PROCEEDINGS OF SPIE

Complex Light and Optical Forces XVI

David L. Andrews Enrique J. Galvez Halina Rubinsztein-Dunlop Editors

22–27 January 2022 San Francisco, California, United States

20–24 February 2022 ONLNE

Sponsored and Published by SPIE

Volume 12017

Proceedings of SPIE 0277-786X, V. 12017

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 SPIEDigitalLibrary.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 XVI*, edited by David L. Andrews, Enrique J. Galvez, Halina Rubinsztein-Dunlop, Proc. of SPIE 12017, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X ISSN: 1996-756X (electronic)

ISBN: 9781510649057 ISBN: 9781510649064 (electronic)

Published by **SPIE** P.O. Box 10, Bellingham, Washington 98227-0010 USA Telephone +1 360 676 3290 (Pacific Time) SPIE.org Copyright © 2022 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.



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

NON-LINEAR EFFECTS

12017 02 Characterization and transformation of the OAM in stationary light beams (Invited Paper) [12017-5]

NOVEL OPTICAL BEAMS

12017 04 (2D+1) pendulum beams: non-diffracting optical spatial wavepackets that simulate quantum pendulum dynamics [12017-51]

OPTICAL ANGULAR MOMENTUM

- 12017 05 Spin-orbit cross control in nonlinear wave mixing (Invited Paper) [12017-23]
- 12017 06 **Two-photon absorption with tightly focused optical vortices** [12017-25]
- 12017 07 Exploring topological optical features due to twisted elliptical birefringent slab [12017-26]

OPTICAL BEAMS I

12017 08	Optical helicity, chirality, and spin of 3D-structured Laguerre-Gaussian optical vortices [12017-29]
12017 09	Field amplitude analysis of the double ring perfect optical vortex [12017-30]

OPTICAL BEAMS II

12017 0A	Spin-hall effect of light at near-normal incidence due to reflection at a plane dielectric interface [12017-37]
12017 OB	Complex light based on machine learning [12017-38]

NANO- AND MICROMANIPULATION

- 12017 0C Light robotics: new micro-drones powered by light [12017-43]
- 12017 0D Generalized Lorenz-Mie theory of nonlinear optical trapping of core/shell hybrid nanoparticles [12017-45]

WORKSHOP ON METHODS OF COMPLEX LIGHT

12017 OE Practical modal decomposition over turbulent free-space links [12017-201]

OPTICAL FORCES

- 12017 OF Resonant evanescent excitation of OAM modes in a high-contrast circular step-index fiber (Invited Paper) [12017-39]
- 12017 0G **Dual beam optical fiber traps for aerosols with angular deviation** [12017-41]
- 12017 OH Spin-orbit interaction of light in inhomogeneous-anisotropic medium: higher-order effects [12017-42]

POSTER SESSION

12017 01 New insights on complex light shaping [12017-50]