

Linking Symmetry, Crystal Structure, Electronic Structure and Properties Part II

tutorial

December 19 2018 | 4:00 pm
Lecture Hall MPI | B.1.11



Abstract

Physicists must be able to reason intelligently and think intuitively about the electronic structure of the compounds they investigate in order to understand how the properties they aim to optimize can be tuned and manipulated.

In this continuation of the previous lecture, we will very quickly review the basic concepts of atomic/molecular orbitals becoming electronic bands when placed onto lattices. We will then discuss basic symmetry concepts and see how those symmetry operations can be used to predict and understand features in electronic structure spectra, intuitively. We will also discuss non-symmorphic symmetries (glide planes and screw axes) and see how those expand the unit cell and result in demanded band degeneracies at the edges of the BZ, protected against spin orbit coupling perturbations. We will work together through some real life examples like a simply pierls distortion, Dirac Nodal Line Semimetal, ZrSiS, and others.

This will be an interactive lecture. The audience will be involved. Please have a cup of coffee before attending.

Speaker

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