

PROCEEDINGS OF SPIE

Photonic and Phononic Properties of Engineered Nanostructures XIV

**Ali Adibi
Shawn-Yu Lin
Axel Scherer**
Editors

**29 January – 1 February 2024
San Francisco, California, United States**

Sponsored and Published by
SPIE

Volume 12896

Proceedings of SPIE 0277-786X, V. 12896

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 *Photonic and Phononic Properties of Engineered Nanostructures XIV*, edited by Ali Adibi, Shawn-Yu Lin, Axel Scherer, Proc. of SPIE 12896, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

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

ISBN: 9781510670525
ISBN: 9781510670532 (electronic)

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

Copyright © 2024 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*

PLASMONIC STRUCTURES

12896 02 **Terahertz radiation of plasmonic hot carriers (Invited Paper)** [12896-4]

NONLINEAR PHOTONIC NANOSTRUCTURES

12896 03 **Design and simulation of dielectric metasurface for aberration correction in fiber-scanning microendoscope** [12896-12]

RECONFIGURABLE NANOPHOTONICS USING PHASE-CHANGE MATERIALS

12896 04 **Demonstration of wideband tunability in chalcogenide metamaterials** [12896-16]

NOVEL INVERSE DESIGN TECHNIQUES FOR NANOPHOTONIC STRUCTURES

12896 05 **Photonic power splitter design based on deep learning and gradient descent method** [12896-25]

NANOPHOTONIC DESIGN APPROACHES BASED ON ARTIFICIAL INTELLIGENCE

12896 06 **Optimizing the design of birefringent metasurfaces with deep learning neural networks** [12896-30]

RESONANCE-BASED NANOPHOTONIC DEVICES

12896 07 **Deciphering cavity modes in Berkeley surface-emitting lasers (BerkSELS)** [12896-33]

12896 08 **Quantum dot micropillar cavities with SiO₂ hard mask microlenses** [12896-35]

METAPHOTONIC DEVICES FOR IMAGING AND SENSING APPLICATIONS

12896 09 **Multi-perspective imaging system enabled by off-axis metasurface lensing** [12896-42]

PHOTONIC METASURFACES

12896 0A **Infrared sensing using metasurface with Dolmen plasmonic nanostructures** [12896-48]

NOVEL DEVICES AND PHENOMENA IN ENGINEERED NANOSTRUCTURES II

12896 0B **Compound and silicon-based tunnel microwave optoelectronic CMOS technology: techniques to achieve ultra-low series resistance designs and powered photonic terahertz waveguides** [12896-57]

12896 0C **Quasi-BIC resonance in TiO₂ metasurface for emission enhancement of two-dimensional material** [12896-59]

POSTER SESSION

12896 0D **Quality factor enhancement of InP nanobeam cavities using atomic layer deposition** [12896-67]

12896 0E **Mechanochromic photonic sensor using highly refractive colloidal particles** [12896-72]

DIGITAL POSTER SESSION

12896 0F **Silicon photonic bowtie cavities with atomic-scale dimensions** [12896-34]