

Séminaire SOLEIL

Crystal growth and anisotropy studies of rare earth intermetallics

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**Lundi 18 février à 14h00
Grand Amphi SOLEIL**

Séminaires

The physics of strongly correlated electron systems (SCES), in particular the heavy fermion systems are extensively studied in condensed matter physics. The heavy fermion nature of SCES system is mostly found in Ce, Yb and U based intermetallic compounds. The magnetism in such systems is governed by two competing mechanisms namely RKKY and Kondo interaction. RKKY interaction, which is mediated via the spin polarization of conduction electrons, drives the localized electrons into an ordered pattern. On the other hand the Kondo effect results in a non-magnetic ground state where the conduction electrons screen the local moment by forming a spin singlet state. Depending upon the strength of RKKY and Kondo interaction, such systems show various ground state properties, for example, CeAl₃ and CeCu₆ are heavy-fermion Kondo lattice compounds without any long-range magnetic order, CeAl₂ and CeB₆ are Kondo lattice compounds that order magnetically at low temperature. Pressure induced superconductivity is observed in CeIn₃. One of the pre-requisites for a Ce-compound to become a superconductor is that the sample must be of high quality and preferably single crystalline.

In this talk I am going to discuss about the single crystal growth and anisotropic magnetic properties of such rare earth systems particularly Ce-based compounds. The single crystals have been grown by employing various crystal growth techniques, like flux method, Bridgman method, Czochralski pulling method. My talk will focus on some of our recently grown single crystals, their growth methods and their interesting anisotropic physical properties.

- References:
- [1] Pranab Kumar Das et. al., Phys. Rev. B, **83**, 134416 (2011).
 - [2] Pranab Kumar Das et. al., J. Phys.: Condens Matter **24** 146003 (2012).
 - [3] Pranab Kumar Das et. al., J. Phys.: Condens Matter **24** 476001 (2012).

**Ce séminaire sera suivi d'une pause-Café**

Formalités d'entrée : accès libre dans l'amphi du Pavillon d'Accueil. Si la manifestation a lieu dans le Grand Amphi SOLEIL du Bâtiment Central, merci de vous munir d'une pièce d'identité (à échanger à l'accueil contre un badge d'accès).

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