

PROCEEDINGS OF SPIE

***Frontiers in Ultrafast Optics:
Biomedical, Scientific, and
Industrial Applications XX***

**Peter R. Herman
Michel Meunier
Roberto Osellame**
Editors

**1–4 February 2020
San Francisco, California, United States**

Sponsored by
SPIE

Cosponsored by
Amplitude (France)
TRUMPF Inc. (United States)

Published by
SPIE

Volume 11270

Proceedings of SPIE 0277-786X, V. 11270

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

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 SPIEDigitalLibrary.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 Ultrastat Optics: Biomedical, Scientific, and Industrial Applications XX*, edited by Peter R. Herman, Michel Meunier, Roberto Osellame, Proceedings of SPIE Vol. 11270 (SPIE, Bellingham, WA, 2020) Seven-digit Article CID Number.

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510633032

ISBN: 9781510633049 (electronic)

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 © 2020, 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 \$21.00 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/20/\$21.00.

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

SPIEDigitalLibrary.org

Paper Numbering: *Proceedings of SPIE* follow an e-First publication model. A unique citation identifier (CID) number is assigned to each article 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	<i>Authors</i>
vii	<i>Conference Committee</i>

LASE PLENARY SESSION

11270 02	Compact terahertz driven electron and x-ray sources (Plenary Paper) [11270-302]
----------	--

SESSION 1 BIOMEDICAL APPLICATIONS FOR ULTRAFAST LASERS

11270 04	Aluminum oxide membrane as a functional element for filtering bioparticles in micro hydraulic devices [11270-2]
11270 05	Increase in efficacy of near-infrared laser induced refractive index change (LIRIC) in corneal tissue with sodium fluorescein and riboflavin: comparison of two repetition rates [11270-3]

SESSION 2 ULTRAFAST LASERS FOR THE MANIPULATION OF CELLS

11270 09	User-defined and localized cellular alignment using femtosecond laser hydrogel densification [11270-7]
----------	---

SESSION 3 ULTRAFAST LASER-MATTER INTERACTION

11270 0C	Uncovering the mechanism of the ultrafast UV-energy dissipation in the eumelanin pigment [11270-10]
----------	--

SESSION 4 ULTRAFAST LASER IMAGING AND DIAGNOSTICS

11270 0K	Ultrafast pulse metrology for industrial applications [11270-20]
----------	---

SESSION 5 ULTRAFAST LASER MICRO/NANO-MACHINING

11270 0Q	Enhanced efficacy in refractive corrections of rabbit corneas with low repetition rate blue femtosecond laser pulses [11270-26]
----------	--

SESSION 6 ULTRAFAST LASER WRITING OF INTEGRATED PHOTONIC DEVICES

11270 0V **High contrast ultrashort pulse written transmission filter based on Moiré fiber grating** [11270-31]

SESSION 7 ADVANCED ULTRAFAST LASER PROCESSING TECHNIQUES

11270 0Y **Generalized non-diffracting beams for ultrafast materials processing** [11270-34]

11270 12 **Picosecond laser-induced shock waves patterning on shape memory alloys** [11270-37]

11270 13 **Hollow-core-fiber laser-light-cable on TruMirco Series 2000 for easy system integration**
[11270-38]

SESSION 8 NOVEL ULTRAFAST LASER SOURCES

11270 15 **Widely-tunable femtosecond source tunable between 770-1180 nm for two-photon fluorescence microscopy** [11270-40]

11270 16 **High repetition rate CEP-stable Yb-doped fiber amplifier** [11270-41]

SESSION 9 3D ULTRAFAST LASER MICROFABRICATION

11270 1B **Resonant micro-opto-mechanical modulators fabricated by femtosecond laser micromachining** [11270-45]

11270 1E **All laser-based fabrication of optical elements** [11270-48]

SESSION 10 ULTRAFAST LASER-INDUCED MODIFICATIONS IN TRANSPARENT MATERIALS: JOINT SESSION WITH 11267 AND 11270

11270 1H **Femtosecond laser micromachining in hydrophobic intraocular lenses: efficacy and material effects** [11270-51]

POSTER SESSION

11270 1J **Delay control in laser-assisted photoionization of water molecules by attopulses** [11270-53]