Special Issue

New Quantum Materials

Message from the Guest Editor

Quantum materials feature electronic correlations and/or spin–orbit interactions and a delicate interplay between spin, charge, orbit, and lattice degrees of freedom. The surprising insulating behavior in binary 3D-transition metal oxides reported in 1937 led to the realization of the importance of electronic correlations first proposed by Peierls and Mott; the high-temperature superconductivity in ternary 3d-transition metal oxides discovered in 1986 by Bednorz and Muller violates the Bardeen–Cooper–Schrieffer theory that otherwise perfectly describes conventional superconductivity. A growing number of theoretical proposals focusing on effects of spin–orbit interactions, such as quantum spin Hall effect in graphene in 2005 by Kane and Mele and its experimental confirmation in HgTe in 2007 by Konig et al., have led to the explosion of interest in high-Z materials. This Special Issue on new quantum materials provides a timely forum for expedited communications focused on most recent developments in the ever-expanding frontiers of quantum materials.

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Materials (ISSN 1996-1944) was launched in 2008. The journal covers twenty-five comprehensive topics: biomaterials, energy materials, advanced composites, advanced materials characterization, porous materials, manufacturing processes and systems, advanced nanomaterials and nanotechnology, smart materials, thin films and interfaces, catalytic materials, carbon materials, materials chemistry, materials physics, optics and photonics, corrosion, construction and building materials, materials simulation and design, electronic materials, advanced and functional ceramics and glasses, metals and alloys, soft matter, polymeric materials, quantum materials, mechanics of materials, green materials, general. *Materials* provides a unique opportunity to contribute high quality articles and to take advantage of its large readership.

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