

PROCEEDINGS OF SPIE

Holography: Advances and Modern Trends VIII

Antonio Fimia
Miroslav Hrabovský
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 12574

Proceedings of SPIE 0277-786X, V. 12574

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

Holography: Advances and Modern Trends VIII, edited by Antonio Fimia,
Miroslav Hrabovský, Proc. of SPIE Vol. 12574, 1257401
© 2023 SPIE · 0277-786X · doi: 10.1117/12.2688456

Proc. of SPIE Vol. 12574 1257401-1

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 *Holography: Advances and Modern Trends VIII*, edited by Antonio Fimia, Miroslav Hrabovský, Proc. of SPIE 12574, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

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

ISBN: 9781510662681
ISBN: 9781510662698 (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*

ADVANCED HOLOGRAPHY: SPECIAL SESSION HONORING JOHN (SEÁN) SHERIDAN

- 12574 03 **Multilayer volume holographic gratings from BayFol HX: light and neutron optical characteristics (Invited Paper)** [12574-1]
- 12574 04 **Enhanced design of pure phase greyscale diffractive optical elements by phase-retrieval-assisted multiplexing of complex functions** [12574-2]
- 12574 05 **Modelling HOE performance with an extended source: experimental investigation using misaligned point sources** [12574-3]
- 12574 06 **Development of holographic optical elements for use in wound monitoring** [12574-4]
- 12574 07 **Spinning optical drills by dynamic high-order Bessel beam mixing** [12574-5]

METAMATERIALS AND DIGITAL HOLOGRAPHY

- 12574 08 **Laser ultrasonics for measurement of the thickness of metal plates using a photorefractive liquid crystal (Invited Paper)** [12574-7]
- 12574 0A **Fresnel incoherent correlation holography with Lucy-Richardson-Rosen algorithm and modified Gerchberg-Saxton algorithm** [12574-41]

HOLOGRAPHIC MATERIALS I

- 12574 0C **Development of high efficiency and wide acceptance angle holographic solar concentrators for breakthrough photovoltaic applications** [12574-11]
- 12574 0D **Fabrication and characterisation of large area, uniform, and controllable surface relief patterns in photopolymer material** [12574-13]
- 12574 0E **Design and fabrication of volume holographic optical couplers for a range of non-normal incidence angles** [12574-14]

HOLOGRAPHIC MATERIALS II

- 12574 0F **Generating diffraction efficiency profiles in Bayfol HX vHOEs (Invited Paper)** [12574-15]
- 12574 0G **Diffraction efficiency in reflection holograms stored in photopolymers doped with metallic nanoparticles** [12574-16]
- 12574 0H **Improvements in VPHGs for astronomy based on photopolymers** [12574-17]
- 12574 0I **High-performance liquid chromatography and UV-visible measurements to optimize the storage of volume holograms in hydrogels** [12574-18]
- 12574 0J **System for the manufacture of low-frequency gratings with different geometric profiles** [12574-19]

DIGITAL HOLOGRAPHY I

- 12574 0L **Holographic-laser-excited volumetric graphics (Invited Paper)** [12574-21]
- 12574 0M **Holographic solution to a fundamental problem in diffractive optics: resolution beyond diffraction and lithography limits** [12574-22]
- 12574 0N **Deep variational Hilbert quantitative phase imaging** [12574-23]
- 12574 0O **Realizing large-area diffractive lens using multiple subaperture diffractive lenses and computational reconstruction** [12574-24]

DIGITAL HOLOGRAPHY II

- 12574 0R **Quantitative comparison of the light sources in grating-based common-path quantitative phase microscopy** [12574-26]
- 12574 0S **Design and fabrication of multiple LED illuminated computer-generated holograms generating 3D effects for automotive applications** [12574-27]
- 12574 0V **Experimental examination of lensless digital holographic microscopy imaging capabilities based on custom-designed spatial resolution targets** [12574-30]
- 12574 0W **Compressive digital holography and Gibbs ringing** [12574-31]

3D HOLOGRAPHY

- 12574 0X **Performance evaluation of different optical schemes for realization of holographic printers**
[12574-32]
- 12574 0Y **Grating-based common-path quantitative phase microscopy in low photon budget regime**
[12574-33]
- 12574 0Z **CCD and Hartmann-Shack wavefront sensor to analyse holographic lens resolution**
(Best Student Paper Award) [12574-34]
- 12574 10 **Measuring the lipid content in angiosperms using in-line digital holographic microscopy**
[12574-35]
- 12574 11 **Double exposure ESPI for non-contact photoacoustic tomography** [12574-36]

