

Master thesis:

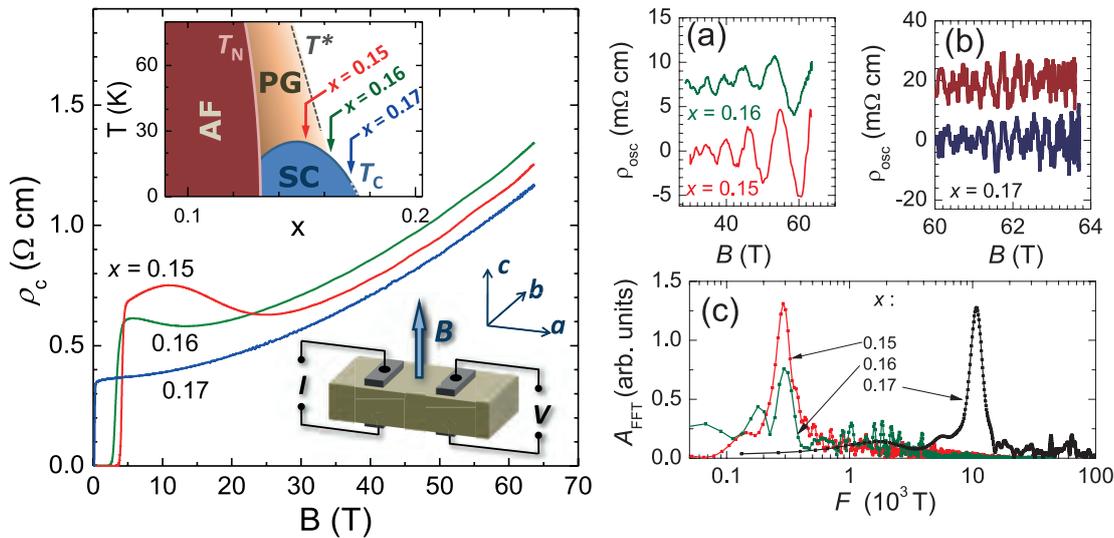
The enigma of high- T_c superconductivity in cuprates has remained unsolved since almost quarter century. In the complex zoo of the cuprate family, $\text{Nd}_{2-x}\text{Ce}_x\text{CuO}_4$ (NCCO) is a rather simple electron-doped compound, ideal to study basic physical properties. Recently, high-field experiments have proven extremely helpful for investigating the electronic structure of cuprates in the normal conducting state. In high magnetic fields superconductivity becomes suppressed and the normal state is accessed. This enables experimentalists to hunt for magnetic quantum (Shubnikov-de Haas) oscillations, anomalies in the Hall, Nernst or Seebeck effect or other transport phenomena that give deep insight into the electronic world of such materials. The Walther-Meissner-Institute (WMI) keeps leading positions in the research on

High-field magnetotransport in High-Temperature Superconductors

In the WMI crystal lab single crystals of NCCO are grown with the world's best quality. Experiments in magnetic fields up to 17 T and thorough sample characterization are done at the WMI. To apply the world's highest magnetic fields up to 90 T we use various high-field facilities of the EuroMagNET II.

For our present research on NCCO we are looking for a Master student whose main task will be to perform magnetotransport studies in magnetic fields at low temperatures.

The laboratory is equipped with: 15 – 17 T superconducting magnets; various cryostats covering the temperature range between 300 K and 20 mK; precise technique for measuring resistive and magnetic properties of submilligramme samples. A part of the experiments, in steady fields up to 35 T, will be performed at the High Magnetic Field Laboratory in Grenoble and in pulsed fields up to 90 T at the High Magnetic Field Laboratories in Dresden and Toulouse.



Contact:

Students interested in joining our research are invited to contact Dr. Mark Kartsovnik (WMI, room 132, tel. 089/28914223) or Prof. Dr. Rudolf Gross (E23: Chair of technical physics);
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