

Department of Physics and Astronomy Colloquium Series

Tuesday November 26th, 2024, 2:30pm in PSE 317

Speaker: Amar Vutha

Institution: University of Toronto

Title: Searching for dark matter using nuclear shape oscillations

Abstract:

Despite strong astrophysical hints that dark matter (DM) exists, there is zero evidence from lab experiments so far. In an attempt to search for DM with better sensitivity across a broad range of masses, we are using a new experimental system that is sensitive to DM candidates such as axions.

In our experiment, we use nuclear physics to sense axionlike particles, atomic physics to amplify the nuclear response, and crystal physics to make the experiment robust against noise. This combination lets us search for DM signals with high sensitivity, while providing lots of ways to control systematic errors and backgrounds.

I will talk about (a) why it is possible to look for dark matter using small-scale precision experiments, (b) how our experiment works, and (c) results from our first data run.