



Weekly Seminar

Hybrid inorganic-organic materials: a new family in condensed matter physics



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Time: 4:00pm, November 11, 2015 (Wednesday)

2015 11 11 , 4:00

Venue: Room w563, Physics building, Peking University

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In recent years there have been remarkable interests in the synthesis and investigation of hybrid organic-inorganic materials, such as the metal-organic frameworks (MOFs), due to their potential applications in gas storage, catalysis, nonlinear optics, photoluminescence, solar cell, as well as their intriguing magnetic and electric properties for fundamental science study. In this talk, I present our recent progress on the novel magnetic and multiferroic properties in a series of MOFs with a perovskite-like structure. Resonant quantum tunneling of magnetization (RQTM), a phenomenon previously only seen in the single-molecule quantum magnets, has been observed in a Fe-based MOF. The coexistence of magnetic ordering and ferroelectric/antiferroelectric ordering makes these hybrid MOFs a new type of multiferroic materials. Meanwhile, the magnetoelectric coupling effects, i.e., magnetic field control of electric polarization and electric control of magnetization, have been firstly demonstrated in MOFs by us. Moreover, the simultaneous presence of RQTM and magnetoelectric coupling in the MOF yields a completely new effect, termed as resonant quantum magnetoelectric effect. The rich diversity of physical behaviors in hybrid inorganic-organic materials opens up exciting new frontiers for condensed matter physics.

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