



## **UV-MIR ISM/Galaxy Studies**

**Danielle BERG**

**(University of Texas, Austin, USA)**

Monday, July 28, 2025, 14:00–15:45

The ultraviolet (UV), optical, and mid-infrared (MIR) regimes each offer a uniquely powerful window into the physical conditions of the interstellar medium (ISM) in galaxies. In this lecture, we will explore how UV–MIR spectroscopy enables detailed measurements of gas-phase abundances, dust depletion patterns, and attenuation properties in nearby galaxies. We will highlight the synergy between UV, optical, and MIR diagnostics, particularly in low-metallicity and star-forming systems that serve as analogs to the early universe.

A major focus will be placed on recent advances from spatially resolved surveys using instruments such as MUSE and JWST/MIRI, which map ionized gas, metallicity gradients, and feedback-driven structures across galactic disks. We will also discuss dust attenuation and the geometry-dependent nature of extinction corrections. Looking ahead, I will introduce the Ultraviolet Explorer (UVEX) and Habitable Worlds Observatory (HWO) and their potential to revolutionize UV-optical ISM studies of the local universe through deep, wide-field spectroscopy. We will conclude with a discussion of how future observatories will jointly advance our understanding of ISM processes across cosmic time.

### **Bibliography**

Useful reading/links can be found here: <https://www.danielleaberg.com/copy-of-useful-links>.

### **Biography**

Danielle A. Berg is an assistant professor in the Department of Astronomy at the University of Texas at Austin. Her research focuses on the physical and chemical conditions of the interstellar medium (ISM) in galaxies across cosmic time, with an emphasis on understanding galaxy evolution through measurements of elemental abundances, ionizing radiation, and dust. She is a principal investigator of the HST CLASSY Treasury Survey and the CLASSYIR JWST Treasury Survey, is a science project lead for the NASA UVEX telescope, and is a leader of the CHAOS Survey and the JWST AURORA program, which is pioneering rest-frame UV diagnostics in high-redshift galaxies. Berg has played a leading role in developing empirical abundance

calibrations for low-metallicity galaxies and is actively involved in future mission planning for the Habitable Worlds Observatories.