Fiber Laser Applications (FILAS)

February 16-17 2011, Ceylan Intercontinental Istanbul Hotel, Istanbul, Turkey

FILAS - a new topical meeting focusing on fiber laser technologies and applications. 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 FILAS 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

View My Schedule
Customize your program

- Browse speakers and the agenda of sessions
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- Search by author, title, OCIS code and more.
- Plan and print your personal itinerary before coming to the conference
- Key to Authors and Presiders
- Abstracts

Lasers, Sources and Related Photonic Devices: OSA Optics & Photonics Congress

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

Sponsor:

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Fiber Laser Applications (FILAS)

February 16-17 2011, Ceylan Intercontinental Istanbul Hotel, Istanbul, Turkey

Program

Itinerary Planner
Invited Speakers
Tour
Special Events

Schedule at a Glance

The Fiber Laser Applications meeting brings together industry and research experts to present and discuss the latest advances on fiber laser technology and how they impact on numerous application areas, from both classical and novel industrial applications to environmental monitoring and medicine.

Successful laser applications depend on bringing together industrial and scientific competencies, and FILAS 2011 will provide such a forum. This conference is being articulated with ASSP - Advanced Solid State Photonics - fundamental scientific aspects are primarily covered by ASSP and applications are primarily covered by FILAS. The bridging between fundamental scientific aspects and applications will also be covered by FILAS 2011.

Topics to be covered by FILAS 2011 include:

- Fiber laser technologies
  - High power cw, pulsed, IR, visible and UV fiber lasers
- Fiber laser applications
  - Cutting and welding
  - Scintering and powder deposition
  - Photovoltaic materials processing
  - Microelectronics and flat panel displays
  - Micromachining and precision marking
  - Femtosecond laser micromachining
  - Environmental monitoring
  - Medical
  - Novel applications (e.g. optical clockworks, etc.)
  - Sensing

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!

Invited Speakers

The program for Fiber Laser Applications (FILAS) will be held Wednesday, February 16 through Thursday, February 17.

View the conference program and plan your itinerary for the conference

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Customize your program

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- Browse sessions by type or day.

- Search by author, title, OCIS code and more.
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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

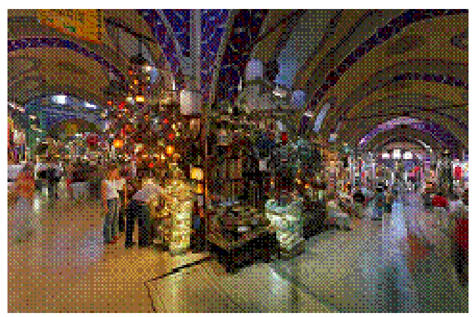


Figure 2 Grand Bazaar – Gazella Tours

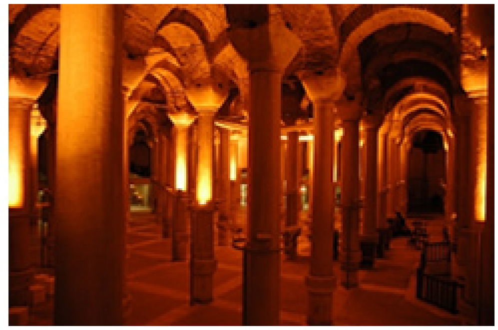
To reserve your seat

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.

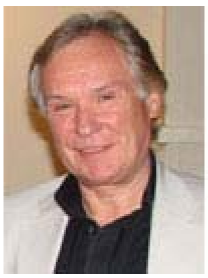
Special Events

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 Lavsus 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.

IPG Reception & Dinner
Thursday, 17 February 2011
18:30 – 21:30
Location: Esma Sultan
Invitation Only
More information will be available closer to the event. Event details are subject to change.

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Fiber Laser Applications (FILAS)

February 16-17 2011, Ceylan Intercontinental Istanbul Hotel, Istanbul, Turkey

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 Fiber Laser Applications (FILAS) Technical Program Committee.

On this page:

Program Committee

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Valentin Gapontsev, *IPG Photonics Corp., USA*
Jose Salcedo, *Multiwave Photonics, Portugal*

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Andrei Starodumov, *Coherent, USA*
Andreas Tünnermann, *Univ. Jena, Germany*

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.

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Amplitude Systemes
6, allée du doyen Georges Brus
33600 Pessac FRANCE
P: +33.5.5646.4060
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c/o Optolita UAB
Mokslininku str. 11
Vilnius, LT-08412 LITHUANIA
P: +370.5.272.99.00
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50 Old Webster Road
Oxford, MA 01540 USA
P: +1.508.373.1100
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Stockport, Cheshire SK4 3GL UK
P: +44.0.161.975.5300
F: +44.0.161.975.5309
sales@laserquantum.com
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Multiwave Photonics, SA
R. Eng. Frederico Ulrich 2650
Moreira da Maia 4470-605 PORTUGAL
P: +351.22.9408260
F: +351.22.9408261
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Thorlabs GmbH
Hans-Boeckler-Str. 6
85221 Dachau/Munich GERMANY
P: +49.0.8131.5956.0
F: +49.0.8131.5956.99
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UltraFast Innovations GmbH
Am Coulombwall 1
85748 Garching GERMANY
T: +49.89.289.14097
F: +49.89.289.14141
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VENTEON Laser Technologies GmbH
Hertzstr. 1B
30827 Garbsen GERMANY
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F: +49.0.511.762.17220
info@venteon.com
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1400 Campus Drive West
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ASSP, AIOM, FILAS & HILAS
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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.

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

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Postdeadline Paper Programs

Postdeadline Paper Programs are available at Registration.

Fiber Laser Applications (FILAS)

February 16-17 2011, Ceylan Intercontinental Istanbul Hotel, Istanbul, Turkey

Invited Speakers

Keynote Speakers

Wednesday, 16 February 2011

FWA1 • 11:30 a.m., Title to Be Announced, Valentin Gapontsev, *IPG Photonics Corp., USA*

Thursday, 17 February 2011

FThA1 • 8:00 a.m., Fibre Lasers: Current Research and Future Products, David Payne, *Univ. of Southampton, UK*

Invited Speakers

Wednesday, 16 February 2011

Joint with ASSP JWA1 • 8:15 a.m., Advanced Specialty Fibers for Applications in Fiber Lasers, L. Dong, *IMRA America Inc., USA*

Joint with ASSP, JWA4 • 9:15 a.m., Compact, Highly Coherent Fiber Lasers and Amplifiers for Sensing and Oil and Gas Exploration, A. Chavez-Pirson, *NP Photonics, Inc., USA*

FWA3 • 12:00 p.m., Compact Fiber Laser Light Sources for Linear and Nonlinear Microscopy, A. Leitenstorfer, *Fachbereich Physik, Univ. Konstanz Germany, Germany*

FWA4 • 12:30 p.m., High Power Thulium Fiber Lasers, M. Richardson, *Univ. of Central Florida, USA*

FWB1 • 2:30 p.m., Ultralow Phase Noise RF Generation Using a Fiber-Frequency Comb, Y. Le Coq, Observatoire de Paris, France

FWB4 • 3:30 p.m., High Power Fiber Laser Frequency Combs for XUV Spectroscopy, I. Hartl, *IMRA America Inc., USA*

FWC1 • 4:30 p.m., Fiber-Based Coherent Doppler Lidar for Precision Landing on the Moon and Mars, F. Amzajerdian, L. Petway, B. Barnes, G. Hines, , NASA, Hampton, VA; D. Pierrottet, G. Lockard, *Coherent Applications, Inc., USA*

FWC4 • 5:30 p.m., Tm:Fiber Pumped Solid-State Ho:YLF 2-μm Coherent Laser Transmitter for Air and Space-based CO2 Measurements, Upendra Singh[1], Yingxin Bai[2], Jirong Yu[1]; [1]*NASA Langley Res. Ctr., Hampton, VA, USA,* [2]*Science Systems and Applications, Inc., Hampton, VA, USA.*

Thursday, 17 February 2011

FThA5 • 9:30 a.m., Distributed Feedback Lasers in Phosphate Glass Active Fiber, A. Schulzgen1, P. Hofmann[1], P. Hofmann[2], L. Li[2], N. Peyghambarian[2], L. Xiong[3], A. Laronche[3], J. Albert[3], [1]*CREOL, College of Optics and Photonics, Univ. of Central Florida, USA,* [2]*College of Optical Sciences, Univ. of Arizona, USA,* [3]*Carleton Univ., Canada*

FThB1 • 10:30 a.m., Recent Progress on the ALPINE (Advanced Lasers for Photovoltaic INdustrial processing Enhancement) FP7 Integrated Project, Y. Hernandez, *Multitel, Belgium*

FThB4 • 11:30 a.m., ns and fs Fiber Lasers, J. Liu[1], P. Wan[1], L. Yang[1], F. Amzajerdian[2], [1]*PolarOnyx Inc., USA,* [2]*NASA Langley Res. Ctr., USA*

FThB5 • 12:00 p.m., Photovoltaics Applications of High Power Green and UV Fiber Lasers, *J. Saby, Eolite Systems, France*

FThC1 • 2:00 p.m., High Repetition Rate Short Pulse Micromachining with Fiber Lasers, S. Nolte, *Friedrich-Schiller-Univ. Jena, Germany*

FThC4 • 3:00 p.m., **Influence of Peak Power and ns Pulse Duration on Micromachining,** S. Hendow, *Multiwave Photonics, Portugal*

FThC5 • 3:30 p.m., 488 nm Fiber Laser and Applications, N. Traynor, *Azur Light Systems, France*

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

	Bosphorus, P Floor	*Dolmabahce Foyer, R Floor*	*Anadolu, P Floor*	*Citronelle, N Floor*	*Marmara, P Floor*
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,** *Dolmabahce Foyer, R Floor*				
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,** *Dolmabahce Foyer, R Floor*				
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,** *Dolmabahce Foyer, R Floor*				
10.00–16.45	**Exhibits Open,** *Dolmabahce Ballroom, R Floor*				
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,** *Dolmabahce Foyer, R Floor*				
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,** *Dolmabahce Foyer, R Floor*				
10.00–16.30	**Exhibits Open,** *Dolmabahce Ballroom, R Floor*				
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)**				

	Bosphorus, P Floor	*Dolmabahce Foyer, R Floor*	*Anadolu, P Floor*	*Citronelle, N Floor*	*Marmara, P Floor*
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,** *Dolmabahce Foyer, R Floor*				
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,** *Dolmabahce Foyer, R Floor*				
10.00–16.30	**Exhibits Open,** *Dolmabahce Ballroom, R Floor*				
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,** *Dolmabahce Foyer, R Floor*				
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,** *Dolmabahce Foyer, R Floor*				
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-Phasematched Nonlinear Optics: History and Prospects, *Martin M. Fejer[1]; [1]E. L. Ginzton Lab, Stanford Univ., USA.* Microstructured ferroelectrics and semiconductors have enabled quasi-phasematching 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 Gallo[1], Martin Levenius[1], Fredrik Laurell[1], Valdas Pasiskevicius[1]; [1]Applied Physics, KTH - Royal Inst. of Technology, Sweden.* We demonstrate dual-beam optical parametric generation in hexagonally poled $LiTaO_3$. 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 Kurimura[1], Masaki Harada[1,2], Ken-ichi Muramatsu[2], Motoi Ueda[2], Muneyuki Adachi[1,3], Tsuyoshi Yamada[3], Tokio Ueno[3]; [1]Nat'l Inst. for Mat. Sci, Tsukuba, Japan; [2]Nikon Corp., Sagamihara, Japan; [3]Nidek 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. Parrotta[1], Walter Lubeigt[1], Alan J. Kemp[1], David Burns[1], Martin D. Dawson[1], Jennifer E. Hastie[1]; [1]Inst. 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 1136-1154.5nm with total output power up to 120mW.

AMA5 • 9.45
1.6W Continuous-wave Diamond Raman Laser, *Walter Lubeigt[1], Vasili Savitski[1], Gerald M. Bonner[1,2], Jennifer E. Hastie[1], Martin D. Dawson[1], David Burns[1], Alan J. Kemp[1]; [1]Inst. of Photonics, Univ. of Strathclyde, Glasgow, UK; [2]MQ Photonics, Macquarie Univ., Sydney, NSW, Australia.* Low-birefringence, single-crystal, synthetic diamond is used as a Raman medium in a $Nd:YVO_4$ laser. CW output powers of 1.6W at the Raman wavelength were recorded. In quasi-CW operation, on-time output powers of 2.8W 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. Cizmeciyan[1], Huseyin Cankaya[1], Adnan Kurt[2], Alphan Sennaroglu[1]; [1]Koc Univ., Istanbul, Turkey; [2]Teknofil, 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 Thai[1], Christoph Skrobol[2,3], Philip K. Bates[1], Gunnar Arisholm[4], 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 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 Kienle[1], Peh Siong Teh[1], Shaif-Ul Alam[1], Corin B. E. Gawith[2], David C. Hanna[1], David J. Richardson[1], David P. Shepherd[1]; [1]Optoelectronics Res. Ctr., Univ. of Southampton, Southampton, UK; [2]Covesion Ltd., Romsey, UK.* We demonstrate a high-pulse-energy, synchronously-pumped (7.19MHz), 100ps, widely tunable MgO:PPLN OPO providing 0.49μJ

pulses at 1.5μm and 0.19μJ pulses at 3.6μm. 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 Andrieux[1], Abdallah Rihan[1], Thomas Zanon[1], Malo Cadoret[1], Jean-Jacques Zondy[1]; [1]Length 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 Nixon[1], Eitan Ronen[1], Moti Fridman[1], Asher A. Friesem[1], Nir Davidson[1]; [1]Weizmann 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]; [1]Laser Zentrum Hannover e.V., Hannover, Germany; [2]Ctr. 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. Lu[1], Gerry T. Moore[1]; [1]Air 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 Nodop[1], Cesar Jauregui[1], Florian Jansen[1], Jens Limpert[1], Andreas Tünnermann[1]; [1]Inst. of Applied Physics, Univ. of Jena, Jena, Germany.* Inhibition of SRS in doublecladd 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 Gurel[1], Ibrahim L. Budunoglu[1], Cagri Senel[1], Punya P. Paltani[1], F Oemer Ilday[1]; [1]Physics 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. Willis[1], Joshua Bradford[1], Robert Sims[1], Lawrence Shah[1], Martin Richardson[1], Jens Thomas[2], Ria Becker[2], Christian Voigtländer[2], Andreas Tünnermann[2,3], Stefan Nolte[2,3]; [1]CREOL, Univ. of Central Florida, Orlando, FL, USA; [2]Inst. of Applied Physics, Friedrich-Schiller-Univ., Jena, Germany; [3]Fraunhofer 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 Stutzki[1], Florian Jansen[1], Tino Eidam[1,2], Cesar Jauregui[1], Jens Limpert[1,2], Andreas Tünnermann[2,3]; [1]Inst. for Applied Physics, FSU Jena, Jena, Germany; [2]Helmholtz-Inst. Jena, Jena, Germany; [3]Fraunhofer 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 62μm.

