

PROCEEDINGS OF SPIE

Current Developments in Lens Design and Optical Engineering XXVI

**Simon Thibault
Ching-Cherng Sun
Jessica DeGroote Nelson**
Editors

**5–6 August 2025
San Diego, California, United States**

Sponsored and Published by
SPIE

Volume 13596

Proceedings of SPIE 0277-786X, V. 13596

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 *Current Developments in Lens Design and Optical Engineering XXVI*, edited by Simon Thibault, Ching-Cherng Sun, Jessica DeGroot Nelson, Proc. of SPIE 13596, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510691001

ISBN: 9781510691018 (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*

THEORY AND APPLICATIONS

- 13596 02 **Lens melting as a method for designing freeform gradient index lenses** [13596-1]
- 13596 04 **Focus-invariant presbyopia-correcting phase optics design and optimization** [13596-3]
- 13596 05 **Optimization strategies for a pressurized, athermal, and achromatic lens designs** [13596-4]

SYSTEM-LEVEL ILLUMINATION DESIGN AND OPTIMIZATION

- 13596 07 **Demonstration of a microcavity LED with a nanoporous DBR and a GaN tunnel junction contact** [13596-7]
- 13596 09 **Ring profile with new center flat axicon lens** [13596-9]

DEVELOPMENTS IN OPTICAL COMPONENTS, TECHNIQUES, AND MATERIALS I

- 13596 0B **Designing selective thermal absorbers with factorization machines with quantum annealing** [13596-11]
- 13596 0C **Sphero-cylindrical lenses based on fluidic shaping on elliptical frames** [13596-12]

DEVELOPMENTS IN OPTICAL COMPONENTS, TECHNIQUES, AND MATERIALS II

- 13596 0E **The Swiss army lens: an efficient optimization strategy for simultaneous, pressure invariant, passive athermal, and achromatic lenses with CODE V** [13596-15]
- 13596 0F **Metalens with invariant size nanocylinders** [13596-16]
- 13596 0G **Adjoint optimization for inverse design of randomly reduced metalens** [13596-17]

APPLICATIONS FOR SOLID-STATE LIGHTING

13596 OI **Concentration evaluations under different spatial lighting uniformity conditions** [13596-21]

POSTER SESSION

- 13596 OJ **Ultra-thin full-field 50-degree collimating lens design for AR glasses optical lightguide system** [13596-22]
- 13596 OK **Multifocal contact lenses design to third order using the conic constant of the anterior surface** [13596-23]
- 13596 OL **Holographic image formation using a Shack-Hartmann wavefront sensor** [13596-24]
- 13596 OM **Classification of optical aberrations induced by atmospheric turbulence using neural networks** [13596-25]
- 13596 ON **Wavefront coding for retinal imaging** [13596-26]
- 13596 OP **Imaging lens design for star sensor in the beyond 5G low Earth orbit satellite program** [13596-28]
- 13596 OR **Optical design of a high-ratio zoom lens with intermediate optics** [13596-30]
- 13596 OT **Comparison of built-up indices for urban features extraction** [13596-32]
- 13596 OV **Ultra-wide angle optical lens design for spaceborne applications** [13596-35]
- 13596 OW **Imaging lens design for star sensor via anastigmat new glass combination** [13596-36]