SPECIAL COSMOLOGY SEMINAR

EMPLOYING MACHINE LEARNING FOR NOISE MITIGATION AND SENSITIVITY ENHANCEMENT IN THE LIGO DETECTORS

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There are multiple sources of noise beyond the fundamental ones that impact the sensitivity of LIGO. This includes instrumental and environmental sources that may show up as short duration bursts of energy also known as noise transients or couple to the gravitational-wave measurement and manifest as narrow spectral features in the instrument's amplitude spectral density. In the first half of my talk, I present my work on using machine learning for transient noise identification, leading to noise modeling and then noise reduction. In the second half, I will discuss our work on first identifying noise couplings with coherence monitoring and then cleaning the broadband noise using a convolutional neural network algorithm we call DeepClean. I will discuss how this cleaning pipeline improves the sensitivity of the instruments in various frequency bands where such noise currently exists.

WEDNESDAY JAN 15TH | READING ROOM | STARTING AT 2PM

UCR PHYSICS & ASTRONOMY