg-ATuB13, **ATuE2**
Kohler, Markus C.-**HFA6**
Koke, Sebastian-HThD5
Kokh, Alexandr E-**AIThE1**
Kokh, Konstantin-AIThE1
Kolodziejski, Leslie A-AWA03
Kondo, Kiminori-HThA4
Kononova, Nadezda-AIThE1
Konoplev, Oleg-**ATuB16**
Konyushkin, Vasilii A-AIThA3
Koopmann, Philipp-AMB19, **ATuA5**,
ATuB14
Korableva, Stella-AIThB03
Korostelin, Yu-ATuA2
Kostecki, Jerzy-HWC12
Kovacs, Mate-HWC9
Kozawa, Yuichi-AMB17, **ATuB03**, AWA07,
HWC10
Kozlovskii, Vladimir-ATuA2
Kracht, Dietmar-AMB06, AMB12, ATuB05,
ATuB07
Krainak, Michael A-ATuB16
Krausz, Ferenc-AMB02, HFB4, HThE1,
HWC19, JWC1
Krebs, Manuel-**HWA2**
Krikunova, Maria-HWB2
Krol, Denise-**AIFB1**, **AIThD**
Kroll, Franziska-AMB16, ATuB13
Kruse, Jan-HWB5, HWC21
Kränkel, Christian-ATuC1, JWB2
Kuhn, Vincent-**ATuB05**
Kuleshov, Nikolai V-AMB21
Kuleshov, Nikolai-AWA22
Kumpulainen, Tero-FThE9
Kurimura, Sunao-**AMA3**, AWA14, AWA16
Kurt, Adnan-AIWB5, AMB01
Kuznetsova, Svetlana-FThE16
Kwasniewski, Albert-JWB4
Kwiatkowski, Jacek-AWA05
Kärtner, Franz-AME5, ATuC5, AWA03,
HThC3, HThC4, **HThD**, JWC4
Körfer, Markus-HThD1
Kühn, Henning-JWB2

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Laarmann, Tim-HThD1
Laban, Dane-HWB3
Labor, Serge-AIWA5
Lagatsky, Alexander-**ATuA3**
Lai, Chien-Jen-HThC3, **HThC4**
Lamrini, Samir-ATuA5
Lancry, Mathieu, Dr-AIFB2
Landman, A.-ATuA2
Lang, Tino-AMD2
Laroche, Mathieu-**ATuB09**
Laronche, Albane-FThA5
Latokartano, Jyrki-FThE9
Laurell, Fredrik-AIWC3, AMA2, JWB1
Le Coq, Yann-**FWB1**
Le Garrec, Bruno-AMB20
Le Gouët, Julien-FThE6
Lebbou, Kheirredine-AIWA5
Lebedev, Vyacheslav F-ATuB28

