MONTANA STATE UNIVERSITY | College of LETTERS & SCIENCE

Physics Colloquium

Friday, November 3rd
4:10 – 5:00 PM
Barnard Hall 103

The Search for Low Dimensional Quantum Matter

Dr. Adrian Del Maestro
U. Tennessee, Knoxville

Abstract: As the spatial dimension is lowered, locally stabilizing interactions between atoms are reduced, leading to the emergence of quantum fluctuating phases of matter without classical analogues. In this colloquium I will discuss theoretical progress and experimental proposals for the realization of a two-dimensional quantum liquid. Bosonic atoms deposited on an atomically thin substrate (e.g. graphene) represents a playground for such exotic quantum many-body physics with highly tunable interaction potentials. I will show that simple mechanical deformations of the substrate can unlock a plethora of two-dimensional solid and superfluid states, and discuss protocols for how these could be realized in the laboratory through lattice expansion.

Host: Anton Vorontsov

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