

PROCEEDINGS OF SPIE

Smart Photonic and Optoelectronic Integrated Circuits 2026

Laurent Vivien
Sailing He
Carlos Alonso-Ramos
Editors

19–20 January 2026
San Francisco, California, United States

Sponsored and Published by
SPIE

Volume 13901

Proceedings of SPIE 0277-786X, V. 13901

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 *Smart Photonic and Optoelectronic Integrated Circuits 2026*, edited by Laurent Vivien, Sailling He, Carlos Alonso-Ramos, Proc. of SPIE 13901, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510697195

ISBN: 9781510697201 (electronic)

Published by

SPIE

P.O. Box 10, Bellingham, Washington 98227-0010 USA

Telephone +1 360 676 3290 (Pacific Time)

SPIE.org

Copyright © 2026 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*

OPTICAL PHASE ARRAY AND LIDAR

- 13901 02 **On-board cycloidal LiDAR with OOFDMA beam steering for real-time wind hazard perception in urban air mobility** [13901-3]
- 13901 03 **Layout aware thermal crosstalk in photonic integrated circuit simulation** [13901-4]

LIGHT EMISSION AND AMPLIFICATION: FROM MATERIALS TO DEVICES AND CIRCUITS

- 13901 04 **Rare-earth-doped YSZ photonic devices (Invited Paper)** [13901-7]

ADVANCED FABRICATION AND PACKAGING

- 13901 05 **High-uniformity HBr wet etching for compound semiconductor optoelectronics using precision single-wafer processing** [13901-12]
- 13901 06 **Inverse-designed 3D-printed coupling element for polymer photonic circuits realized via two-photon polymerization** [13901-13]

SILICON PHOTONICS RELIABILITY: JOINT SESSION WITH CONFERENCES 13901 AND 13902

- 13901 07 **III-V/Si heterogeneously integrated photonic devices using chip-on-wafer bonding technology (Invited Paper)** [13901-14]
- 13901 08 **Reliability of heterogeneously integrated hybrid lasers for optical compute interconnects (Invited Paper)** [13901-15]

IMAGING AND SENSING

- 13901 09 **Accelerating discovery: pushing the frontiers of speed, resolution, and clarity in microscopy (Keynote Paper)** [13901-16]
- 13901 0A **Multifunctional plasmonic nanoantenna arrays: bridging biosensing and electrophysiological monitoring (Invited Paper)** [13901-17]

PROGRAMMABLE PHOTONICS AND NEUROMORPHIC SYSTEMS

- 13901 0B **PIC design optimization for high-speed data center applications** [13901-20]
- 13901 0C **Optimizing the physical front end: microring neuromorphic sensing for weak RF signals** [13901-21]
- 13901 0D **Nonvolatile linear resonant switching for neuromorphic photonics in a PCM-integrated silicon racetrack microresonator** [13901-22]
- 13901 0E **Photonic imitation learning for control tasks using deep photonic agentic networks** [13901-23]

PHOTONIC DEVICES: PASSIVE, NONLINEAR, AND OPTOELECTRONICS

- 13901 0F **Grating-coupled input/output interfaces for silicon nitride integrated photonics (Invited Paper)** [13901-24]
- 13901 0G **Single frequency spaced flat comb generation using in-phase/quadrature modulator controlled by parameter estimation and spectral shaping** [13901-26]
- 13901 0H **Limits of phase recovery in CV-QKD systems: an experimental analysis (Invited Paper)** [13901-27]
- 13901 0I **Optically assisted equalisation of high-speed transmission signals based on an integrated recurrent spectrum slicer (Invited Paper)** [13901-34]

POSTER SESSION

- 13901 0J **Intelligent coordination of airport operations using VLC and MARL** [13901-28]
- 13901 0K **Laser modeling for fast design of photonic integrated circuits** [13901-29]
- 13901 0L **OOFDMA-enabled multibeam LiDAR with Risley prism steering for high-precision optical target acquisition and power mapping** [13901-31]

DIGITAL POSTER SESSION

- 13901 0M **Fiber-integrated phase-change microsphere system for all-optical modulation and computing** [13901-30]