[1] E. V. Sampathkumaran et al., Phys. Rev. B **47**(13), 8349, (1993).

TT 32.21 Thu 14:00 Poster B

Uniaxial pressure and strain dependences of the characteristic energies in $CeCu_{6-x}Au_x$ — •Kai Grube[1], Stefanie Drobnik[1,2], Roland Schäfer[1], Frédéric Hardy[1], Christoph Meingast[1], Oliver Stockert[3], and Hilbert von Löhneysen[1,2] — [1]Forschungszentrum Karlsruhe, Institut für Festkörperphysik, 76021 Karlsruhe, Germany — [2]Physikalisches Institut, Universität Karlsruhe, 76128 Karlsruhe, Germany — [3]MPI für chemische Physik fester Stoffe, 01187 Dresden, Germany

If paramagnetic compounds are driven into a magnetically ordered state by a nonthermal control parameter, the spontaneous symmetry breaking in the ordered state, as well as the interplay of characteristic energies inevitably lead to a change of the anisotropy of the compound at low temperatures. This can be used to identify the dominant energy scales and to study in more detail continuous phase transitions at zero temperature, i.e. so-called quantum critical points (QCP). The archetypical heavy-fermion system $CeCu_{6-x}Au_x$ is one of the best investigated examples of a magnetic QCP. It can easily be tuned across the onset of antiferromagnetic order by changing its volume either by alloying with Au or applying pressure. For several distinct Au contents we have determined the uniaxial pressure and strain dependences of the Kondo and the magnetic interaction energies, with the Grüneisen parameter obtained through thermal expansion, specific heat, and compressibility measurements. The results show a strongly anisotropic antiferromagnetic phase which develops from a nearly isotropic Kondo-lattice state.

TT 32.22 Thu 14:00 Poster B

High-pressure magnetization measurements on single-crystalline CoS_2 — •Sandra Drotziger[1], Kai Grube[2], Marc Uhlarz[1], Christian Pfleiderer[3], John Wilson[4], and Hilbert von Löhneysen[1,2] — [1]Physikalisches Institut, Universität Karlsruhe, 76128 Karlsruhe — [2]Forschungszentrum Karlsruhe, Institut für Festkörperphysik, 76021 Karlsruhe — [3]Physik Department E21, Technische Universität München, 85748 Garching — [4]H.H. Wills Physics Laboratory, University of Bristol, UK

Suppression of magnetic order in weak itinerant magnets has recently attracted scientific interest due to novel phases emerging in the vicinity of a quantum phase transition. Among these systems, the pyrite compound CoS_2 is a promising candidate for general considerations as it has a simple cubic structure with high magnetic isotropy. At $T_C \approx 122\,K$ CoS_2 develops ferromagnetic order with a spontaneous moment of $\mu_s = 0.84\,\mu_B$/Co. With increasing pressure the ferromagnetism is suppressed to lower temperatures and the order of the phase transition changes from second to first order at the tricritical point $p^* \approx 0.1\,GPa$ [1]. For $p > p^*$ a first order field-induced phase transition is observed. We report pressure studies of the DC magnetization measurements on CoS_2 single crystals as a function of temperature down to 2.3 K and magnetic field up to 12 T. The measurements were performed in a miniaturized diamond anvil cell made of a non-magnetic CuBe alloy. The temperature of the metamagnetic transition increases linearly, with a slope almost independent of p.

[1] S. Barakat, PhD Thesis, University of Cambridge (2001).

TT 32.23 Thu 14:00 Poster B

$CeRu_2Si_2$ and Quantum Critical Metamagnetism? — •Franziska Weickert[1,2], Philipp Gegenwart[3,1], Markus Garst[4], and Frank Steglich[1] — [1]Max-Planck-Institut für Chemische Physik fester Stoffe, 01187 Dresden — [2]Hochfeld-Magnetlabor Dresden, 01328 Dresden — [3]I. Physikalisches Institut, Universität Göttingen, 37077 Göttingen — [4]Institut für Theoretische Physik, Universität Köln, 50938 Köln

$CeRu_2Si_2$ is a well-known prototypical heavy fermion system and shows a sudden strong increase in the magnetization M and the sample length ΔL for magnetic fields parallel to the crystallographic c-direction at around 7.8 T. These anomalies occur below 4 K and sharpen with decreasing temperatures, but no features for a first order phase transition are observed down to 15 mK.

We report new thermal expansion α, magnetostriction λ and specific heat C/T measurements, which have been made in mT magnetic field steps around the metamagnetic crossover down to 15 mK on very pure single crystals.

The results show hints for the existence of a quantum critical endpoint in $CeRu_2Si_2$ and were compared with an extended model of metamagnetic quantum criticality, which was first introduced by *Millis et al.* in 2002.