AMB12

0.5 μJ 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]; [1]Laser Development, Laser Zentrum Hannover e.V., Hannover, Germany; [2]Ctr. for Quantum-Engineering and Space-Time Res. - QUEST, Hannover, Germany; [3]Inst. 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 Xin[1], Jonathan Zuegel[1]; [1]Lab 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 Yb $^{3+}$:YAG Regenerative Amplifier using a Total-Reflection Active-Mirror, *Yasuki Takeuchi[1], Hiroaki Furuse[2], Akira Yoshida[1], Takuya Nakanishi[1], Toshiyuki Kawashima[3], Hirofumi Kan[3], Takayoshi Norimatsu[1], Noriaki Miyanaga[1], Junji Kawanaka[1]; [1]Inst. of Laser Engineering, Osaka Univ., Osaka, Japan; [2]Inst. for Laser Technology, Osaka, Japan; [3]Hamamatsu Photonics K.K., Shizuoka, Japan.* The first chirped-pulse regenerative amplifier using a total-reflection active-mirror with a cryogenic Yb^{3+}: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:YVO_4 Laser Emitting around 1.6 μm, *Christian Brandt[1], V. N. Matrosov[2], Klaus Petermann[1], Günter Huber[1]; [1]Inst. of Laser-Physics, Univ. of Hamburg, Hamburg, Germany; [2]SOLIX LTD., Minsk, Belarus.* Efficient resonantly inband pumped laser operation around 1.6 μm wavelength is demonstrated in Er(1 at.%):YVO_4. The maximum slope efficiency obtained is 57.9% and the maximum output power was 2.3 W.

AMB16

Broadband, diode-pumped Yb:SiO_2 multicomponent glass laser, *Markus Loeser[1], Fabian Roeser[1], Almud Reichelt[1], Franziska Kroll[1], Mathias Siebold[1], Ulrich Schramm[1], Stephan Grimm[2], Johannes Kirchhof[2], Doris Litzkendorf[2]; [1]Res. Ctr. Dresden-Rossendorf, Dresden, Germany; [2]IPHT, 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:YVO_4 Crystal, *Kazufumi Yamagishi[1], Yuichi Kozawa[1], Shunichi Sato[1]; [1]Inst. 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:YVO_4 crystal using a soft aperture effect of the pump beam.

AMB18

On the potential of 914 nm pumping of Nd:YVO_4 for laser operation at 1064 nm, *Xavier Délen[1], François Balembois[1], Olivier Musset[2], Patrick Georges[1]; [1]Laboratoire Charles Fabry, Palaiseau, France; [2]Laboratoire Interdisciplinaire Carnot de Bourgogne, Dijon, France.* 1064 nm-Nd :YVO_4 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 $Lu_{2-x}Sc_xO_3$, *Fabian Reichert[1], Klaus Petermann[1], Günter Huber[1], Philipp Koopmann[1], Matthias Fechner[1], Christian Brandt[1]; [1]Inst. 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 $^4F_{3/2} \rightarrow {}^4I_{9/2}$ 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 Marmois[1], Bruno Le Garrec[1], Gilbert Bourdet[2]; [1]Dept. of Power Lasers, C.E.A., Le Barp, France; [2]LULI, 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 CaF_2 and YAG.

AMB21

Negative Thermooptic Coefficients and Athermal Directions in Pure and Yb-doped Monoclinic $KY(WO_4)_2$, *Pavel A. Loiko[1], Konstantin V. Yumashev[1], Nikolai V. Kuleshov[1], Anatoly A. Pavlyuk[2]; [1]Ctr. for Optical Materials and Technologies, Belarusian National Technical Univ., Minsk, Belarus;[2]Inst. of Inorganic Chemistry, Siberian Branch of Russian Acad. of Sciences, Novosibirsk, Russian Federation.* Thermooptic coefficients were measured in pure and Yb(20at.%)-doped monoclinic $KY(WO_4)_2$ crystal by a beam deviation method in the visible and near-IR. Athermal propagation directions were calculated in $KY(WO_4)_2$ at the wavelength of 1.06 μm.

AMB22

Fabrication of composite Yb:YAG lasers by use of the room-temperature-bonding technique, *Konosuke Takayanagi[1], Kenjiro Hara[1], Takuya Ishikawa[1], Ken Imura[1], Ichiro Shoji[1]; [1]Dept. of Electrical, Electronic, and Communication Enjineering, 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 Aminpour[2]; [1]Physics, Univ. of Guilan, Rasht, Islamic Republic of Iran; [2]physics, 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 Klenke[1], Sven Breitkopf[1], Marco Plötner[1], Jens Limpert[1,2], Andreas Tünnermann[1,2]; [1]Inst. of Applied Physics, Friedrich Schiller Univ. Jena, Jena, Germany; [2]Helmholtz 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 μJ pulse energy.

AMC2 • 11.45

Coherent combining of two femtosecond fiber chirped pulse amplifiers, *Louis Daniault[1], Marc Hanna[1], Laurent Lombard[2], Didier Goular[2], Pierre Bourdon[2], Frédéric Druon[1], Patrick Georges[1]; [1]Laboratoire Charles Fabry de l'Inst. d'Optique, Palaiseau, France;[2]ONERA, 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 Matsumoto[1], Tetsuya Kobayashi[1], Akira Shirakawa[1], Ken-ichi Ueda[1]; [1]Inst. 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 Goodno[1], Chun-Ching Shih[1], Joshua Rothenberg[1]; [1]Northrop 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 μJ Pulse Energies, *Marcel Schultze[1], Thomas Binhammer[2], Guido Palmer[1], Moritz Emons[1], Tino Lang[1], Uwe Morgner[1,3]; [1]Inst. of Quantum Optics, Leibniz Univ. Hannover, Hannover, Germany; [2]VENTEON Laser Technologies GmbH, Garbsen, Germany; [3]Ctr. 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 μJ 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)

AMD • Ultrafast Sources I

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 Brida[1], Cristian Manzoni[2,1], Dario Polli[1,2], Giulio Cerullo[1,2]; [1]Politecnico di Milano, Milano, Italy; [2]IFN-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 μJ Pulse Energies, *Marcel Schultze[1], Thomas Binhammer[2], Guido Palmer[1], Moritz Emons[1], Tino Lang[1], Uwe Morgner[1,3]; [1]Inst. of Quantum Optics, Leibniz Univ. Hannover, Hannover, Germany; [2]VENTEON Laser Technologies GmbH, Garbsen, Germany; [3]Ctr. 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 μJ 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 Thai[1], Olivier Chalus[1], Philip K. Bates[1], Jens Biegert[1,2]; [1]ICFO, Castelldefels (Barcelona), Spain; [2]ICREA-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 μJ 67 fs pulses at 3.1 μm.

AMD4 • 15.15

Continuum generation in laser host materials with pump pulse durations covering the entire femtosecond regime, *Maximilian Bradler[1], Eberhard Riedle[1]; [1]LS fuer BioMolekulare Optik, Munich, Germany.* We demonstrate supercontinuum generation in laser host materials with pulses from 7 fs to 1 ps. At most μJ 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 Carstens[1], Jan Rothhardt[1,2], Jens Limpert[1,2], Andreas Tünnermann[1,3]; [1]Inst. of Applied Physics, Jena, Germany; [2]Helmholtz Inst. Jena, Jena, Germany;[3]Fraunhofer 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 μJ (19 W), 5.7 GW pulses.

AMD6 • 15.45
Generation of ultrafast visible and mid-IR pulses via adiabatic frequency conversion, *Barry D. Bruner[1], Haim Suchowski[1], Ayelet Ganany-Padowicz[2], Irit Juwiler[3], Ady Arie[2], Yaron Silberberg[1]; [1]Dept. of Physics of Complex Systems, Weizmann Inst. of Science, Rehovot, Israel; [2]Dept. of Physical Electronics, Faculty of Engineering, Tel Aviv Univ., Tel Aviv, Israel; [3]Dept. 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. Newbury[1] 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 μm frequency comb from a subharmonic OP-GaAs OPO pumped by a femtosecond Cr:ZnSe laser, *Konstantin Vodopyanov[1], Evgeni Sorokin[2], Peter Schunemann[4], Irina Sorokina[3]; [1]Photonics Inst., TU Vienna, Vienna, Austria; [2]Physics Dept., NTNU, Trondheim, Norway; [3]BAE Systems, Nashua, NH, USA; [4]Stanford Univ., Stanford, CA, USA.* More than 1000-nm-wide frequency comb centered at 4.9 μm 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 μm.

AME3 • 17.15
Development and characterization of all-normal dispersion fiber laser for frequency comb generation, *Cagri Senel[1], F Oemer Ilday[1], Oguzhan Kara[2], Ramiz Hamid[3], Cihangir Erdogan[3]; [1]Physics, Bilkent Univ., Ankara, Turkey; [2]Physics Engineering, Hacettepe Univ., Ankara, Turkey;[3]National 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. Yost[1], Arman Cingoz[1], Thomas K. Allison[1], Jun Ye[1], Axel Ruehl[2], Ingmar Hartl[2], Martin E. Fermann[2]; [1]JILA- Univ. of Colorado Boulder, Boulder, CO, USA; [2]IMRA 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 Li[1], Guoqing Chang[2], Li-Jin Chen[2], David F. Phillips[1], Franz Kärtner[2], Ronald L. Walsworth[1]; [1]Harvard-Smithsonian Ctr. for Astrophysics, Cambridge, MA, USA; [2]MIT, 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 Cr^{2+} and Fe^{2+} doped II-VI Materials and Lasers, *Sergey Mirov[1]; [1]Dept. of Physics, Univ. of Alabama at Birmingham, Birmingham, USA.* Recent advances in Cr^{2+} and Fe^{2+} 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 Cr^{2+}:CdS laser, *Evgeni Sorokin[1], Dmitry Klimentov[2], Irina Sorokina[2], Vladimir Kozlovskii[3], Yu Korostelin[3], A. Landman[3], Yuri Podmar'kov[3], Yan Skasyrskii[3], Mikhail Frolov[3]; [1]TU Vienna, Vienna, Austria; [2]Physics Dept., NTNU, Trondheim, Norway; [3]P.N. Lebedev Physical Inst., Moscow, Russian Federation.* We report spectroscopic and laser study of Cr^{2+}: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 Lagatsky[1], Dolores Serrano[2], Concepción Cascales[2], Carlos Zaldo[2], Tom Brown[1], Wilson Sibbett[1]; [1]Physics and Astronomy, Univ. of St Andrews, St Andrews, UK;[2]Inst.o de Ciencia de Materiales de Madrid, Madrid, Spain.* Femtosecond modelocking in Tm,Ho-codoped $NaY(WO_4)_2$ and $KY(WO_4)_2$ 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. Strauss[1], D. Preussler[1], O. J. Collett[1], M. J. Esser[1], C. Jacobs[1], C. Bollig[1], W. Koen[1], K. Nyangaza[1]; [1]National 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 $Tm:Sc_2O_3$ at 2116 nm and Beyond, *Philipp Koopmann[1,2], Samir Lamrini[2], Karsten Scholle[2], Peter Fuhrberg[2], Klaus Petermann[1], Günter Huber[1]; [1]Inst. of Laser-Physics, Hamburg, Germany; [2]LISA laser products, Katlenburg-Lindau, Germany.* We report on the high power laser operation of $Tm:Sc_2O_3$ 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 Winters[1], Philip Schlup[1], Randy Bartels[1]; [1]Colorado 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]; [1]Univ. of Bristol, Bristol, UK; [2]Ctr. for Nanoscience and Quantum Information, Bristol, UK.* A Ytterbium-fiber-pumped continuous wave optical parametric oscillator rapidly tunable in the 2.73-4.02µm 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 Zuegel[1], Milton J. Shoup[1], John H. Kelly[1], Curt Frederickson[2]; [1]Univ. of Rochester/Lab for Laser Energetics, Rochester, NY, USA; [2]Continuum, 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 Lantum Zirconate Titanate Ceramics, *Atsushi Sugita[1], Yasumasa Kawata[1], Naoki Wakiya[1], Hisao Suzuki[1]; [1]Shizuoka Univ., Hamamatsu, Japan.* Here we will report that nonlinear refractivity and its temporal response of Lead Lantanum Zirconate Titanate ceramics were almost comparable to those of

$SrTiO_3$ 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 Kozawa[1], Shunichi Sato[1]; [1]Inst. 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 $Ho:BaYLuF_8$ crystal, *Yingxin Bai[1], Jirong Yu[2], Brian Walsh[2], Songsheng Chen[2], Mulugeta Petros[3], Norman Barnes[2], Upendra Singh[2], Arlete Cassanho[4], Hans Jessen[4]; [1]Science and Systems Applications, Incorperation, Hampton, VA, USA; [2]NASA Langley Res. Ctr., Hampton, VA, USA; [3]STC, Hampton, VA, USA; [4]AC material, Tarpon Springs, FL, USA.* A novel 2µm laser crystal, $Ho:BaYLuF_8$, has been grown. Spectra for the transition between $^5I_7$ and $^5I_8$ 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]; [1]Laser Development Dept., Laser Zentrum Hannover e.V., Hannover, Germany; [2]Ctr. 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 Balembois[1], Julien Didierjean[2], Patrick Georges[1]; [1]Laboratoire Chalres Fabry de l'Inst. d'Optique, Palaiseau cedex, France; [2]Fibercryst, 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 Kanzelmeyer[1], Katharina Hausmann[1,2], Thomas Theeg[1], Jörg Neumann[1,2], Dietmar Kracht[1,2]; [1]Laser Zentrum Hannover e.V., Hannover, Germany; [2]Quantum 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 Taira[2], Gerard Aka[1]; [1]LCMCP, ENSCP, Paris, France; [2]Laser 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 Laroche[1], Celia Bartolacci[1], Gilles Hervé[1], Girard Sylvain[1], Thierry Robin[2], Benoit Cadier[2]; [1]CIMAP, Caen, France; [2]IXFIBER, 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 Pr^{3+} doped fluoride crystals, *Patrice Camy[1]; [1]CIMAP, Caen, France.* We report CW visible laser operation of Pr^{3+} doped $LiLuY_4$, $LiYF_4$ and KY_3F_{10} 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 Hideur[1], Caroline Lecaplain[1], Lovamamy Rasoloniaina[1], Olga Egorova[2], Evgeni Dianov[2], Sergei Semjonov[2], Jérémy Michaud[1]; [1]CNRS UMR 6614 CORIA, Saint etienne du Rouvray, France;[2]Fiber 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 Sangla[2], Julien Saby[1], Francois Salin[1], Eric Freysz[2]; [1]Eolite Systems, Pessac, France; [2]Univ. 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 $Yb:CaF_2$ disk laser, *Markus Loeser[1], Mathias Siebold[1], Franziska Kroll[1], Fabian Roeser[1], Joerg Koerner[2], Joachim Hein[2], Ulrich Schramm[1]; [1]Res. Ctr. Dresden-Rossendorf,* *Dresden, Germany; [2]Inst. of Optics and Quantum Electronics, Jena, Germany.* We present gain measurements and a time-resolved thermal lens analysis of a diode-pumped Yb:CaF_2 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:Lu_2O_3 thin disk laser, *Martin Schellhorn[1], Philipp Koopmann[2,3], Karsten Scholle[2], Peter Fuhrberg[2], Klaus Petermann[3], Günter Huber[3]; [1]ISL, French German Res. Inst., Saint-Louis, France; [2]LISA laser products, Katlenburg-Lindau, Germany; [3]ILP, Univ. of Hamburg, Hamburg, Germany.* We report the first diode-pumped Tm:Lu_2O_3 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 Farsund[1], Gunnar Arisholm[1], Gunnar Rustad[1]; [1]FFI (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 Konoplev[1], Aleksey A. Vasilyev[1], Antonios A. Seas[2], Anthony W. Yu[2], Steven X. Li[2], George B. Shaw[2], Mark A. Stephen[2], Michael A. Krainak[2]; [1]Sigma Space Corporation, Lanham, MD, USA;[2]NASA 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