Papadogiannis, Nektarios-HThD1
Papadopoulos, Dimitris N-ATuE3, HWA6,
JWB3
Parent, Gilles-AIFB7
Parrotta, Daniele C-AMA4
Paschke, Katrin-AWB1
Pasin, Ece-AWA15
Pasiskevicius, Valdas-AIWC3, AMA2, JWB1
Pattathil, Rajeev-HWC16
Paulus, Gerhard G-HWC3
Pavlov, Vitaly V-AIThB03
Pavlyuk, Anatoly A-AMB21
Payne, David-FWA1
Pellegrina, Alain-HWA6, JWB3
Perevezentsev, Evgeny-HThE4
Persson, Emil-HWC1
Petermann, Klaus-AIThC4, AMB15, AMB19,
ATuA5, ATuB14, ATuCl, JWB2
Peters, Rigo-ATuCl
Petersen, Alan B.-AIThE4
Petit, Johan-AIThB18
Petkovsek, Rok-FThB1
Petrich, Gale S-AWA03
Petros, Mulugeta-ATuB04, FWC3
Petrov, Alexander-HThD1
Petrov, Valentin-AIFA3, AIThA5, AWA14,
AWA16, AWA18, AWB1, AWB4,
JWB4
Petway, Larry-FWC1
Petzar, Paul-FWC3
Peyghambarian, Nasser-FThA5, FWC2
Pfeifer, Thomas-HFA6
Phillips, David F-AME5
Phillips, Jonathan-HThE3
Pichola, Wieslaw-AWA05
Pierrot, Simonette-FThC2, JWA5
Pierrotet, Diego-FWC1
Pikuz, Tatiana A-HThA4
Pirozhkov, Alexander-HThA4
Pirzio, Federico-AWA18
Plipavičius, Jurgis-AWA19
Plötner, Marco-AMC1
Podmar'kov, Yuri-ATuA2
Poinsot, Claire-AIFB7
Poletto, Luca-HFA2
Pollak, Thomas M-AIFA2
Polli, Dario-AMD1
Pollnau, Markus-ATuD6, ATuD7
Polovinkin, Vladimir A.-HWB4
Pons, Bernard-HFA3
Popmintchev, Dimitar-HThB5
Popmintchev, Tenio-HThB5
Popov, Alexander-HWC13, HWC15
Porowski, Sylwester-AIWC1
Poteomkin, Anatoly K-HThA3
Poumellec, Bertrand-AIFB2
Pradel, Annie-AIFB7
Preussler, D.-ATuA4
Pugatch, Rami-FThE2
Pugzlys, Audrius-AWB5, HThB5, HThD4,
HWA5, HWC3, JWC5
Pujol, Maria Cinta-AIThA5, AIThB01,
AIThC5
Pullen, Michael Gregory-HWB3
Pupeza, Ioachim-HFB4
Pureur, David-FThE11
Quiney, Harry-HWB3

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Radeonychev, Yevgeny V-HWB4
Radier, Christophe-HWC7
Raith, Philipp-HFA6
Ramirez, Lourdes Patricia-HWA6
Ranieri, Izilda M-ATuB22

Rasoloniaina, Lovamamy-ATuB11
Rathje, Tim-HWC3
Raybaut, Myriam-AIThB18
Raz, Oren-HFA3
Realì, Giancarlo-AWA18
Rehlich, Kay-HThD1
Reichelt, Almud-AMB16
Reichert, Fabian-AIThC4, **AMB19**
Reichle, Donald-AIThB09
Renz, Günther-AWA24
Ricaud, Sandrine-ATuB21, ATuE3, JWB3
Ricci, Aurelien-HWA6
Rice, Joseph-FThA2
Rice, Robert-AIWB4
Richardson, David J-AMB03
Richardson, Kathleen-AIThB19
Richardson, Martin-AMB10, ATuD4, **FWA4**,
FWB3, HThE5
Rico, M.-AIWA6, AWA13
Riedel, Robert-HThD1
Riedle, Eberhard-AMD4, JWC1
Rihan, Abdallah-AMB04
Robin, Thierry-ATuB09
Roesser, Fabian-AMB16, ATuB13
Roither, Stefan-HFA4, HWC1
Romann, Albert-FWA2, **JWA2**
Ronen, Eitan-AMB05
Ross, Ian-HThE2, HWC5
Rossbach, Jörg-HThD1
Rotari, Eugeniu-FThB3
Rotermund, Fabian-AIThB01, AWA18,
AWB4
Rothenberg, Joshua-AMC4
Rothhardt, Jan-AMD5, ATuD3, FThB2, **JWA3**
Rousseau, Jean-Philippe-HWA6
Ruehl, Axel-AME4, FWA2, FWB4, JWA2
Rustad, Gunnar-ATuB15, **AWA25**
Ryba-Romanowski, Witold-AIThB06,
AIThB10, ATuE5
Rönsch, Juliane-HThD1

