PROCEEDINGS OF SPIE

SPIDigitalLibrary.org/conference-proceedings-of-spie

Front Matter: Volume 8780

, "Front Matter: Volume 8780," Proc. SPIE 8780, High-Power, High-Energy, and High-Intensity Laser Technology; and Research Using Extreme Light: Entering New Frontiers with Petawatt-Class Lasers, 878001 (21 May 2013); doi: 10.1117/12.2031427

SPIE.

Event: SPIE Optics + Optoelectronics, 2013, Prague, Czech Republic

PROCEEDINGS OF SPIE

High-Power, High-Energy, and High-Intensity Laser Technology; and Research Using Extreme Light: Entering New Frontiers with Petawatt-Class Lasers

**Joachim Hein
Georg Korn
Luis O. Silva**
Editors

**15–17 April 2013
Prague, Czech Republic**

Sponsored by
SPIE

Cooperating Organisations
HiPER Project (United Kingdom)
ELI Beamlines (Czech Republic)
International Commission For Optics

Published by
SPIE

Volume 8780

Proceedings of SPIE 0277-786X, V. 8780

SPIE is an international society advancing an interdisciplinary approach to the science and application of light.

High-Power, High-Energy, and High-Intensity Laser Technology; and Research Using Extreme Light: Entering New Frontiers with Petawatt-Class Lasers, edited by Joachim Hein, Georg Korn, Luis Oliveira Silva, Proc. of SPIE Vol. 8780, 878001 · © 2013 SPIE · CCC code: 0277-786X/13/\$18 · doi: 10.1117/12.2031427

Proc. of SPIE Vol. 8780 878001-1

The papers included in this volume were part of the technical conference cited on the cover and title page. Papers were selected and subject to review by the editors and conference program committee. Some conference presentations may not be available for publication. The papers published in these proceedings reflect the work and thoughts of the authors and are published herein as submitted. The publisher is not responsible for the validity of the information or for any outcomes resulting from reliance thereon.

Please use the following format to cite material from this book:

Author(s), "Title of Paper," in *High-Power, High-Energy, and High-Intensity Laser Technology; and Research Using Extreme Light: Entering New Frontiers with Petawatt-Class Lasers*, edited by Joachim Hein, Georg Korn, Luis O. Silva, Proceedings of SPIE Vol. 8780 (SPIE, Bellingham, WA, 2013) Article CID Number.

ISSN: 0277-786X

ISBN: 9780819495822

Published by

SPIE

P.O. Box 10, Bellingham, Washington 98227-0010 USA

Telephone +1 360 676 3290 (Pacific Time) • Fax +1 360 647 1445

SPIE.org

Copyright © 2013, Society of Photo-Optical Instrumentation Engineers.

Copying of material in this book for internal or personal use, or for the internal or personal use of specific clients, beyond the fair use provisions granted by the U.S. Copyright Law is authorized by SPIE subject to payment of copying fees. The Transactional Reporting Service base fee for this volume is \$18.00 per article (or portion thereof), which should be paid directly to the Copyright Clearance Center (CCC), 222 Rosewood Drive, Danvers, MA 01923. Payment may also be made electronically through CCC Online at copyright.com. Other copying for republication, resale, advertising or promotion, or any form of systematic or multiple reproduction of any material in this book is prohibited except with permission in writing from the publisher. The CCC fee code is 0277-786X/13/\$18.00.

Printed in the United States of America.

Publication of record for individual papers is online in the SPIE Digital Library.

SPIE
Digital Library

SPIDigitalLibrary.org

Paper Numbering: Proceedings of SPIE follow an e-First publication model, with papers published first online and then in print and on CD-ROM. Papers are published as they are submitted and meet publication criteria. A unique, consistent, permanent citation identifier (CID) number is assigned to each article at the time of the first publication. Utilization of CIDs allows articles to be fully citable as soon as they are published online, and connects the same identifier to all online, print, and electronic versions of the publication. SPIE uses a six-digit CID article numbering system in which:

- The first four digits correspond to the SPIE volume number.
- The last two digits indicate publication order within the volume using a Base 36 numbering system employing both numerals and letters. These two-number sets start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B ... 0Z, followed by 10-1Z, 20-2Z, etc.

