

PROCEEDINGS OF SPIE

Specialty Optical Fibres

Kyriacos Kalli
Alexis Mendez
Pavel Peterka
Editors

24–25 April 2023
Prague, Czech Republic

Sponsored by
SPIE

Cooperating Organisations
ELI Beamlines (Czech Republic)
HiLASE Centre (Czech Republic)
Laserlab Europe
AWE (United Kingdom)
STFC (United Kingdom)

Published by
SPIE

Volume 12573

Proceedings of SPIE 0277-786X, V. 12573

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 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 *Specialty Optical Fibres*, edited by Kyriacos Kalli, Alexis Mendez, Pavel Peterka, Proc. of SPIE 12573, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510662667

ISBN: 9781510662674 (electronic)

Published by

SPIE

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

Telephone +1 360 676 3290 (Pacific Time)

SPIE.org

Copyright © 2023 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

vii *Conference Committee*

SESSION 1 POLYMER OPTICAL FIBERS AND FIBER BRAGG GRATINGS

- 12573 03 **Femtosecond laser written ZBLAN tilted fibre Bragg grating for mode-locked mid-infrared laser applications** [12573-2]
- 12573 04 **Humidity responsivity of CYTOP-XYLEX fibre Bragg grating sensors** [12573-3]
- 12573 05 **Femtosecond inscription of a spectral array of four fiber Bragg gratings at the same spot, using a single uniform phase-mask** [12573-4]

SESSION 2 OPTICAL FIBER SENSORS AND DEVICES

- 12573 06 **Distributed acoustic sensing over available fiber networks: what can available fiber infrastructure tell us about our planet (Invited Paper)** [12573-5]
- 12573 07 **Non-Hermitian light control in periodically modulated multimode fibers** [12573-7]
- 12573 08 **Single-mode nanoparticles-doped optical fibers: opportunities for high-performance biosensing (Invited Paper)** [12573-8]

SESSION 3 SOFT GLASS FIBERS AND OPTICAL FIBER TECHNOLOGY

- 12573 0B **Numerical optimization of tunable Dy-doped ZBLAN fiber lasers for yellow emission** [12573-11]
- 12573 0D **Specialty fiber fabrication using carbon monoxide laser heating (Invited Paper)** [12573-13]

SESSION 4 SPECIALTY FIBERS FOR FIBER LASER DEVICES

- 12573 0E **Fiber components based on large-mode chirally coupled core specialty fibers for all-fiber laser systems (Best Student Paper Award)** [12573-14]
- 12573 0H **Temperature-dependence of cross-relaxation coefficient of the thulium-doped silica fibers** [12573-17]

SESSION 5 NOVEL OPTICAL FIBER DESIGNS

- 12573 OI **Ring core fiber supporting orbital angular momentum for modal multiplexing (Invited Paper)** [12573-18]
- 12573 OL **Thulium-doped fiber amplifier optimized for wavelengths beyond 1800 nm** [12573-21]
- 12573 OM **Statistical learning method for modal analysis of optical fibers** [12573-22]

SESSION 6 OPTICAL FIBERS FOR BIOMEDICAL APPLICATIONS

- 12573 OP **Soft infrared optoelectronic fibers for modulation and recording of neural activity** [12573-25]
- 12573 OQ **Ultra-low numerical aperture counter-propagating intracavity optical tweezers** [12573-26]
- 12573 OR **Novel technologies to micro and nanostructure highly nonplanar optical fibers: from the micro to the sub-50 nm regime (Invited Paper)** [12573-27]

POSTER SESSION

- 12573 OS **Design and fabrication of special photonic crystal fibers for sensing applications** [12573-28]
- 12573 OT **Signal processing treatments for static and dynamic Brillouin distributed sensing** [12573-29]
- 12573 OU **Post-radiation effects of core pumped monolithic holmium-doped silica fibre lasers** [12573-30]
- 12573 OV **Semi-analytical computation method for propagation loss of hollow-core anti-resonant fiber** [12573-31]
- 12573 OW **Spectrally effective mitigation of polarization mode dispersion in optical fibers** [12573-32]
- 12573 OX **Nanocrystalline ceramic coatings for the capillary fiber lasers** [12573-33]
- 12573 OY **Adjusting the transmission bands of the negative curvature hollow-core fibers** [12573-35]
- 12573 OZ **Soliton Raman shift wavelength tuning through the pump pulse polarization control** [12573-36]
- 12573 10 **Luminescence lifetime of Er-doped silica optical fibers: the role of composition and fabrication processing** [12573-37]
- 12573 11 **Optimization of erbium and ytterbium concentration in nanostructured core fiber for dual-wavelength fiber lasers** [12573-38]

12573 15

Elimination of temperature cross-sensitivity for polymer FBG-based humidity sensor by gamma radiation treatment [12573-43]