TRR 80 Sonderseminar

Am Montag, den 11. September um 10:00 Uhr

spricht

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über das Thema

Chiral effects on physical properties

Chirality is commonly found in nature at all length and time scale, from particle physics to structure of cosmos. It is characterized by a reflection asymmetry that we are most familiar with in terms of our left hand being the mirror opposite of our right hand. In biological systems, chirality is also found in commonly from molecule-level, and the role of chirality is one of the most important feature. When this kind of handedness appears in the structure of atoms or molecules in a solid, it affects the way that the magnetic moments of unpaired electrons organize themselves through the Dzyaloshinskii-Moriya (DM) interactions [1,2-4, 6]. In a centro-symmetric structure, these interactions cancel out. The DM interaction is one of antisymmetric exchange interactions and the strength is ca. 10% of symmetric exchange interactions and stabilize a long-pitch screw-like helical and/or perpendicular arrangements of the magnetic spins, if ferroic-DM vectors exist in the materials. Normally, DM interactions exist with symmetric exchange interactions, then they must compete with ferromagnetic or antiferromagnetic exchange, which tries to align all the magnetic moments in the same direction. The resulting helical magnetic arrangement with a winding period of several tens or hundreds of nanometers, which is much longer than the lattice constant. Therefore, even though the chiral properties depend on the symmetry, they can be understood and manipulated at the mesoscopic level, independently of the structural details. [5, 7-13]

The crystals belong to chiral space group and have long range magnetic ordering are still rare and difficult to design of crystals. The crystal design of molecule-based chiral magnetic materials is often use chiral induction with chiral ligands for coordination compounds. But the crystal design of inorganic chiral magnets is not established. [14-16]

In this presentation, we would like to discuss how chirality influence on magnetism.

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Gäste sind herzlich willkommen.
Der Vortrag findet im Seminarraum S-403 / Institut für Physik, UniversitätAugsburg statt.
Gastgeber: Prof. Dr. István Kézsmárki