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CSU PHYSICS TECHNICAL TALK

Recent Advances on Magnetic Skyrmions

Speaker: Dr. Albert Fert

Colorado State University

5:00 PM Tuesday, November 14, 2017

Location: 120 Engineering (Hammond Auditorium)

Abstract

Magnetic skyrmions are small local spin configurations stabilized by the protection due to their topology. In most cases, they are induced by chiral interactions between atomic spins existing in non-centro-symmetric magnetic compounds or in thin films in which inversion symmetry is broken by the presence of an interface. The skyrmions can be extremely small with diameters in the nm range and, importantly, they behave as quasi-particles that can be moved as “nanoballs”, making them suitable for “abacus”-type applications in information storage, logic or communication technologies.

Up to the last years skyrmions were observed only at low temperature (and in most cases under large applied fields), but an important effort of research has been recently devoted to find thin film and multilayered structures in which skyrmions are now stabilized above room temperature (RT). It has also been found that skyrmions can be easily created, detected and driven by currents. The talk focuses on these recent results on the way to implementation in devices prototypes.