

PROCEEDINGS OF SPIE

Complex Light and Optical Forces XII

**Enrique J. Galvez
David L. Andrews
Jesper Glückstad**
Editors

**30 January–1 February 2018
San Francisco, California, United States**

Sponsored and Published by
SPIE

Volume 10549

Proceedings of SPIE 0277-786X, V. 10549

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 *Complex Light and Optical Forces XII*, edited by Enrique J. Galvez, David L. Andrews, Jesper Glückstad, Proceedings of SPIE Vol. 10549 (SPIE, Bellingham, WA, 2018) Seven-digit Article CID Number.

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510615830

ISBN: 9781510615847 (electronic)

Published by

SPIE

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

Telephone +1 360 676 3290 (Pacific Time) · Fax +1 360 647 1445

SPIE.org

Copyright © 2018, Society of Photo-Optical Instrumentation Engineers.

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 copying fees. The Transactional Reporting Service base fee for this volume is \$18.00 per article (or portion thereof), which should be paid directly to the Copyright Clearance Center (CCC), 222 Rosewood Drive, Danvers, MA 01923. Payment may also be made electronically through CCC Online 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. The CCC fee code is 0277-786X/18/\$18.00.

Printed in the United States of America Vm7 i ffUb '5gg: WJUH g' bWzi bXYf`jW bgY Zca 'GD-9.

Publication of record for individual papers is online in the SPIE Digital Library.

**SPIE. DIGITAL
LIBRARY**

SPIDigitalLibrary.org

Paper Numbering: *Proceedings of SPIE* follow an e-First publication model. A unique citation identifier (CID) number is assigned to each article 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 *Authors*
- vii *Conference Committee*
- xi *Introduction*

FUNDAMENTAL ASPECTS OF COMPLEX LIGHT

- 10549 03 **Partially coherent vortex beams (Invited Paper)** [10549-2]
- 10549 05 **Localization of light: beginning of a new optics** [10549-4]

QUANTUM EFFECTS

- 10549 08 **Spatial modes for testing indefinite causal order (Invited Paper)** [10549-7]
- 10549 09 **Creating the first Bose-Einstein condensate in space** [10549-8]

OPTICAL MODES

- 10549 0B **Generation of fractal structured eigenmodes from lasers** [10549-10]
- 10549 0D **Core-shell (TiO₂@Silica) nanoparticles for random lasers** [10549-12]

SPIN-ORBIT COMPLEX LIGHT

- 10549 0E **Complex light-assisted optical metrology techniques (Invited Paper)** [10549-13]
- 10549 0F **Spectral anomaly of ultrashort vortex pulses with axially oscillating twist** [10549-14]
- 10549 0J **Experimental demonstration of broadband generation of optical vortices using asymmetrically spliced fibers** [10549-18]
- 10549 0K **Realization of the spin-dependent manipulation of structured light by tailoring the polarization** [10549-57]

COMPLEX LIGHT SENSING

- 10549 0L **Polarization state vector beam spectrum analyzer using q-plates encoded onto a spatial light modulator (Invited Paper)** [10549-19]

10549 0M **Determination of the topological charge of complex light beams by shearing interference from a wedged optical flat (Travel Support Award)** [10549-21]

SPATIALLY VARIABLE POLARIZATION

10549 0P **Generation of arbitrary axisymmetrically polarized pulses with a broadband spectrum (Invited Paper)** [10549-24]

10549 0S **Customized focal light landscapes by complex vectorial fields for advanced optical trapping** [10549-27]

OPTICAL FORCES

10549 0X **Thermodynamics of radiation pressure and photon momentum (Part 2) (Invited Paper)** [10549-32]

CHIRALITY IN LIGHT AND MATTER

10549 15 **Chiroptical interactions between twisted light and chiral media** [10549-40]

SPIN-ORBIT CONTROL

10549 1A **Pancharactnam-Berry phase used for realizing spin-dependent propagation and polarization measurement** [10549-45]

ENHANCED OPTICAL TRAPPING

10549 1D **Light robotics: a new field of research** [10549-48]

10549 1F **Integrated plasmonic dimers: a platform for ultra-efficient trapping of nanoparticles** [10549-50]

SORTING

10549 1I **Software for real-time light shaping and biophotonics applications** [10549-54]

10549 1J **Cell growth regulation studies on our biophotonics workstation** [10549-55]