

# Condensed Matter Theory Center Seminar



Tuesday, January 22  
11:00 am – 12:30 pm, Physics Building 2205

## Gil Young Cho

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### **“Superconductivity of doped Weyl semimetals: finite-momentum pairing and electronic analogues of the 3He-A phase”**

We study superconducting states of doped inversion-symmetric Weyl semimetals. Specifically, we consider a lattice model realizing a Weyl semimetal with an inversion symmetry and study the superconducting instability in the presence of a short-ranged attractive interaction. With a phonon-mediated attractive interaction, we find two competing states: a fully gapped finite-momentum (FFLO) pairing state and a nodal even-parity pairing state. We show that, in a BCS-type approximation, the finite-momentum pairing state is energetically favored over the usual even-parity paired state and is robust against weak disorder. Though energetically unfavorable, the even-parity pairing state provides an electronic analogue of the 3He-A phase in that the nodes of the even-parity state carry non-trivial winding numbers and therefore support a surface flat band. We also briefly discuss interesting bound states to the half-quantum and full quantum vortices in FFLO state.

Reference: GY Cho, J Bardarson, Y.-M. Lu, and JE Moore, PRB, 86, 214514 (2012) (Editors' suggestion)

(All are welcome to attend)