The CID Number appears on each page of the manuscript. The complete citation is used on the first page, and an abbreviated version on subsequent pages. Numbers in the index correspond to the last two digits of the six-digit CID Number.

Contents

xi	Conference Committee
xv	Introduction to Part A: High-Power, High-Energy, and High-Intensity Laser Technology

Part A High-Power, High-Energy, and High-Intensity Laser Technology

HIGH ENERGY LASER FACILITIES

- 8780 02 **Orion: a commissioned user facility (Invited Paper)** [8780-1]
P. A. Treadwell, P. Allan, N. Cann, C. Danson, S. Duffield, S. Elsmere, R. Edwards, D. Egan, M. Girling, E. Gumbrell, E. Harvey, M. Hill, D. Hillier, D. Hoarty, L. Hobbs, N. Hopps, D. Hussey, K. Oades, S. James, M. Norman, J. Palmer, S. Parker, D. Winter, T. Bett, AWE plc (United Kingdom)
- 8780 03 **Recent developments on the Vulcan High Power Laser Facility (Invited Paper)** [8780-2]
I. Musgrave, A. Boyle, D. Carroll, R. Clarke, R. Heathcote, M. Galimberti, J. Green, D. Neely, M. Notley, B. Parry, W. Shaikh, T. Winstone, D. Pepler, A. Kidd, C. Hernandez-Gomez, J. Collier, STFC Central Laser Facility, Rutherford Appleton Lab. (United Kingdom)
- 8780 05 **PEnLOPE: a high peak-power diode-pumped laser system for laser-plasma experiments (Invited Paper)** [8780-4]
M. Siebold, F. Roeser, M. Loeser, D. Albach, U. Schramm, Helmholtz-Zentrum Dresden-Rossendorf e. V. (Germany)

CRYOGENIC LASERS

- 8780 06 **DiPOLE: A multi-slab cryogenic diode pumped Yb:YAG amplifier (Invited Paper)** [8780-5]
S. Banerjee, K. Ertel, P. Mason, J. Phillips, J. Greenhalgh, J. Collier, STFC Central Laser Facility, Rutherford Appleton Lab. (United Kingdom)
- 8780 08 **Diode-pumped, cryogenically cooled, femtosecond burst mode laser** [8780-7]
J. Körner, Friedrich-Schiller-Univ. Jena (Germany); J. Hein, Friedrich-Schiller-Univ. Jena (Germany) and Helmholtz Institute Jena (Germany); H. Liebetrau, Friedrich-Schiller-Univ. Jena (Germany); M. Kahle, R. Seifert, Helmholtz Institute Jena (Germany); D. Klöpfel, Friedrich-Schiller-Univ. Jena (Germany); M. C. Kaluza, Friedrich-Schiller-Univ. Jena (Germany) and Helmholtz Institute Jena (Germany)

ULTRASHORT PULSE LASERS

- 8780 0A **High-power, picosecond pulse thin-disk lasers in the Hilase project** [8780-9]
M. Chyla, Institute of Physics of the ASCR, v.v.i. (Czech Republic) and Czech Technical Univ. in Prague (Czech Republic); T. Miura, M. Smrz, Institute of Physics of the ASCR, v.v.i. (Czech Republic); P. Severova, O. Novak, S. S. Nagisetty, Institute of Physics of the ASCR, v.v.i. (Czech Republic) and Czech Technical Univ. in Prague (Czech Republic); A. Endo, T. Mocek, Institute of Physics of the ASCR, v.v.i. (Czech Republic)

