

Vážené kolegyne a kolegovia, pozývame vás na seminár:

Dr. Michael Eisterer

TU Wien Atominstitut, Vienna, Austria

MgB₂ vs. iron-based superconductors: competitors for applications at intermediate temperatures?

Abstract: The iron-based superconductors (FeSC) and MgB₂ have transition temperatures in between the boiling points of liquid helium and nitrogen. They thus may be cooled by cryocoolers avoiding the expensive usage of liquid helium. On the other hand, conductors made of these materials are potentially much cheaper than the high-temperature superconducting wires of the first and second generation having transition temperatures well above the boiling point of nitrogen. The application window of MgB₂ and the FeSC is thus restricted to temperatures below about 30 K. At liquid helium temperature NbTi is still the workhorse of superconductivity due to its easy handling and its comparatively low price, making the new materials only attractive at high fields, where the performance of NbTi becomes insufficient.

The basic properties such as the upper critical field, its anisotropy, and the pinning properties of the two classes of materials will be compared in view of their application potential. The inter-grain connectivity, which is one key parameter in all but the conventional superconductors, will be discussed. This issue strongly affects the applicable production techniques and hence the resulting price. In addition, it leads to current percolation reducing the maximum loss free macroscopic currents. The underlying mechanisms in these two classes of materials will be highlighted.

Seminár sa uskutoční v piatok 25.11.2016 o 10.00 v zasadačke EIÚ SAV.