SFB 608

Einladung zum Kolloquium

Ort: Universität zu Köln
II. Physikalisches Institut, Seminarraum 201

Zeit: Mittwoch, den 03. März 2004, 15 Uhr c.t.

Sprecher: Dr. T.G. Perring
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Thema: Magnetic dynamics in bilayered manganites showing colossal magnetoresistance

Bilayer manganites of the form $La_{2-2x}Sr_{1+2x}Mn_2O_7$, with mean hole density x per Mn site, are the naturally layered analogues of the colossal magnetoresistive pseudo-cubic manganites $RE_{1-x}A_xMnO_3$ (RE=rare earth, A=Ca,Sr,Ba). Just as for the cubic manganites, the layered compounds also show colossal magnetoresistance around the three dimensional ordering temperature T_C = 90-120 K for hole doping 0.3 - 0.4. The bilayered manganites are interesting because they allow the influence of another control parameter - that of dimensionality - on the physical properties of the manganites to be explored.

The manganites have a rich variety of physical properties that result from a coupling of the charge, spin, lattice and orbital degrees of freedom. The talk will focus on the magnetism of the bilayered manganites, for the hole doping range in which the manganese moments order ferromagnetically within the bilayers. Results of a comprehensive study of the low temperature ($T<T_C$) spin waves will be presented, and the implications of the results for the applicability of the venerable double exchange model for the magnetic interactions in the manganites will be discussed. Evidence will also be shown for the formation of antiferromagnetic correlations above T_C, that coexist with ferromagnetic critical scattering, and whose temperature and magnetic field dependence mirrors that of the resistivity.

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