LASER MATERIALS

- 8780 0E **Thermo-optical measurements of ytterbium doped ceramics (Sc_2O_3 , Y_2O_3 , Lu_2O_3 , YAG) and crystals (YAG, CaF_2) at cryogenic temperatures (Invited Paper)** [8780-13]
B. Le Garrec, Institute of Physics of the ASCR, v.v.i. (Czech Republic); V. Cardinali, CEA-CESTA (France); G. Bourdet, LULI, Unité Mixte n° 7605, CNRS, Ecole Polytechnique (France)
- 8780 0G **Spectroscopic characterization of various Yb^{3+} doped laser materials at cryogenic temperatures for the development of high energy class diode pumped solid state lasers** [8780-15]
V. Jambunathan, Institute of Physics of the ASCR, v.v.i. (Czech Republic); J. Koerner, Friedrich-Schiller-Univ. Jena (Germany); P. Sikocinski, M. Divoky, M. Sawicka, A. Lucianetti, Institute of Physics of the ASCR, v.v.i. (Czech Republic); J. Hein, Friedrich-Schiller-Univ. Jena (Germany); T. Mocek, Institute of Physics of the ASCR, v.v.i. (Czech Republic)
- 8780 0H **Laser induced damage of dielectrics down to few cycle pulse duration: test bench and measurements** [8780-16]
O. Utéza, R. Clady, N. Sanner, M. Sentis, LP3, CNRS, Aix-Marseille Univ. (France)

NEW LASER DESIGNS

- 8780 0I **Multipass amplifiers of POLARIS** [8780-17]
S. Keppler, Friedrich-Schiller-Univ. Jena (Germany); C. Wandt, Max-Planck-Institut für Quantenoptik (Germany); M. Hornung, R. Bödefeld, Friedrich-Schiller-Univ. Jena (Germany) and Helmholtz-Institut Jena (Germany); A. Kessler, Helmholtz-Institut Jena (Germany); A. Sävert, M. Hellwing, Friedrich-Schiller-Univ. Jena (Germany); F. Schorcht, Helmholtz-Institut Jena (Germany); J. Hein, Friedrich-Schiller-Univ. Jena (Germany); M. C. Kaluza, Friedrich-Schiller-Univ. Jena (Germany) and Helmholtz-Institut Jena (Germany)
- 8780 0J **Characterization of $\text{Yb}:\text{YAG}$ active slab media based on a layered structure with different doping** [8780-18]
A. Lapucci, M. Ciofini, Istituto Nazionale di Ottica, CNR (Italy); L. Esposito, Institute of Science and Technology for Ceramics, CNR (Italy); P. Ferrara, L. A. Gizzi, Istituto Nazionale di Ottica, CNR (Italy); J. Hostaša, Institute of Science and Technology for Ceramics, CNR (Italy) and Institute of Chemical Technology, Prague (Czech Republic); L. Labate, Istituto Nazionale di Ottica, CNR (Italy); A. Pirri, G. Toci, M. Vannini, Istituto di Fisica Applicata Nello Carrara, CNR (Italy)

- 8780 OK **LD-pumped erbium and neodymium lasers with high energy and output beam quality** [8780-19]
V. V. Kabanov, T. V. Bezyazchnaya, M. V. Bogdanovich, A. V. Grigor'ev, Y. V. Lebiadok, K. V. Lepchenkov, A. G. Ryabtsev, G. I. Ryabtsev, M. A. Shchemelev, B.I. Stepanov Institute of Physics (Belarus)

NEW DEVICES

- 8780 OM **Deformable mirror technologies at AOA Xinetics** [8780-21]
A. Wirth, J. Cavaco, T. Bruno, K. M. Ezzo, Northrop Grumman Adaptive Optics / Xinetics (United States)
- 8780 OP **Design of a tunable parametric wavelength conversion system between 2 and 3 μm pumped by a high-average-power Yb:YAG thin-disk laser** [8780-23]
O. Novák, Institute of Physics of the ASCR, v.v.i. (Czech Republic) and Czech Technical Univ. in Prague (Czech Republic); T. Miura, Institute of Physics of the ASCR, v.v.i. (Czech Republic); P. Severová, Institute of Physics of the ASCR, v.v.i. (Czech Republic) and Czech Technical Univ. in Prague (Czech Republic); A. Endo, T. Mocek, Institute of Physics of the ASCR, v.v.i. (Czech Republic)

