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Complex Light and Optical Forces VI

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Editors

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Introduction

This year marked the sixth edition of the conference on Complex Light and Optical Forces that is part of Photonics West. We had a record number of submissions, indicative of the rising visibility and stature of the conference. Indeed, this conference is the only yearly venue worldwide for presenting research on complex light. In addition, due to the increasing amount of research in using complex light in quantum information, we organized two joint sessions with the conference on Advances in Photonics of Quantum Computing, Memory, and Communication V.

The conference had two full days of sessions with the following titles: Fundamental OAM; Optical Forces; New Developments in Optical Trapping; Complex Light I: Knots and Vortices; Complex Light II: Generation and Propagation; and Polarization Singularities and Vector Beams. The joint sessions had the titles Quantum Spatial and Quantum Imaging. The conference featured 43 presentations, which include 11 invited presentations, 25 contributed, and 7 posters. These numbers include the joint sessions, which had invited and contributed talks from both conferences.

The present volume is representative of the conference, containing new findings, theories, and experimental results. They highlight current interest and debate on the fundamentals of spin-orbit coupling and experimental tests to observe its manifestations. Other aspects of polarization and spatial modes of light are revisited with presentations on the generation and propagation of polarization singularities, including Poincare beams. The generation and propagation of complex light beams features articles on the propagation of optical vortices in free space, nonlinear media, liquid crystals, and optical fibers; and the generation and propagation of other high-order beams, such as Bessel beams. A huge application of complex light is its ability to exert forces. Articles in this volume feature aspects of manipulation that range from fundamental contributions, on new ways to exert forces with various types of beams and light patterns, to applied, including efforts to create self-contained devices that manipulate and sort. Finally, the presence of complex light in quantum information is highlighted by articles on the generation of spatial entangled states, squeezed states, and the ongoing research in sorting spatial states of photons.

In summary, the present volume is representative of a growing field of photonics that has contributed much to our understanding of light and its applications in manipulation, and which remains leaving much promise of more to come.

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