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Progress in Ultrafast Intense Laser Science

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Preface

We are pleased to present the fifth volume of Progress in Ultrafast Intense Laser Science. As the frontiers of ultrafast intense laser science rapidly expand ever outward, there continues to be a growing demand for an introduction to this interdisciplinary research field that is at once widely accessible and capable of delivering cutting-edge developments. Our series aims to respond to this call by providing a compilation of concise review-style articles written by researchers at the forefront of this research field, so that researchers with different backgrounds as well as graduate students can easily grasp the essential aspects.

As in the previous volumes of PUILS, each chapter of this book begins with an introductory part, in which a clear and concise overview of the topic and its significance is given, and moves onto a description of the authors' most recent research results. All the chapters are peer-reviewed. The articles of this fifth volume cover a diverse range of the interdisciplinary research field, and the topics may be grouped into three categories: coherent responses of gaseous and condensed matter to ultrashort intense laser pulses (Chaps. 1–4), propagation of intense laser pulses (Chaps. 5, 6), and laser-plasma interaction and its applications (Chaps. 7–10).

From the third volume, the PUILS series has been edited in liaison with the activities of Center for Ultrafast Intense Laser Science in The University of Tokyo, and JILS (Japan Intense Light Field Science Society), the latter of which has also been responsible for sponsoring the series and making the regular publication of its volumes possible. From the present volume, the Consortium on Education and Research on Advanced Laser Science, the University of Tokyo, joins this publication activity as one of the sponsoring programs. The series has also collaborated since its inception with the annual symposium series of ISUILS (http://www.isuils.jp), which is designed to stimulate interdisciplinary discussion at the forefront of ultrafast intense laser science.

We would like to take this opportunity to thank all the authors who have kindly contributed to the PUILS series by describing their most recent work at the frontiers of ultrafast intense laser science. We also thank the reviewers

who have read the submitted manuscripts carefully. One of the co-editors (KY) thanks Ms. Maki Oyamada and Ms. Chie Sakuta for their help with the editing processes. Last but not least, our gratitude goes out to Dr. Claus Ascheron, Physics Editor of Springer Verlag at Heidelberg, for his kind support.

We hope this volume will convey the excitement of Ultrafast Intense Laser Science to the readers, and stimulate interdisciplinary interactions among researchers, thus paving the way to explorations of new frontiers.

Tokyo, *Kaoru Yamanouchi*
Pisa, *Antonio Giulietti*
Glasgow, *Kenneth Ledingham*
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