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Sabbagh, Ali Asghar, Alvani-AIThB15
Saby, Julien-ATuB12, **FThB5, FThC2, JWA5**
Sada, Cinzia-AIThE5
Sakaki, Hironao-HThA4
Salcedo, Jose-FThE7
Salimi, Reza-AIThB15
Salin, Francois-ATuB12, FThB1, FThB5,
FThC2, JWA5
Sameie, Hassan-AIThB15
Sang, Robert-HWB3
Sanghera, Jas-AIThD2, FThA2
Sangla, Damien-ATuB12
Sansone, Giuseppe-HThB2
Santarelli, Giorgio-FWB1
Sarabi, Ali A-AIThB15
Saraceno, Clara J.-ATuCl
Sato, Nakahiro-HThA5
Sato, Shunichi-AMB17, ATuB03, **AWA07**,
HWCl0
Sato, Yoichi-AIThA6
Savitski, Vasilii-AMA5
Sayinc, Hakan-ATuB07
Schaffers, Kathleen-JWB
Schellhorn, Martin-ATuB14, **AWA08**
Schepler, Kenneth-AIFB5
Schiller, Stephan-AWA17
Schlarb, Holger-HThD1
Schlegel, Iris-HFA6
Schlup, Philip-ATuA6
Schmidt, Andreas-AIThA5, AWB1, AWB4
Schmidt, Bernhard-HThD1
Schmitz, Michael-HThD1

Scholle, Karsten-ATuA5, ATuB14
Schramm, Ulrich-AMB16, ATuB13
Schreiber, Siegfried-HThD1
Schreiber, Thomas-ATuB, AWA10
Schubert, Olaf-HFB1
Schulte-Schrepping, Horst-HThD1
Schultze, Marcel-AMD2, AWB3
Schulz, Michael-HThD1
Schulzgen, Axel-FThA5, **FWB**
Schunemann, Peter-AIFA1, AIFA2, **AIThE**,
AME2
Schwesyg, Judith Renate-AIThE3
Schäferling, Martin-ATuB19
Schättiger, Farina-ATuC2
Schöffler, Markus-HFA4, HWC1
Schrinzi, Armin-HWB2
Seaberg, Matthew-HThB5
Seah, Chu Perng-**AWA11**
Seas, Antonios A-ATuB16
Segonds, Patricia-AIFA2
Seise, Enrico-AMC1
Sekine, Takashi-HThA5
Sell, Alexander-HFB1
Selleri, Stefano-FThB1
Semashko, Vadim-AIThB03
Semjonov, Sergei-ATuB11
Sendogdu, Damla-ATuB24
Senel, Cagri-AMB09, **AME3**
Sennaroglu, Alphan-AIWB5, **AMA**, AMB01,
AWA03
Serebryannikov, Evgenii E-HWC2
Sergeev, Alexander-HThA3
Serivalsatit, Kam-AIWA2
Serrano, Diana-AIThC3
Serrano, Dolores-AIWA6, ATuA3
Serrat, Carles-HThB3
Setlur, Anant-AIThC1
Shafir, Dror-HFA3
Shah, Lawrence-AMB10, ATuD4, FWA4,
FWB3
Shaw, Brandon-AIThD2, **FThA2**
Shaw, George B-ATuB16
Shaykin, Andrey-HThA3
Shen, Jianwei-AWA17
Shepherd, David P-AMB03
Shevyrdyaeva, Galina-JWB4
Shih, Chun-Ching-AMC4
Shimohira, Koki-AWA07
Shimomura, Takuya-HThA4
Shirakawa, Akira-AMC3, **AWB**
Shoji, Ichiro-AMB22
Shoup, Milton J, III-ATuB01
Sibbett, Wilson-ATuA3
Siebenmorgen, Jörg-JWB2
Siebold, Mathias-AMB16, ATuB13, ATuE2
Siegel, Thomas-HFA2
Siiman, Leo-AMC5
Silberberg, Yaron-AMD6
Silva, Alissa-ATuA7
Simic, Aleksandar-AIFB6
Simon-Boisson, Christophe-HWC7
Sims, Robert-AMB10, **ATuD4**, FWA4, FWB3
Singh, Upendra N- ATuB04, FWC3, **FWC4**
Singh, Vivek-AIThB19
Skantzakis, Emmanouel-HWB5, HWC21
Skasyrskii, Yan-ATuA2
Škoda, Václav-ATuB29
Skorczakowski, Marek-AWA05
Skrobol, Christoph-AMB02, HThE1, HWC19
Smetanin, Sergey N.-**ATuB28**
Smilingov, Rokas-AWA19
Smirnov, Vadim-FThB3, **FWB2**
Smirnova, Olga-HFA1, HWC3
Soifer, Hadas-HFA3

