**Superconductivity in bilayer nickelates: multiorbital effects and Cooper-pairing**
**(Session number, Oral)**

Ilya M. Eremin, Steffen Bötzel, Marius Scholten, and Frank Lechermann

Theoretical Physics III, Faculty of Physics and Astronomy, Ruhr-University Bochum,
44801 Bochum, Germany

Recently discovered high-Tc superconductivity in pressurized bilayer nickelate bulk crystals La3Ni2O7 (La-327) and their thin films under compressive strain are believed to be driven by the non-phononic repulsive interaction. Depending on the strength of the interlayer repulsion, the symmetry of the superconducting order parameter is expected to be either d-wave or sign-changing bonding-antibonding s±-wave order parameter, respectively.

In my presentation I will analyze the peculiar features of the electronic structure of these systems and the interplay of the 3dz2 and 3dx2-y2 orbitals in the normal and the superconducting states. Discussing various superconducting states we show that the bilayer structure of the spin response allows to elucidate the role of the interlayer interaction and the nature of the Cooper-pairing in a very efficient way. Furthermore, we study the influence of the point-like non-magnetic impurities on the superconducting state of La-327 and demonstrate that s±-wave and d-wave symmetries show a very different behavior as a function of impurity concentration, which can be studied experimentally by irradiating the La-327 samples by electrons prior applying the pressure. While d−wave superconducting state will be conventionally suppressed, the s±-wave state shows more subtle behavior, depending on the asymmetry between bonding and antibonding subspaces. For the electronic structure, predicted to realize in La-327, the s±−wave state will be robust against complete suppression and the transition temperature, Tc demonstrates a transition from convex to concave behavior, indicating a crossover from s±-wave to s++-wave symmetry as a function of impurity concentration. We further analyze the sensitivity of the obtained results with respect to the potential electronic structure modification and applied pressure.

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