

Department of Physics and Materials Science



SEMINAR

Detecting and Characterizing AGN in the Local Universe with NED

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Abstract: The NASA/IPAC Extragalactic Database (NED) is a catalog of over 1.1 billion unique objects, combining large-scale photometric surveys across the electromagnetic spectrum with data extracted from thousands of published research papers, and the NED Local Volume Sample (LVS) is a subset of 1.9 million galaxies with distances up to 1 Gpc. Machine learning methods were used to detect active galactic nuclei (AGN) candidates within the NED LVS to provide as complete an estimate as possible for the number of active galaxies in the local universe and to characterize their host environments. We find that the local AGN fraction may be as high 20 percent, and a BPT analysis indicates that many AGN lie in hosts primarily ionized by starbursts. These results suggest that there may be a large number of AGN that are heavily obscured at optical wavelengths, attesting to the need for AGN detection methods that rely on observations at all wavelengths.

This work was completed while Mason was a visiting graduate student fellow at the Infrared Processing and Analysis Center (IPAC) at Caltech. Established in 2013, the IPAC Visiting Graduate Student Fellowship (VGSF) offers six-month positions to graduate students who want to conduct PhD-level astronomical research in close association with IPAC scientists. Students gain applicable research experience with leaders in the scientific areas of exoplanets, galactic and extra-galactic studies, stellar formation, cosmology, and more.

Bio: Mason Ruby is a 6th year PhD student at the University of Memphis studying observational astrophysics with Dr. Francisco Muller-Sanchez. His research interests include the coevolution of super massive black holes (SMBHs) and their host galaxies, the processes by which merging galaxies evolve into systems containing binary SMBHs that can emit gravitational waves, and the application of machine learning methods to large-scale astronomical datasets.

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