Solarz, Piotr-AI**ThB06**, AI**ThB10**
Soloviev, Alexander-H**ThA3**
Song, Liwei-H**ThD3**
Sorokin, Evgeni-**AME2**, **ATuA2**
Sorokina, Irina-**AME2**, **ATuA2**, **ATuB17**,
F**ThE10**, **FThE13**, **FThE8**
Sosnowski, Tom-**ATuC5**
Soulard, Rémi-A**IFA4**
Sousa, Eduardo C-**ATuB22**
Sousa, João M-**FThE7**
Speghini, Adolfo-A**IBW5**
Speiser, Jochen-A**WA24**
Spengler, Joachim-H**ThD1**
Spiegelberg, Christina-F**WB2**
Squibb, Richard-H**ThD4**
Staack, Martin-H**ThD1**
Stachowiak, Piotr-AI**ThB06**
Stagira, Salvatore-H**FA2**, **HThB2**
Starodubtsev, Mikhail-H**ThA3**
Stefani, Fabio-F**ThA3**
Steinmetz, Alexander-**ATuD5**
Steinmeyer, Günter-A**WB4**
Stephen, Mark A-**ATuB16**
Stolen, Roger-A**IBW4**
Strauss, Hencharl Johan-**ATuA4**
Stutzki, Fabian-**AMB11**, **ATuC4**, **ATuD3**,
F**ThB2**
Suchocki, Andrzej-AI**ThB07**
Suchowski, Haim-**AMD6**
Sugita, Atsushi-**ATuB02**
Šulc, Jan-**ATuB18**, **ATuB29**, **AWA21**
Sutter, Dirk H-**ATuC2**
Suzuki, Hisao-**ATuB02**
Swann, William C-**AME1**
Swiderski, Jacek-**AWA05**
Sylvain, Girard-**ATuB09**
Sysoliatin, Alexej-F**WC2**
Szczyrek, Mirosław-H**WC12**
Südmeyer, Thomas-**ATuC1**

T

Tahriri, Mohammadreza-AI**ThB15**
Taira, Takunori-AI**ThA**, AI**ThA6**, AI**WA3**,
A**TuB08**, **ATuE1**
Takagi, Masaru-H**ThA5**
Takayanagi, Konosuke-**AMB22**
Takeshita, Kenji-A**WA06**
Takeuchi, Yasuki-**AMB14**
Tampo, Motonobu-H**ThA4**
Tan, Yang-A**IFB4**
Tang, Yunxin-H**ThE2**, **HWC16**, **HWC5**
Tatarakis, Michael-H**ThD1**
Tautz, Raphael-J**WC1**
Tavella, Franz-H**ThD1**
Teh, Peh Siong-**AMB03**
Teichmann, Stephan-H**ThB4**
Teimourpour, Mohammad Hosain-AI**ThB12**
Temyanko, Valery-F**WC2**
Ter-Gabrielyan, Nikolay-**ATuE5**, **AWA02**
Thai, Alexandre-**AMB02**, **AMD3**, **HThD2**,
HWC19
Theeg, Thomas-**AMB12**, **ATuB07**
Thilman, Nicky-J**WB1**
Thomas, Jens-**AMB10**
Tiedtke, Kai-H**ThD1**
Tiffany, Bradley-A**WA12**
Tikhonova, Olga-H**WC13**, **HWC15**
Tisch, John W-H**ThD4**
Tischer, Markus-H**ThD1**
Torchia, G. A-A**IFB4**
Torres, Ricardo-H**FA2**
Traynor, Nicholas-A**WA29**, **FThC5**
Treich, Rolf-H**ThD1**
Trono, Cosimo-F**ThA3**

Troy, Neil-A**IFB1**
Trushin, Sergei A-H**ThE1**
Tsakiris, George-H**ThC5**, **HWB5**, **HWC21**
Tsaur, Gin-yih-H**WC17**
Tudorovskaya, Maria-H**WC14**
Tyazhev, Aleksey-J**WB4**
Tzallas, Paraskevas-H**WB5**, **HWC21**
Tünnermann, Andreas-**AMB08**, **AMB10**,
A**MB11**, **AMC1**, **AMD5**, **ATuC4**,
A**TuD1**, **ATuD3**, **ATuD5**, **FThA**,
F**ThB2**, **FThC1**, **HFB4**, **HWA2**,
J**WA3**
Tünnermann, Henrik-**AMB06**

