DEPARTMENT OF
PHYSICS &
ASTRONOMY

Physics & Astronomy
Colloquium
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Prof. Jessie Runnoe

Vanderbilt University
3:30 - 4:30 p.m. | Tuesday, Sept. 2
ELECE Building 101
(Host: Prof. Michael Fausnaugh)

The ongoing hunt for supermassive black hole binaries

Supermassive black hole binaries are thought to be an inevitable product of the prevailing galaxy evolution scenarios where most massive galaxies host a central black hole and undergo mergers over cosmic time. The early stages of this process have been observed in the form of interacting galaxy pairs and widely separated dual quasars, but the close, gravitationally bound binaries that are expected to follow have proven elusive. The detection of this population is important because at the smallest separations they become bright sources of low-frequency gravitational waves and are prime targets for multi-messenger detections with pulsar timing arrays (PTAs) and the upcoming Laser Interferometer Space Antenna (LISA). In this talk, I will discuss observational signatures of close binary supermassive black holes, especially in the context of regular quasar variability, and ongoing work towards multi-messenger detections with telescopes and gravitational wave detectors.

Biography

Dr. Jessie Runnoe is an Assistant Professor of [Physics](#) & [Astronomy](#) and affiliated faculty with the [Vanderbilt Data Science Institute](#). She was awarded a Dean's Faculty Fellowship by the Vanderbilt College of Arts & Science in 2019 and her research is supported by NASA and the NSF. Runnoe has a deep commitment to making astronomy a diverse, equitable, and inclusive field: she is a member of the steering committee for the Establishing Multi-messenger astronomy Inclusive Training (EMIT) graduate training program, a faculty mentor for the [Fisk-Vanderbilt Bridge Program](#), and was a co-PI for Vanderbilt Physics & Astronomy's participation in the APS Inclusion, Diversity, and Equity Alliance. Runnoe is also a committed educator having revamped *ASTR 8060: Observational Methods in Astronomy* and developed a new course teaching hands-on computational skills for astrophysics in the big-data era (*ASTR 8080: Data Mining in Large Astronomical Surveys*). She joined the Vanderbilt faculty in 2019.