A flexible view of dust: Attenuation curves, UV bumps, and Lyα escape with JWST - CANUCS and beyond

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Dust attenuation strongly affects the observed properties of galaxies and remains one of the main uncertainties in interpreting galaxy evolution across cosmic time. Before the James Webb Space Telescope (JWST), constraints on dust attenuation laws in high-redshift galaxies were limited by the lack of rest-frame UV and optical spectroscopy and broad wavelength coverage, leading most studies to rely on local attenuation or extinction templates such as the Calzetti, SMC, or Milky Way laws.

In this talk, I will review recent progress in constraining dust attenuation properties in high-redshift galaxies using JWST observations, with a particular focus on galaxies during the epoch of reionization. Leveraging JWST/NIRSpec and NIRCam observations of galaxies across a broad redshift range ($z \sim 2$–12), we find evidence that dust attenuation curves evolve with cosmic time, becoming systematically flatter toward earlier epochs. We also report the detection of the 2175 Å ultraviolet bump in a galaxy at $z \approx 7.55$, providing evidence for the presence of small carbonaceous dust grains in the early Universe.

I will discuss the observed correlations between attenuation-curve shape, UV-bump strength, and galaxy properties such as V-band attenuation, stellar age, and metallicity, together with their possible physical interpretation in the context of dust production, grain processing, and radiative transfer effects.

Finally, I will present recent spatially resolved JWST studies of the lensed Lyα emitter HCM 6A at $z = 6.5676$, where resolved dust and Lyα maps reveal how feedback-driven multiphase ISM geometries regulate Lyα escape in moderately dusty galaxies during the epoch of reionization.