TRR 80 Sonderseminar

Am Freitag, den 19. Dezember um 10:00 Uhr

spricht

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über das Thema

Understanding magnetocaloric materials from first principles

The magnetocaloric effect is widely discussed as an efficient alternative to the prevailing gas-compressor refrigeration concept. An efficient refrigeration cycle requires materials which provide large adiabatic temperature and isothermal entropy changes at the magnetic phase transformation which should preferably take place around ambient conditions. Hot candidates are cubic La-Fe-Si and Ni-Mn-based Heusler compounds which undergo a first-order transition. In both cases, the performance relies on an intimate interdependence between magnetism and lattice degrees of freedom. For La-Fe-Si in particular, we encounter an unusual and significant effect of the magnetic phase transition on the element-resolved vibrational density of states. This is connected with an overall softening of phonons in the paramagnetic phase, which is unexpected due to the large volume decrease at the transition. The pronounced magneto-elastic effect originates from specific changes in the electronic density of states at the Fermi level arising from the itinerant nature of the Fe moments.

Gäste sind herzlich willkommen.
Der Vortrag findet im Seminarraum R-506 / Institut für Physik, Universität Augsburg statt.

Gastgeber: Prof. Dr. Ulrich Eckern
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