LASERS FOR ADVANCED APPLICATIONS

- 8780 OR **Preliminary experimental and simulation results of the ESA QOMA project: a new DPSS laser source suitable for space applications** [8780-25]
G. Tsaknakis, C. Evangelatos, P. Bakopoulos, National Technical Univ. of Athens (Greece); D. Papadopoulos, Lab. Charles Fabry, CNRS, Univ. Paris Sud (France); G. Avdikos, Raymetrics S.A. (Greece); L. Deyra, F. Balembois, P. Georges, Lab. Charles Fabry, CNRS, Univ. Paris Sud (France); A. Papayannis, National Technical Univ. of Athens (Greece); S. Boukios, ThyssenKrupp AG (Germany); G. Tzeremes, European Space Agency (Netherlands)

POSTER SESSION A

- 8780 OW **Modeling and optimization of thin disk structure for high power sub-joule laser** [8780-30]
P. Severová, Institute of Physics of the ASCR, v.v.i. (Czech Republic) and Czech Technical Univ. in Prague (Czech Republic); M. Smrz, Institute of Physics of the ASCR, v.v.i. (Czech Republic); M. Chyla, Institute of Physics of the ASCR, v.v.i. (Czech Republic) and Czech Technical Univ. in Prague (Czech Republic); T. Miura, A. Endo, T. Mocek, Institute of Physics of the ASCR, v.v.i. (Czech Republic)
- 8780 OX **Investigation of Yb:LuAG crystals with high doping concentration** [8780-31]
J. Šulc, Z. Hubka, H. Jeřínková, Czech Technical Univ. in Prague (Czech Republic); K. Nejezchleb, V. Škoda, Crytur, Ltd. Turnov (Czech Republic)

- 8780 11 **Simulation of performance of wavefront correction using deformable mirror in high-average-power laser systems** [8780-37]
J. Pilar, Institute of Physics of the ASCR, v.v.i. (Czech Republic), and Czech Technical Univ. in Prague (Czech Republic); M. Divoky, Institute of Physics of the ASCR, v.v.i. (Czech Republic); P. Sikocinski, Institute of Physics of the ASCR, v.v.i. (Czech Republic) and Czech Technical Univ. in Prague (Czech Republic); V. Kmetik, O. Slezak, A. Lucianetti, Institute of Physics of the ASCR, v.v.i. (Czech Republic); S. Bonora, CNR-IFN (Italy); T. Mocek, Institute of Physics of the ASCR, v.v.i. (Czech Republic)
- 8780 13 **Simple measurement of picosecond laser pulses in a wavelength range above 1 μm** [8780-39]
M. Smrz, T. Miura, P. Straka, A. Endo, T. Mocek, Institute of Physics of the ASCR, v.v.i. (Czech Republic)

Part B *Research Using Extreme Light: Entering New Frontiers with Petawatt-Class Lasers*

HIGH-FIELD PHYSICS AND SIMULATIONS I

- 8780 15 **On extreme field limits in high power laser matter interactions: radiation dominant regimes in high intensity electromagnetic wave interaction with electrons (Invited Paper)** [8780-51]
S. V. Bulanov, Japan Atomic Energy Agency (Japan), A. M. Prokhorov General Physics Institute (Russian Federation), and Moscow Institute of Physics and Technology (Russian Federation); T. Z. Esirkepov, M. Kando, J. K. Koga, T. Nakamura, Japan Atomic Energy Agency (Japan); S. S. Bulanov, The Univ. of California, Berkeley (United States); A. G. Zhidkov, Osaka Univ. (Japan); Y. Kato, The Graduate School for the Creation of New Photonics Industries (Japan); G. Korn, Institute of Physics of the ASCR, v.v.i. (Czech Republic)
- 8780 1A **Effect of the radiation reaction in classical regimes of interaction of ultra-strong electromagnetic fields with plasmas** [8780-56]
R. Capdessus, E. d'Humières, V. T. Tikhonchuk, CELIA, CNRS-CEA, Univ. Bordeaux 1 (France)

