

# Preface

We are pleased to present the annual ISSP Activity Report for the academic year 2014. 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. Such activities are being conducted by relatively small independent groups at ISSP and their collaborators. At the same time, importance of large experimental and computational facilities in materials science has been rapidly increasing in recent years. An important mission of ISSP is active participation in the development and operation of some of those large facilities that are difficult to maintain for typical 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 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 external users access to advanced spectroscopy that uses quantum beams such as neutron and synchrotron light sources. It is a pity for the neutron scattering society that the JRR-3 reactor at Tokai has been shut down after the earthquake in 2011 but we are expecting reopening in near future. The pulsed neutron spectrometer at J-PARC developed jointly by ISSP and KEK is now in operation. At the Laser and Synchrotron Research Center, we explore frontier of advanced spectroscopy in ultraviolet and soft X-ray region by combining high power laser being developed in Kashiwa and synchrotron beamline installed in Spring-8.



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