

PROCEEDINGS OF SPIE

Frontiers in Ultrafast Optics: Biomedical, Scientific, and Industrial Applications XXIV

**Peter R. Herman
Roberto Osellame
Adela Ben-Yakar**
Editors

**28–30 January 2024
San Francisco, California, United States**

Sponsored by
SPIE

Co-sponsored by
Amplitude Laser Group (France)
TRUMPF Inc. (United States)

Published by
SPIE

Volume 12875

Proceedings of SPIE 0277-786X, V. 12875

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

Frontiers in Ultrafast Optics: Biomedical, Scientific, and Industrial Applications XXIV,
edited by Peter R. Herman, Roberto Osellame, Adela Ben-Yakar, Proc. of SPIE
Vol. 12875, 1287501 · © 2024 SPIE · 0277-786X · doi: 10.1117/12.3029986

Proc. of SPIE Vol. 12875 1287501-1

The papers 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. Additional papers and presentation recordings may be available online in the SPIE Digital Library at SPIDigitalLibrary.org.

The papers 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 these proceedings:

Author(s), "Title of Paper," in *Frontiers in Ultrafast Optics: Biomedical, Scientific, and Industrial Applications XXIV*, edited by Peter R. Herman, Roberto Osellame, Adela Ben-Yakar, Proc. of SPIE 12875, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X
ISSN: 1996-756X (electronic)

ISBN: 9781510670105
ISBN: 9781510670112 (electronic)

Published by

SPIE

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

Telephone +1 360 676 3290 (Pacific Time)

SPIE.org

Copyright © 2024 Society of Photo-Optical Instrumentation Engineers (SPIE).

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 fees. To obtain permission to use and share articles in this volume, visit Copyright Clearance Center 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.

Printed in the United States of America by Curran Associates, Inc., under license from SPIE.

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

SPIE. DIGITAL LIBRARY
SPIDigitalLibrary.org

Paper Numbering: A unique citation identifier (CID) number is assigned to each article in the Proceedings of SPIE at the time of 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 and print versions of the publication. SPIE uses a seven-digit CID article numbering system structured as follows:

- The first five 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.

Contents

v *Conference Committee*

BIOMEDICAL APPLICATIONS FOR ULTRAFAST LASER SYSTEMS I

- 12875 02 **Ultrabroadband two-beam CARS as a tool in diagnostics and therapy (Invited Paper)** [12875-1]
- 12875 03 **Direct diode pumped Ti:Sapphire oscillator with novel ultrabroad tuning scheme optimized for non-linear optical microscopy** [12875-3]

BIOMEDICAL APPLICATIONS FOR ULTRAFAST LASER SYSTEMS II

- 12875 04 **Plasma persistence, accumulated absorption, and scattering: what physics lets us control the heat left behind in ultrafast-pulse burst-mode laser surgery (Invited Paper)** [12875-6]
- 12875 05 **Design of an ultrafast laser surgical probe towards maximum achievable MRR** [12875-8]
- 12875 06 **Photonic chip of parallel all fiber Bessel-like beam generator array** [12875-9]

SHAPING AND CHARACTERIZATION OF ULTRASHORT PULSES

- 12875 07 **A novel detection mechanism for nonlinear distortions in ultrashort pulses transmitted through dynamic fiber optic links** [12875-15]
- 12875 08 **Single-photon-level femtosecond time-resolved measurement by asynchronous optical sampling with dual-wavelength comb** [12875-16]
- 12875 09 **Spatio-temporal characterization of ultrashort light pulses by structured sampling with a single-pixel detector** [12875-17]
- 12875 0A **Controlling the pulse width by the sample's second-order dispersion to study its instantaneous and non-instantaneous nonlinear refractions** [12875-18]
- 12875 0B **Multiwavelength channel femtosecond beam combiner with independent GDD control** [12875-42]

LASER MODIFICATIONS IN TRANSPARENT MATERIALS

- 12875 0C **Thermal stability of nanogratings in oxide glasses: a route to overcome silica** [12875-21]

12875 OD **Femtosecond laser nanomachining of bulk fused silica** [12875-23]

ULTRAFAST LASER MICRO/NANO-MACHINING

12875 OE **Customized edge cutting of display glass with laser-only machining** [12875-27]

12875 OF **The development of direct laser interference patterning: past, present, and new challenges (Invited Paper)** [12875-28]

NOVEL ULTRAFAST LASER SOURCES

12875 OG **Kilowatt-class high repetition rate ultrafast lasers based on industrial slab and disk laser platforms** [12875-31]

EMERGING COMMERCIAL APPLICATIONS OF ULTRAFAST LASERS

12875 OH **Project Silica: sustainable cloud archival storage in glass (Invited Paper)** [12875-39]

POSTER SESSION

12875 OI **Ultrafast studies on a cyanobacterial chloride pump and its proton pumping mutant** [12875-40]

12875 OJ **Effect of repetition rate on ultrashort pulse laser propagation and energy deposition** [12875-41]

Conference Committee

Symposium Chairs

Stefan Kaierle, Laser Zentrum Hannover e.V. (Germany)
John Ballato, Clemson University (United States)

Symposium Co-chairs

Vassilia Zorba, Lawrence Berkeley National Laboratory
(United States)
Kaoru Minoshima, University of Electro-Communications (Japan)

Program Track Chairs

Henry Helvajian, The Aerospace Corporation (United States)
Guido Hennig, Daetwyler Graphics AG (Switzerland)

Conference Chairs

Peter R. Herman, University of Toronto (Canada)
Roberto Osellame, CNR-Istituto di Fotonica e Nanotecnologie (Italy)
Adela Ben-Yakar, The University of Texas at Austin (United States)

Conference Program Committee

Craig B. Arnold, Princeton University (United States)
Yves Bellouard, Ecole Polytechnique Fédérale de Lausanne
(Switzerland)
Daniel Flamm, TRUMPF Laser- und Systemtechnik GmbH (Germany)
Alexander Heisterkamp, Leibniz University Hannover (Germany)
Denise M. Krol, University of California, Davis (United States)
Eric Mazur, Harvard University (United States)
Eric P. Mottay, Amplitude (France)
Beat Neuenschwander, Berner Fachhochschule Technik und
Informatik (Switzerland)
Stefan Nolte, Friedrich-Schiller-Univ. Jena (Germany)
Aleks Ovsianikov, Technische University Wien (Austria)
Christopher B. Schaffer, Cornell University (United States)
Jan Siegel, Instituto de Óptica "Daza de Valdés" (Spain)
Koji Sugioka, RIKEN Center for Advanced Photonics (Japan)
Mitsuhiro Terakawa, Keio University (Japan)
Alfred Vogel, University zu Lübeck (Germany)
Dvir Yelin, Technion-Israel Institute of Technology (Israel)