TT 32.24 Thu 14:00 Poster B

Development of the magnetic order in $Yb(Rh_{1-x}Co_x)_2Si_2$ — •Christoph Klingner, Cornelius Krellner, Tanja Westerkamp, Niels Oeschler, Manuel Brando, Christoph Geibel, and Frank Steglich — Max Planck Institute for Chemical Physics of Solids, D-01187 Dresden, Germany

In recent years $YbRh_2Si_2$ has been intensively investigated due to its proximity to an antiferromagnetic quantum critical point (QCP). As expected for Yb-Kondo lattice compounds the magnetic ordering of $YbRh_2Si_2$ (T_N=70mK) can be shifted to higher temperature by applying pressure. Doping with Cobalt results in positive chemical pressure, allowing therefore the investigation of the magnetic phase diagram and the behavior while stabilizing the antiferromagnetic ordered state. The advantage of less complex measurements compared to high pressure experiments leads to more detailed and precise results than in pressure studies. In this contribution we report on the growth of a series of single crystals $Yb(Rh_{1-x}Co_x)_2Si_2$ with concentrations x between 0 and 1. The low temperature properties studied by resistivity, specific heat and magnetization measurements for different concentrations will be presented. Further on the behaviour of the transitions under an applied magnetic field will be discussed. Finally, a phase diagram of $Yb(Rh_{1-x}Co_x)_2Si_2$ will be presented and compared with the pressure phase diagram of $YbRh_2Si_2$.

TT 32.25 Thu 14:00 Poster B

Thermodynamics of Spin-Ladder and Spin-Chain Systems close to Quantum Criticality — •J. Rohrkamp[1], T. Lorenz[1], A. V. Sologubenko[1], O. Heyer[1], M. Garst[2], F. Anfuso[2], A. Rosch[2], K. Krämer[3], and M. M. Turnbull[4] — [1]II. Physikalisches Institut, Universität zu Köln — [2]Institut für Theoretische Physik, Universität zu Köln — [3]Department of Chemistry and Biochemistry, University of Bern — [4]Carlson School of Chemistry and Department of Physics, Clark University

Compounds with magnetic subsystems representing simple model spin systems with weak magnetic coupling constants are ideal candidates to test theoretical predictions for the generic behavior close to quantum phase transitions. We present measurements of the thermal expansion, magnetostriction and thermal conductivity of the spin-$\frac{1}{2}$-ladder system piperidinium copper bromide $(C_5H_{12}N)_2CuBr_4$ and the spin-$\frac{1}{2}$-chain compound copper pyrazine dinitrate $Cu(C_4H_4N_2)(NO_3)_2$. Both compounds show quantum phase transitions as a function of magnetic field with pressure dependent critical fields. The low-temperature thermal expansion approaches $1/\sqrt{T}$ divergences at the critical fields and shows a complex behavior with various sign changes inbetween.

TT 32.26 Thu 14:00 Poster B

Search for coupled S=1/2 dimer systems in a new class of nitronyl nitroxides biradicals — •K. Remović-Langer1[1], U. Tutsch[1], C. T. Pham[1], M. Baumgarten[2], E. A. Mostovich[2], B. Wolf[1], and M. Lang[1] — [1]Physikalisches Institut, J.W. Goethe-Universität, Max-von-Laue-Str. 1, SFB/TR 49, D-60438 Frankfurt(M), Germany — [2]Max-Planck-Institut für Polymerforschung, Ackermannweg 10, SFB/TR 49, D-55128 Mainz, Germany

Recently, quantum magnets such as coupled-dimer systems and easy-plane antiferromagnets have emerged as interesting objects for studying the properties of magnetic field-induced Bose-Einstein condensation (BEC). Up until the present day, most of the studies have been focused on the magnetic field-induced BEC. Some recent experiments, however, give evidence for a transition which could be interpreted as pressure-induced BEC. So far, TlCuCl3, is the only quantum magnet on which field- and pressure-induced transitions have been studied. Biradical-based coupled-dimer systems, yielding moderate intradimer and tunable dimer-dimer interactions, are promising target materials for studying the properties of those field- and pressure-induced quantum phase transitions. We report here on the results of magnetic measurement on a group of metal-organic nitronyl nitroxides dimer systems which are proving to be a promising class of material for realization of systems to study field- and pressure-induced quantum phase transitions and their critical phenomena.

TT 32.27 Thu 14:00 Poster B

Structural and magnetic properties of a betaine-bridged trimer Cu^{2+} spin system — •K. Remović-Langer[1], B. Wolf[1], L. Wiehl[2], E. Haussühl[2], B. Winkler[2], N. Hasselmann[3], F. Sauli[3],