MONTANA STATE UNIVERSITY | College of LETTERS & SCIENCE

Physics Colloquium

Friday, March 25, 2022
4:10 – 5:00 PM
Barnard Hall 103

Black Holes, Gravitational Waves, and Machine Learning Probes

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Abstract:
Solutions to the Einstein equation describe phenomena ranging from black holes, to the cosmological evolution of the universe, to gravitational waves---all of which come together in gravitational-wave astronomy. As gravitational-wave observatories become more powerful, they will paint ever-more-detailed pictures of the astrophysics of binaries and extreme gravitational phenomena. In the first part of this colloquium, I will describe how advanced perturbative techniques are enabling the precise modeling of these systems. As detections of gravitational waves become commonplace, efficient inference algorithms will be critical for comparing these predictions against data. I will show how simulation-based inference with machine learning can yield accurate results in just a fraction of typical current analysis times. Together, these new calculational and inference tools pave the way for the next era in gravitational-wave astronomy.

Host:
Neil Cornish

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