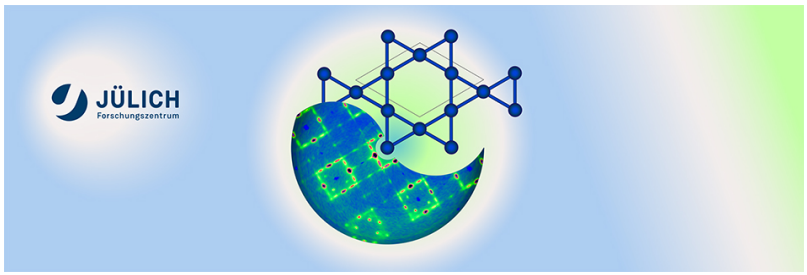

Beitrag ID: **84** Typ: **Talk**

Kondo coupling-driven topological phase transition in the Weyl semimetal candidate CeAlGe

Mittwoch, 8. Oktober 2025 15:45 (15 Minuten)

CeAlGe crystallizes in a tetragonal structure I41md, where the spatial-inversion symmetry is broken, and is expected to exhibit Weyl fermions near a Fermi surface that becomes more stable by broken time-reversal symmetry [1]. It has been known that the magnetic ground state and relevant topological properties of CeAlGe depend on the chemical stoichiometry. For example, CeAlGe grown by the flux method yields 5 ~ 15% additional Al in the Ge site and exhibits a commensurate antiferromagnetic order below T = 5.1 K [2], whereas the crystal grown by floating-zone methods with 30 bar of Ar gas (p=30 bar) is resulted in stoichiometric composition and exhibits an incommensurate order below T = 4.4 K in which topological Hall effects are induced by external magnetic fields [3]. In this presentation, we will present the experimental results of newly synthesized CeAlGe using the optical floating-zone furnace with a lower Ar pressure of p=5 bar. Our neutron diffraction and electrical Hall transport experiments revealed that the topological magnetism is still stabilized with shorter periodicity. Furthermore, we performed electrical transport experiments under pressure up to 2 GPa. Given all experimental results obtained using flux-grown and two floating-zone-grown CeAlGe crystals, we will discuss the mechanism of topological magnetism with respect to the Kondo coupling strength.

[1]G. Chang et al., Physical Review B, 2018, 97, 01104.
[2]T. Suzuki et al., Science, 2019, 365, 377-381.
[3]P. Puphal et al., Physical Review Letters, 2020, 124, 017202.

Autoren: SHIN, Soohyeon (Forschungszentrum Juelich GmbH); Prof. SEO, Soonbeom (Changwon National University); PLOKHIKH, Igor; Dr. WHITE, Jonathan S. (Paul Scherrer Institut); Dr. JANG, Harim (Sungkyunkwan University); Dr. POMJAKUSHIN, Vladimir Y. (Paul Scherrer Institut); SU, Yixi (Jülich Centre for Neutron Science (JCNS) at MLZ, Forschungszentrum Jülich GmbH); Prof. PARK, Tuson (Sungkyunkwan Univeristy); Dr. POMJAKUSHINA, Ekaterina (Paul Scherrer Institut)

Vortragende(r): SHIN, Soohyeon (Forschungszentrum Juelich GmbH)

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