Tm^{3+}-doped CW fiber laser based on a highly GeO_2-doped dispersion shifted fiber, *Vladislav Dvoyrin[1], Irina Sorokina[1], Vladimir Kalashnikov[2], Valery Mashinsky[3], L. Ischakova[3], Evgeni Dianov[3], V. F. Khopin[4], A. N. Guryanov[4]; [1]Norwegian Univ. of Science & Technology, Trondheim, Norway; [2]Inst. für Photonik, TU Wien, Vienna, Austria; [3]Fiber Optics Res. Ctr., Russian Acad. of Sciences, Moscow, Russian Federation; [4]Inst. of Chemistry of High-Purity Substances, Russian Acad. of Sciences, Nizhny Novgorod, Russian Federation.* All-fiber Tm-laser with 55GeO_2-45SiO_2 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 Jelinkova[1], Maxim Doroschenko[2], Michal Jelinek[1], Jan Šulc[1], Tasoltan Basiev[2], Valerii V. Badikov[3], Dmitrii V. Badikov[3]; [1]Faculty of Nuclear Sciences and Physical Engineering, Czech Technical Univ. in Prague, Prague 1, Czech Republic; [2]General Physics Inst., Moscow, Russian Federation; [3]Kuban State Univ., Krasnodar, Russian Federation.* The characteristics of room temperature Dy^{3+}:$PbGa_2S_4$ 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 Walbaum[1], Tim Hellwig[1], Martin Schäferling[1], Carsten Fallnich[1]; [1]Inst. 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 Hellwig[1], Till Walbaum[1], Petra Gross[1], Carsten Fallnich[1]; [1]Inst. 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:$CaGdAlO_4$ thin disk laser, *Sandrine Ricaud[1,4], Bruno Viana[2], Philippe Goldner[2], Marwan Abdhou-Ahmed[3], Birgit Weichelt[3], Eric Mottay[4], Patrick Georges[1], Frédéric Druon[1]; [1]Laboratoire Charles Fabry de l'Inst. d'Optique, Palaiseau, France; [2]Laboratoire de Chimie Appliquée de l'Ecole nationale Supérieure de Chimie de Paris, Paris, France; [3]Inst. fur Strahlwerkzeuge, Stuttgart, Germany; [4]Amplitude Systemes, Pessac, France.* We report a continuous-wave Yb :$CaGdAlO_4$ 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 Nd^{3+}:$YLiF_4$ laser at 1053 nm with high efficiency and diffraction limited beam quality, *Niklaus Wetter[1], Marco A. Ferrari[1], Eduardo C. Sousa[1], Izilda M. Ranieri[1], Sonia L. Baldochi[1]; [1]CLA-IPEN/SP_CNEN, São Paulo, Brazil.* In this work we present passively Q-switched operation of a Nd^{3+}:$YLiF_4$ 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 10^{10} in femtosecond Ti:sapphire amplifier with a non-collinear optical parametric amplifier, *Cheng Liu[1], Zhaohua Wang[1], Weichang Liu[1], Qing Zhang[1], Zhiyi Wei[1]; [1]Lab of Optical Physics, Inst. of Physics, Beijing, China.* We demonstrated a new scheme to promise high contrast ratio in femtosecond Ti:sapphire amplifer. 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]; [1]National Metrology Inst. (UME), Gebze-Kocaeli, Turkey; [2]National Metrology Inst. (UME), Gebze, Turkey; [3]National Metrology Inst. (UME), Gebze, Turkey.* 200-1000 mm lengths measured with 50-200 nm uncertainty using developed Köster's interferometer and three frequency stabilized lasers. Absolute frequency of used stabilized He-Ne/I_2, Nd:YAG/I_2, ECDL/Cs are measured using Ti:Sa fs Comb.

ATuB25

Fiber amplification of pulse bursts at low repetition rates via synchronous pulsed pumping, *Hamit Kalaycioglu[1], F Oemer Ilday[1], Koray Eken[2], Seydi Yavas[1]; [1]Bilkent Univ., Ankara, Turkey; [2]Fiberlast 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-Herrera[1], Alejandro Martinez-Rios[2], Oracio Barbosa-Garcia[2]; [1]Universidad Politecnica de Valencia, Valencia, Spain; [2]Centro 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 Ma[1], Jun Dong[1]; [1]Dept. 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:Nd^{3+} laser systems with gain-grating phase conjugation and interchannel phase locking control by a passive LiF:F_2- Q-switch, *Tasoltan T. Basiev[1], Alexander V. Fedin[2], Andrey V. Gavrilov[2], Sergey N. Smetanin[2], Anatoly S. Boreysho[3], Vyacheslav F. Lebedev[3]; [1]Laser Materials and Technology Res. Ctr., A.M. Prokhorov General Physics Inst., Moscow, Russian Federation; [2]Laser Physics, Kovrov State Technological Acad., Kovrov, Russian Federation; [3]Laser 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:F_2- Q-switch, but it results in phase-locked oscillation of all the laser system.

ATuB29

Pr:$YAlO_3$ microchip laser at 662 nm, *Martin Fibrich[1], Helena Jelínková[1], Jan Šulc[1], Karel Nejezchleb[2], Václav Škoda[2]; [1]Czech Technical Univ. in Prague, FNSPE, Prague, Czech Republic; [2]Crytur Ltd., Turnov, Czech Republic.* A continuous-wave Pr:$YAlO_3$ microchip laser operation at 662 nm is reported. Microchip resonator was formed by dielectric mirrors directly coated on the Pr:$YAlO_3$ 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 Südmeyer[1], Cyrill Roman Emmanuel Baer[1], Christian Kränkel[1,2], Clara J. Saraceno[1], Oliver H. Heckl[1], Matthias Golling[1], Rigo Peters[2], Klaus Petermann[2], Günter Huber[2], Ursula Keller[1]; [1]Dept. of Physics, ETH Zurich, Zurich, Switzerland; [2]Inst. 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 Schättiger[1], Jochen Kleinbauer[2], Dirk H. Sutter[2], Alexander Killi[2], Thomas Dekorsy[1]; [1]Dept. of Physics and Ctr. of Applied Photonics, Univ. of Konstanz, Konstanz, Germany; [2]TRUMPF-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 Kalashnikov[1], Alexander Apolonski[2]; [1]Inst. fuer Photonik, TU Wien, Vienna, Austria; [2]Dept. 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 Baumgartl[1], Florian Jansen[1], Fabian Stutzki[1], Cesar Jauregui[1], Jens Limpert[1], Andreas Tünnermann[1,2]; [1]Friedrich-Schiller-Univ., Jena, Germany; [2]Fraunhofer 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 Chen[1], Tom Sosnowski[2], Chi-Hung Liu[3], Li-Jin Chen[1], Jonathan Birge[1], Almantas Galvanauskas[3], Franz Kärtner[1], Guoqing Chang[1]; [1]Dept. of Electrical Engineering and Computer Science and Res. Lab of Electronics, MIT, Cambridge, MA, USA; [2]Arbor Photonics, Inc., Ann Arbor, MI, USA; [3]Dept. 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 Jauregui[1], Tino Eidam[1], Jens Limpert[1], Andreas Tünnermann[1,2]; [1]Friedrich-Schiller Univ., Jena, Jena, Germany; [2]IOF, 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 Zhang[1], Viktor Fromzel[1], Mark Dubinskii[1]; [1]US 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 Stutzki[1], Florian Jansen[1], Steffen Hädrich[1,2], Henning Carstens[1], Jens Limpert[1,2], Andreas Tünnermann[1,2]; [1]Inst. of Applied Physics, Friedrich-Schiller-Univ. Jena, Jena, Germany; [2]Helmholtz-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 Sims[1], Pankaj Kadwani[1], Lawrence Shah[1], Martin Richardson[1]; [1]CREOL/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 Steinmetz[1], Dirk Nodop[1], Tino Eidam[1], Jens Limpert[1], Andreas Tünnermann[1,2]; [1]Friedrich-Schiller-Univ. Jena, Inst. of Applied Physics, Jena, Germany; [2]Fraunhofer 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 Yb^{3+}-doped double tungstate channel waveguide lasers, *Dimitri Geskus[1], Shanmugam Aravazhi[1], Kerstin Wörhoff[1], Markus Pollnau[1]; [1]IOMS, Univ. of Twente, Enschede, Netherlands.* KGd1-xLux$(WO_4)_2$:Yb^{3+} 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 Al_2O_3:Yb^{3+} on Silicon, *Edward H. Bernhardi[1], Kerstin Wörhoff[1], René M. de Ridder[1], Markus Pollnau[1]; [1]Integrated 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 Taira[1]; [1]Laser 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 Koerner[1], Joachim Hein[1], Martin Kahle[1], Hartmut Liebetrau[1], Malte Kaluza[1], Mathias Siebold[2]; [1]Intititute of Optics and Quantum Electronics, Jena, Germany; [2]Forschungszentrum 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:CaF_2 laser at cryogenic temperature, *Frédéric Druon[1], Sandrine Ricaud[1,4], Dimitris N. Papadopoulos[2], Patrick Georges[1], Patrice Camy[3], Jean-Louis Doualan[3], Richard Moncorgé[3], Antoine Courjaud[4], Eric Mottay[4]; [1]Laboratoire Charles Fabry de l'Inst. d'Optique, Palaiseau, France; [2]Inst. de la Lumière Extrême, Palaiseau, France; [3]Ctr. de recherche sur les Ions, les Matériaux et la Photonique, Caen, France;[4]Amplitude Systèmes, Pessac, France.* A high-power diode-pumped Yb:CaF_2 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 Chanteloup[1], Daniel Albach[1], Antonio Lucianetti[1], Thierry Novo[1], Bernard Vincent[1]; [1]CNRS, 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 Er^{3+}:YVO4 Laser at 1593.5 nm, *Nikolay Ter-Gabrielyan[1], Viktor Fromzel[1], Tadeusz Lukasiewicz[3], Witold Ryba-Romanowski[2], Mark Dubinskii[1]; [1]US Army Res. Lab, Adelphi, MD, USA; [2]Inst. of Low Temperature and Structure Res., Wroclaw, Poland; [3]Inst. of Electronic Materials Technology and Structure Res., Warsaw, Poland.* Laser operation of a resonantly-pumped Er^{3+}:YVO_4 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

Bosphorus, P Floor

8.00–8.15
FILAS Opening Remarks

JWA • Joint ASSP/FILAS Session

8.15–10.00
Farzin Amzajerdian; NASA Langley Res. Ctr., USA, Presider

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.

JWA2 • 8.45
Mode-Locked Yb-Fiber Laser for Rapid Dual Pulse Scanning Applications, *Albert Romann[1], Christian Mohr[1], Axel Ruehl[2], Ingmar Hartl[1], Martin E. Fermann[1]; [1]IMRA America, Inc., Ann Arbor, MI, USA; [2]Inst. 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.

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 Demmler[1], Christoph Jocher[1], Jens Limpert[1,2], Andreas Tünnermann[1,3]; [1]Friedrich-Schiller-Univ. Jena,*

Anadolu, P Floor

8.00–8.15
AIOM Opening Remarks

AIWA • Transparent Ceramics and Laser Crystals I

8.15–10.00
Peter Moulton; Q-Peak, Inc., USA, Presider

AIWA1 • 8.15 **Invited**
Fabrication of Transparent Ceramics Using Spark Plasma Sintering, *Byungnam Kim[1]; [1]National Inst. for Materials Science, Tsukuba, Japan.* Transparent Al_2O_3, $MgAl_2O_4$ and ZrO_2 ceramics with fine microstructures were fabricated by controlling the heating rate and pressure during spark plasma sintering. The scattering theory for Al_2O_3 ceramics was evaluated with the measured properties.

AIWA2 • 8.45
Development of Submicrometer-Grained Highly Transparent Sesquioxide Ceramics, *John Ballato[1], Karn Serivalsatit[1]; [1]Materials 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.

AIWA3 • 9.00
Fabrication of Rare-Earth Patterned Laser Ceramics by use of Gradient Magnetic Field, *Jun Akiyama[1], Takunori Taira[1]; [1]IMS, Okazaki, Japan.* New micro-domain orientation controlling and patterning process for

Citronelle, N Floor

8.00–8.15
HILAS Opening Remarks

HWA • High-Intensity Fiber and Hollow Waveguide Sources

8.15–10.00
Mauro Nisoli; Politecnico di Milano, Italy Italy.

HWA1 • 8.15 **Invited**
Technologies for Integrated High Power Ultrashort-Pulse Fiber Lasers, *Almantas Galvanauskas; Univ. of Michigan, USA.* Abstract not available.

HWA2 • 8.45
Fiber Laser Based High Harmonic Generation at High Repetition Rate and Average Power, *Manuel Krebs[1], Steffen Hädrich[1,2], Jens Limpert[1,2], Andreas Tünnermann[1,3]; [1]Inst. of Applied Physics, Friedrich-Schiller-Univ. Jena, Jena, Germany; [2]Helmholtz-Inst. Jena, Jena, Germany; [3]Fraunhofer 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 proof that this a promising source for processes requiring high photon flux such as photoemission spectroscopy.

