27695-8204, USA

We investigate the magnetic properties of the system $CuTe_2O_5$ by susceptibility and electron spin resonance ESR measurements. The anisotropy of the effective g-factors and the ESR linewidth indicates that the anticipated structural dimer does not correspond to the singlet-forming magnetic dimer. Moreover, the spin susceptibility of $CuTe_2O_5$ can only be described by taking into account interdimer interactions of the same order of magnitude than the intradimer coupling. Analyzing the exchange couplings in the system we identify the strongest magnetic coupling between two Cu ions to be mediated by a super-superexchange interaction via a bridging Te ligand, while the superexchange coupling between the Cu ions of the structural dimer only results in the second strongest coupling.

TT 20.46 Wed 14:00 Poster A

Electric transport properties of $LaAlO_3/SrTiO_3$ interfaces studied by scanning electron microscopy — •Christian Gürlich[1], Matthias Ruoff[1], Stefan Thiel[2], Christof Schneider[2], German Hammerl[2], Christoph Richter[2], Jochen Mannhart[2], Reinhold Kleiner[1], and Dieter Koelle[1] — [1]Physikalisches Institut, Experimentalphysik II, Universität Tübingen, Auf der Morgenstelle 14, D-72076 Tübingen, Germany — [2]Center for Electronic Correlations and Mangnetism, Institut of Physics, Augsburg University, D-86135 Augsburg, Germany

It was shown recently that conducting electron gases are formed at interfaces in heterostructures consisting of insulating oxides such as $SrTiO_3/LaTiO_3$ (STO/LTO) or $LaAlO_3/SrTiO_3$ (LAO/STO) [1]. These conducting electron gases might be confined to sheets that are only very few nanometers thick. Lateral confinement into a bridge-like structure has been realized for STO/LAO interfaces, using lithographic patterning by modulating the thickness of the LAO layers with unit cell resolution [2]. Here, we present a scanning electron microscopy study of the electric transport properties of such structures. Irradiation with a focused electron beam induces pronounced changes of the sample resistance, with a typical reduction by more than a factor of two at 300 K. After switching off the electron beam, the resistance returns to the initial state with relaxation times above several hundred seconds.

[1] H. Y. Hwang, Science vol. 313, 1895 (2006) and references therein.
[2] C. W. Schneider *et al.*, Appl. Phys. Lett. vol. 89, 122101 (2006).

TT 20.47 Wed 14:00 Poster A

Unoccupied electronic structure of TiOCl studied by XAS — •Sebastian Glawion[1], Götz Berner[1], Matthias Schlachter[1], Michael Sing[1], Markus Hoinkis[2], Gianina Gavrila[3], Leonardo Pisani[4], Roser Valenti[4], and Ralph Claessen[1] — [1]Experimentelle Physik 4 and Röntgen Research Center for Complex Materials, Universität Würzburg, D-97074 Würzburg, Germany — [2]Experimentalphysik II, Universität Augsburg, D-86135 Augsburg, Germany — [3]Institut für Physik, Technische Universität Chemnitz, D-09107 Chemnitz, Germany — [4]Institut für Theoretische Physik, Universität Frankfurt, D-60054 Frankfurt, Germany

TiOCl is a Mott-insulating quantum magnet showing a dimerized spin-Peierls phase for temperatures below T_c1=67K. This phase is reached through two distinct phase transitions. The intermediate phase shows incommensurate order, while the susceptibility of the high-T phase nicely reflects the behaviour of a 1D Heisenberg antiferromagnet. Intensive studies in this latter phase have been conducted on the occupied density of states in the valence band both by (AR)PES and various calculations. However, since the low-T phase cannot be reached by PES due to charging problems, we conducted X-ray absorption studies searching for possible changes in the electronic structure induced by the different kinds of ordering. Our results nicely agree with previous LDA+U and GGA+U calculations but do not seem to show major differences between the different phases.

TT 20.48 Wed 14:00 Poster A

Electronic Raman scattering and phonon anomalies in Na_xCoO_2. — Vladimir Gnezdilov[1], Patric Scheib[2], •Peter Lemmens[2], Fangcheng Chou[4], Lambert Alff[5], Yoshiharu Krockenberger[3], Hanns-Ulrich Habermeier[3], Chengtian Lin[3], and Bernhard Keimer[3] — [1]Institute for Low Temperature Physics and Engineering, NASU, Kharkov, Ukraine — [2]Institut für Physik der kondensierten Materie, TU Braunschweig, Braunschweig — [3]Max-Planck-Institute for Solid State Research, Stuttgart — [4]Center for Materials Science and Engineering, MIT, Cambridge, USA — [5]Institute of Material Science, TU Darmstadt, Darmstadt

Raman scattering in nonsuperconducting and superconducting cobaltates $Na_xCoO_2 \cdot yH_2O$ shows pronounced anomalies in the phonon as well as the electronic contribution to the scattering cross section. The effect of doping and hydration on these anomalies is studied and used for a characterization of single crystals and thin films. Work supported by DFG, ESF-HFM and MRSEC Program of NSF under award number DMR 02-13282.

