Magnetically doped topological insulators

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Topological insulators are materials with unique electronic structure of surface states. In contrary to normal insulators and semiconductors, the topological surface state dispersion is protected by a time-reversal symmetry and thus robust against nonmagnetic impurities and disorder. The robust nature and full spin polarization of topological surface states predestine them for a wide range of spintronic applications.
One of the possibilities is a combination of topological insulator with a ferromagnetic material leading to quantum anomalous Hall effect, which can be utilized for example in metrology without need of large external magnetic fields.
In this lecture we will present our recent research of atomic and electronic structure of magnetically doped topological insulators, where we have shown directly the magnetic order effect on the electronic band structure for the first time [1].

[1] E. Rienks et al., *Large magnetic gap at the Dirac point in $Bi_2Te_3/MnBi_2Te_4$ heterostructures*, Nature **576**, 423 (2019).