

Band Topology of Helical Structures

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Helix is a common structure in our everyday life. In elementary physics, helical metal wires—springs are commonly used to measure force as their mechanical properties are well described by the Hooke's law. In this talk, Dr Xiao will show that helical structures also exhibit many interesting electromagnetic properties. In particular, he will talk about the topological properties of the band and show that there exist both Weyl points and a nodal surface in a helical array. The existence of Weyl points is achieved by breaking the inversion symmetry and the charge of the Weyl point can be either 1 or 2. On the other hand, the existence of nodal surface is protected by the screw symmetry and is fixed at the Brillouin zone boundary along the direction of helix axis.