

PROCEEDINGS OF SPIE

Functional Material Applications: From Energy to Sensing

Alistair H. Kean

Nikhil Bhalla

Editors

24–25 October 2023

Glasgow, United Kingdom

Sponsored by

SPIE

Supported by

Glasgow Convention Bureau (United Kingdom)

Cooperating Organizations

Fraunhofer UK Research Limited (United Kingdom)

Innovate UK KTN (United Kingdom)

Photonics Leadership Group (United Kingdom)

Photonics 21 (United Kingdom)

Censis (United Kingdom)

Technology Scotland (United Kingdom)

Published by

SPIE

Volume 12796

Proceedings of SPIE 0277-786X, V. 12796

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 *Functional Material Applications: From Energy to Sensing*, edited by Alistair H. Kean, Nikhil Bhalla, Proc. of SPIE 12796, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510668454

ISBN: 9781510668461 (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

v *Conference Committee*

METAMATERIALS

12796 02 **Machine-learning-based microwave ghost imaging using reconfigurable metasurface**
[12796-3]

SENSING

12796 03 **Cystatin C for chronic kidney disease monitoring via the application of gold core-shells in lateral flow immunoassays** [12796-6]

12796 04 **SPR sensor based on switch effect for very low hydrogen detection** [12796-7]

12796 05 **Towards fast 2D imaging of gas flows using focal planar arrays** [12796-34]

PLASMONICS

12796 06 **Deep eutectic solvents as a potential contrast enhancing agent for plasmon enhanced colorimetric histology** [12796-10]

12796 07 **SF₆ plasma-assisted Au nanostructure formation for LSPR sensing** [12796-12]

12796 08 **Axicon cloak: broadband field of view invisibility for a visible light** [12796-36]

PHOTONICS

12796 09 **Deposition of antireflective coatings on 3D micro-optics using atomic layer deposition**
[12796-19]

12796 0A **The research of birefringence of infrared optical crystal ZnS and Si** [12796-20]

12796 0B **Beam shaping for high-speed surface functionalisation** [12796-21]

SEMICONDUCTORS

- 12796 0C **Analysis of process mechanism of Ag terminals welded On Cu substrate** [12796-32]
- 12796 0D **Integrated ultrahigh vacuum facility for photocathode preparation and in-situ characterization** [12796-33]

POSTER SESSION

- 12796 0E **Real-time monitoring of surface relief grating formation in azopolymer thin films** [12796-26]
- 12796 0F **At-source hospital wastewater treatment to eliminate harmful pharmaceuticals: a novel immobilised approach using UV-LED activated photocatalytic nanomaterials** [12796-27]
- 12796 0G **Investigation of self-powered photoresponse performance of all inorganic lead-free halide perovskites (CsSnCl₃) nanocrystals (NCs) decorated Er:ZnO nanowires/Si heterojunctions** [12796-29]
- 12796 0H **Synthesis and characterization study of a novel lead-free hybrid organic-inorganic halide double perovskite (MA)₂NbBiCl₆ for photonics applications** [12796-30]