

PROCEEDINGS OF SPIE

Nanophotonics XI

David L. Andrews
Angus J. Bain
Antonio Ambrosio
Editors

12–16 April 2026
Strasbourg, France

Sponsored by
SPIE

Cooperating Organisations
EOS—European Optical Society
SIOF—Società di Ottica e Fotonica (Italy)
Photonics21 (Germany)

Published by
SPIE

Volume 14076

Proceedings of SPIE 0277-786X, V. 14076

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 *Nanophotonics XI*, edited by David L. Andrews, Angus J. Bain, Antonio Ambrosio, Proc. of SPIE 14076, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9798902321118

ISBN: 9798902321125 (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

vii *Conference Committee*

STRUCTURED LIGHT AND CHIRALITY I

- 14076 02 **Three-dimensional spin skyrmions at vortex cores of electromagnetic and acoustic waves (Invited Paper)** [14076-1]

OPTOMECHANICS AND PLASMONICS

- 14076 03 **Transverse optomechanical interaction mediated by mechanically induced symmetry breaking: Hamiltonian dynamics** [14076-5]
- 14076 04 **Optimizing plasmonic substrates through advanced FDTD simulations** [14076-8]

NANO-BIOSENSING

- 14076 05 **Photoacoustic nanoscale biosensing and metrology using lab-fabricated polymer-based high-frequency transducers** [14076-12]

METASURFACES

- 14076 06 **Face on oriented confinement and rotation of a hexagonal disk shaped upconverting particle induced by localised heating at a liquid-liquid interface** [14076-61]

FABRICATION

- 14076 07 **X-ray optics fabrication: state of art and challenges for current and future applications (Invited Paper)** [14076-16]
- 14076 08 **Optical sieve for nanoplastic detection, sizing, and counting: improved detection efficiency through principal component analysis (SPIE Best Student Paper Award)** [14076-17]
- 14076 09 **UV-nanoimprint lithography for nanostructured surface enhanced Raman spectroscopy substrates** [14076-18]
- 14076 0A **Design, testing, and applications of optical biomimetic $(\text{SiO}_2)_x-(\text{TiO}_2)_y-(\text{ZrO}_2)_z$ nanocoatings** [14076-113]

OPTICAL RESONANCE AND COMPUTATIONAL NANOPHOTONICS

- 14076 0B **Wavelength-dependent characteristics of Bessel beams produced by physical and SLM-based axicons** [14076-22]
- 14076 0C **Intraband optical absorption in cylindrical quantum dots driven by a non-resonant Bessel beam** [14076-23]
- 14076 0D **Low-defect quantum dot lasers directly grown on silicon analyzed using cross-sectional scanning tunneling microscopy and spectroscopy** [14076-24]

STRUCTURED LIGHT AND CHIRALITY II

- 14076 0E **InAs/GaAs QD bilayers for independent control of wavelength and density** [14076-38]

STRUCTURED LIGHT AND CHIRALITY III

- 14076 0F **Robust optical topologies through real world channels** [14076-41]
- 14076 0G **Topological reconfiguration of full Poincaré beams via spin-decoupled metasurfaces** [14076-43]

2D MATERIALS AND DEVICES II

- 14076 0H **Ultrafast coherent polariton dynamics investigated by two-dimensional electronic spectroscopy (Invited Paper)** [14076-44]
- 14076 0I **Symmetry breaking of spectrally non-degenerate modes in an integrated microresonator** [14076-45]
- 14076 0J **Single photon emitters in carbon-doped hexagonal boron nitride** [14076-47]

NANOCAVITIES

- 14076 0K **Nanometer-scale cavities for mid-infrared radiation via image phonon polariton resonators** [14076-49]
- 14076 0L **Geometry-induced enhancement and tunability of silver nanocube–SiC phonon-polariton cavities** [14076-50]

STRUCTURED LIGHT AND CHIRALITY IV

- 14076 OM **Structured beams and focusing delivery schemes: a comparative analysis for extreme ultraviolet ultrafast tabletop ptychography (Invited Paper)** [14076-53]
- 14076 ON **Structural colouration in blow flies** [14076-55]

POSTER SESSION

- 14076 OO **Size-dependent spectroscopic investigation of folic acid and citrate-stabilized gold nanoparticles** [14076-60]
- 14076 OP **Investigation on the photoluminescence quenching of NaBiF₄, Er³⁺, Yb³⁺ particles with two infrared wavelengths, 975nm and 1064nm** [14076-62]
- 14076 OQ **Facets of a 3 and 4 beam hydro-thermophoretic trap** [14076-63]
- 14076 OR **Finite element modeling of charge dynamics and optical responses in type-I CdSe/ZnS nanodisk heterostructures** [14076-65]
- 14076 OS **Numerical modeling of near-field to far-field emission evolution of CdSe/ZnS core/crown nanodisk arrays** [14076-66]
- 14076 OT **Intraband transitions and absorption spectra in CdSe boomerang-shaped quantum dot** [14076-68]
- 14076 OU **Theoretical investigation of excitonic complexes and optical properties in spherical InP quantum dots** [14076-69]
- 14076 OV **Single-interferogram wide-field Bayesian analysis for geometrical characterization of nanophotonic elements** [14076-72]
- 14076 OW **Interband absorption in double GaAs/Ga_{1-x}Al_xAs quantum dots** [14076-75]
- 14076 OX **Multiscale structuring with MacEtch for silicon-based photonics** [14076-81]
- 14076 OY **Easily-bored aperiodic diffractive lenses** [14076-83]
- 14076 OZ **Electronic structure and interband optical transitions in dumbbell quantum dots** [14076-87]
- 14076 10 **Analytic–numerical framework for intraband optical properties of lens-shaped quantum dots** [14076-88]
- 14076 11 **Low-loss silicon nitride photonics: a process for unlocking high-performance nonlinear optics** [14076-92]
- 14076 12 **Structural color for automotive signaling** [14076-96]

- 14076 13 **Cavity optomechanics in MoS₂ micro-drum resonators (SPIE Best Student Paper Award)**
[14076-99]
- 14076 14 **Impact of Sn composition on exciton binding energy in SiGeSn/GeSn multiquantum wells**
[14076-100]
- 14076 15 **Characterization of high-power-excited CdSe/CdS quantum dots for spectroscopy and photonics** [14076-104]
- 14076 16 **Bioinspired approach to infrared harvesting** [14076-105]
- 14076 17 **Beyond optical chirality density: tensor descriptors of electromagnetic chirality in anisotropic media** [14076-108]
- 14076 18 **Arrested rotation of plasmonic optical matter driven by chiral light** [14076-109]
- 14076 19 **Composition modulation-mediated band alignment engineering from type I to type III in 2D vdW heterostructures** [14076-114]
- 14076 1A **Laser-driven proton acceleration in nanoantenna-doped media** [14076-116]