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Magnetics Society Distinguished Lecture Series

High Magnetic Anisotropy Nano-Composites and Applications

- From Bulk through Multilayers to Nano-scaled Particles



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Nagoya, Japan

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Lecture Theatre CYC-C, LG 1, Chow Yei Ching Building, Department of Electrical and Electronic Engineering, University of Hong Kong (for map, please see http://www.eee.hku.hk/contact/contact_map.htm)

“Magnetic anisotropy” is clearly one of the basic properties in magnetic substances. In particular, magneto-crystalline anisotropy is thought to be intrinsic for a given “bulk” material, but theoretical understandings of it are not satisfactory, as often demonstrated in many cases. In multilayers and nanoparticles where surface (interfacial) magnetic anisotropy plays a key role, magnetic behaviors are significantly influenced by extrinsic (induced) magnetic anisotropy. Among many alloy systems, ordered alloys are known to exhibit high magnetic anisotropy, and in particular, the $L1_0$ ordered phase is of great interest because of bit-patterned magnetic data storage applications. Nano-composite particles of high magnetic anisotropy phase, together with other magnetic anisotropy are also the subject of intensive research, since they offer potential for various applications, such as hybrid data storage, sensors and bio-devices. The talk addresses “Magnetism and structure of thin films and nano-composite particles of high magnetic anisotropy ordered phase. An in-depth review of magnetic anisotropy in representing materials is given, followed by recent developments of novel materials of high magnetic anisotropy. Recent developments on high magnetic anisotropy of novel multilayers and nano-composites will be presented. Emphasis is placed on “quasi- $L1_2$ structured alloy thin films of very high magnetic anisotropy and on (FePt/FeRh) nano-composites of the first order-transition type, in conjunction with possible applications.

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