POSTER SESSION

- 12574 12 **Chalcogenide thin films as a material for holographic applications** [12574-37]
- 12574 13 **Developing novel holographic optomechanical sensing platform for detection of volatile organic compounds** [12574-38]
- 12574 14 **Study of the conservation of different holograms sandwiched between glasses** [12574-39]

Conference Committee

Symposium Chairs

Bedřich Rus, ELI Beamlines (Czech Republic)
Saša Bajt, Deutsches Elektronen-Synchrotron (Germany)
Ivo Rendina, Istituto per la Microelettronica e Microsistemi, CNR (Italy)
Mike Dunne, SLAC National Accelerator Laboratory (United States)
Chris Edwards, Central Laser Facility, Science and Technology
Facilities Council (United Kingdom)

Conference Chairs

Antonio Fimia, Universidad Miguel Hernández de Elche (Spain)
Miroslav Hrabovský, Palacký University Olomouc (Czech Republic)

Conference Programme Committee

Augusto Beléndez Vázquez, Universidad de Alicante (Spain)
Andrea Bianco, INAF - Osservatorio Astronomico di Brera (Italy)
Hans I. Bjelkhagen, Hansholo (United Kingdom)
Friedrich-Karl Bruder, Covestro AG (Germany)
Sergio Calixto-Carrera, Centro de Investigaciones en Óptica, A.C.
(Mexico)
Christiane Carre, Ecole Nationale Supérieure des Sciences
Appliquées et de Technologie (France), CNRS Foton (France), and
Université de Rennes 1 (France)
Radim Chmelík, Brno University of Technology (Czech Republic)
Giuseppe Coppola, Istituto per la Microelettronica e Microsistemi,
CNR (Italy)
Claas Falldorf, Bremer Institut für angewandte Strahltechnik GmbH
(Germany)
Martin Fally, Universität Wien (Austria)
Tigran Galstian, Centre d'Optique, Photonique et Laser, Université
Laval (Canada)
Unnikrishnan Gopinathan, Instruments Research and Development
Establishment (India)
Yoshio Hayasaki, Utsunomiya University Center for Optical Research
and Education (Japan)
John J. Healy, University College Dublin (Ireland)
Bryan M. Hennelly, National University of Ireland, Maynooth (Ireland)
Ken Yuh Hsu, National Chiao Tung University (Taiwan)
Damien P. Kelly, Oryx Consulting (Germany)
Milos Kopecky, Institute of Physics of the ASCR, v.v.i.
(Czech Republic)

Raymond K. Kostuk, The University of Arizona (United States)
Libor Kotacka, Optaglio s.r.o. (Czech Republic)
Malgorzata Kujawińska, Warsaw University of Technology (Poland)
Jacques Lalevée, Université de Haute Alsace (France)
Osamu Matoba, Kobe University (Japan)
Robert R. McLeod, University of Colorado Boulder (United States)
Miroslav Miler, Academy of Sciences of the Czech Republic
(Czech Republic)
Christoph Neipp, Universidad de Alicante (Spain)
Takanori Nomura, Wakayama University (Japan)
Sergey B. Odínokov, Bauman Moscow State Technical University
(Russian Federation)
Inmaculada Pascual, Universidad de Alicante (Spain)
Giancarlo Pedrini, Institut für Technische Optik (Germany)
Kalaichelvi Saravanamuttu, McMaster University (Canada)
Guohai Situ, Shanghai Institute of Optics and Fine Mechanics (China)
Yasuhiro Takaki, Tokyo University of Agriculture and Technology
(Japan)
Yasuo Tomita, The University of Electro-Communications (Japan)
Vladimir Y. Venediktov, Saint Petersburg Electrotechnical University
"LETI" (Russian Federation)
Przemyslaw W. Wachulak, Military University of Technology (Poland)
Min Wan, University College Dublin (Ireland)
Dayong Wang, Beijing University of Technology (China)
Rafael Yuste, Columbia University (United States)
Stanislovas J. Zacharovas, Geola Digital uab (Lithuania)
Haizheng Zhong, Beijing Institute of Technology (China)
Igor Zhurminsky, Centre Suisse d'Electronique et de Microtechnique
SA (Switzerland)