TT 20.49 Wed 14:00 Poster A

Low-Temperature Antiferromagnetic Phase Transition in α-YbPdSn — •Tobias Görlach[1], Sergiy Putselyk[1], Andreas Hamann[1], Tihomir Tomanic[1], Falko Schappacher[2], Rainer Pöttgen[2], and Hilbert v. Löhneysen[1,3] — [1]Physikalisches Institut, Universität Karlsruhe, D-76128 Karlsruhe, Germany — [2]Institut für Anorganische und Analytische Chemie, Westfälische Wilhelms-Universität Münster, Corrensstr. 30, D-48149 Münster, Germany — [3]Forschungszentrum Karlsruhe, Institut für Festkörperphysik, D-76021 Karlsruhe, Germany

Ternary intermetallic compounds of the type YbTX where T is a transition metal and X is a main group metal, show a wide variety of magnetic properties at low temperatures [1]. More specifically, stannides (X = Sn) show different types of magnetic order. While YbNiSn orders ferromagnetically at T_C = 5.6 K, YbRhSn and YbPtSn order antiferromagnetically at 1.85 K and 3.5 K, respectively, YbPtSn also being metamagnetic. Here we present evidence for magnetic order at very low temperatures in YbPdSn, whose magnetic properties have previously been investigated at temperatures above 4.2 K only. Our low-temperature measurements of the specific heat and the magnetic susceptibility indicate an antiferromagnetic phase transition at 200 mK which is suppressed rapidly in moderate magnetic fields.

[1] R. Pöttgen, D. Johrendt and D. Kußmann, in: *Handbook of the Physics and Chemistry of the Rare Earths* (Elsevier Science B.V., Amsterdam, 2001), vol. **32**, ch. 207, pp. 455–515.

TT 20.50 Wed 14:00 Poster A

Thermal expansion and specific heat of magnetically frustrated $(Ni_{1-x}Co_x)_3V_2O_8$ — •Qin Zhang[1], William Knafo[1,2], Kai Grube[1], Hilbert v. Löhneysen[1,2], Christoph Meingast[1], and Thomas Wolf[1] — [1]Forschungszentrum Karlsruhe, Institut für Festkörperphysik, D-76021 Karlsruhe, Germany — [2]Physikalisches Institut, Universität Karlsruhe, D-76128 Karlsruhe, Germany

$Ni_3V_2O_8$ and $Co_3V_2O_8$ both have the same basic kagome-staircase structure, leading to geometric frustration of the magnetic ordering of the spins on Ni and Co sites. Both compounds exhibit a number of magnetic phase transitions at low temperatures, which partially relieve the frustration. In addition to magnetic ordering, these compounds also exhibit ferroelectric properties. Here we present thermal expansion and specific heat data on high-quality single crystals of $(Ni_{1-x}Co_x)_3V_2O_8$, which allow us to map out the phase diagram of the Ni-Co series, as well as to calculate various pressure derivatives associated with magnetic ordering.

TT 20.51 Wed 14:00 Poster A

Magnetisation of ferromagnetic Pr_5Si_3 under hydrostatic pressure — •Stefan Legl[1], Christian Pfleiderer[1], Dmitri Souptel[2], and Günter Behr[2] — [1]Physik Department E21, Technische Universität München, D-85748 Garching, Germany — [2]IFW Dresden, PF 270116, D-01171 Dresden, Germany

We report the low temperature magnetisation, specific heat and resistivity of single crystal Pr_5Si_3 at ambient pressure under magnetic field up to 9T and temperatures down to 3K.

Pr_5Si_3 orders ferromagnetically below T_c=50K. The ferromagnetic state is strongly anisotropic where the basal plane in the hexagonal crystal structure is the easy magnetic plane.

Under hydrostatic pressures up to 18 kbar the magnetisation for temperatures down to 3K and magnetic fields up to 9T shows only a weak variation of the ordered moment and T_c. Magnetisation loops at low magnetic fields show changes characteristic of the emergence of a magnetic modulation under pressure.

TT 20.52 Wed 14:00 Poster A

Transport and Ordering of Polarons in PrCaMnO: Electric induced Colossal Resistance Effect — •Sebastian Schramm, Peter Moschkau, Jörg Hoffmann, and Christian Jooss — Institut für Materialphysik, Universität Göttingen

The resistivity of the low-bandwidth manganite $Pr_{1-x}Ca_xMnO_3$ (x =