

MATERIALS SCIENCE

ELECTRONIC & MAGNETIC PROPERTIES

The nanotechnology support project is now in progress as one of the priority research programs. This project provides substantial support for research on Electronic & Magnetic Properties of matter. Some interesting achievements have been reported. From both the basic and technological points of view, these activities concerning nanotechnology indeed show the pioneering world in these scientific fields. Certainly, the activities proposed for general and long-term proposal categories are also high. Representative activities are introduced here. The key techniques used at SPring-8 in investigating the electronic and magnetic properties of matter are high-resolution spectroscopy (including X-ray scattering) and microscopy. The experiments carried out used the high brilliance of the SPring-8 storage ring very efficiently. Bulk-sensitive photoemission spectroscopy in soft and hard X-ray regions, microscopy, magnetic dichroism measurements and inelastic X-ray scattering are widely used for materials science in SPring-8, namely, for investigating the real bulk-, interface-, and nanosize particle information. Evidence of the existence of a magnetic moment in nanosize gold particles was obtained by magnetic circular dichroism without any ambiguity originating from the impurity and background effects usually observed in the SQUID measurement (see report by Yamamoto *et al.*). Phase separation evidence in strongly correlated organic systems was observed clearly by infrared microspectroscopy (see report by Sasaki *et al.*). The controversy in spin-charge separation in strongly correlated systems seemed to be solved by bulk-sensitive angle-resolved photoemission studies (see report by Suga *et al.*). Further bulk-sensitive studies have become possible by hard X-ray photoemission spectroscopy (see report by Makino *et al.*). The fact that bulk-sensitive techniques need no surface treatments is of great benefit to industrial science. The attendance of a variety of users from many fields holds much promise for the development of a new field and for greater activities. Those who have new ideas and/or materials are welcome as users in the materials science field at SPring-8.

