NASSP Honours Project 2025

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Photometric Selection of Lyman-alpha Emitters at z $\sim$ 4.9

Project Description:

Lyman alpha emitters (LAEs) are star-forming galaxies identified by their strong Lyman-alpha emission (Lyα, 1216Å), found at early stages of galaxy evolution. Surveying these galaxies around quasars provides critical insight into the formation and evolution of galaxies and the quasar environment. The photometric selection criteria for identifying LAEs that exhibit an excess of flux in a narrowband band that is centred on Lyα emission. In this project, we will use the photometric method to select LAEs in the quasar field at z $\sim$ 4.9, using narrowband and broadband imaging data.

During this project, our objective is to define photometric criteria for the selection of LAE candidates at z $\sim$ 4.9 and to understand the environment of the quasars. We will also compare the density of the quasar with the mean density of the universe. Through this project, the student will understand galaxy evolution in the early universe and high redshift galaxy selection techniques. The student will gain hands-on experience with Python-based tools for astronomical data analysis.