MONTANA STATE UNIVERSITY | College of LETTERS & SCIENCE

Physics Colloquium

Monday, February 27, 2017
4:10 – 5:00 PM
Barnard/EPS 103

The Ins and Outs of Black Holes

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Abstract:

Accreting or feeding black holes are among the most exotic and powerful sources of energy in the universe, and their energy output, called "feedback," can influence the formation and growth of galaxies. However, observing galaxy-scale feedback directly is a challenge because such large objects evolve on glacial timescales. In contrast, stellar-mass black holes in our galaxy offer an opportunity to study feedback processes in action. As a result of their small sizes and deep gravitational potentials, these systems can vary on timescales as short as milliseconds, even as they launch relativistic jets and ionized winds, outshine stars by orders of magnitude, and provide testbeds for some of General Relativity's most exciting predictions. In this talk, I will describe how my recent work on high-resolution X-ray spectroscopy of winds from black holes probes the physical foundations of feedback. Focusing on photoionization and variability, I will highlight some implications of my work for the processes that regulate the energy output of black holes. Finally, I will discuss how my results make atomic physics the linchpin of our understanding of connections between black holes and their environments.

Host: Neil Cornish

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

Dr. Neilsen is a candidate for a Physics Faculty Position