

PROCEEDINGS OF SPIE

Computational Optics 2026

Andreas Erdmann

Nikolai P. Schmitt

Daniel G. Smith

Editors

15–16 April 2026

Strasbourg, France

Sponsored by

SPIE

Cosponsored by

Nikon Research Corp of America (United States)

ASML Netherlands B.V. (Netherlands)

Carl Zeiss GmbH (Germany)

Cooperating Organisations

EOS—European Optical Society

SIOF—Società di Ottica e Fotonica (Italy)

Photonics21 (Germany)

Published by

SPIE

Volume 14110

Proceedings of SPIE 0277-786X, V. 14110

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 *Computational Optics 2026*, edited by Andreas Erdmann, Nikolai P. Schmitt, Daniel G. Smith, Proc. of SPIE 14110, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9798902321798

ISBN: 9798902321804 (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*

STUDENT PRESENTATIONS I

- 14110 02 **Deep learning wavefront retrieval in a double-pass setup (Best Paper Award)** [14110-2]
- 14110 03 **Diffractive neural networks for robust laser beam shaping with B-spline-parameterized phase masks (Best Paper Award)** [14110-4]
- 14110 04 **Numerical field optimization for enhanced efficiency in time-reversible gradient computation of open-source GPU-accelerated FDTD simulations** [14110-5]
- 14110 05 **Fast EUV diffraction modeling via physics-informed neural operators and structure decomposition** [14110-6]
- 14110 06 **Transfer learning for dispersion-driven inverse design across photonic devices** [14110-7]

METHODS

- 14110 07 **Numerical simulation of long pulse amplification in solid-state laser amplifiers** [14110-10]
- 14110 08 **The radiation spectrum method: a next-generation computational tool for photonics** [14110-11]

STUDENT PRESENTATIONS II

- 14110 09 **Reconfigurable beam shaping with rotating phase masks using diffractive neural networks** [14110-12]
- 14110 0A **Analysis of modes in periodic EUV mask structures using a Bloch–Floquet-based analytical modal approach** [14110-13]
- 14110 0B **Computational voxel control in two-photon lithography via a generalized compact model** [14110-17]
- 14110 0C **Complex sample characterization using a multidimensional single-pixel microscope (Best Paper Award)** [14110-34]

METASURFACES AND NANOSTRUCTURES

- 14110 0D **Tilt angle estimation for conical diffraction correction in lensless imaging of nanostructures** [14110-19]

LITHOGRAPHY

- 14110 0E **Efficient speckle approximation for imaging simulations in optical lithography** [14110-22]
- 14110 0F **Deep neural network for modeling displacement Talbot lithography** [14110-23]
- 14110 0G **Simulating rotated 1D patterns in anamorphic systems efficiently for lens aberration reconstruction from in-resist measurements** [14110-24]
- 14110 0H **3D-profile-aware SMO for EUV lithography** [14110-25]

DEEP LEARNING IN PHOTONICS

- 14110 0I **A methodology to automate precision optical alignment using sensitivity-aware optimization** [14110-27]
- 14110 0J **Transformer models for optical systems design** [14110-28]

POSTER SESSION

- 14110 0K **Engineering the imaging system's field of view using coded phase apertures** [14110-31]
- 14110 0L **Multiagent reinforcement learning for discrete optimization of hole based photonic integrated circuits** [14110-32]
- 14110 0M **Investigation of self-reconstruction in polarization singularity lattices** [14110-35]
- 14110 0N **Simulation of EUV mask defect classification based on optical neural network** [14110-36]
- 14110 0O **High-FOM surface plasmon resonance sensors through dielectric and structural engineering** [14110-39]