

Preface

In October, 2014, School of Science, the University of Tokyo (UTokyo), jointly with Department of Civil Engineering, School of Engineering, established the Students and Researchers Exchange Program in Sciences (STEPS) with Lomonosov Moscow State University (MSU) and Saint Petersburg State University (SPBU) with financial support from the Re-Inventing Japan Project of the Ministry of Education, Culture, Sports, Science and Technology. Since then, we have been working to promote the STEPS program not only by exchanging students and researchers but also by holding scientific symposia and gatherings. The 1st STEPS Symposium on Photon Science was held on March 21 and 22, 2015 in the auditorium of the Chemistry Main Building on the Hongo Campus of the University of Tokyo, and was the first scientific gathering sponsored by the STEPS program.

In the symposium, a total of 28 talks were given by invited speakers from the three universities, and a variety of subjects in photon science were covered as represented by the titles of the nine chapters in this book: laser–plasma interaction, electron scattering, exotic properties of light, imaging, molecules and clusters in intense laser fields, new methods in spectroscopy, photochemistry of novel materials, light propagation and its applications, and material synthesis.

Invited talks were given by the following 28 professors: Mikhail Fedorov (International Laser Center), Maria Khrenova (Faculty of Chemistry), Olga Kosareva (International Laser Center and Faculty of Physics), Konstantin Kouzakov (Department of Nuclear Physics and Quantum Theory of Collisions, and Faculty of Physics), Vladimir Makarov (Chair of General Physics and Wave Processes, International Laser Center, and Faculty of Physics), Andrey Savel'ev

(Chair of General Physics and Wave Processes, International Laser Center, and Faculty of Physics), Alexander Shkurinov (Faculty of Physics and International Laser Center), Svyatoslav Shlenov (Faculty of Physics and International Laser Center), and Andrey Stolyarov (Faculty of Chemistry) from MSU; Alexander Andreev (Department of Quantum Electronics, Faculty of Physics), Alexander Konev (Department of Organic Chemistry, Institute of Chemistry), Alina Manshina (Department of Laser Chemistry and Laser Materials Science, Institute of Chemistry), Alexander Pastor (Department of Optics, Faculty of Physics), Alexey Povolotskiy (Institute of Chemistry), Sergey Pulkin (Department of General Physics 1, Faculty of Physics), Nikolay Timofeev (Department of Optics, Faculty of Physics), Sergey Tunik (Department of General and Inorganic Chemistry, Institute of Chemistry), Yury Tver'yanovich (Department of Laser Chemistry and Laser Materials Science, Institute of Chemistry), and Oleg Vyvenko (V. A. Fok Institute of Physics and Interdisciplinary Resource Center) from SPBU; Keisuke Goda (Department of Chemistry, School of Science), Masahiro Hoshino (Department of Earth and Planetary Science, School of Science), Shin Inouye (Department of Applied Physics, School of Engineering and Photon Science Center), Reika Kanya (Department of Chemistry, School of Science), Erik Lötstedt (Department of Chemistry, School of Science), Shinichi Ohkoshi (Department of Chemistry, School of Science), Takeaki Ozawa (Department of Chemistry, School of Science), Tatsuya Tsukuda (Department of Chemistry, School of Science), Junji Yumoto (Department of Physics, School of Science, and Institute for Photon Science and Technology) from UTokyo.

All of the lectures were well-prepared, and were very exciting and informative. The attendees enjoyed taking part in discussion, not only during the short discussion periods that were held right after the presentations, but also during the coffee breaks and lunch breaks. We, therefore, thought it appropriate to record the topics at the forefront of photon science addressed in the lectures in the form of a book for the benefit of researchers and graduate students in a variety of research fields in science, and have asked the lecturers to arrange their chapters based on transcriptions of the actual lectures.

I greatly appreciate the effort and cooperation made by the invited lecturers to modify their transcribed manuscripts into these completed forms. I would also like to thank the two secretaries at Center for Ultrafast Intense Laser Science, School of Science, the University of Tokyo, Ms. Tomoko Natalie Tateyama and Ms. Kaoru Kikuchi, and also Ms. Mihoshi Abe for their help with the preparation of this book. I hope this book will be regarded as a valued record of the STEPS program, facilitating its further promotion.

Finally, I would like to thank Ms. Valeria Shatilova at the STEPS office of School of Science, the University of Tokyo for helping us prepare for the 1st STEPS Symposium on Photon Science, and Dr. Claus Ascheron, Physics Editor at Springer, for kindly accepting this compilation of lectures as a volume in the Springer Series in Chemical Physics.

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