PROCEEDINGS OF SPIE

Holography: Advances and Modern Trends IX

Antonio Fimia Miroslav Hrabovský Izabela Naydenova Editors

8-10 April 2025 Prague, Czech Republic

Sponsored by SPIE

Cosponsored by ELI Beamlines, ELI-ERIC (Czech Republic) Inprentus, Inc. (United States) CeramOptec® (Latvia)

Cooperating Organisations
HiLASE (Czech Republic)
AWE (United Kingdom)
Czech and Slovak Optical Society (Czech Republic)

Published by SPIE

Volume 13529

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 *Holography: Advances and Modern Trends IX*, edited by Antonio Fimia, Miroslav Hrabovský, Izabela Naydenova, Proc. of SPIE 13529, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510688544

ISBN: 9781510688551 (electronic)

Published by

SPIE

P.O. Box 10, Bellingham, Washington 98227-0010 USA Telephone +1 360 676 3290 (Pacific Time) SPIE.org

Copyright © 2025 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.



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

DIGITAL HOLOGRAPHIC MICROSCOPY I

	DIGITAL HOLOGRAF HIC MICROSCOFT I
13529 02	Biological cell imaging by digital holographic microscopy with double field of view (Invited Paper) [13529-1]
13529 03	Imaging of phase transitions in single levitated aerosol particles using digital in-line holography (Invited Paper) [13529-2]
13529 04	Single-shot characterization of microlenses using digital holographic microscopy (Best Student Paper Award) [13529-3]
13529 05	The use of digital holographic microscopy for the characterisation of fibrous biomaterials [13529-4]
13529 06	Portable cellphone-based lensless holographic microscope with a customized freeform lens $[13529-5]$
13529 07	Temporal phase unwrapping for under-sampled spectral signal with tilted interference [13529-6]
	HOLOGRAPHIC RECORDING MATERIALS I
13529 09	Advancing the performance of dual-thiol holographic photopolymers via kinetic selectivity [13529-8]
13529 0A	Insight into the mechanism of thiol-based photopolymers for DOEs [13529-9]
	HOLOGRAPHIC RECORDING MATERIALS II
13529 OC	Doping hybrid photopolymerisable glass with BODIPY photosensitiser: an efficient approach to improve UV resistance [13529-11]
13529 0D	Recording holographic diffusers in a photopolymerizable glass [13529-12]
13529 OE	Improving the mechanical robustness, UV curability, and humidity resistance of an acrylamide/polyvinyl alcohol-based photopolymer material for volume holography applications with LEDs by using D-sorbitol as a naturally occurring plasticiser [13529-13]
13529 OF	Thermal behavior and production capabilities of photopolymer-based VPHGs [13529-14]

HOLOGRAPHIC OPTICAL ELEMENTS I

13529 OH	In-situ automotive camera calibration using holographic resolution targets [13529-16]
13529 01	Customized PVA/AA diffraction gratings by high repetition rate femtosecond direct laser writing [13529-17]
13529 OJ	Automated holographic recording using six-axis robot arm pair [13529-18]
13529 OL	Application of nanodiamond-polymer composite holographic gratings in a very cold neutron interferometer (Invited Paper) [13529-40]
	HOLOGRAPHIC OPTICAL ELEMENTS II
13529 OM	Wavelength-shifted holographic recording of multiplexed volume holographic optical couplers for solar collection (Invited Paper) [13529-20]
13529 ON	Fundamental tools in the design of hololens-based optical devices [13529-21]
13529 00	On-axis collimation of LED output using stacked volume holographic optical elements [13529-22]
13529 OP	Design constraints and feasibility of holographic optical lenses for vision correction [13529-23]
13529 0Q	Design and fabrication of hierarchical microstructures for advanced optical applications [13529-29]
	HOLOGRAPHIC PROGRAPHIC MATERIALS III
-	HOLOGRAPHIC RECORDING MATERIALS III
13529 OR	Stability analysis of symmetric holographic transmission gratings stored in photohydrogels [13529-24]
13529 OS	Modification of the hygroscopic properties of a low-toxicity photopolymer [13529-25]
13529 OT	Investigation of a polymer-based holographic grating for visible light dosimetry using a bleachable dye [13529-26]
13529 OU	Advanced hydrogel-based volume holographic gratings for label-free biosensing [13529-27]

POSTER SESSION

13529 OY	Low-toxicity photopolymer biophotopol optimization to record wavelength-shifted holographic couplers [13529-32]
13529 OZ	Fabrication and characterization of liquid crystal cells based on azo dye photoalignment $[13529-33]$
13529 11	Experimental study of PVA/AA photopolymers by means of pulsed laser exposure [13529-35]
13529 12	Green's method for solving the Helmholtz scalar equation with applications to refractive index media [13529-36]