

Abstract Submitted
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Semi-metal and Topological Insulator in Perovskite Iridates VIJAY SHANKAR V, JEAN-MICHEL CARTER, Department of Physics, University of Toronto, M. AHSAN ZEB, Cavendish Laboratory, University of Cambridge, HAE-YOUNG KEE, Department of Physics, University of Toronto — The two-dimensional (2D) layered perovskite Sr_2IrO_4 was proposed to be a spin-orbit (SO) Mott insulator, where the effect of Hubbard interaction is amplified on a narrow $J_{eff}=\frac{1}{2}$ band due to strong spin-orbit coupling. On the other hand, the three-dimensional (3D) orthorhombic perovskite SrIrO_3 remains metallic. We construct a tight-binding model for SrIrO_3 to understand the physical origin of the metallic behaviour and study possible metal-insulator transitions. In particular, we identify possible perturbations that turn the material into a topological insulator.

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