PROCEEDINGS OF SPIE

Advanced Optics for Imaging Applications: UV through LWIR VIII

Jay N. Vizgaitis
Peter L. Marasco
Jasbinder S. Sanghera
Editors

1 May 2023 Orlando, Florida, United States

Sponsored and Published by SPIE

Volume 12530

Proceedings of SPIE 0277-786X, V. 12530

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 Advanced Optics for Imaging Applications: UV through LWIR VIII, edited by Jay N. Vizgaitis, Peter L. Marasco, Jasbinder S. Sanghera, Proc. of SPIE 12530, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510661745

ISBN: 9781510661752 (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.



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

v Conference Committee

	NOVEL OPTICS FOR SYSTEMS
12530 04	Passive vibration isolation system for an optical unit of a MWIR missile warning sensor [12530-1]
12530 06	Composite TiO ₂ /polypropylene solid immersion lenses for super-resolution terahertz imaging [12530-5]
	ADVANCED OPTICAL DESIGN
12530 09	Wide field-of-view NURBS-based freeform afocal telescope [12530-8]
12530 0A	Wide-wide linear astigmatism free-three mirror system (LAF-TMS) enabling wide field-of-view and spectral bandwidth detection [12530-9]
12530 OB	Impact of data variety on physics-informed neural network lens design [12530-10]
	OPTICAL COATINGS AND MATERIALS
12530 OC	Salt spray resistant silver coatings for aerospace and defense applications [12530-11]
12530 0D	Corrosion resistance environment durable SWIR-MWIR AR coatings [12530-12]
12530 OE	Reduction in NIR absorption of spinel through annealing [12530-15]
12530 OF	Resilience of IRG glasses under ionizing radiations [12530-16]
	METAMATERIALS
12530 OH	Monochrome metasurface lens design for optical wireless transceivers [12530-18]
12530 01	Wide field-of-view long-wave infrared metalenses [12530-19]

12530 OJ	Mapping meta-atoms to near field response for inverse design of optical metasurfaces [12530-20]
12530 OK	Metasurface hybrid lens inverse design with diffractive/refractive co-optimization [12530-21]

Conference Committee

Symposium Chairs

Tien Pham, The MITRE Corporation (United States) **Douglas R. Droege**, L3Harris Technologies, Inc. (United States)

Symposium Co-chairs

Augustus W. Fountain III, University of South Carolina (United States) **Teresa L. Pace**, L3Harris Technologies, Inc. (United States)

Program Track Chair

Ann Marie Raynal, Sandia National Laboratories (United States)

Conference Chairs

Jay N. Vizgaitis, optX Imaging Systems (United States)
 Peter L. Marasco, Air Force Research Laboratory (United States)
 Jasbinder S. Sanghera, U.S. Naval Research Laboratory (United States)

Conference Program Committee

Bjørn F. Andresen, Infrared Technologies and Applications (Israel) **Guy Beadie**, Peak Nano Optics (United States)

Kyle R. Bryant, U.S. Army Combat Capabilities Development Command (United States)

John P. Deegan, Rochester Precision Optics, LLC (United States)

Stephen P. McGeoch, Thales Optronics, Ltd. (United Kingdom)

S. Craig Olson, L3Harris Technologies, Inc. (United States) **Clara Rivero-Baleine**, Lockheed Martin Missiles and Fire Control

Clara Rivero-Baleine, Lockheed Martin Missiles and Fire Control (United States)

Harry H. Schlemmer, HENSOLDT Optronics GmbH (Germany)

Miguel P. Snyder, DEVCOM C5ISR (United States)

Doron Sturlesi, Rafael Advanced Defense Systems Ltd. (Israel)

Alan Symmons, Vital Materials Co., Ltd. (United States)

Stan Szapiel, Raytheon ELCAN Optical Technologies (Canada)

Nicholas A. Thompson, Excelitas Technologies Corporation (United Kingdom)

Jue Wang, Corning Incorporated (United States)