

Preface

We are pleased to present the annual ISSP Activity Report for the academic year 2012. ISSP (Institute for Solid State Physics) was established in 1957 as a joint-use research institution attached to the University of Tokyo. Since then both in-house research and collaboration with external users have been essential elements of the activities of ISSP.

The research at ISSP has been pursued along two major directions. Synthesis of new materials and nano-structures in search for novel phenomena and functions using advanced and original techniques is at the core of modern condensed matter science. Many groups at ISSP and their collaborators are involved in this type of “small science”. On the other hand, importance of large experimental and computational facilities in materials science has been rapidly increasing in recent years. An important mission of ISSP is to participate in the development and operation of some of those large facilities that are difficult to maintain for university faculties. Notable achievements in this direction are summarized below.

(1) ISSP has been operating supercomputers dedicated to materials science. In addition, the Center of Computational Materials Science launched in 2011 provides technical supports to facilitate use of massively parallel computational resources such as the K-computer. (2) The International MegaGauss Science Laboratory continues to develop both the destructive ultrahigh magnetic field by electromagnetic compression aimed at 1000 tesla and the non-destructive long-pulse magnetic field by a flywheel generator. (3) ISSP has been providing access to quantum beams such as neutrons and synchrotron light sources. Concerning neutron scattering, the JRR-3 reactor at Tokai is still shut down after the earthquake in 2011, however the pulse spectrometer at J-PARC is now in operation. The latest development in 2012 is the opening of the new Laser and Synchrotron Research Center, which is aimed at making a new frontier of advanced spectroscopy by combining laser, synchrotron, and X-FEL light sources in ultraviolet and soft X-ray region.



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