

PROCEEDINGS OF SPIE

2D Photonic Materials and Devices VIII

**Arka Majumdar
Carlos M. Torres Jr.
Hui Deng**
Editors

**27–29 January 2025
San Francisco, California, United States**

Sponsored and Published by
SPIE

Volume 13368

Proceedings of SPIE 0277-786X, V. 13368

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 *2D Photonic Materials and Devices VIII*, edited by Arka Majumdar, Carlos M. Torres Jr., Hui Deng, Proc. of SPIE 13368, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510684843

ISBN: 9781510684850 (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.

**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*

2D MATERIAL OPTOELECTRONICS AND INTEGRATED NANOPHOTONICS II

13368 02 **Carrier losses due to radiative- and auger-recombination in monolayer TMDCs** [13368-7]

TWISTRONIC-ENABLED NOVEL PHOTONIC FUNCTIONALITIES

13368 04 **Engineering correlated excitons in semiconductor Moiré superlattices (Invited Paper)**
[13368-9]

ATOMICALLY LAYERED MATERIALS FOR QUANTUM TECHNOLOGIES I

13368 05 **Multi-degree-of-freedom control of nonlinear optical two-dimensional quantum materials (Invited Paper)** [13368-15]

PHOTONICS WITH 2D HETEROSTRUCTURES

13368 06 **Coulomb engineering of exciton broadening in monolayer transition metal dichalcogenides** [13368-22]

13368 07 **Near Infrared detection of graphene/metal intercalated graphene photodetector**
[13368-42]

2D MATERIAL NONLINEAR OPTICAL DEVICES AND CAVITY-ENHANCED NONLINEAR OPTICS

13368 08 **Cavity-driven ultrafast chiral optical switching (Invited Paper)** [13368-28]

13368 09 **Nonlinear optical activities in van der Waals ternary transition metal dichalcogenides**
[13368-29]

13368 0A **On-chip nonvolatile tunable second-harmonic-generation through integration of NbOBr₂**
[13368-30]

2D MATERIAL OPTOELECTRONICS AND INTEGRATED NANOPHOTONICS III

- 13368 0B **The influence of contact electrode crystallinity and channel layer numbers to molybdenum disulfide transistors** [13368-38]
- 13368 0C **Quantum efficiency dependence on semiconductor 2D dopants in TMDC-MoS₂ based Schottky-photodiode** [13368-35]
- 13368 0D **Synergetic engineered all van der Waals photodetectors for robust photodetection** [13368-40]

DIGITAL POSTER SESSION

- 13368 0E **Characterization of hexagonal boron nitride quantum emitters in nanoflakes after post-processing treatments** [13368-18]