

Different Magnetic Phases in the Doped Polar Semiconductor GeTe

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Germanium Telluride is a material which for decades attracted huge interest for various reasons. It was among the first experimentally found self-doped semiconductors with a many-valley band structure exhibiting superconductivity. It also features a ferroelectric phase transition well above room temperature, and is a famous base material in thermoelectrics. Recently a giant Rashba spin splitting was theoretically predicted and experimentally found. When doping Manganese into GeTe a ferromagnetic phase develops leading to a polar diluted magnetic semiconductor with potential for multiferroicity. The polar distortion is suppressed below room temperature upon increasing the Mn concentration. At low doping the bulk system exhibits two competing magnetic phases which had been overlooked in earlier studies. The onset temperatures of ferromagnetic interaction differ by a factor of five to six, adding another highly interesting feature to this multifunctional system. In this presentation I will review GeTe and present a comprehensive study on the magnetic phases in $\text{Ge}_{1-x}\text{Mn}_x\text{Te}$.