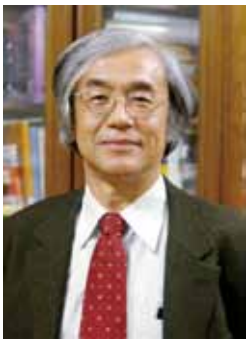

This Annual Review 2011 is a summary of research activities performed in the Institute for Molecular Science (IMS) during September 2010–August 2011. IMS is one of the world's core research facilities for molecular science and is a center for inter-university joint research in Japan, as well. It sets an extremely wide range of research goals, from understanding the behavior of individual molecules to that of collective molecular processes on the scale of life forms and in space. Currently, the IMS is engaged in four areas of research: theoretical and computational molecular science, photo-molecular science, materials molecular science and life and coordination-complex molecular science. It operates seven research facilities, including the UVSOR Facility.

The staff at IMS are making steady progress in basic research on molecular structures, reactions and functions demonstrating "novel molecular capabilities," as reported in this Review. In addition to these individual research activities, IMS conducts the six special programs in the institute basis; (i) Two computational chemistry programs: TCCI (Theoretical and Computational Chemistry Initiative) as a part of CMSI (Computational Materials Science Initiative) in HPCI (High Performance Computational Infra), and Nano-science simulation for the "Grand Challenge Applications" of the next generation supercomputer projects, (ii) Nano-network project, including the joint research initiative using 920MHz NMR, (iii) Extreme photonics in collaboration with RIKEN, (iv) COE of molecular and materials simulations as a joint program of NINS, (v) Quantum Beam Development Program in collaboration with Kyoto University and Nagoya University, and (vi) Networked Laboratories for the Frontiers of Photon Science and Technology in collaboration with Japan Atomic Energy Research Institute, Osaka University and Kyoto University. With two international programs for Asia, namely, Asian Core program and JENESYS (Japan-East Asia Network of Exchange for Students and Youths) program, IMS has invited active young scientists from various East Asian countries to carry out collaborative researches. Asian Core programs now becomes IMS own project and continue to strengthen the tie among the four key institutes of Chemical Physics in Asia, namely, KAIST in Korea, IASM in Taiwan, ICCAS in China and IMS in Japan.

Three professors retired at the end of March 2011. Professor Urisu, Professor Nishi, and Professor Yakushi have become our emeritus professors. We are grateful to all these professors for their great contribution to IMS. As for our new faculty, Dr. Shigeyuki Masaoka, an expert of Inorganic Chemistry, has joined us as an Associate Professor of Life and Coordination-Complex Molecular Science Department.

IMS is employing a new scientific perspective to examine the boundary between "micro" and "macro" phenomena, which is "an intrinsic arena for the generation of life" and "for the evolution of functioning molecular materials." We do expect your advice and support for initiating this new era of molecular science.

September, 2011

OHMINE, Iwao
Director-General, Institute for Molecular Science