Gigantic negative magnetoresistance in a disordered Topological Insulator

Recently the phenomenon of negative magnetoresistance (MR) is attracting renewed interest due to its occurrence in Weyl semimetals because of the chiral anomaly. In other systems a large MR typically relates to magnetism. In this talk a novel mechanism leading to a large negative MR will be presented that is based not on magnetism, but on disorder. In the newly synthesized bulk-insulating topological insulator material T1Bi$_x$Sb$_{1-x}$Te$_2$ we find a suppression of the resistivity by up to 98 % in 14 T at low temperature. From transport data and numerical simulations, this gigantic negative MR is understood by a percolation of charge puddles formed in the disordered bulk.

All interested are cordially welcome!
K. Everschor-Sitte, Email: kaeversc@uni-mainz.de