$MnWO_4$ (Huebnerite) crystallizes in a monoclinic crystal structure composed of alternating layers of Mn^{2+} and W^{6+} ions which are octahedrally coordinated by oxygen ions. The partially frustrated spin system exhibits a negative Curie-Weiss temperature $T_{CW} \approx -75$ K in the paramagnetic regime and undergoes a sequence of transitions into complex antiferromagnetic phases below $T_N \approx 13.5$ K, including transitions from commensurate to incommensurate and collinear to non-collinear magnetic order, which are connected to the onset or decay of ferroelectric polarization [1]. Thus $MnWO_4$ belongs to the class of multiferroics. We present a detailed study of the phonon modes of this compound based on polarized reflectivity measurements in the FIR and MIR regime. In addition, polarized transmission measurements in the sub-mm regime below the phonon frequencies have been carried out in order to investigate the low-energy magnetoelectric excitations, so-called electro-magnons [2,3].

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TT 32.76 Thu 14:00 Poster B

High-field Gd^{3+}–ESR on the spin-antiferromagnet $GdNi_2B_2C$ — •Uwe Schaufuss[1], Ferenc Murányi[1], Vladislav Kataev[1], Mathias Dörr[2], Martin Rotter[3], and Bernd Büchner[1] — [1]IFW Dresden, Institute for Solid State Research — [2]Institut für Festkörperphysik, Technische Universität Dresden — [3]Institute for Physical Chemistry, University of Vienna, Austria

The layered metalic compounds RNi_2B_2C (R = rare earth ions) attracted attention in the last years for its rich TH–phase diagrams. superconductivity and antiferromagnetic (afm) ordering with commensurate or incomensurate spin structure can be found in this material family. In order to obtain a deeper insight in the magnetic interactions in the spin-only antiferromagnet $GdNi_2B_2C$ we have performed Gd^{3+}–electron spin resonance study in a frequency range $10 - 350$ GHz on a single crystal of this material. The main crystalographic axes were successively set parallel to the magnetic field. We found that the Korringa relaxation rate was surprisingly anisotropic implying anisotropic interactions between the localized Gd^{3+}-spins and the conduction electrons. In the afm state we observed a large isotropic afm-gap of 76 GHz which is much larger than expected from the dipole-dipole interaction. This gap is field dependent and vanishes in strong fields. We will discuss possible reason for the unusual magnetic anisotropy in $GdNi_2B_2C$.

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TT 32.77 Thu 14:00 Poster B

Heat capacity, thermal expansion and magnetic properties of the itinerant ferromagnet MnSi — •Qin Zhang[1], William Knafo[1,2], Frédéric Hardy[1,2], Kai Grube[1], Peter Schweiss[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

MnSi, which is one of the most studied weak itinerant ferromagnetic systems, has recently attracted considerable attention due to its novel magnetic phase diagram under pressure and associated non-Fermi-liquid like resistivity [1,2]. Here, we present heat capacity, thermal expansion, magnetostriction and magnetization data on several different MnSi crystals, which were grown either from Mn, Si or Sn flux using the Bridgman method. Our results show that the details of the magnetic ordering transition depend strongly on whether the crystal is grown from Mn or Si enriched flux, although single-crystal x-ray refinements of these crystals show no difference of the Mn and Si site occupation within an error of ±0.5%.

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TT 32.78 Thu 14:00 Poster B

Electronic Quasiparticles on the Spin-Wave Energy Scale in Ferromagnets — •Andreas Hofmann[1], Xiaoyu Cui[1], Jörg Schäfer[1], Eli Rotenberg[2], Luc Patthey[3], and Ralph Claessen[1] — [1]Universität Würzburg, D-97074 Würzburg — [2]Lawrence Berkeley Laboratory, Berkeley, CA 94720, USA — [3]Paul-Scherrer-Institut, CH-5232 Villigen