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Udem, Thomas-H**FB4**
Ueda, Ken-ichi-**AMC3**
Ueda, Motoi-**AMA3**
Ueno, Tokio-**AMA3**
Ugolotti, Elena-A**WA18**
Unterrainer, Karl-H**WC3**

V

Vadimova, Olga-H**ThE4**
Vaquez de Aldana, Javier R-A**IFB4**
Vasilyev, Aleksey A-**ATuB16**
Vasilyev, Sergey-**AWA17**
Vaupel, Andreas-H**ThE5**
Veisz, Laszlo-J**WC1**
Velotta, Raffaele-H**FA2**
Venus, George-F**WB2**
Verhoef, Aart J-**HWB2**, **HWC2**
Viana, Bruno-**ATuB21**
Vigreux, Caroline-A**IFB7**
Vihinen, Jorma-F**ThE9**
Villoresi, Paolo-H**FA2**
Villval, Philippe-AI**ThE1**, AI**ThE2**
Vincent, Bernard-**ATuE4**
Vlezko, Vasily-AI**ThE1**
Vodopyanov, Konstantin-**AME2**
Voigtländer, Christian-**AMB10**
Volkova, Ekaterina-H**WC13**, **HWC15**
Vozi, Caterina-H**FA2**, **HThB2**
Vyatkin, Anton G.-AI**ThA2**, **AIWA4**
Vyatkin, Anton-H**ThE4**

W

Wachulak, Przemyslaw-H**WC12**
Wakiya, Naoki-**ATuB02**
Walbaum, Till-**ATuB19**, **ATuB20**, **AWA20**
Wallace, William-H**WB3**
Walsh, Brian-AI**ThB09**, **ATuB04**
Walsworth, Ronald L-**AME5**
Wan, Chenhao-A**WA12**
Wan, Peng-F**ThB4**, **FThE15**
Wandt, Christoph-H**ThE1**
Wandt, Dieter-**AMB12**
Wang, Ding-H**ThD3**
Wang, Jing-A**WA03**
Wang, Jiyang-A**WA14**, **AWB1**
Wang, Jyhpyng-H**ThC2**
Wang, Xu-H**WC4**
Wang, Xue-Lin-AI**ThB14**
Wang, Zhaohua-**ATuB23**
Webb, Benjamin-H**ThE5**
Weflen, Daniel-H**WB3**
Wei, Zhiyi-**ATuB23**
Weichelt, Birgit-**ATuB21**
Wessels, Peter-**AMB06**, **ATuB05**
Wetter, Niklaus-**ATuB22**
Weyers, Markus-**AWB2**
Willis, Christina C C-**AMB10**, **FWA4**
Willner, Arik-H**ThD1**
Winstone, Trevor-H**ThE2**

Winters, David-**ATuA6**
Witcher, Jonathan J-A**IFB1**
Wolf, Martin-H**FB1**
Wolter, Benjamin-A**WB4**
Wolters, Ulrike-J**WB2**
Wu, Rui Fen-A**WA11**
Wyborn, Brian-H**ThE2**
Wörhoff, Kerstin-**ATuD6**, **ATuD7**

X

Xie, Xinhua-H**FA4**, **HWC1**
Xin, Ran-**AMB13**
Xiong, Lingyun-F**ThA5**
Xu, Canhua-H**ThD3**
Xu, Huailiang-H**FA4**
Xu, Kai-AI**ThB17**
Xu, Zhenyu-F**WB1**
Xu, Zhizhan-H**ThD3**

