

# PREFACE

Since its start of operation in 1997, SPring-8 has acquired a successful history as a progressive and innovative synchrotron radiation facility. Users of SPring-8 have carried out high-level research in a wide range of fields, including physics, chemistry, biology, medical science, and engineering, covering the basic research to practical applications. In 2013 and 2014, experiments carried out at SPring-8 resulted in 1002 and 822 published papers, respectively. In addition, user operation of the SACLA X-ray free electron laser facility was launched in 2012. In 2013, SACLA experiments resulted in 21 published papers, and the average number of citations per paper was as high as 8.3 in May 2015.



A number of SPring-8 and SACLA users were awarded prizes in 2014 and 2015 for their achievements in science and technology. Professor Hideo Hosono (Tokyo Institute of Technology) was awarded the Imperial Prize and Japan Academy Prize for his discovery and development of high-performance metal oxides as electroactive materials and catalysts. Professor Tetsuo Irifune (Ehime University) was awarded the Medal with Purple Ribbon for his research on ultra-high pressure synthesis in earth and materials sciences. The Medal with Purple Ribbon was also awarded to Professor Chikashi Toyoshima (The University of Tokyo) for his research on membrane proteins in the field of structural biology.

To maximize the scientific output and social impact of SPring-8 and SACLA experiments, we have recently reorganized the JASRI groups of beamline scientists and engineers into four divisions: Research & Utilization, Protein Crystal Analysis, Industrial Application, and XFEL Utilization. In addition, the Proposal Review Committee (PRC), whose role includes the beam time allocation for the 26 public beamlines of SPring-8, has been divided into eight subcommittees focusing on spectroscopy, XAFS/fluorescence analysis, diffraction/scattering, life science, long-term research, SR smart innovation, social interest, and industrial applications. The SACLA PRC decides the beam time allocation for SACLA users.

In this 2014 volume of SPring-8 Research Frontiers, two feature review articles are reported together with highlights of the scientific achievements of SPring-8 and SACLA users and beamline scientists. Two outstanding scientific reports based on SACLA experiments are included in the Chemical Science section, and twelve progress reports on the technology development in SACLA accelerators and beamlines are also included in this volume.

I am very grateful to the many authors and experts who contributed their papers to this volume. Special thanks are due to Dr. Naoto Yagi and the members of the editorial board for their constant efforts.

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