SECONDARY SOURCES GENERATED BY HIGH-POWER LASERS

- 8780 1B **Secondary source generation using 30-fs, PW Ti:sapphire laser (PULSER) (Invited Paper)** [8780-57]
T. M. Jeong, H. T. Kim, I. J. Kim, I. W. Choi, C. M. Kim, K. H. Pae, T. J. Yu, S. K. Lee, J. H. Sung, Institute for Basic Science (Korea, Republic of) and Gwangju Institute of Science and Technology (Korea, Republic of); P. V. Nickles, J. Lee, Gwangju Institute of Science and Technology (Korea, Republic of); C. H. Nam, Institute for Basic Science (Korea, Republic of) and Gwangju Institute of Science and Technology (Korea, Republic of)

EXTREME LIGHT SOURCES AND FACILITIES

- 8780 1H **Extreme light infrastructure nuclear physics (ELI-NP): present status and perspectives (Invited Paper)** [8780-63]
D. Ursescu, Horia Hulubei National Institute for Physics and Nuclear Engineering (Romania) and National Institute for Lasers, Plasma and Radiation Physics (Romania); O. Tesileanu, Horia Hulubei National Institute of Physics and Nuclear Engineering (Romania); D. Balabanski, Horia Hulubei National Institute of Physics and Nuclear Engineering (Romania) and Institute for Nuclear Research and Nuclear Energy (Bulgaria); G. Cata-Danil, C. Ivan, I. Ursu, Horia Hulubei National Institute of Physics and Nuclear Engineering (Romania); S. Gales, Horia Hulubei National Institute of Physics and Nuclear Engineering (Romania) and IPN Orsay, IN2P3, CNRS and Univ. ParisXI (France); N. V. Zamfir, Horia Hulubei National Institute of Physics and Nuclear Engineering (Romania)

HIGH-FIELD PHYSICS AND SIMULATIONS II

- 8780 1J **Dense electron-positron plasmas generated by 10PW lasers in the QED-plasma regime (Invited Paper)** [8780-64]
C. P. Ridgers, The Univ. of York (United Kingdom); C. S. Brady, The Univ. of Warwick (United Kingdom); J. G. Kirk, Max-Planck-Institut für Kernphysik (Germany); T. Blackburn, Univ. of Oxford (United Kingdom); T. D. Arber, The Univ. of Warwick (United Kingdom); A. R. Bell, Univ. of Oxford (United Kingdom)
- 8780 1K **Nature of the strong field capabilities of lasers (Invited Paper)** [8780-65]
H. R. Reiss, Max Born Institute (Germany) and American Univ. (United States)
- 8780 1L **Kapitza-Dirac effect and nonresonant nonlinear quantum interaction of laser and electron beams** [8780-66]
H. Hora, The Univ. of New South Wales (Australia); P. H. Handel, Univ. of Missouri (United States)
- 8780 1O **The radiation reaction effect in ultra intense laser foil interactions** [8780-69]
O. Klimo, M. Jirka, Institute of Physics of the ASCR, v.v.i. (Czech Republic) and Czech Technical Univ. in Prague (Czech Republic); M. Masek, Institute of Physics of the ASCR, v.v.i. (Czech Republic); J. Limpouch, Institute of Physics of the ASCR, v.v.i. (Czech Republic), and Czech Technical Univ. in Prague (Czech Republic); M. Bussmann, Helmholtz-Zentrum Dresden-Rossendorf e.V. (Germany); G. Korn, Institute of Physics of the ASCR, v.v.i. (Czech Republic)
- 8780 1Q **Computational relativistic quantum dynamics and its application to relativistic tunneling and Kapitza-Dirac scattering** [8780-71]
H. Bauke, M. Klaiber, E. Yakaboylu, K. Z. Hatsagortsyan, S. Ahrens, Max-Planck-Institut für Kernphysik (Germany); C. Müller, Max-Planck-Institut für Kernphysik (Germany) and Heinrich-Heine-Univ. Düsseldorf (Germany); C. H. Keitel, Max-Planck-Institut für Kernphysik (Germany)
- 8780 1R **Energy transfer in counter-propagating plasmas at sub-relativistic velocities** [8780-87]
V. T. Tikhonchuk, R. Capdessus, E. d'Humières, S. Jequier, S. P. Davis, CELIA, CNRS-CEA, Univ. Bordeaux 1 (France)

