

Abstract Submitted  
for the MAS21 Meeting of  
The American Physical Society

**Monopole Superconductivity in Magnetically Doped  $\text{Cd}_3\text{As}_2$** <sup>1</sup>

ERIC BOBROW, YI LI, Johns Hopkins University — When magnetically doped, the Dirac semimetal  $\text{Cd}_3\text{As}_2$  features Fermi pockets enclosing Weyl points with chiralities  $\pm 1$  and  $\pm 2$ . The superconducting pairing between parity related Fermi pockets with opposite Chern numbers exhibits exotic pairing gap functions, which have nodes enforced by nonzero Cooper pair Berry phase. We show that for pairing between Fermi pockets with Chern numbers  $\pm 1$  or  $\pm 2$  in magnetically doped  $\text{Cd}_3\text{As}_2$ , the gap function exhibits monopole harmonic symmetry with monopole charge 1 or 2, depending on the chemical potential. The total vorticity of the gap function, i.e., the winding of the pairing phase over a Fermi surface, is independent of the form of the proximity pairing and is equal to twice the monopole charge of the Cooper pair.

<sup>1</sup>This work was supported as part of the Institute for Quantum Matter, an Energy Frontier Research Center funded by the U.S. Department of Energy, Office of Science, Basic Energy Sciences under Award No. DE-SC0019331.

Eric Bobrow  
Johns Hopkins University

Date submitted: 05 Nov 2021

Electronic form version 1.4