CMP Seminar

Sang-Wook Cheong

Rutgers University

Topological entanglement of structural and magnetic domains in layered chiral magnets

Transition metal dichalcogenides (TMDs) have been extensively investigated as 2D materials last decade. A large amount of transition metals (M) can be intercalated into the van der Waals gaps of a wide range of TMD materials, but a limited recent studies in intercalated TMDs have been reported. The limited examples include Fe_xTaS_2 crystals with x=1/4 and 1/3, which exhibit intriguing configurations of antiphase and/or chiral domains related to the ordering of intercalated M ions with 2a×2a and √3a×√3a superstructures, respectively. In addition, $Cr_{1/3}NbS_2$ undergoes helical spin order below 133 K, and shows an interesting soliton-lattice behavior when in-plane magnetic fields are applied in the helical spin state. We have explored a series of chiral $M_{1/3}Ta(Nb)S(Se)_2$ to investigate the correlation among crystallographic symmetries, magnetic domain topologies and their physical properties. These results as well as Moire patterns with self-twisted TMDs induced by intercalation will be discussed.

Wednesday, March 18th, 2020 at 3:00 p.m.
Room: 4270 BPS Bldg.
Host: Xianglin Ke