**Quantum anomalous Hall effect at the interface between magnetic and topological crystalline insulators**

Jinwoong Kim and David Vanderbilt  
Rutgers University, New Jersey, USA

By employing tight-binding and first-principles calculations, we investigate the possible appearance of the quantum anomalous Hall (QAH) effect at the interface between topological crystalline insulators (SnTe, SnSe) and magnetic insulators (EuO, EuS, EuSe). For a surface Dirac cone associated with a band inversion in the bulk, a mass gap acquisition via an effective Zeeman field is a subject of broad interest because of the potential for exotic thin-film states such as the QAH and axionic phases. A number of studies have demonstrated the appearance of such states by using diverse interfacial and magnetic-element-doped systems in agreement with predictions. Although achieving a large mass gap is critical for further investigations and room temperature devices, the microscopic mechanisms determining the size of the mass gap have not been clearly addressed. In this study, we enumerate several combinations of topological crystalline insulators and magnetic insulators in a search for an optimal electronic structure, where a large interface mass gap is isolated inside a bulk insulating gap.