Y

Yadegari, Mustafa-**AMB23**
Yakovlev, Ivan-H**ThA3**
Yamada, Tsuyoshi-**AMA3**
Yamagishi, Kazufumi-**AMB17**
Yamanouchi, Kaoru-H**FA4**
Yamauchi, Tomoya-H**ThA4**
Yan, Wenbo-AI**ThE5**
Yang, Lihmei-F**ThB4**, **FThE15**
Yavas, Seydi-**ATuB25**
Ye, Jun-**AME4**, **FWB4**
Yee, Ki-Ju-A**WB4**
Yeom, Dong-II-A**WB4**
Yeung, Mark-H**ThD1**
Yoon, Chong Seung-AI**ThB02**
Yoon, Tai Hyun-F**ThE3**
Yoshida, Akira-**AMB14**, **AWB1**
Yost, Dylan C-**AME4**, **FWB4**
Yu, Anthony W-**ATuB16**
Yu, Jirong-**ATuB04**, **FWC3**, **FWC4**
Yumashev, Konstantin V-**AMB21**
Yumashev, Konstantin-A**WA22**
Zagorodnev, Vladimir-AI**ThB04**, AI**ThD4**

Z

Zaldo, C.-**AIWA6**, **AWA13**
Zaldo, Carlos-**ATuA3**
Zaltron, Annamaria-AI**ThE5**
Zanon, Thomas-**AMB04**
Zawilski, Kevin T-A**IFA2**
Zdyrko, Bogdan-AI**ThB19**
Zeng, Heping-H**FA5**
Zepf, Matthew-H**ThD1**
Zhang, Bosheng-H**ThB5**
Zhang, Chunmei-H**ThD3**
Zhang, Guang-A**IBW3**
Zhang, Huaqin-A**WA14**, **AWB1**
Zhang, Jun-**ATuD2**
Zhang, Li-H**FA4**, **HWC1**
Zhang, Qing-**ATuB23**
Zhang, Shaoqian-A**IFB7**
Zhang, Wei-F**WB1**
Zhang, Xianghua-A**IFB7**
Zhao, Jin-Hua-AI**ThB14**
Zheltikov, Alexey M-H**WC2**, **HWC3**
Zhou, Bing-H**WA4**
Zhu, Cheng-**AMC5**
Zhydachevski, Yaroslav-AI**ThB07**
Zinoviev, Andrey-A**IFA4**
Zondy, Jean-Jacques-A**IFA3**, **AMB04**
Zorn, Martin-A**WB2**
Zuegel, Jonathan-**AMB13**, **ATuB01**, **JWC2**
Zukauskas, Andrius-J**WB1**

Lasers, Sources and Related Photonic Devices

OSA Optics & Photonics Congress 2011

Update Sheet

Withdrawals

AIThB02 AIFB3
AIThB03 AIFB6
AIThB11 HWC13
AIThB13 HFB3
AIThB17

Presider Updates

Kent E. Mattsson, *Technical Univ. of Denmark, Denmark*, will preside over the session, AIThD, Crystal and Glass Fibers II

Author Block Update

The author block for **HWA3** should read: Xiaowei Chen, Aurelien Ricci, Arnaud Malvache, Aurelie Jullien, Rodrigo Lopez-Martens; *Lab d'Optique Appliquee, Palaiseau Cedex, France*.

Presenter Changes

HWB5 will be presented by Paraskevas Tzallas, IESL, FORTH, *Heraklion, Greece*.

AMB10, ATuD4, and FWB3 will be presented by Lawrence Shah, *CREOL College of Optics and Photonics, Univ. of Central Florida, USA*.

HThE3 will be presented by P. D. Mason, *STFC Rutherford Appleton Laby, Central Laser Facility, UK*

HThC5 will be presented by Rainer Hoerlein, *Ultrafast Innovations, Germany*

Session Changes

AIThF • AIOM Postdeadline Session ends at 19.15.

Special Events

Please join the HILAS and FILAS chairs for an informal "rump" session to discuss the 2011 inaugural offerings of these two meetings and to brainstorm for how to improve in 2012.

FILAS Rump Session

Wednesday, 16 February 2011
13.00–14.00
Marmara

HILAS Rump Session

Thursday, 17 February 2011
20.00–21.00
Citronelle

Welcome Event

Please join the ASSP Chairs on Sunday at the City Lights Bar within the hotel from 18.00–19.00.

Student Awards

The ASSP Student Award sponsored by Lockheed Martin will be presented following session AWB on Wednesday, 16 February.



The FILAS Student Award sponsored by Multiwave Photonics will be presented during the IPG dinner on Thursday, 17 February.



Additional Support provided by:



Postdeadline Paper Programs

Postdeadline Paper Programs are available at Registration.