HWA3 • 9.00
Highly efficient hollow fiber compression scheme for generating multi-mJ, carrier-envelope phase stable, sub-5fs pulses, *Xiaowei Chen[1]; [1]Laboratoire d'Optique Appliquee, Palaiseau Cedex, France.* We present a simple technique

Jena, Germany; [2]Helmholtz-Inst., Jena, Germany; [3]Fraunhofer 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/cm^2 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-Pirson[1]; [1]NP 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).

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. Vyatkin[1], Efim Khazanov[1]; [1]Inst. 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 Nehari[1], Kheirredine Lebbou[1], Alain Brenier[1], Gérard Panczer[1], Jean Godfroy[2], Serge Labor[2], Hervé Legal[2], Gilles Chériaux[3], Jean-Paul Chambaret[4], Richard Moncorgé[5]; [1]Univ. de Lyon 1, LPCML, Lyon, France; [2]RSA, Le Rubis SA, Jarrie-Grenoble, France; [3]Ecole Polytechnique, LOA-ENSTA, Palaiseau, France; [4]CNRS, ILE, Palaiseau, France; [5]Univ. 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 (Ti^{3+}-doped Al_2O_3) crystals have been grown by using the Kyropoulos technique. Very encouraging laser results are obtained.

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 Arnold[2], Bing Zhou[2], Shichua Chen[2], Arnaud Couairon[3], Andre Mysyrowicz[2]; [1]Dept. of Physics, Istanbul Technical Univ., Istanbul, Turkey; [2]Laboratoire d'Optique Appliquée, École Nationale Supérieure desTechniques Avancées, Palaiseau, France; [3]Ctr. 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:CaF$_2$ MOPA in Hollow-Core Fiber, *Daniil Kartashov[1], Giedrius Andriukaitis[1], Dusan Lorenc[1], Audrius Pugzlys[1], Andrius Baltuska[1], Linas Giniunas[2], Romualdas Danielius[2], Jens Limpert[3]; [1]Photonics Inst. Vienna Univ. of Technology, Vienna, Austria; [2]Light Conversion Ltd, Vilnius, Lithuania; [3]Inst. of Applied Physics, Friedrich Schiller Univ., Jena, Germany.* 200-fs 6mJ pulses from a cw-diode-pumped Yb:CaF$_2$ 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 Pierrot[1], Flavien Liegeois[2], Julien Saby[1], Benjamin Cocquelin[1], Yves Hernandez[2], Francois Salin[1], Domenico Giannone[2]; [1]Eolite Systems, Pessac, France; [2]Multitel, 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. Rico[1], X. Han[1], José María Cano-Torres[1], Dolores Serrano[1], C. Zaldo[1]; [1]Inst.o de Ciencia de Materiales de Madrid. CSIC., Madrid, Spain.* The Tm^{3+} laser efficiency of NaGd(MoO4)2 crystals (η=50.8%, Pout=641mW) grown in $Na_2MoO_4/Na_2Mo_2O_7$ 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 Ramirez[1], Dimitris N. Papadopoulos[1,2], Alain Pellegrina[1,2], Pascal Monot[3], Aurelien Ricci[4,5], Aurelie Jullien[4], Xiaowei Chen[2,4], Jean-Philippe Rousseau[4], Rodrigo Lopez-Martens[4], Patrick Georges[1], Frédéric Druon[1]; [1]Inst. d'Optique, Palaiseau, France; [2]Inst. de la Lumière Extrême, Palaiseau, France; [3]CEA, IRAMIS, Gif-sur-Yvette, France; [4]Laboratoire d'Optique Appliquée, Palaiseau, France; [5]Thales 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

AWA • ASSP Poster Session II

10.00–11.30

AWA01

Background suppression using a fiber stretcher for optimally chirped CARS microscopy, *Petra Gross[1], Lisa Kleinschmidt[1], Carsten Cleff[1], Carsten Fallnich[1]; [1]Inst. 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:Sc_2O_3 - A Comparison, *Larry Merkle[1], Nikolay Ter-Gabrielyan[1], Viktor Fromzel[1]; [1]Army Res. Lab, Adelphi, MD, USA.* At cryogenic temperatures, Er:Sc_2O_3 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 Demirbas[1], Gale S. Petrich[1], Duo Li[1], Jing Wang[1], Sheila Nabanja[1], Jonathan Birge[1], Peter Fendel[1], Alphan Sennaroglu[1], Leslie A. Kolodziejski[1], Franz Kärtner[1], James G. Fujimoto[1]; [1]Dept. 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 Didierjean[2], François Balembois[1], Patrick Georges[1]; [1]Laboratoire Chalres Fabry de l'Inst. d'Optique, Palaiseau cedex, France; [2]Fibercryst, Lyon, France.* We describe an efficient Q-switched laser emission from a directly grown Er^{3+}: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 Skorczakowski[1], Jacek Swiderski[1], Wieslaw Pichola[1], Jacek Kwiatkowski[1], Maria Maciejewska[1], Lukasz Galecki[1]; [1]Inst. 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 Furuse[1], Junji Kawanaka[2], Noriaki Miyanaga[2], Haik Chosrowjan[1], Masayuki Fujita[1], Shinya Ishii[3], Kazuo Imasaki[1], Kenji Takeshita[3], Yasukazu Izawa[1]; [1]Inst. for Laser Technology, Osaka, Japan; [2]Inst. of Laser Engineering, Osaka Univ., Osaka, Japan; [3]Mitsubishi 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 Shimohira[1], Yuichi Kozawa[1], Shunichi Sato[1]; [1]Inst. 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 Schellhorn[1]; [1]ISL, 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 Cha[1], Hee Joo Choi[1]; [1]Dept. 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 Hideur[1], Caroline Lecaplain[1], Bülend Ortaç[2], Guillaume Machinet[3], Johan Boullet[3], Eric Cormier[3], Martin Baumgartl[4], Thomas Schreiber[5]; [1]CNRS UMR 6614 CORIA, Saint etienne du Rouvray, France; [2]UNAM-Inst. of Materials Science and Nanotechnology, Ankara, Turkey; [3]Univ. de Bordeaux -CNRS-CEA CELIA, Bordeaux, France; [4]Inst. for Applied Physics, Jena, Germany; [5]Fraunhofer 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 Seah[1], Tze Yang Ng[1], Rui Fen Wu[1]; [1]DSO 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. Leger[1], Bradley Tiffany[1], Chenhao Wan[1]; [1]Electrical 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 $Li_3Lu_3Ba_2(MoO_4)_8$ single crystal, *M. Rico[1], X. Han[1], Concepción Cascales[1], C. Zaldo[1]; [1]Inst.o de Ciencia de Materiales de Madrid. CSIC., Madrid, Spain.* Tm-doped $Li_3Lu_3Ba_2(MoO_4)_8$ monoclinic crystals were grown by TSSG-method. Laser operation is shown at λ=1940 nm with 62% of slope efficiency. The disordered crystal structure confers potential applications for mode-locked sub-200 fs laser pulses.

AWA14

$Nd:LuVO_4$ Laser Passively Mode-Locked by $\chi(2)$ -Lens Formation in Periodically-Poled Stoichiometric Lithium Tantalate, *Hristo Iliev[1], Ivan Buchvarov[1], Sunao Kurimura[2], Huaijin Zhang[3], Jiyang Wang[3], Junhai Liu[4], Valentin Petrov[5]; [1]Physics, Sofia Univ., Sofia, Bulgaria; [2]Advanced Materials Lab, National Inst. for Materials Science, Tsukuba, Japan; [3]National Lab of Crystal Materials, Jinan, China; [4]College of Physics, Qingdao Univ., Qingdao, China; [5]Max-Born-Inst. for Nonlinear Optics and Ultrafast Spectroscopy,, Berlin, Germany.* Stable mode-locking of a $Nd:LuVO_4$ 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 Ozgoren[1], Bulent Oktem[1], F Oemer Ilday[2], Ece Pasin[3], Koray Eken[3]; [1]Material Science and Nanotechnology Graduate Program, Bilkent Univ., Ankara, Turkey; [2]Dept. of Physics, Bilkent Univ., Ankara, Turkey; [3]FiberLAST, Ltd, Ankara, Turkey.* We demonstrate micromachining with 1ns-long pulses from an all-fiber laser. Fiber lasers generating uncompressible long pulses have been ignored as undesired modes, however their robust, low-repetition-rate operation is well suited to micromachining.

AWA16

1.34-μm $Nd:YVO_4$ Laser Mode-Locking by Chi-2 Lensing in Periodically Poled Stoichiometric Lithium Tantalate, *Ivan Buchvarov[1], Sunao Kurimura[2], Valentin Petrov[3]; [1]Physics, Sofia Univ., Sofia, Bulgaria; [2]National Inst. for Materials Science, Tsukuba, Japan; [3]Max-Born-Inst. for Nonlinear Optics and Ultrafast Spectroscopy, Berlin, Germany.* Self-starting Chi-2 lens mode-locking of a 1.34-μm $Nd:YVO_4$ 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 Vasilyev[1], Alexander Nevsky[1], Ingo Ernsting[1], Michael Hansen[1], Jianwei Shen[1], Stephan Schiller[1]; [1]Inst. 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 Agnesi[1], Alessandro Greborio[1], Federico Pirzio[1], Giancarlo Reali[1], Elena Ugolotti[1], Sun Young Choi[2], Fabian Rotermund[2], Uwe Griebner[3], Valentin Petrov[3]; [1]Electronics Dept., Univ. of Pavia, Pavia, Italy; [2]Division of Energy Systems Res., Ajou Univ., Suwon, Republic of Korea; [3]Max-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 Aleknavičius[1], Rokas Smilingis[1], Mikhail Grishin[1], Andrejus Michailovas[1], Kirilas Michailovas[1], Jurgis Plipavičius[2], Valdas Girdauskas[3]; [1]Inst. of physics, Ctr. for Physical Sciences and Technology, Vilnius, Lithuania; [2]Faculty of Chemistry, Vilnius Univ., Vilnius, Lithuania; [3]Faculty 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 Walbaum[1], Petra Gross[1], Carsten Fallnich[1]; [1]Inst. 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:PbGa$_2$S$_4$ laser excited by diode pumped Nd:YAG, *Jan Šulc[1], Helena Jelinkova[1], Maxim E. Doroshenko[2], Tasoltan T. Basiev[2], Vyacheslav V. Osiko[2], Valerii V. Badikov[3], Dmitrii V. Badikov[3]; [1]Faculty of Nuclear Sciences and Physical Engineering, Czech Technical Univ. in Prague, Prague 1, Czech Republic; [2]Laser Materials and Technology Res. Ctr., General Physics Inst., Moscow, Russian Federation; [3]Kuban State Univ., Krasnodar, Russian Federation.* The room temperature operating Dy:PbGa$_2$S$_4$ 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 Gaponenko[1], Victor Kisel[1], Alexander Malyarevich[1], Konstantin Yumashev[1], Nikolai Kuleshov[1], Alexei Onushchenko[2]; [1]Ctr. for Optical Materials and Technologies, Belarusian National Technical Univ., Minsk, Belarus; [2]Res. 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 PbGa$_2$S$_4$:Dy^{3+} crystal, *Maxim E. Doroshenko[1], Tasoltan T. Basiev[1], Vyacheslav V. Osiko[1], Valerii V. Badikov[2], Dmitrii V. Badikov[2]; [1]General Physics Inst. RAS, Moscow, Russian Federation; [2]Kuban State Univ., Krasnodar, Russian Federation.* Direct diode pumped mid-IR oscillations of PbGa$_2$S$_4$:Dy^{3+} 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 Renz[1], Peter Mahnke[1], Jochen Speiser[1], Adolf Giesen[1]; [1]Inst. of Technical Physics, German Aerosopace 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 Rustad[1], Oystein Farsund[1], Gunnar Arisholm[1]; [1]FFI (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 Cousin[1], Nicolas Forget[2], Philip K. Bates[1], Jens Biegert[1], Alexander Gruen[1]; [1]ICFO - the Inst. of Photonic Sciences, Castelldefels (Barcelona), Spain; [2]FASTLITE, 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 Mennerat[1]; [1]Direction 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 Dergachev[1]; [1]Q-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 Machinet[1], Jerome Lhermite[1], Caroline Lecaplain[2], Johan Boullet[1,3], Ammar Hideur[2], Nicholas Traynor[3,4], Eric Cormier[1]; [1]Celia, Talence, France; [2]Coria, Rouen, France; [3]Alphanov, Talence, France; [4]Azur 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 $Rb:KTiOPO_4$ for High Power Optical Frequency Conversion, *Andrius Zukauskas[1], Nicky Thilmann[1], Valdas Pasiskevicius[1], Fredrik Laurell[1], Carlota Canalias[1]; [1]Laser 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 Huber[1], Kolja Beil[1], Thomas Calmano[1], Susanne T. Fredrich-Thornton[1], Uwe Kelling[1], Christian Kränkel[1], Henning Kühn[1], Jörg Siebenmorgen[1], Ulrike Wolters[1], Klaus Petermann[1]; [1]Inst. 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 Amzajerdian; 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 Mohr[1], Albert Romann[1], Axel Ruehl[2], Ingmar Hartl[1], Martin E. Fermann[1]; [1]IMRA America, Inc., Ann Arbor, MI, USA; [2]Inst. 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 Leitenstorfer[1]; [1]Fachbereich 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 DiMauro[1]; Ohio State Univ., USA.* Abstract not available.

HWB2 • 12.00
Attosecond Depletion of Resonant Auger Decay in Krypton, *Aart J. Verhoef[1], Alexander V. Mitrofanov[1], Maria Krikunova[2], Nikolay Kabachnik[2], Armin Scrinzi[3], Markus Drescher[2], Andrius Baltuska[1]; [1]Inst. für Photonik, TU Wien, Wien, Austria; [2]Inst. für Experimentalphysik, Univ. Hamburg, Hamburg, Germany; [3]Computational & 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 Druon[1], Sandrine Ricaud[1,4], Dimitris N. Papadopoulos[1,2], Alain Pellegrina[1,2], Marc Hanna[1], Patrice Camy[3], Jean-Louis Doualan[3], Richard Moncorgé[3], Antoine Courjaud[4], Patrick Georges[1]; [1]LCF IO, Palaiseau, France; [2]ILE, Palaiseau, France; [3]CIMAP, Caen, France; [4]Amplitude 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.

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 ◎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.

