

Thursday, March 28, 2024

4:10 – 5:00 PM

Roberts Hall Room 101

Dark Black Holes

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Abstract: Gravitational wave detections of merging ultracompact objects provide a completely new way to constrain a large class of dark matter models. If the dark matter consists of a rich spectrum of particles, it will generically contain channels for dissipative energy loss that can lead to the formation of compact objects. We have recently calculated a crucial set of molecular cooling processes for "atomic dark matter" that enable the first complete numerical simulations of structure formation in dissipative dark matter. I will show how the results enable a more accurate calculation of black hole masses in the model and inform gravitational wave searches. Current data, especially from searches for sub-solar mass objects, already provide new constraints on the particle physics properties of dark matter. A detection of a dark matter black hole in an upcoming search would be revolutionary, providing particle physics information through a purely gravitational channel.

Host: Neil Cornish

** Refreshments served in the Barnard Hall second floor atrium at 3:45 PM **