

Spring 2025 Colloquium

Physics and Astronomy, East Texas A&M University

Thursday, March 20, 2025

4:00 pm to 5:00 pm, McFarland Science Building 127

(coffee and cookies will be served at 3:50 pm)

Mapping the Full Baryon Cycle of Galaxies in Emission and Absorption

Dr. Michelle Berg
Texas Christian University

Abstract

Galaxy evolution hinges on the process of star formation. Starting as blue spirals, galaxies evolve into red, dead, ellipticals. How this process of quenching occurs is still an open question, since it depends on several factors such as mass and environment. The gas fuel necessary to continue star formation is situated in three separate locations: the interstellar medium (ISM, gas in the disk), the circumgalactic medium (CGM, gas in the halo), and the intergalactic medium (IGM, gas between large scale structures). Each of these reservoirs can contribute to galaxy quenching in their own unique ways. Due to recent technological advances, integral field unit spectrographs can be used to study this gas in emission and be paired with previous techniques using quasar absorption lines. To show the power of these combined observations, I will highlight my previous work linking galaxy properties to their CGM gas properties at $z < 1$. I will also present work at $z \sim 2$ where I am using gravitational lensing to constrain typical cloud size scales and gas supply estimates in the IGM. Finally, I will discuss an upcoming JWST program studying the ISM to understand star formation in extreme low gas density environments. By studying all three gas reservoirs in and around galaxies using both emission and absorption observations, we can piece together this puzzle of galaxy quenching.



Professor Michelle Berg is an observational astronomer using ultraviolet, optical, and infrared observations to study galaxy evolution. She received her Ph.D. from the University of Notre Dame in 2022 and was a postdoc at the University of Texas at Austin through 2024. In fall 2024, she started as faculty at Texas Christian University in the Physics & Astronomy department.