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 Hanne[3], Alexei Grum-Grzhimailo[4,5], Brant Abeln[4], Klaus Bartschat[4], Daniel Weflen[4], Igor Ivanov[6], Anatoli Kheifets[6], Harry Quiney[7], Igor Litvinyuk[1,2], Robert Sang[1,2], Dave Kielpinski[1,2]; [1]ARC Ctr. of Excellence for Coherent X-Ray Science, Griffith Univ., Nathan, QLD, Australia; [2]Australian Attosecond Science Facility and Ctr. for Quantum Dynamics, Griffith Univ., Nathan, QLD, Australia; [3]Atomic and Electronics Physics Group, Westfälische Wilhelms-Univ., Münster, Germany;[4]Dept. of Physics and Astronomy, Drake Univ., Des Moines, IA, USA; [5]Inst. of Nuclear Physics, Moscow State Univ., Moscow, Russian Federation; [6]Res. School of Physical Sciences, The Australian National Univ., Canberra, ACT, Australia; [7]ARC 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.

HWB4 • 12.30

Nearly bandwidth-limited attosecond pulses via periodic resonance interaction with hydrogen-like atoms, *Vladimir A. Polovinkin[1], Yevgeny V. Radeonychev[1], Olga A. Kocharovskaya[2,1]; [1]Inst. of Applied Physics of the Russian Acad. of Science, Nizhny Novgorod, Russian Federation;[2]Dept. 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.

Bosphorus, P Floor	Anadolu, P Floor	Marmara, P Floor

JWB4 • 12.45

Phase-Matching Properties of BaGa4S7 and $BaGa_4Se_7$: Wide-Bandgap Nonlinear Crystals for the Mid-Infrared, *Valerii V. Badikov[2], Dmitrii V. Badikov[2], Galina Shevyrdyaeva[2], Aleksey Tyazhev[1], Georgi Marchev[1], Vladimir Panyutin[1], Valentin Petrov[1], Albert Kwasniewski[3]; [1]A3, Max-Born-Inst., Berlin, Germany; [2]High Technologies Lab, Kuban State Univ., Krasnodar, Russian Federation; [3]Inst. for Crystal Growth, Berlin, Germany.* Biaxial $BaGa_4S_7$ and $BaGa_4Se_7$ 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 Tzallas[1], Emmanouel Skantzakis[1,2], George Tsakiris[3]; [1]IESL, FORTH, Heraklion, Greece; [2]Physics Dept, Univ. of Crete, Heraklion, Greece;[3]MPQ, 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.

Bosphorus, P Floor	Anadolu, P Floor	Marmara, P Floor

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 Homann[1], Raphael Tautz[2,3], Ferenc Krausz[2,4], Eberhard Riedle[1], Laszlo Veisz[2]; [1]LS für BioMolekulare Optik, Ludwig-Maximilians-Univ. München, München, Germany; [2]Max-Planck-Inst. für Quantenoptik, Garching, Germany; [3]LS für Photonik und Optoelektronik, Ludwig-Maximilians-Univ. München, München, Germany; [4]LS 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 Bromage[1], Christophe Dorrer[1], Jonathan Zuegel[1]; [1]Lab 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. Mattsson[1]; [1]DTU 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 Jiang[1]; [1]AdValue 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 ~6dB/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 Coq[1], Wei Zhang[1], Zhenyu Xu[2], Jacques Millo[2], Rodolphe Boudot[2], Michel Lours[1], Pierre-Yves Bourgeois[2], Andre Luiten[3], Yann Kersalé[2], Giorgio Santarelli[1]; [1]LNE-SYRTE - Observatoire de Paris, CNRS, UPMC, Paris, France; [2]FEMTO-ST Inst., CNRS, ENSMM, Besancon, France; [3]Univ. 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 Smirnov[1], Leonid Glebov[2], Derrek Drachenberg[2], Apurva Jain[2], Ivan Divliansky[2], George Venus[2], Christina Spiegelberg[1]; [1]OptiGrate, Orlando, FL, USA; [2]CREOL/ 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.

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

JWC4 • 15.30

Scalable High-Energy Sub-Cycle Waveform Synthesis for High-Field Physics, *Shu-Wei Huang[1], Giovanni Cirmi[1], Kyung-Han Hong[1], Jeffrey Moses[1], Jonathan Birge[1], Siddharth Bhardwaj[1], Vasileios-Marios Gkortsas[1], Andrew Benedick[1], Li-Jin Chen[1], Enbang Li[2], Benjamin Eggleton[2], Giulio Cerullo[3], Franz Kärtner[1]; [1]RLE, MIT, Cambridge, MA, USA; [2]CUDOS ARC, Univ. of Sydney, Sydney, NSW, Australia; [3]Dipartimento di Fisica, Politecnico di Milano, Milano, Italy.* We demonstrate coherent pulse synthesis from two few-cycle phase-stable OPCPAs, 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, *Giedrius Andriukaitis[1], Tadas Balciunas[1], Alexey Andrianov[1,2], Oliver D. Mücke[1], Igor Diomin[1], Linas Giniunas[3], Romas Danielius[3], Andrius Baltuska[1], Audrius Pugzlys[1]; [1]Inst. of photonics, Vienna Univ. of Technology, Vienna, Austria; [2]Inst. of Applied Physics, Russian Acad. of Sciences, Nizhny*

AIWB3 • 15.15

~2 μm laser output in short length highly Tm^{3+}-doped tungsten tellurite glass double cladding fiber, *Kefeng Li[1,2], Lili Hu[1], Guang Zhang[1,2], Danping Chen[1]; [1]Shanghai Inst. of Optics and Fine Mechanics, Chinese Acad. of Sciences, Shanghai, China; [2]Graduate School of Chinese Acad. of Sciences, Beijing, China.* Highly Tm^{3+}-doped tungsten tellurite glass double cladding fibers were prepared by using rod-in-tube method. A 306 mW laser output at ~2 μm was demonstrated from a 8.9 cm length of this fiber.

AIWB4 • 15.30

Crystalline Semiconductor Core Optical Fibers, *John Ballato[1], Thomas Hawkins[1], Paul Foy[1], Colin McMillen[1], Roger Stolen[1], Robert Rice[2]; [1]Materials Science and Engineering, Clemson Univ., Anderson, SC, USA; [2]Northrop 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 um and suggest that such semiconductor optical fibers could be of practical value for nonlinear and infrared applications.

AIWB5 • 15.45

Spectroscopic investigation of Tm^{3+}:TeO_2-K_2O-Nb_2O_5 glasses at different doping levels for 2 μm laser applications, *Adil T. Gorgulu[1], Huseyin Cankaya[1], Adnan Kurt[2], Adolfo Speghini[3], Marco Bettinelli[3], Alphan Sennaroglu[1]; [1]Koc Univ., Istanbul, Turkey; [2]Teknofil, Inc., Istanbul, Turkey; [3]Univ. of Verona and INSTM, Verona, Italy.* Spectroscopic measurements performed

FWB3 • 15.15

Atmospheric Propagation Testing Using Broadband Thulium Fiber Systems, *Pankaj Kadwani[1], Robert Sims[1], Jeffery Chia[2], Faleh Altat[3], Lawrence Shah[1], Martin Richardson[1]; [1]Townes Laser Inst., CREOL College of Optics and Photonics, The Univ. of Central Florida, Orlando, FL, USA; [2]College of Optical Sciences, The Univ. of Arizona, Tuscan, AZ, USA; [3]Masdar 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 **Invited**

High Power Fiber Laser Frequency Combs for XUV Spectroscopy, *Axel Ruehl[1], Martin E. Fermann[1], Ingmar Hartl[1], A. Cingöz[2], Dylan C. Yost[2], Jun Ye[2]; [1]IMRA America Inc, Ann Arbor , MI, USA, [2]Department 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.

Bosphorus, P Floor	Anadolu, P Floor	Marmara, P Floor

Novgorod, Russian Federation; [3]Light 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 Tm^{3+}:TeO_2-K_2O-Nb_2O_5 glass at different concentrations show a high emission cross section (6.22×10-21cm^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

Anadolu, P Floor	Bosphorus, P Floor	Marmara, P Floor

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 Boulanger[1]; [1]Univ. 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 $Yb^{3+}:YCa_4O(BO_3)_3$ Laser Generating 35 fs Pulses, *Uwe Griebner[1], Akira Yoshida[2,1], Andreas Schmidt[1], Valentin Petrov[1], Huaijin Zhang[3], Jiyang Wang[3], Junhai Liu[4], Christian Fiebig[5], Katrin Paschke[5], Götz Erbert[5]; [1]Max Born Inst., Berlin, Germany;[2]Inst. of Laser Engineering, Osaka Univ., Osaka, Japan; [3]Shadong Univ., Jinan, China; [4]Quingdao Univ., Quingdao, China; [5]Ferdinand-Braun-Inst., Berlin, Germany.* A mode-locked $Yb:Ca_4YO(BO_3)_3$ 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 Griebner[1], Peter Klopp[1], Martin Zorn[2], Markus Weyers[2]; [1]Max Born Inst., Berlin, Germany; [2]Ferdinand-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 Palmer[1], Moritz Emons[1], Marcel Schultze[1], Uwe Morgner[1,2]; [1]Leibniz Univ. Hannover, Inst. für Quantenoptik, Hannover, Germany; [2]Laser 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 Amzajerdian[1], Larry Petway[1], Bruce Barnes[1], Glenn Hines[1], Diego Pierrottet[2], George Lockard[2]; [1]NASA, Hampton, VA, USA; [2]Coherent 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 1.27μm, *James A. Nagel[1], Valery Temyanko[1], Jeremy Dobler[2], Evgeni Dianov[3], Alexej Sysoliatin[3], Alexander Biriukov[3], Robert Norwood[1], Nasser Peyghambarian[1]; [1]College of Optical Sciences, Univ. of Arizona, Tucson, AZ, USA; [2]ITT Geospatial Systems, Fort Wayne, IN, USA; [3]Fiber Optic Res. Ctr., Russian Acad. of Sciences, Moscow, Russian Federation.* We report rate.

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

AWB4 • 17.15

Octave Spanning Ultra-Broadband Carbon Nanotube Saturable Absorber for Bulk Solid-State Lasers, *Sun Young Choi[1], Won Bae Cho[1], Dong-Il Yeom[1], Kihong Kim[1], Fabian Rotermund[1], Ji-Hee Kim[2], Ki-Ju Yee[2], Andreas Schmidt[3], Günter Steinmeyer[3], Benjamin Wolter[3], Valentin Petrov[3], Uwe Griebner[3]; [1]Division of Energy Systems Res., Ajou Univ., Suwon, Republic of Korea; [2]Dept. of Physics, Chungnam National Univ., Daejeon, Republic of Korea; [3]Max Born Instutute 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.

FWC3 • 17.15

Tm:Fiber Laser Resonantly-Pumped Ho:YLF Laser for air/space borne lidar application, *Yingxin Bai[1], Jirong Yu[2], Songsheng Chen[2], Mulugeta Petros[3], Paul Petzar[2], Upendra N. Singh[2]; [1]Science and Systems Applications, Incorporation, Hampton, VA, USA; [2]NASA Langley, Hampton, VA, USA; [3]Science 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 $LiNbO_3$ via a hybrid patterning technique, *Michele Manzo[1], Fredrik Laurell[1], Valdas Pasiskevicius[1], Katia Gallo[1]; [1]Laser 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 8x6.78μm2 periodicity in 0.5mm substrates.

AIWC4 • 17.45

Direct Bonding of Periodically-Poled Lithium Niobate Crystals for Broadly Tunable Quasi-Phase Matching*, Myoungsik Cha[1]; [1]Pusan 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 Pugzlys[1], Giedrius Andriukaitis[1], Daniel Adam[1], Andrius Baltuska[1], Guillaume Machinet[2], Jerome Lhermite[2], Dominique Descamps[2], Eric Cormier[2], Ronald Holzwarth[3]; [1]Photonics Inst., Vienna Univ. of Technology, Vienna, Austria; [2]Ctr. Lasers Intenses et Applications, Univ. de Bordeaux-CNRS-CEA, Talence, France; [3]Menlo 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 Singh[1], Yingxin Bai[2], Jirong Yu[1]; [1]NASA Langley Res. Ctr., Hampton, VA, USA, [2]Science 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 CO_2 profiles and column concentration from an airborne and space-borne platform.