Angle-resolved photoemission (ARPES) is excellently suited to resolve energy renormalization of electronic quasiparticles dressed with an excitation. Beyond electron-phonon coupling, one must expect the fingerprint of magnetic excitations. Significant mass enhancement due to spin excitations has been identified for the first time in metallic surface states of Fe(110) [1]. The energy window exceeds that of phonons by far and is in striking coincidence with the spin wave spectrum. Bulk bands of magnetic materials are also subject to strong mass enhancement, as reflected e.g. in the Fermi velocity. In most recent experiments on Ni(110) using ARPES, the question has been addressed whether such electronic self-energy effects can be resolved in the spectral function. In taking ARPES data at symmetry planes of the Ni Fermi surface, structure is indeed observed in the real and imaginary parts of the self-energy. The energy scale of 200-300 meV coincides with characteristic spin wave energies. Moreover, the bulk bands show indication of two simultaneous kinks, on both the phonon and spin wave energy scale. The consequences of such experiments will be analyzed.

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TT 32.79 Thu 14:00 Poster B

Magnetic ordering in striped nickelates — •Udo Schwingenschlögl[1], Cosima Schuster[1], and Raymond Frésard[2] — [1]Institut für Physik, Universität Augsburg, D-86135 Augsburg — [2]Laboratoire CRISMAT, UMR CNRS-ENSICAEN(ISMRA) 6508, 6 Bld. du Maréchal Juin, F-14050 Caen

Stripe phases are observed in a large variety of materials, including layered copper and nickel oxides. It is expected that the electronic properties of these doped Mott insulators can be described using suitably chosen Hubbard models, care being taken of the orbital degeneracy for the nickelates. However, the ground state of the microscopic models depends crucially on the choice of parameters. Hence, an estimate from ab initio calculations is desirable. We report on the electronic and magnetic structure of the striped nickelate $Sr_xLa_{2-x}NiO_4$ with x=1/3, where diagonal filled stripes are formed, using DFT (GGA) calculations. In contrast to experimental findings, the LDA+U approach results in A-type diagonal filled antiferromagnetic stripes, while in the pure GGA scheme C-type diagonal filled stripes are favored. A further determination of the structural parameters is therefore required.

TT 32.80 Thu 14:00 Poster B

Ferromagnetism in the multi-orbital periodic Anderson model — •Unjong Yu, Krzysztof Byczuk, and Dieter Vollhardt — Theoretical Physics III, Center for Electronic Correlations and Magnetism, Institute for Physics, University of Augsburg, D-86135 Augsburg, Germany

At less than half-filling the localized f-electrons of the periodic Anderson model (PAM) can order ferromagnetically already at moderate values of the Coulomb repulsion U [1]. In the case of disorder in the f-level the corresponding critical temperature T_C always decreases [2,3]. By contrast, disorder in the conduction electrons can give rise to a surprisingly rich non-monotonic dependence of T_C [3]. Here we present results of the first investigation of the influence of *band-degeneracy* of the conduction- and/or f-electrons on the stability of the ferromagnetic phase of the PAM. In particular, a remarkable increase of T_C with the degeneracy in the localized levels is found. The origin of this increase and other features will be discussed.

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TT 32.81 Thu 14:00 Poster B

Valence transition in the periodic Anderson model — •Alexander Mai, Nham Phan Van, and Klaus W. Becker — Institut für Theoretische Physik, TU Dresden, Germany

The origin of a possible quantum valence transition in the periodic Anderson model has been discussed controversially over the last years. Using an extension of the Projector-based Renormalization Method (PRM) to a continuous renormalization technique (CPRM) we try to merge the different points of view into one. We show that for fixed particle density the transition is smooth with a small slope in systems with small orbital degeneracy, whereas it becomes rather steep for large degeneracies. In contrast, for fixed chemical potential we find a rather abrupt change as function of the f-electron energy. The discussion is completed by an outlook on a possible superconducting phase in the PAM.

TT 32.82 Thu 14:00 Poster B

Valence transition in the periodic Anderson model in the