Special Issue

Superconductivity and Magnetism

Message from the Guest Editor

In principle, superconductivity and magnetism are two competing orders of matter and therefore, in theory, should be mutually excluded. However, there are situations, already predicted by Vitaly Ginzburg in 1950, in which the two phenomena can coexist. In this way, the Cooper pairs penetrate into the ferromagnetic layer for proximity effect, and one has the unique possibility to study properties of superconducting electrons under the influence of a large exchange field. These eterostructures are also suitable for a lot of technical applications. In a conventional superconductor, the glue of Cooper pairs are phonons, i.e., vibrations of the crystal lattice. Furthermore, it is now almost certain that the mechanism responsible for superconductivity in cuprates and in iron pnictides is antiferromagnetic spin fluctuations.

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