

Contribution ID: 87

Type: **Oral**

Unveiling Hidden Lyman-Alpha Emitters in DESI with Deep Learning

Friday, May 16, 2025 5:00 PM (15 minutes)

Millions of spectra have been collected by the Dark Energy Spectroscopic Instrument (DESI) survey. While the DESI survey is designed to observe specific types of sources, unexpected sources are often included and hidden within the dataset. In this talk, I will show that a fraction of the sources observed by DESI are galaxies producing strong Lyman-alpha emission lines, known as Lyman-alpha emitters (LAEs), at redshifts greater than 2. These LAEs remain hidden in the DESI dataset because the survey and its data pipeline are not designed to detect them. To identify LAEs within the DESI dataset, we have developed and trained a convolutional neural network algorithm capable of automatically detecting LAEs, determining their redshifts, and estimating the emission line profiles simultaneously. Applying this algorithm to a million DESI spectra, we successfully identify approximately 15,000 LAEs. Finally, I will discuss the applications of this newly identified LAE sample, including its role in preparing for the DESI-II survey, which will select LAEs as one of its main target populations, as well as its use in investigating the physical properties of LAEs through high-quality combined spectra.

Section

Galaxy/Extragalactic

Primary authors: Mr CHAN, Jui-Kuan (National Taiwan University); Dr LAN, Ting-Wen (National Taiwan University)

Presenter: Mr CHAN, Jui-Kuan (National Taiwan University)

Session Classification: Extragalactic astronomy and cosmology