

Jonathan Trump – Astronomy Seminar 9/19/2018

Title: Mapping the Census of Supermassive Black Holes

Abstract: The past 20 years have revealed that supermassive black holes play an essential role in the formation and growth of galaxies. But a reliable census of supermassive black holes over cosmic time is has remained elusive. That picture is changing with the advent of two new emphases in astronomical surveys: massively multiplexed spatially resolved spectroscopy, and industrial-scale time-domain monitoring. I will show how Hubble WFC3 grism spectroscopy spatially resolves a population of nuclear black holes that are otherwise missed due to host galaxy dilution. CANDELS/3D-HST grism data uniquely reveal the black hole content of low-mass hosts, discriminating between models of black hole formation at cosmic dawn. Meanwhile the pioneering new SDSS-RM project is now vastly expanding the number of supermassive black holes with reliable mass measurements through time-domain echo-mapping. Beyond mass, SDSS-RM is also starting to enable the first survey measurements of the other two fundamental black hole quantities: accretion rate and spin. I will conclude by looking forward to the next generation of observatories: JWST, WFIRST, and Euclid for a new spatially resolved frontier of the supermassive black hole census, and SDSS-V and LSST for a new time-domain frontier of black hole mass, accretion, and spin.