HIGH-POWER INTENSE LASER SOURCES WITH ENHANCED REPETITION RATES

- 8780 1T **ELI-Beamlines laser systems: status and design options (Invited Paper)** [8780-74]
B. Rus, P. Bakule, D. Kramer, G. Korn, J. T. Green, J. Nývák, M. Fibrich, F. Batysta, J. Thoma, J. Naylor, T. Mazanec, M. Vitek, R. Barros, E. Koutris, J. Hřebíček, J. Polan, R. Baše, P. Homer, M. Košelja, T. Havlíček, A. Honsa, M. Novák, C. Zervos, P. Korous, M. Laub, Institute of Physics of the ASCR, v.v.i. (Czech Republic); J. Houžvička, Crytur s.r.o. (Czech Republic)
- 8780 1V **Design of kW level picosecond compressor of pump pulses for high power OPCPA** [8780-77]
P. Bakule, Institute of Physics of the ASCR, v.v.i. (Czech Republic); J. Novák, Institute of Physics of the ASCR, v.v.i. (Czech Republic) and Czech Technical Univ. in Prague (Czech Republic); D. Kramer, P. Strkula, M. Novák, J. Hřebíček, E. Koutris, C. Zervos, R. Baše, F. Batysta, Institute of Physics of the ASCR, v.v.i. (Czech Republic); Z. Hubka, Institute of Physics of the ASCR, v.v.i. (Czech Republic) and Czech Technical Univ. in Prague (Czech Republic); J. T. Green, B. Rus, Institute of Physics of the ASCR, v.v.i. (Czech Republic)
- 8780 1W **DiPOLE: a scalable laser architecture for pumping multi-Hz PW systems** [8780-78]
K. Ertel, S. Banerjee, P. D. Mason, P. J. Phillips, R. J. S. Greenhalgh, C. Hernandez-Gomez, J. L. Collier, STFC Central Laser Facility, Rutherford Appleton Lab. (United Kingdom)
- 8780 1Y **Requirements and test capabilities for the damage threshold of optical surfaces in the ELI-beamlines facility** [8780-80]
D. Kramer, R. Barros, B. Rus, J. Hřebíček, T. Medřík, M. Kozlová, E. Koutris, Institute of Physics of the ASCR, v.v.i. (Czech Republic)
- 8780 20 **Thin disk picosecond pump laser for jitter stabilized kHz OPCPA** [8780-82]
J. Novak, Institute of Physics of the ASCR, v.v.i. (Czech Republic) and Czech Technical Univ. in Prague (Czech Republic); P. Bakule, J. T. Green, F. Batysta, Institute of Physics of the ASCR, v.v.i. (Czech Republic); T. Metzger, TRUMPF Laser- und Systemtechnik GmbH (Germany); J. Hřebíček, J. Naylor, T. Mazanec, M. Vitek, B. Rus, Institute of Physics of the ASCR, v.v.i. (Czech Republic)

