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Tanja Dreischuh
Sanka Gateva
Alexandros Serafetinides
Editors

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Introduction

The International School on Quantum Electronics: Laser Physics and Applications (ISQE) has been organized biennially since 1980 by the Institute of Electronics of the Bulgarian Academy of Sciences, with the aim to provide a forum for exchange and dissemination of knowledge and ideas on the latest developments in the field of lasers and their applications in material processing, laser spectroscopy and metrology, nonlinear optics, biology and remote sensing.

The 18th International School on Quantum Electronics (ISQE 2014) took place from 29 September to 3 October 2014 in the Black Sea resort town of Sozopol, Bulgaria. This year, the school commemorated the 145th anniversary of the Bulgarian Academy of Sciences foundation and the 50th anniversary of the Nobel Prize for Physics being awarded to Charles Towns, Nikolay Basov and Alexander Prokhorov for works leading to the development of the laser and maser principles. The event was supported by SPIE, the European Physical Society (EPS), the Ministry of Education and Science of Republic of Bulgaria, the Bulgarian Academy of Sciences, the National Technical University of Athens (Greece), and the American Elements Co. to whom the Organizing Committee expresses its deep gratitude.

For over 30 years, ISQE has provided an excellent opportunity for young researchers to meet internationally renowned scientists to exchange ideas, review the latest technologies and achievements, discuss future directions, and initiate new collaborations and joint research projects. Many former school participants have gone on to become leading scientists in research establishments and companies throughout the world. More than 90 scientists from Algeria, Armenia, France, Greece, India, Israel, Italy, Japan, Mexico, Poland, Romania, Russia, Serbia, Turkey and Bulgaria participated in ISQE 2014 and presented around 100 contributions – invited lectures, oral and poster presentations. To recognize research excellence and scientific presentation abilities, SPIE and EPS sponsored the Best Student Paper Awards Competition.

This proceedings volume contains fifty-seven invited and contributed papers covering the School topics of laser-matter interactions, laser spectroscopy and metrology, laser remote sensing and ecology, lasers in biology and medicine, and laser systems and nonlinear optics. All the submitted manuscripts were peer-reviewed by experts in the respective fields using the SPIE review process.

ISQE 2014 owes its success to many people. The International Program Committee planned and organized the scientific program, ensuring high-quality plenary presentations. The Local Committee bore the brunt of the organization and ensured the smooth running of the conference. The choice of Sozopol, one of the

oldest towns on the Bulgarian Black Sea coast, strongly enhanced the friendly and stimulating atmosphere of the conference.

The Editors of the volume would like to thank all the invited speakers and participants for their contribution to these proceedings, the members of the International Advisory and Program Committees for their great support, as well as the reviewers for their time and effort evaluating the papers. Thanks also go to the SPIE staff for their invaluable assistance. We hope that the readers will find this collection of papers interesting and useful and we would like to invite them to take part in the next 19th ISQE, which will be held in September 2016.

Tanja Dreischuh
Sanka Gateva
Alexandros Serafeinides