Abstract Submitted
for the APR21 Meeting of
The American Physical Society

Axion Comagnetometry MATTHEW MOSCHELLA, Princeton University — If dark matter is an ultralight axion-like particle, the gradient of its classical field can be detected in precision atomic experiments, including helium-potassium comagnetometers. In this talk, I will discuss a re-analysis of existing comagnetometer data with world-leading sensitivity to axions in the mass range from 10^{-17} to 10^{-12} eV that couple to neutrons. Proper interpretation of this data requires a careful treatment of the dark matter velocity distribution, which leads to stochastic fluctuations of the signal amplitude. I will introduce a complete statistical treatment for these stochastic effects, which has implications for any experiment that is sensitive to the gradient of the axion field.

Matthew Moschella
Princeton University

Date submitted: 08 Jan 2021 Electronic form version 1.4