ACCELERATION OF PARTICLES USING HIGH-POWER PW-CLASS LASERS

- 8780 23 **Enhanced TNSA acceleration with 0.1-1 PW lasers** [8780-85]
D. Margarone, Institute of Physics of the ASCR, v.v.i. (Czech Republic); O. Klimo, Institute of Physics of the ASCR, v.v.i. (Czech Republic) and Czech Technical Univ. in Prague (Czech Republic); I. J. Kim, Gwangju Institute of Science and Technology (Korea, Republic of); J. Prokupek, J. Limpouch, Institute of Physics of the ASCR, v.v.i. (Czech Republic) and Czech Technical Univ. in Prague (Czech Republic); T. M. Jeong, Gwangju Institute of Science and Technology (Korea, Republic of); T. Mocek, Institute of Physics of the ASCR, v.v.i. (Czech Republic); J. Psikal, Institute of Physics of the ASCR, v.v.i. (Czech Republic) and Czech Technical Univ. in Prague (Czech Republic); H. T. Kim, Gwangju Institute of Science and Technology (Korea, Republic of); J. Proska, Czech Technical Univ. in Prague (Czech Republic); K. H. Nam, I. W. Choi, Gwangju Institute of Science and Technology (Korea, Republic of); T. Levato, Institute of Physics of the ASCR, v.v.i. (Czech Republic); L. Stolcova, Czech Technical Univ. in Prague (Czech Republic); S. K. Lee, Gwangju Institute of Science and Technology (Korea, Republic of); M. Krus, Institute of Physics of the ASCR, v.v.i. (Czech Republic) and Czech Technical Univ. in Prague (Czech Republic); F. Novotný, Czech Technical Univ. in Prague (Czech Republic); J. H. Sung, Gwangju Institute of Science and Technology (Korea, Republic of); J. Kaufman, Institute of Physics of the ASCR, v.v.i. (Czech Republic) and Czech Technical Univ. in Prague (Czech Republic); T. J. Yu, Gwangju Institute of Science and Technology (Korea, Republic of); G. Korn, Institute of Physics of the ASCR, v.v.i. (Czech Republic)
- 8780 24 **Collective electron interaction at ultrafast acceleration of plasma blocks (Invited Paper)** [8780-86]
H. Hora, The Univ. of New South Wales (Australia)
- 8780 27 **Laser ion acceleration: from present to intensities achievable at ELI-Beamlines** [8780-89]
J. Limpouch, J. Psikal, O. Klimo, J. Vyskočil, Czech Technical Univ. in Prague (Czech Republic) and Institute of Physics of the ASCR, v.v.i. (Czech Republic); J. Proška, F. Novotný, Czech Technical Univ. in Prague (Czech Republic); L. Štolcová, Czech Technical Univ. in Prague (Czech Republic) and Institute of Physics of the ASCR, v.v.i. (Czech Republic); M. Květoň, Czech Technical Univ. in Prague (Czech Republic)

POSTER SESSION B

- 8780 28 **Energetic study of focused ultrashort Gaussian beams** [8780-75]
L. Carretero, P. Acebal, S. Blaya, A. Fimia, R. Madrigal, Univ. Miguel Hernandez de Elche (Spain)
- 8780 29 **A LIF scheme for HIPER application based on the combination of ultrahigh laser nonlinear force driven plasma blocks and the relativistic acceleration of ions blocks** [8780-90]
S. Moustazis, Technical Univ. of Crete (Greece); P. Lalouis, Institute of Electronic Structure and Laser FORTH (Greece); H. Hora, The Univ. of New South Wales (Australia)

Author Index

Conference Committee

Symposium Chairs

Jiri Homola, Institute of Photonics and Electronics of the ASCR, v.v.i
(Czech Republic)
Chris Edwards, Central Laser Facility, Science and Technology
Facilities Council (United Kingdom)
Mike Dunne, Lawrence Livermore National Laboratory (United States)
Ivo Rendina, Istituto per la Microelettronica e Microsistemi, CNR
(Italy)

Honorary Symposium Chair

Miroslav Miller, Institute of Photonics and Electronics of the ASCR, v.v.i
(Czech Republic)

Part A High-Power, High-Energy, and High-Intensity Laser Technology

Conference Chair

Joachim Hein, Friedrich-Schiller-Universität Jena (Germany)

Conference Programme Committee

Andy J. Bayramian, Lawrence Livermore National Laboratory
(United States)
Jean-Christophe Francis Chanteloup, Ecole Polytechnique (France)
Klaus Ertel, STFC Rutherford Appleton Laboratory (United Kingdom)
Leonida A. Gizzi, Consiglio Nazionale delle Ricerche (Italy)
Bruno Le Garrec, Institute of Physics/ELI Beamlines (France)
Mathias Siebold, Helmholtz-Zentrum Dresden-Rossendorf e. V.
(Germany)

Session Chairs

High Energy Laser Facilities
Bruno J Le Garrec, Institute of Physics/ELI Beamlines (Czech Republic)

Cryogenic Lasers
Paul A. Treadwell, AWE plc (United Kingdom)

Ultrashort Pulse Lasers
Gordon von der Goenna, Hellma Materials GmbH (Germany)

Laser Materials

Ian Musgrave, STFC Rutherford Appleton Laboratory
(United Kingdom)