HWC • HILAS Poster Session

16.30–18.00

HWC1
Mapping the Coulomb Potential's Influence on the Motion of Electronic Wave Packets in Strong Laser Fields, *Xinhua Xie[1], Stefan Roither[1], Daniil Kartashov[1], Emil Persson[2], Li Zhang[1], Stefanie Gräfe[2], Markus Schöffler[1,3], Matthias Lezius[4], Reinhard Dörner[3], Joachim Burgdörfer[2], Andrius Baltuska[1], Markus Kitzler[1]; [1]Photonics Inst., Vienna Univ. of Technology, Vienna, Austria; [2]Inst. for Theoretical Physics, Vienna Univ. of Technology, Vienna, Austria; [3]Inst. für Kernphysik, J.W. Goethe Univ., Frankfurt/Main, Germany; [4]Max-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. Mitrofanov[1], Aart J. Verhoef[1], Evgenii E. Serebryannikov[2], Julien Lumeau[3], Leonid Glebov[3], Alexey M. Zheltikov[2], Andrius Baltuska[1]; [1]Photonics Inst., TU Wien, Vienna, Austria;[2]International Laser Ctr., Moscow State Univ., Moscow, Russian Federation; [3]CREOL, 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 muticolor OPA, *Tadas Balciunas[1], Dusan Lorenc[1], Misha Ivanov[2], Olga Smirnova[3], Audrius Pugzlys[1], Alexey M. Zheltikov[4], Daniel Dietze[1], Juraj Darmo[1], Karl Unterrainer[1], Tim Rathje[5], Gerhard G. Paulus[5], Andrius Baltuska[1]; [1]Inst. of photonics, Vienna Univ. of Technology, Vienna, Austria; [2]Dept. of Physics, Imperial Colledge London, London, UK; [3]Max Born Inst., Berlin, Germany; [4]Dept. of Physics, M.V. Lomonosov Moscow State Univ., Moscow, Russian Federation; [5]Inst. 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 Wang[1], Joseph H. Eberly[1]; [1]Physics & 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 Lyachev[1], Oleg Chekhlov[1], John Collier[1], Marco Galimberti[1], Cristina Hernandez-Gomez[1], Pavel Matousek[1], Ian Musgrave[1], Ian Ross[1], Yunxin Tang[1]; [1]Central 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 Mironov[1], Efim Khazanov[1], Vladimir Lozhkarev[1], Vladislav Ginzburg[1], Gerard Mourou[2]; [1]Inst. of Applied Physics of RAS, Nizhny Novgorod, Russian Federation; [2]Inst. de la Lumière Extrème, Palaiseau, France.* Method of small-scale self-focusing suppression at intense laser beams (1÷4TW/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 Chériaux[1], Christophe Radier[2,1], Fabio Giambruno[1], Christophe Simon-Boisson[2], Vincent Moro[2]; [1]LOA, Palaiseau, France; [2]TOSA 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. Augstein[1], Carla Figueira de Morisson Faria[1]; [1]Physics 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 Kovacs[1], Mihaly Gorbe[3,2], Karoly Osvay[1]; [1]Optics and Quantum Electronics, Univ. of Szeged, Szeged, Hungary; [2]CE Optics, Szeged, Hungary;[3]Faculty 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 Sato[1], Yuichi Kozawa[1], Takahiro Nakamura[1]; [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 Lee[1], Jongseok Lim[1], Jaewook Ahn[1]; [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 Fiedorowicz[1], Andrzej Bartnik[1], Roman Jarocki[1], Jerzy Kostecki[1], Miroslaw Szczurek[1], Przemyslaw Wachulak[1]; [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 Popov[1], Olga Tikhonova[1], Ekaterina Volkova[1]; [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 Schroedinger 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 Lein[1]; [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 Tikhonova[1], Alexander Popov[1], Ekaterina Volkova[1]; [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 Tang[1], Chris Hooker[1], Oleg Chekhlov[1], Steve Hawkes[1], Klaus Ertel[1], Rajeev Pattathil[1], John Collier[1]; [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 Tsaur[1]; [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 Ganeev[1]; [1]Insitute 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 Thai[1], Christoph Skrobol[2,3], Philip K. Bates[1], Gunnar Arisholm[4], 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 Liu[1], Karen Z Hatsagortsyan[1]; [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 Tzallas[1], Jan Kruse[1,2], Faucher Olivier[3], George Tsakiris[4]; [1]IESL and Physics Dept, FORTH and Univ. of Crete, Heraklion, Greece;[2]Physics Dept, Univ. of Crete, Heraklion, Greece; [3]Univ. of Bourgogne, Dijon, France; [4]MPQ, 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. Vyatkin[1], Efim Khazanov[1]; [1]Inst. 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**
Nd^{3+} and Yb^{3+} doped fluoride laser ceramics, , *Tasoltan T. Basiev[1], Maxim E. Doroshenko[1], Vasilii A. Konyushkin[1];[1]Russian Acad of Sciences, Moscow, Russian Federation.* Fluoride laser ceramics of high optical quality doped with Yb^{3+} and Nd^{3+} 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 Gapontsev[1]; [1]IPG Photonics Corp., Oxford, MA, USA.* Abstract not available.

FThA2 • 8.45
Mid-IR Fiber Supercontinuum Source for Hyperspectral Image Projector, *Brandon Shaw[1], Rafael Gattass[1], Jas Sanghera[1], Ishwar Aggarwal[1], Joseph Rice[2]; [1]Naval Res. Lab, Washington, DC, USA; [2]National 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. Barty[1]; [1]MS 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 Malka[1]; [1]LOA, 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 Maccioni[1], Nicolò Beverini[1], Stefano Firpi[1], Mauro Morganti[1], Fabio Stefani[1], Cosimo Trono[2], Piero Guerrini[3], Alain Maguer[3]; [1]Dipartimento di Fisica, Università di Pisa, Largo Pontecorvo 3, Pisa, Italy; [2]CNR-Istituto di Fisica Applicata "Nello Carrara", Polo Scientifico, Sesto Fiorentino (FI), Italy; [3]Nato 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:CaF$_2$ grown by Liquid Phase Epitaxy, *Patrice Camy[1]; [1]CIMAP, Caen, France.* Ytterbium doped CaF$_2$ 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 Yb^{3+}:CaF$_2$ bulk crystals.

FThA4 • 9.15

Fiber Amplifiers of Radially or Azimuthally Polarized Light, *Micha Nixon[1], Moti Fridman[1], Asher A. Friesem[1], Nir Davidson[1]; [1]Weizmann 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.

HThA3 • 9.15

LWFA Experiments at PEARL Facility, *Alexander Soloviev[1], Konstantin Burdonov[1], Vladislav Ginzburg[1], Eugeny Katin[1], Efim Khazanov[1], Alex Kirsanov[1], Vladimir Lozhkarev[1], Grigory Luchinin[1], Anatoly Mal'shakov[1], Mikhail A. Martyanov[1], Oleg Palashov[1], Anatoly K. Poteomkin[1], Alexander Sergeev[1], Andrey Shaykin[1], Mikhail Starodubtsev[1], Ivan Yakovlev[1]; [1]The 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.

AIThA5 • 9.30

Simultaneous Dual-Wavelength Laser Operation in Co-Doped (Ho,Tm):KLu(WO$_4$)$_2$ Crystal, *Xavier Mateos[1], Venkatesan Jambunathan[1], Maria Cinta Pujol[1], Joan Josep Carvajal[1], Magdalena Aguiló[1], Francesc Díaz[1], Andreas Schmidt[2], Uwe Griebner[2], Valentin Petrov[2]; [1]Univ. Rovira i Virgili, Tarragona, Spain; [2]Max-Born Inst., Berlin, Germany.* Simultaneous lasing of Ho^{3+} at 2061 nm and Tm^{3+} at 1937 or 1919 nm is observed in co-doped monoclinic (Ho,Tm):KLu(WO$_4$)$_2$ at room temperature with output power and slope efficiency reaching 218 mW and 27%, respectively.

FThA5 • 9.30 Invited

Distributed Feedback Lasers in Phosphate Glass Active Fiber, *Axel Schulzgen[1], Peter Hofmann[1,2], Li Li[2], Nasser Peyghambarian[2], Lingyun Xiong[3], Albane Laronche[3], Jacques Albert[3]; [1]CREOL, College of Optics and Photonics, Univ. of Central Florida, Orlando, FL, USA; [2]College of Optical Sciences, Univ. of Arizona, Tucson, AZ, USA; [3]Dept. 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.

HThA4 • 9.30

Highly-Efficient Ion Acceleration in Laser Plasma via Interaction of Intense Laser Pulse with Cluster-Gas Target, *Yuji Fukuda[1], Motonobu Tampo[1], Masaki Kando[1], Yukio Hayashi[1], Keigo Kawase[1], Anatoly Y. Faenov[1,2], Tatiana A. Pikuz[1,2], Tatsufumi Nakamura[1], Hironao Sakaki[1], Alexander Pirozhkov[1], Takuya Shimomura[1], Hiromitsu Kiriyama[1], Masato Kanasaki[1,3], Tomoya Yamauchi[3], Ryosuke Kodama[4], Kiminori Kondo[1], Sergei V. Bulanov[1,5]; [1]Kansai Photon Science Inst., Japan Atomic Energy Agency, Kizugawa, Japan; [2]Joint Inst. of High Temperatures, Russian Acad. of Sciences, Moscow, Russian Federation; [3]Graduate School of Maritime Sciences, Kobe Univ., Hyogo, Japan; [4]Graduate School of Engineering, Osaka Univ., Osaka,*

Anadolu, P Floor	Marmara, P Floor	Citronelle, N Floor

AIThA6 • 9.45
Influence of Nd^{3+}-concentration on laser transitions in Nd:YAG, *Yoichi Sato[1], Takunori Taira[1]; [1]Laser 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 Nd^{3+}-concentration and fabrication processes.

Dolmabahce Foyer, R Floor
10.00–10.30
Coffee Break

Dolmabahce Ballroom, R Floor
10.00–16.30
Exhibits Open

Japan; [5]A.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 Sekine[1], Toshiyuki Kawashima[1], Nakahiro Sato[1], Masaru Takagi[1], Hirofumi Kan[1], Yoneyoshi Kitagawa[2], Yoshitaka Mori[2], Ryohei Hanayama[2], Shinichiro Okihara[2], Kazuhisa Fujita[2], Katsuhiro Ishii[2], Naoki Nakamura[3], Yasushi Miyamoto[3], Hirozumi Azuma[4], Tomoyoshi Motohiro[4], Tatsumi Hioki[4]; [1]Development bureau, Hamamatsu Photonics K. K., Shizuoka, Japan; [2]The Graduate School for the Creation of New Photonics Industries, Shizuoka, Japan; [3]Advanced Material Engineering Division, TOYOTA Motor Corporation, Shizuoka, Japan; [4]TOYOTA 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-μm-thick deuterated polystyrene film has preliminarily demonstrated by 10 TW HAMA laser.

Dolmabahce Foyer, R Floor

AIThB • AIOM Poster Session

10.30–11.30

AIThB01

(Yb^{3+}, Er^{3+}) and (Yb^{3+}, Tm^{3+})-codoped Lu_2O_3 nanorods: Hydrothermal synthesis and visible emissions, *E. William Barrera Bello[1], Maria Cinta Pujol[1], Concepción Cascales[3], Fabian Rotermund[2], Francesc Díaz[1]; [1]Fisica i Cristal.lografia de Materials i nanomaterials (FiCMA-FiCNA), Universitat Rovira i Virgili, Tarragona, Spain; [2]Division of Energy Systems Res., Ajou Univ., Suwon, Republic of Korea; [3]Inst.o de Ciencia de Materiales de Madrid, Madrid, Spain.* Yb^{3+},Er^{3+} and Yb^{3+},Tm^{3+} codoped Lu_2O_3 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 Yb^{3+} concentration.

AIThB02

Growth and Optical Properties of ZnO Nanorod Gratings, *GeonJoon Lee[1], Hyun Jung Nam[2], Chang Kwon Hwangbo[2], Hyunjin Lim[3], Hyeonsik Cheong[3], Hee Soo Kim[4], Chong Seung Yoon[4], Sun-Ki Min[5], Sung-Hwan Han[5], YoungPak Lee[1]; [1]Quantum Photonic Science Res. Ctr., Hanyang Univ., Seoul, Republic of Korea; [2]Dept. of Physics, Inha Univ., Incheon, Republic of Korea; [3]Dept. of Physics, Sogang Univ., Seoul, Republic of Korea; [4]Dept. of Materials Science and Engineering, Hanyang Univ., Seoul, Republic of Korea; [5]Dept. 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. Pavlov[1], Mikhail Marisov[1], Vadim Semashko[1], Alexander Naumov[1], Stella Korableva[1], Alexey Nizamutdinov[1]; [1]Physics, 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 Dy^{3+} Ions Doped In Silver Halade Fibers, *Andrey Okhrimchuk[1], Leonid Butvina[1], Ninel Lichkova[2], Vladimir Zagorodnev[2], Evgeni Dianov[1]; [1]Fiber Optics Res. Ctr. of RAS, Moscow, Russian Federation; [2]Inst. of Microelectronics Technology of RAS, Chernogolovka, Russian Federation.* Middle-IR luminescence of AgHal:Dy^{3+} crystal was investigated. Detrimental influence of clusterization on efficiency of the midde-IR transitions was found.

AIThB05

Low-Phonon BaF_2: Ho^{3+}: Tm^{3+} Doped Crystals for 3.5 - 4 μm Lasing, *Yurii V. Orlovskii[1], Olim Alimov[1], Tasoltan T. Basiev[1]; [1]Laser Materials and Technology Res. Ctr., General Physics Inst., Moscow, Russian Federation.* New pumping and sensitization scheme of 3.9 μm laser transition of Ho^{3+} in low-phonon the BaF_2:Ho^{3+}:Tm^{3+} crystals is studied. Energy transfer from Tm^{3+} to Ho^{3+} and back transfer from Ho^{3+} to Tm^{3+} are analyzed.

AIThB06

Heat Generation and Flow and Thermal Effects on Optical Spectra in Laser Diode Pumped Thulium-doped Vanadate Crystals, *Radoslaw Lisiecki[1], Piotr Stachowiak[1], Andrzej Jezowski[1], Piotr Solarz[1], Grazyna Dominiak-Dzik[1], Witold Ryba-Romanowski[1], Tadeusz Lukasiewicz[2]; [1]Inst. of Low Temperature and Structure Res., Polish Acad. of Sciences, Wroclaw, Poland; [2]Inst. of Electronic Materials Technology, Warsaw, Poland.* Optical spectra, excited state relaxation dynamics and thermal conductivity in a wide temperature region for thulium-doped YVO_4, $GdVO_4$ and $LuVO_4$ 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 Zhydachevski[3], Andrzej Suchocki[1,2], Marek Berkowski[1]; [1]Inst. of Physics Polish Acad. of Sciences, Warsaw, Poland; [2]Inst. of Physics, Kazimierz Wielki Univ., Bydgoszcz, Poland; [3]Lviv 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 $YAlO_3$:Mn crystals at low concentrations of manganese ions.

AIThB08

MeV He Ion-Implanted Planar Waveguide in RTP Crystal*, Gang Fu[1]; [1]School of Science, Shandong Jianzhu Univ., Jinan, China.* A planar optical waveguide was formed in $RbTiOPO_4$(RTP) crystal by 3.0-MeV He-ion implantation with a dose of 1.0×10^{16}ions/cm^2 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 Barnes[1], Farzin Amzajerdian[1], Brian Walsh[1], Donald Reichle[1], George Busch[2], William Carrion[2]; [1]NASA Langley Res. Ctr., Hampton, VA, USA; [2]NASA Langaley 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 Gd_2SiO_5 Single Crystal Doped with Pr^{3+}, Sm^{3+} and Dy^{3+},*Grazyna Dominiak-Dzik[1], Witold Ryba-Romanowski[1], Radoslaw Lisiecki[1], Piotr Solarz[1], Boguslaw Macalik[1], Marek Berkowski[2]; [1]Inst. of Low Tem. and Structure Res. PAS, Wroclaw, Poland; [2]Inst. 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 Pr^{3+}, Sm^{3+} and Dy^{3+} in Gd_2SiO_5 crystals.

