Objective of the Magnetic Materials Research Laboratory

Magnetism and electricity are some of the most fundamental properties of matter, and modern society is supported by basic materials and devices that functionally utilize these properties. The Institute for Materials Research has historically played a major role in the development of magnetic materials and the advancement of the related scientific principles. In recent years, human society has entered a period of major change in many fields, ranging from information to energy, with the aim of building and achieving sustainability. In this context, this Laboratory is expected to play a leading role in magnetic materials research, one of the most important fields in materials science.

A distinctive feature of this Laboratory is its contribution to the innovation of functional devices and the discovery of novel functionalities based on the development of magnetic materials such as metals and intermetallic compounds. Recent research on magnetic materials has contributed to the development of a wide variety of functions, including quantum and electromagnetic functions as well as energy-related functions that include interactions with heat. However, for further advancement, the development and fabrication of materials with various morphologies, such as bulk materials, thin films, superstructures, nanostructures, interfaces, and composites of different materials, are needed.

To fulfill these social demands and expectations for leading the development of magnetic materials research, this Laboratory aims to actively develop novel magnetic materials, drastically advance the basic principles related to them, and discover novel directions that extend beyond the scope of the conventional applications of magnetic materials.

To be summarized, it is expected that this Laboratory will lead research on magnetic materials by creating novel ones, developing novel functionalities, and playing a role in pioneering new principles that will serve as the basis for this development. As for collaboration with a graduate school, the School of Engineering's Department of Metallurgy, Materials Science and Material Processing or Department of Applied Physics would be preferable.