New Laser Designs

Matthias Siebold, Helmholtz-Zentrum Dresden-Rossendorf e. V.
(Germany)

New Devices

Evgeny A. Perevezentsev, Institute of Applied Physics
(Russian Federation)

Lasers for Advanced Applications

Sebastian Keppler, Friedrich-Schiller-Universität Jena (Germany)

Part B Research Using Extreme Light: Entering New Frontiers with Petawatt-Class Lasers

Conference Chairs

Georg Korn, ELI Beamlines, Institute of Physics of the ASCR, v.v.i.
(Czech Republic)

Luis Oliveira Silva, Universidade Técnica de Lisboa (Portugal)

Conference Programme Committee

Sergei V. Bulanov, Japan Atomic Energy Agency (Japan)

Todd Ditmire, The University of Texas at Austin (United States)

Peter Dombi, Wigner Research Center for Physics of the H.A.S.
(Hungary)

Nelson C. Lopes, Universidade Técnica de Lisboa (Portugal)

Cristina Hernandez-Gomez, STFC Rutherford Appleton Laboratory
(United Kingdom)

Mattias Marklund, Umeå Universitet (Sweden)

Nikolay Narozhny, National Research Nuclear University MEPhI
(Russian Federation)

David Neely, STFC Rutherford Appleton Laboratory (United Kingdom)

Florin Negoita, Horia Hulubei National Institute of Physics and Nuclear
Engineering (Romania)

Alexander Pukhov, Heinrich-Heine-Universität Düsseldorf (Germany)

Johann Rafelski, The University of Arizona (United States)

Bedrich Rus, Institute of Physics of the ASCR, v.v.i. (Czech Republic)

Toshiki Tajima, Ludwig-Maximilians- Universität München (Germany)

Matthew Zepf, Queen's University Belfast (United Kingdom)

Session Chairs

High-Field Physics and Simulations I

Georg Korn, ELI Beamlines, Institute of Physics of the ASCR, v.v.i.
(Czech Republic)

Luis O. Silva, Universidad Técnica de Lisboa (Portugal)

Secondary Sources Generated by High-Power Lasers

Jean-Claude Kieffer, Institut National de la Recherche Scientifique
(Canada)

Extreme Light Sources and Facilities

Matthew Zepf, Queen's University Belfast (United Kingdom)

High-Field Physics and Simulations II

Sergei Bulanov, Japan Atomic Energy Agency (Japan)

Ondrej Klimo, Czech Technical University in Prague (Czech Republic)

High-Power Intense Laser Sources with Enhanced Repetition Rates

David Neely, STFC Rutherford Appleton Laboratory (United Kingdom)

Bedrich Rus, Institute of Physics of the ASCR, v.v.i. (Czech Republic)

Acceleration of Particles using High-Power PW-Class Lasers

Tae Moon Jeong, Gwangju Institute of Science and Technology
(Korea, Republic of)

Sergei Bulanov, Japan Atomic Energy Agency (Japan)

Introduction to Part A: High-Power, High-Energy, and High-Intensity Laser Technology

More than ever, lasers for industrial as well as scientific applications are pushed to deliver higher pulse energies and higher peak power or higher average power. Besides the traditional laser based material processing tools, studies in modern high field physics, like laser plasma interaction, laser particle acceleration, attosecond pulse generation, coherent x-ray production, and inertial confinement fusion research demand specialized lasers with the ability to generate short pulses at such an elevated energy and power level that technical as well as physical limitations apply. To fill the gap between the low repetition rate, (typically flash lamp pumped lasers producing giant pulse energies) and high average power (mostly diode pumped lasers) new technologies are required. These technologies will overcome and extend the limits. It can be noticed that tremendous progress is achieved in the development of large scale laser facilities, laser materials that allow broad band diode pumped pulse amplification, cryogenic cooling that offers an enormous improvement of amplifier efficiencies, laser designs that dramatically simplify the set ups, and new devices that are able to handle the vast power densities. The conference 'High-Power, High-Energy, and High-Intensity Laser Technology' and its proceedings are dedicated to the presentation of all these novel enabling technologies that are needed to build even more powerful laser systems in future.

Joachim Hein