AIThB11

Paper Withdrawn

AIThB12

Bistable Switching based on Pseudo Resonant States in Nonlinear Fractal Photonic Crystals, *Mohammad Hosain Teimourpour[1]; [1]Optics 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 Khoshsima[1], Babak Olyaeefar[1]; [1]Photonics, Res. Inst. for Apllied 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 Huang[1], Jin-Hua Zhao[1], Peng Liu[1], Jing Guan[1], Xue-Lin Wang[1]; [1]School 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 $SrMgAl_2SiO_7$:Eu^{2+}, Dy^{3+} phosphor, *Hassan Sameie[1], Reza Salimi[1], Ali A. Sabbagh[2], Ali A. Sarabi[1], Mohammadreza Tahriri[3], Mohammad A. Mokhtari Farsi[1]; [1]Dept. of Polymer Engineering & Color Technology, Amirkabir Univ. of Technology, Tehran, Islamic Republic of Iran; [2]Color and Polymer Res. Ctr. (CPRC), Amirkabir Univ. of Technology, Tehran, Islamic Republic of Iran; [3]Biomaterials 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, $SrMgAl_2SiO_7$:Eu^{2+},Dy^{3+} 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 Orucu[2], Ozen Gonul[2], Baldassare Di Bartolo[2], John Collins[1]; [1]Physics and Astronomy, Wheaton College, Norton, MA, USA; [2]Physics, 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 Xu[1], Jong Heo[1]; [1]Dept. 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 $ZnGeP_2$ and $AgGaS_2$, *Johan Petit[1], Antoine Godard[2], Myriam Raybaut[2], Jean-Michel Melkonian[2], Michel Lefebvre[2]; [1]DMSC, ONERA, Chatillon, France; [2]DMPH, ONERA, Palaiseau, France.* Chalcopyrite as $ZnGeP_2$ and $AgGaS_2$ 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 Richardson[1], Nathan Carlie[1], J. David Musgraves[1], Bogdan Zdyrko[1], Igor Luzinov[1], Juejun Hu[2], Vivek Singh[2], Anu Agarwal[2], Lionel C. Kimerling[2], Antonio Canciamilla[3], Francesco Morichetti[3], Andrea Melloni[3]; [1]Materials Science and Engineering, COMSET, Clemson Univ., Clemson, SC, USA; [2]Microphotonics Lab, MSE, MIT, Cambridge, MA, USA; [3]Electronics 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 Hernandez[1], Anthony Bertrand[1], Stefano Selleri[2], Francois Salin[3], Lasse Leick[4], Marc Hueske[5], Rok Petkovsek[6], Fabio Ferrario[7], Norbert Lichtenstein[8]; [1]Multitel, Mons, Belgium, [2]Univ. of Parma, Parma, Italy, [3]EOLITE Systems, PESSAC, France, [4]NKT Photonics, Birkeroed, Denmark, [5]LPKF SolarQuipment GmbH, Garbsen, Germany, [6]Univ. of Ljubljana, Ljubljana, Slovenia, [7]Quanta System S.p.A., Solbiate Olona (VA), Italy, [8]Oclaro 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 Stutzki[1], Florian Jansen[1], Thomas Gottschall[1], Thomas V. Andersen[3], Jens Limpert[1,2], Andreas Tünnermann[1,2]; [1]Inst. of Applied Physics, Friedrich-Schiller-Univ. Jena, Jena, Germany; [2]Helmholtz-Inst. Jena, Jena, Germany; [3]NKT Photonics, Birkeroed, 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 M^2 value <1.2.

FThB3 • 11.15
High Efficiency Chirped Bragg Gratings for Pulse Stretching and Compression, *Vadim Smirnov[1], Eugeniu Rotari[1], Ion Cohanoshi[1], Almantas Galvanauskas[2], Leonid Glebov[3]; [1]OptiGrate, Orlando, FL, USA; [2]EECS Dept., Univ. of Michigan, Ann Arbor, MI, USA;[3]CREOL/ 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 Calegari[1], Federico Ferrari[1], Matteo Lucchini[1], Caterina Vozzi[1], Salvatore Stagira[1], Giuseppe Sansone[1], Mauro Nisoli[1]; [1]Dept. 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

Marmara, P Floor	Citronelle, N Floor	Anadolu, P Floor

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 Liu[1], Peng Wan[1], Lihmei Yang[1], Farzin Amzajerdian[2]; [1]PolarOnyx Inc., Sunnydale, CA, USA; [2]NASA 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.

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.

HThB3 • 11.30

High-Order Harmonics Tunable Enhancement by a DC-Electric Field, *Carles Serrat[1,2], Jens Biegert[2,3]; [1]UPC - Universitat Politècnica de Catalunya, Terrassa, Spain; [2]ICFO, Castelldefels (Barcelona), Spain; [3]ICREA, 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. Bates[1], Stephan Teichmann[1], Seth Cousin[1], Alexander Gruen[1], Jens Biegert[1,4], Arnaud Couairon[2], Matteo Clerici[3], Antonio Lotti[3], Daniele Faccio[3], Paolo DiTrapani[3]; [1]Attoscience and Ultrafast Optics, ICFO-Inst. de Ciencies Fotoniques, Castelldefels (Barcelona), Spain; [2]Ctr. de Physique Theorique, Ecole Polytechnique, Palaiseau,, France; [3]CNISM & Dept. of Mathematics and Physics, Universita` dell'Insubria, Como, Italy; [4]ICREA, Institucio 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.

HThB5 • 12.00 **Invited**

Bright Coherent Ultrafast X-rays from mid-IR Lasers, *Tenio Popmintchev[1], Ming-Chang Chen[1], Paul Arpin[1], Michael Gerrity[1], Matthew Seaberg[1], Bosheng Zhang[1], Dimitar Popmintchev[1], Giedrius Andriukaitis[2], Tadas Balciunas[2], Oliver D. Mücke[2], Audrius Pugzlys[2], Andrius Baltuska[2], Margaret Murnane[1], Henry Kapteyn[1]; [1]JILA and Univ. of Colorado at Boulder, Boulder, CO, USA; [2]Photonics 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 Glebova[1], Karima Chamma[1], Julien Lumeau[1], Leonid Glebov[1]; [1]Univ. 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.

Marmara, P Floor	Citronelle, N Floor	Anadolu, P Floor

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 Serrano[1], Alain Braud[1]; [1]CIMAP-ENSICAEN, Caen, France.* KY_3F_{10} and CaF_2 fluoride crystals co-doped with Pr^{3+} and Yb^{3+} ions are investigated as possible quantum cutting systems to enhance solar cells efficiency. More than 95% Pr^{3+} to Yb^{3+} energy transfer efficiencies are obtained.

AIThC4 • 12.30
Crystal growth and Spectroscopy of Cerium doped $CaSc_2O_4$, *Matthias Fechner[1], Fabian Reichert[1], Klaus Petermann[1], Günter Huber[1]; [1]Inst. für Laser-Physik, Hamburg, Germany.* Within cerium doped $CaSc_2O_4$ single crystals a ligand to metal Ce4+ - Ce^{3+} 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 Ho^{3+} in (Tm^{3+},Yb^{3+}): $KLu(WO_4)_2$ nanocrystals for RGB light generation, *E. William Barrera Bello[1], Maria Cinta Pujol[1], Joan Josep Carvajal[1], Xavier Mateos[1], Magdalena Aguiló[1], Francesc Díaz[1], Concepción Cascales[2]; [1]Universitat Rovira i Virgili, Tarragona, Spain;[2]Inst.o de Ciencia de Materiales de Madrid, Madrid, Spain.* Nanocrystalline powder of Ho^{3+},Tm^{3+},Yb^{3+}:$KLu(WO_4)_2$ 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

FThC • Fiber Lasers and Applications II

14.00–16.00
Ulrich Hefter; Rofin-Sinar, Germany, USA

FThC1 • 14.00 **Invited**
High Repetition Rate Ultrashort Pulse Micromachining with Fiber Lasers, *Stefan Nolte[1, 2], Sven Döring[1], Antonio Ancona[3], Jens Limpert[1, 2], Andreas Tünnermann[1, 2]; [1]Inst. of Applied Physics, Friedrich-Schiller-Univ. Jena, Jena, Germany, [2]Fraunhofer Inst. for Applied Optics and Precision Engineering, Jena, Germany, [3]CNR-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 Pierrot[1], Benjamin Cocquelin[1], Julien Saby[1], Nicolas Falletto[1], Francois Salin[1]; [1]Eolite 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 Hernandez[1]; [1]Multitel, 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**
Driving Laser-plasma Interactions with Few-cycle Pulses, *Rodrigo Lopez Martenz; LOA, France.* Abstract not available.

AIThD • Crystal and Glass Fibers II

14.30–16.00
Presider to Be Announced

AIThD1 • 14.30 **Invited**
Mid-Infrared Glasses and Fibers, *Jean-Luc Adam[1]; [1]Univ. 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.

Marmara, P Floor	Citronelle, N Floor	Anadolu, P Floor

FThC4 • 15.00 **Invited**

Influence of Peak Power and ns Pulse Duration on Micromachining, *Sami Hendow[1]; [1]Multiwave 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. Boullet[1], R. Bello-Doua[2], R. Dubrasquet[2], Nicholas Traynor[1], Caroline Lecaplain[4], Ammar Hideur[4], Jerome Lhermite[3], Guillaume Machinet[3], C. Médina[3], Eric Cormier[3]; [1]Azur Light Systems, Talence, France, [2]Alphanov, Centre Technologique Optique et Lasers, Talence, France, [3]Centre Lasers Intenses et Applications, Univ. de Bordeaux, Bordeaux, France, [4]Univ. 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 Wang[1]; [1]Inst. 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 Chen[1], Chien-Jen Lai[1], Franz Kärtner[1]; [1]MIT, 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 Lai[1], Franz Kärtner[1]; [1]EECS, 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 Tsakiris[1]; [1]Attophysics, 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 Shaw[1], Dan Gibson[1], Vinh Nguyen[1], Rafael Gattass[1], Jas Sanghera[1], Ishwar Aggarwal[1], Gabrielle Farrar[2]; [1]Naval Res. Lab, Washington, DC, USA; [2]Univ. Res. Foundation, Greenbelt, MD, USA.* We report on development and characterization of square registered infrared imaging bundles fabricated from As_2S_3 fiber. Bundle cross-talk measurements are presented.

AIThD3 • 15.15

Dy(Pr^{3+})doped GaGeSbS(Se) fibers for CO_2 sensing at 4.35µm, *Jean-Louis Doualan[1]; [1]CIMAP, Caen, France.* Dy^{3+} and Pr^{3+} doped GaGeSbS(Se) glasses provide good emission efficiencies in the mid IR. By using the 4.5µm emission of a Dy^{3+} doped GaGeSbS fiber, the CO_2 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. Butvina[1], Alexey L. Butvina[1], Andrey Okhrimchuk[1], Ninel Lichkova[2], Vladimir Zagorodnev[2], Evgeni Dianov[1]; [1]Fiber optic, FORC RAS, Moscow, Russian Federation; [2]High 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 As_2S_3 fibers for frequency conversion, *Claire Alhenc-Gelas[1], Pierre Bourdon[1], Guillaume Canat[1], Frédéric Druon[2], Anne Durecu[1]; [1]DOTA-SLS, ONERA, Palaiseau, France; [2]Laboratoire Charles Fabry de l'Inst. d'Optique, CNRS, Palaiseau, France.* The potential of mid-IR frequency conversion in As_2S_3 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.

Anadolu, P Floor	Citronelle, N Floor

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. Kokh[1], Nadezda Kononova[1], Vasily Vlezko[1], Konstantin Kokh[1], Philippe Villval[2], Dominique Lupinski[2], Stephane Durst[2]; [1]Inst. of Geology and Mineralogy, Novosibirsk, Russian Federation; [2]Cristal 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 Maillard[1], Regine Maillard[1], Gerard Aka[3], Philippe Villval[2]; [1]Physics, Univ. Metz, Metz, France; [2]Cristal Laser, Messein, France; [3]LCMCP 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 Markosyan[1], Maria Claudia C. Kajiyama[3], Matthias Falk[3], Dieter H. Jundt[3], Karsten Buse[2], Martin M. Fejer[1]; [1]E. L. Ginzton Lab, Stanford Univ., Stanford, CA, USA; [2]Inst. of Physics, Univ. of Bonn, Bonn, Germany; [3]Crystal 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 Tavella[1], Daryl Adams[5], Valeri Ayvazyan[2], Nicoleta-Ionela Baboi[2], J. Bahrdt[3], Efthimios Bakarezos[6], Vladimir Balandin[2], Winfried Decking[2], Brendan Dromey[5], Thomas Dzeltainis[5], Stefan Düsterer[1,2], Markus Drescher[4], Hans-Jörg Eckoldt[2], Bart Faatz[2], Josef Feldhaus[2], Rolf Follath[3], Michael Gensch[3], Nina Golubeva[2], Karsten Holldack[3], Christos Kamperidis[6], Markus Körfer[2], Tim Laarmann[2], Albrecht Leuschner[2], Lutz Lilje[2], Torsten Limberg[2], Atoosa Meseck[3], Velizar Miltchev[4], Rolf Mitzner[3], Dirk Nölle[2], Nektarios Papadogiannis[6], Alexander Petrov[2], Kay Rehlich[2], Robert Riedel[1], Jörg Rossbach[4], Holger Schlarb[2], Bernhard Schmidt[2], Michael Schmitz[2], Siegfried Schreiber[2], Juliane Rönsch[4], Horst Schulte-Schrepping[2], Michael Schulz[1,2], Joachim Spengler[2], Martin Staack[2], Michael Tatarakis[6], Kai Tiedtke[2], Markus Tischer[2], Rolf Treusch[2], Arik Willner[1,2], Mark Yeung[5], Matthew Zepf[5]; [1]Helmholtz Inst. Jena, Hamburg, Germany; [2]Deutsches Elektronensynchrotron, Hamburg, Germany; [3]Helmholtz Zentrum Berlin, Berlin, Germany; [4]Univ. Hamburg, Hamburg, Germany; [5]Queens Univ. Belfast, Belfast, Germany; [6]Ctr. 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 Thai[1], Olivier Chalus[1], Philip K. Bates[1], Jens Biegert[1,2]; [1]Attoscience and Ultrafast Optics, ICFO-Inst. de Ciencies Fotoniques, Castelldefels (Barcelona), Spain; [2]ICREA, 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 Wang[1], Canhua Xu[1], Liwei Song[1], Chuang Li[1], Chunmei Zhang[1], Yansui Huang[1], Xiaowei Chen[1,2], Yuxin Leng[1], Ruxin Li[1], Zhizhan Xu[1]; [1]State Key Lab of High Field Laser Physics, Shanghai Inst.ion of Optics and fine Mechanics, Chinese Acad. of Sciences, Shanghai, China; [2]Laboratoire 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.

Anadolu, P Floor	Citronelle, N Floor

AIThE4 • 17.30

Second harmonic generation below 400 nm using potassium lithium niobate from laser-heated pedestal growth, *Gisele Maxwell[2], Dylan Dalton[2], Alan B. Petersen[1]; [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 Minzioni[1], Giovanni Nava[1], Wenbo Yan[1], Ilaria Cristiani[1], Vittorio Degiorgio[1], Nicola Argiolas[2], Marco Bazzan[2], Maria V. Ciampolillo[2], Annamaria Zaltron[2], Cinzia Sada[2]; [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 Haessler[1], Tadas Balciunas[1], Giedrius Andriukaitis[1], Oliver D. Mücke[1], Audrius Pugzlys[1], Andrius Baltuska[1], Richard Squibb[2], Leslaw Frasinski[2], Jon Marangos[2], John W. Tisch[2], Linas Giniunas[3], Romas Danielius[3], Ronald Holzwarth[4,5]; [1]Inst. of photonics, Vienna Univ. of Technology, Vienna, Austria; [2]Dept. of Physics, Imperial Colledge Longon, 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 Koke[3], Mihaly Gorbe[4,2], Karoly Osvay[1]; [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.

