

Abstract Submitted
for the APR21 Meeting of
The American Physical Society

Higher Spin Dark Matter LEAH JENKS, Brown University, STEPHON ALEXANDER, Brown University and the Center for Computational Astrophysics, EVAN MCDONOUGH, The University of Chicago — Little is known about dark matter beyond the fact that it does not interact with the standard model or itself, or else does so incredibly weakly. A natural candidate, given the history of no-go theorems against their interactions, are higher spin fields. In this talk, I will discuss the scenario of higher spin (spin $s > 2$) dark matter. I will show that the gravitational production of superheavy bosonic higher spin fields during inflation can provide all the dark matter we observe today. Then, I will consider the observable signatures, and show a potential characteristic signature of bosonic higher spin dark matter in directional direct detection; distinct spin-dependent contributions to the double differential recoil rate, which complement the oscillatory imprint of higher spin fields in the cosmic microwave background. Lastly, I will speculate on the extension to higher spin fermions and supersymmetric higher spins as well as other potential detection strategies.

Leah Jenks
Brown University

Date submitted: 08 Jan 2021

Electronic form version 1.4