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Contents

Authors

Numbers in the index correspond to the last two digits of the six-digit citation identifier (CID) article numbering system used in Proceedings of SPIE. The first four digits reflect the volume number. Base 36 numbering is employed for the last two digits and indicates the order of articles within the volume. Numbers start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B...0Z, followed by 10-1Z, 20-2Z, etc.

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1 Recent Advances in Optoelectronics: New Architectures for Detectors and Sources
Ganapathi S. Subramania, Sandia National Laboratories (United States)

2 Extraordinary Absorption and Thermal Phenomena I
Sanjay Krishna, The University of New Mexico (United States)

3 Extraordinary Absorption and Thermal Phenomena II
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4 New Paradigms for Lasing at the Nanoscale I
Michelle L. Povinelli, The University of Southern California (United States)

5 New Paradigms for Lasing at the Nanoscale II
Jesper Mork, Technical University of Denmark (Denmark)

6 New Fabrication Methods and Dynamic Control of Photonic Materials
Volker J. Sorger, The George Washington University (United States)

7 Graphene and 2D Materials for Active Photonics
Paul V. Braun, University of Illinois at Urbana-Champaign (United States)

8 Novel Platforms for Non-classical Light I
Boubacar Kante, University of California, San Diego (United States)

9 New Methods for Designing and Probing Exotic Photonic Environments for Emitters
Ganapathi S. Subramania, Sandia National Laboratories (United States)

Introduction

The science of light enabled extra-ordinary technologies that benefit a broad range of activities in our everyday lives such as telecommunications and computing, medical diagnostic methods, solid state lighting, and energy harvesting. To be able to utilize light's tremendous potential we must be able to tame and control its path in both space and time. Research with new structured-material platforms continues to break new frontiers in photonics. The vast potential of such platforms is enriched with the incorporation of active as well as dynamically tunable materials, such as gain media, materials with nonlinear or time-dependent optical properties as well as quantum emitters.

The Active Photonic Materials VIII conference brought together the newest developments in the fundamentals and applications of structured-material platforms for active, dynamic, and tunable control of light. There were many exciting talks in the growing field of topological photonics that reported unprecedented control over the light's path, such as unidirectional and scatter-free properties. This is enabled in these systems by channeling light into states that are protected by the system's topology and can find applications in photonic circuitry and quantum information systems.

Photonic quantum information systems were also a central theme of the conference with emphasis on non-classical light generation and guiding. In addition, a number of fascinating talks focused on non-Hermitian photonic systems, were a balanced interplay between gain and loss manifests itself in parity-time (PT) symmetry, and is exploited for unidirectional propagation and lasing. Moreover, interesting talks reported also on different novel lasing paradigms that are based on Fano- or plasmonic resonant systems or utilize light localization in randomly structured media.

Furthermore, interesting topics presented in the conference included platforms for extra-ordinary tailoring of the absorption/emission, energy harvesting and harnessing near-field heat transfer. Last but not least, a number of talks focused on tunable or switchable photonic devices enabled with atomically thin materials, such as graphene, phase-change materials such as VO2, the incorporation of liquid crystalline elastomers (LCE), electrochromic polymers, or even dynamically tunable materials, such as Al-doped zinc oxide.

Our conference also ran a best student paper competition, recognizing the best contributed presentation that was presented by a student author. We would like to thank all student contributors for their enthusiasm with which they participated in this competition presenting outstanding and interesting results! The finalist winner of this competition, listed below, was presented with an SPIE award certificate at the conference's closing.

Paper 9920-58, "Parity-time symmetry breaking in optically coupled semiconductor lasers," Joseph S. Suelzer, Yogesh N. Joglekar, Gautam Vemuri, Indiana Univ.-Purdue Univ. Indianapolis (United States).

Active Photonic Materials VIII has brought together theorists and experimentalists to exchange state-of-the art results in this rapidly evolving area of research. As conference chairs, we would like to express our sincere thanks to all the participants of the 9920 conference who contributed with their presentations as well as manuscripts to make this conference a stimulating and vibrant event.

Ganapathi S. Subramania
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