Department of Physics Colloquium

Wednesday, April 9th at 4:00 p.m. / SH 121

Pre-Colloquium at 3:30 p.m. / SH 108

A Spin on Dark Matter

Speaker: Dr. Mustafa Amin

Abstract:

What can we learn about the mass and intrinsic spin of dark matter particles from astrophysical observations? I will discuss how spin can determine the lightest mass dark matter particles can have. When dark matter is a sufficiently light boson, it becomes wavelike — I will show that in this case its intrinsic spin angular momentum can impact the

- (i) variation of dark matter density inside halos,
- (ii) lead to formation of solitons with macroscopic intrinsic spin, and
- (iii) leave clues in initial conditions for formation of structure in the early universe.

Time permitting, I might briefly discuss direct detection prospects for such dark matter, and novel connections to "spinor" Bose-Einstein Condensates in the laboratory.