

PROCEEDINGS OF SPIE

***Novel Optical Systems, Methods,
and Applications XXIII***

Cornelius F. Hahlweg
Joseph R. Mulley
Editors

24 August – 4 September 2020
Online Only, United States

Sponsored and Published by
SPIE

Volume 11483

Proceedings of SPIE 0277-786X, V. 11483

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 *Novel Optical Systems, Methods, and Applications XXIII*, edited by Cornelius F. Hahlweg, Joseph R. Mulley, Proceedings of SPIE Vol. 11483 (SPIE, Bellingham, WA, 2020) Seven-digit Article CID Number.

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510637726

ISBN: 9781510637733 (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

SPIDigitalLibrary.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

NOVEL SYSTEMS, METHODS AND APPLICATIONS I

- 11483 03 **A handheld, EOIR, synthetic aperture, beyond-diffraction-limited, 3D imaging prototype**
[11483-2]
- 11483 04 **Optical coherence tomography with a structure of the spatial heterodyne spectrometer**
[11483-3]
- 11483 05 **Design of heterodyne Fourier-transform spectrometer with a Fourier transform lens** [11483-4]

HYPERSPPECTRAL AND FLUORESCENCE APPLICATIONS

- 11483 07 **Rapid detection of color-treated pearls and separation of pearl types using fluorescence analysis (Invited Paper)** [11483-6]
- 11483 08 **New spectro-imager designs for MOEMS-based instruments in Earth and Universe observation**
[11483-7]
- 11483 0B **Providing the uniform field of illumination in wide spectral and dynamic ranges** [11483-34]

NOVEL SYSTEMS, METHODS AND APPLICATIONS II

- 11483 0C **Ten years after (no, not the band): advancements in optical engineering computations over the decade(s) (Invited Paper)** [11483-10]
- 11483 0D **Analysis of extended depth of focus systems with complex pupil decomposition** [11483-11]
- 11483 0E **Development and testing of a stabilization and image processing system for improvement of mobile fundus camera image quality** [11483-12]
- 11483 0G **Variable extended depth of field imaging using freeform optics** [11483-14]

PHOTONICS, MATERIALS, AND STRUCTURES I

- 11483 0H **Conical microstructures made of biopolymers for guiding and delivering light** [11483-15]
- 11483 0I **Quadramer-based dielectric metasurfaces featuring magnetic octupole resonance** [11483-16]

11483 OK **A Taguchi-based performance predictive optimization model to design broadband antireflector** [11483-18]

PHOTONICS, MATERIALS, AND STRUCTURES II

11483 OL **Performance analysis of vertical photodetector for efficient on chip optical interconnect** [11483-19]

11483 OM **Design of Mach-Zehnder modulator-based optical reversible gate for high speed data transmission** [11483-20]

11483 ON **Solc-style birefringent color filters based on multi-twist retarders** [11483-21]

POSTER SESSION

11483 OQ **Utilizing wall collision broadening of O₂ absorption line for pore size assessment** [11483-23]

11483 OS **Comparison of quantum CPT and EPR magnetometers** [11483-25]

11483 OT **Waveguide chip coupled with microfluidics enables super-resolution live-cell imaging** [11483-26]

11483 OU **Phase tomography of the polycrystalline structure of blood films** [11483-27]

11483 OV **Sensitivity analysis of dye absorption-spectrum transferability relative to substrates** [11483-28]

11483 OX **Investigation on the role of coherence in polarization beam combining of 2 x 100W fiber lasers** [11483-30]

11483 OY **Ray tracing tool for arbitrary gradient index optical components** [11483-31]