Title: Spin 3/2 topological phases in antiperovskite materials

Speaker: Takuto Kawakami

(Yukawa Institute for Theoretical Physics, Kyoto University)

Abstract:

 In antiperovskite materials A3BX with A=(Ca, Sr, La), B=(Pb, Sn) and X=(C, N, O) [1-3], electrons behave as effective spin-3/2 particles due to mixture of spin and orbital angular momenta through the spin-orbit coupling. In addition, owing to their band inversion these materials become topological crystalline insulators. Moreover, the superconducting transition in an antiperovskite Sr3-xSnO was experimentally observed recently [3].

 Motivated by this experiment, we theoretically investigate general properties of the spin 3/2 topological insulators and their superconductivity [4]. In this talk, we are going to demonstrate that the spin-3/2 electrons provide rich topological phases in normal and superconducting states. We will also show that the odd-parity superconductivity of spin 3/2 electrons is unique topological state with higher winding number.

References:

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