FThE • FILAS Poster Session

16.30–18.00

FThE1
Paper Withdrawn

FThE2
Phase Locking Fluctuations of 25 Coupled Fiber Lasers, *Micha Nixon[1], Moti Fridman[1], Rami Pugatch[1], Nir Davidson[1], Asher A. Friesem[1]; [1]Weizmann 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 Yoon[1], Gwang Hoon Jang[1], Jin Ho Kim[1]; [1]Dept. 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 Hernandez[1]; [1]Multitel, 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 Amplication for TeraHertz Spectroscopy, *Jean-Bernard Lecourt[1], Charles Duterte[1], Yves Hernandez[1], Domenico Giannone[1]; [1]Applied 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 S^2 characterization, *Julien Le Gouët[1], Laurent Lombard[1], Guillaume Canat[1]; [1]DOTA, ONERA, Palaiseau, France.* The recently developed multifilament core fiber is characterized using the spatially resolved spectral interference to determine the LP_{11} 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. Melo[1], Jose Salcedo[1], Martin O. Berendt[1], João M. Sousa[1]; [1]Multiwave 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 Tm^{3+}-doped germanate fiber laser source for Si-processing, *Vladislav V. Dvoyrin[2,1], Irina Sorokina[2], Oleg Okhotnikov[3], Valery Mashinsky[2], L. Ischakova[2], Evgeni Dianov[2], Vladimir Khopin[4], A. N. Guryanov[4]; [1]FORC, Moscow, Russian Federation; [2]Dept. of Physics, NTNU, Trondheim, Norway; [3]Tampere Univ. of Technology, Tampere, Finland; [4]Inst. of Chemistry of High-Purity Substances, Nizhny Novgorod, Russian Federation.* We report development of a novel Tm^{3+}-doped fiber laser source at 1.86 μm based on highly nonlinear $55GeO_2$-$45SiO_2$ dispersion shifted fiber, applicable to 3D-volume microprocessing of Si.

FThE9
Tapered Double Clad Ytterbium Fiber Laser for Material Processing, *Jorma Vihinen[1], Jyrki Latokartano[1], Tero Kumpulainen[1], Valery Filippov[1], Juho Kerttula[1], Yuri Chamorovskii[2], Konstantin Golant[2], Oleg Okhotnikov[1]; [1]Tampere Univ. of Technology, Tampere, Finland; [2]Inst. 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 Kalashnikov[1], Irina Sorokina[2], Vladislav Dvoyrin[2,3]; [1]Inst. fuer Photonik, TU Wien, Vienna, Austria; [2]Dept. of Physics, Norwegian Univ. of Science and Technology, Trondheim, Norway; [3]Fiber Optics Res. Ctr., Russian Acad. of Sciences, Moscow, Russian Federation.* We report feasibility of continuum generation from <1 cm of nonlinear dispersion-shifted GeO_2-doped SiO_2-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 Jacquemet[1], David Harnois[1], Alain Mugnier[1], David Pureur[1]; [1]Quantel, 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 Bernard[1], Judicael Bessard[1], Guillaume Brochu[1], Éric Lemaire[1]; [1]Teraxion, 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 Kalashnikov[1], Irina Sorokina[2], Vladislav Dvoyrin[2,3]; [1]Inst. fuer Photonik, TU Wien, Vienna, Austria; [2]Dept. of Physics, Norwegian Univ. of Science and Technology, Trondheim, Norway; [3]Fiber 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 GeO_2-doped SiO_2-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 Lin[1]; [1]Dept. 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 multiwavelenght erbium-doped fiber lasers. The lasing SNR is improved to 60dB.

FThE15
Low Repetition Rate High Energy 1.5 μm Fiber Laser, *Peng Wan[1], Jian Liu[1], Lihmei Yang[1], Farzin Amzajerdian[2]; [1]PolarOnyx, Inc., San Jose, CA, USA; [2]NASA 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 Fjodorow[1], Valeri M. Baev[1], Benjamin Löhden[1], Svetlana Kuznetsova[1], Sergey Cheskis[2]; [1]Physik, Univ. Hamburg, Hamburg, Germany; [2]School 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

Citronelle, N Floor	Anadolu, P Floor

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 Skrobol[1,2], Izhar Ahmad[1], Christoph Wandt[1], Sandro Klingebiel[1], Sergei A. Trushin[1], Ferenc Krausz[1,2], Stefan Karsch[1,2]; [1]Max-Planck-Inst. für Quantenoptik, Garching, Germany; [2]Dept. 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 Lyachev[1], Oleg Chekhlov[1], John Collier[1], Rob Clarke[1], Marco Galimberti[1], Cristina Hernandez-Gomez[1], Pavel Matousek[1], Ian Musgrave[1], David Neely[1], Peter Norreys[1], Ian Ross[1], Yunxin Tang[1], Trevor Winstone[1], Brian Wyborn[1]; [1]Central 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}Wcm^{-2}.

HThE3 • 7:15 p.m.

Performance Modelling of a 1 kJ DPSSL System, *Klaus Ertel[1], Saumyabrata Banerjee[1], Cristina Hernandez-Gomez[1], Paul D. Mason[1], Jonathan Phillips[1], John Collier[1]; [1]Central 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. Mukhin[1], Evgeny Perevezentsev[1], Anton Vyatkin[1], Olga Vadimova[1], Oleg Palashov[1], Efim Khazanov[1]; [1]Dept. of nonlinear and laser optics, Inst. of Applied Physics Russian Acad. of Science, Nizhny Novgorod, Russian Federation.* Spectral and thermooptical 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 Vaupel[1], Nathan Bodnar[1], Benjamin Webb[1], Michaël Hemmer[1], Martin Richardson[1]; [1]CREOL, 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.

Anadolu, P Floor	Citronelle, N Floor

• 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
$CdSiP_2$ and OPGaAs: New Nonlinear Crystals for the Mid-Infrared, *Peter Schunemann[1]; [1]BAE 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 $CdSiP_2$, *Pierre Brand[1], Benoît Boulanger [1], Patricia Segonds[1], Vincent Kemlin[1], Peter G. Schunemann[2], Kevin T. Zawilski[2], Thomas M. Pollak[2], Bertrand Ménaert[1], Jérôme Debray[1], [1]Institut Néel CNRS/UJF, France, [2]BAE Systems, USA* We directly measured the second harmonic generation and difference frequency generation phase-matching directions of the nonlinear crystals $CdSiP_2$ 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 Zondy[1], Valentin Petrov[2], Ludmila Isaenko[3], Olivier Bidault[4]; [1]Joint Lab of Metrology LNE-CNAM, La Plaine Saint Denis, France; [2]Max-Born-Inst. for Nonlinear Optics and Ultrafast Spectroscopy, Berlin, Germany; [3]Inst. of Geology and Mineralogy, SB RAS, Novosibirsk, Russian Federation; [4]I.C.B., CNRS - Univ. de Bourgogne, Dijon, France.* $LiInSe_2$, 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 $LiInSe_2$ 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 Vozzi[1], Matteo Negro[1], Sandro De Silvestri[1], Salvatore Stagira[1], Ricardo Torres[2], Leonardo Brugnera[2], Thomas Siegel[2], Jon Marangos[2], Carlo Altucci[3], Raffaele Velotta[3], Fabio Frassetto[4], Paolo Villoresi[4], Luca Poletto[4]; [1]Dipartimento di Fisica, Politecnico di Milano, Milano, Italy; [2]Blackett Lab, Imperial College London, London, UK; [3]Università di Napoli Federico II, Napoli, Italy; [4]Università 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, *Hadas Soifer[1], Barry D. Bruner[1], Pierre Botheron[2], Dror Shafir[1], Adi Diner[1], Oren Raz[1], Yann Mairesse[2], Bernard Pons[2], Nirit Dudovich[1]; [1]Dept. of Physics of Complex Systems, Weizmann Inst. of Science, Rehovot, Israel; [2]CELIA, 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 Roither[1], Xinhua Xie[1], Daniil Kartashov[1], Li Zhang[1], Huailiang Xu[2], Atsushi Iwasaki[2], Markus Schöffler[1,3], Reinhard Dörner[3], Kaoru Yamanouchi[2], Andrius Baltuska[1], Markus Kitzler[1]; [1]Photonics Inst., Vienna Univ. of Technology, Vienna, Austria; [2]Dept. of Chemistry, School of Science, The Univ. of Tokyo, Tokyo, Japan; [3]Inst. für Kernphysik, J.W. Goethe Univ., Frankfurt/Main, 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.

Anadolu, P Floor	Citronelle, N Floor

AIFA4 • 9.15
Non-resonant pump-induced refractive index changes and non-degenerate two-wave mixing in Nd^{3+} and Yb^{3+} doped laser materials, *Rémi Soulard[1,2], Andrey Zinoviev[3], Arnaud Brignon[2], Jean-Louis Doualan[1], Oleg Antipov[3], Jean-Pierre Huignard[2], Richard Moncorgé[1]; [1]CIMAP, Univ. de Caen, Caen, France; [2]TRT, Thales Res. & Technology, Palaiseau, France; [3]Inst. 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 Godin[1], Richard Moncorgé[1], Jean-Louis Doualan[1], Michael Fromager[1], Kamel Ait-Ameur[1], Tomaz Catunda[2]; [1]Univ. de Caen, CIMAP, Caen, France; [2]USP 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.

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. Kohler[1], Christian Ott[1], Philipp Raith[1], Robert Heck[1], Iris Schlegel[1], Christoph H. Keitel[1], Thomas Pfeifer[1]; [1]MPI 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.

Dolmabahce Foyer, R Floor
10.00–10.30
Coffee Break

AIFB • Waveguides and Laser Patterning	HFB • Emerging Techniques

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. Fletcher[1], Jonathan J. Witcher[1], Neil Troy[1], Richard K. Brow[2], Denise Krol[1]; [1]Univ. of California, Davis, Davis, CA, USA; [2]Missouri 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.

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 Junginger[1], Alexander Sell[1], Olaf Schubert[1,4], Bernhard Mayer[1], Daniele Brida[2], Marco Marangoni[2], Giulio Cerullo[2], Tobias Kampfrath[3], Martin Wolf[3], Alfred Leitenstorfer[1], Rupert Huber[1,4];[1]Dept. of Physics and Ctr. for Applied Photonics, Univ. of Konstanz, Konstanz, Germany; [2]IFN-CNR, Dipartimento di Fisica, Politecnico di Milano, Milano, Italy; [3]Dept. of Physics, Freie Univ. Berlin, Berlin, Germany; [4]Dept. 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.

Anadolu, P Floor	Citronelle, N Floor

AIFB2 • 11.00
Asymmetric orientational femtosecond laser writing detected in several properties in various glasses, *Bertrand Poumellec[1], Matthieu Lancry[1]; [1]ICMMO, 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 Liu[1], Jong Heo[1]; [1]Dept. 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 $Nd:YVO_4$ Channel Waveguide, *Yang Tan[1], Jing Guan[1], Feng Chen[1], Javier R. Vaquez de Aldana[2], G. A. Torchia[3], Antonio Benayas[4], Daniel Jaque[4]; [1]School of Physics, Shandong Univ., Jinan, China; [2]Facultad de Ciencias, Universidad de Salamanca, Salamanca, Spain; [3]Centro de Investigaciones Ópticas, CIC-Conicet, La Plata, Argentina; [4]Departamento de Física de Materiales, Universidad Autónoma de Madrid, Madrid, Spain.* Continuous-wave waveguide laser at 1064 nm was generated from a femtosecond laser inscribed $Nd:YVO_4$ 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 Cr^{2+}:ZnSe, *Patick Berry[1], John MacDonald[2], Ajoy Kar[2], Kenneth Schepler[1]; [1]Air Force Res. Lab, Wright-Patterson AFB, OH, USA; [2]Heriot-Watt Univ., Edinburgh, UK.* Waveguide structures were fabricated in chromium-doped zinc selenide (Cr^{2+}: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. Nezhad[1], Olesya Bondarenko[1], Aleksandar Simic[1], Mercedeh Khajavikhan[1], Yeshaiahu Fainman[1]; [1]UC 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 Baum[1]; [1]LMU 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]; [1]CINT, LANL, Los Alamos, NM, USA; [2]CMMS, 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 Eidam[3], Christoph Jocher[3], Ernst Fill[1,2], Jens Limpert[3], Ronald Holzwarth[1,2], Birgitta Bernhardt[1,2], Thomas Udem[1,2], Theodor W. Hänsch[1,2], Andreas Tünnermann[3], Ferenc Krausz[1,2]; [1]Attosecond and Highfield Physics, Max Planck Inst. for Quantum Optics, Garching, Germany; [2]Departement of Physics, Ludwig-Maximilians-Univ., München, Germany; [3]Inst. 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 intra-cavity average powers with sub-ps pulse durations come into reach.

HFB5 • 12.00
Intracavity high harmonic generation with fs frequency combs, *Jason Jones[1]; [1]College of Optical Sciences, Univ. of Arzizona, 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.

Anadolu, P Floor	Citronelle, N Floor

AIFB7 • 12.15

All-telluride channel waveguides for mid-infrared applications, *Caroline Vigreux[1], Marc Barillot[2], Eléonore Barthélémy[1], Lionel Bastard[3], Jean-Emmanuel Broquin[3], Volker Kirschner[4], Stéphane Ménard[2], Gilles Parent[5], Claire Poinsot[2], Annie Pradel[1], Shaoqian Zhang[6], Xianghua Zhang[6]; [1]ICGM, Montpellier, France; [2]Thales Alenia Space, Cannes La Bocca, France; [3]IMEP-LACH, Grenoble, France; [4]ESA, Noordwijk, Netherlands; [5]LEMTA, Nancy, France;[6]LCV, Rennes, France.* In this paper, the different steps of the fabrication of single-mode RIB waveguides for both [6-11μm] and [10-20μm] 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 Forget[1], Antoine Moulet[1,3], Stéphanie Grabielle[1,2], Christian Cornaggia[2], Olivier Gobert[2], Thomas Oksenhendler[1]; [1]Fastlite, Orsay, France; [2]IRAMIS, Service Photons Atomes & Molécules, CEA, Gif-sur-Yvette, France; [3]Lab 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 mesurement dynamic range >40dB.

NOTES

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

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.