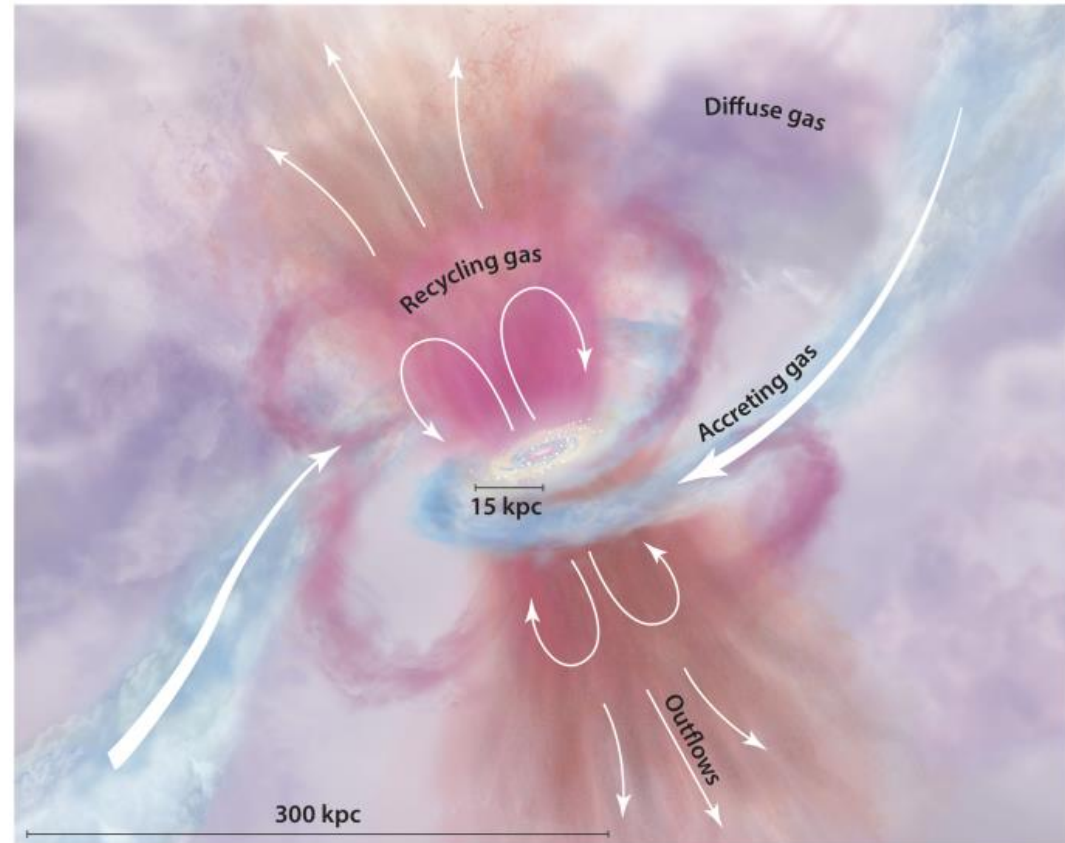


Studying Damped Lyman-alpha Systems Using Quasar Spectra

Natalie Meyer

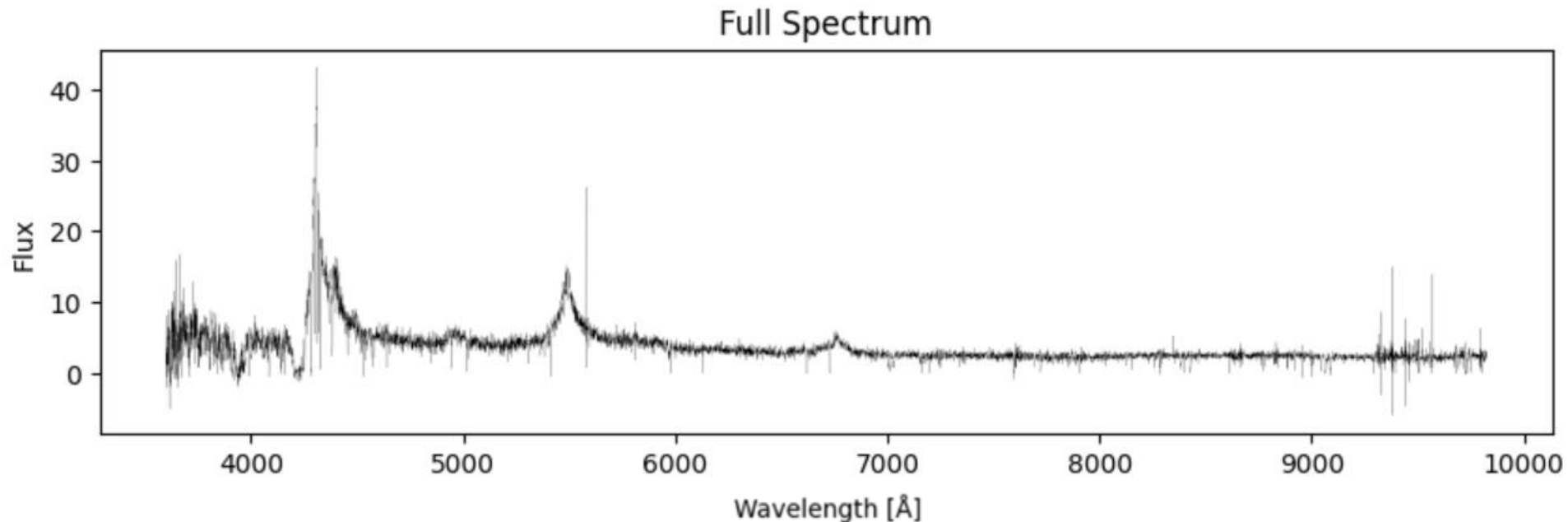
Gas and Dust around Galaxies

- Galaxies contain clouds of gas and dust beyond visible regions
- Drives star formation and galaxy evolution
- Studying gas and dust tells us:
 - Properties of the galaxy
 - History and evolution of the galaxy
 - How gas affects star/galactic formation and evolution



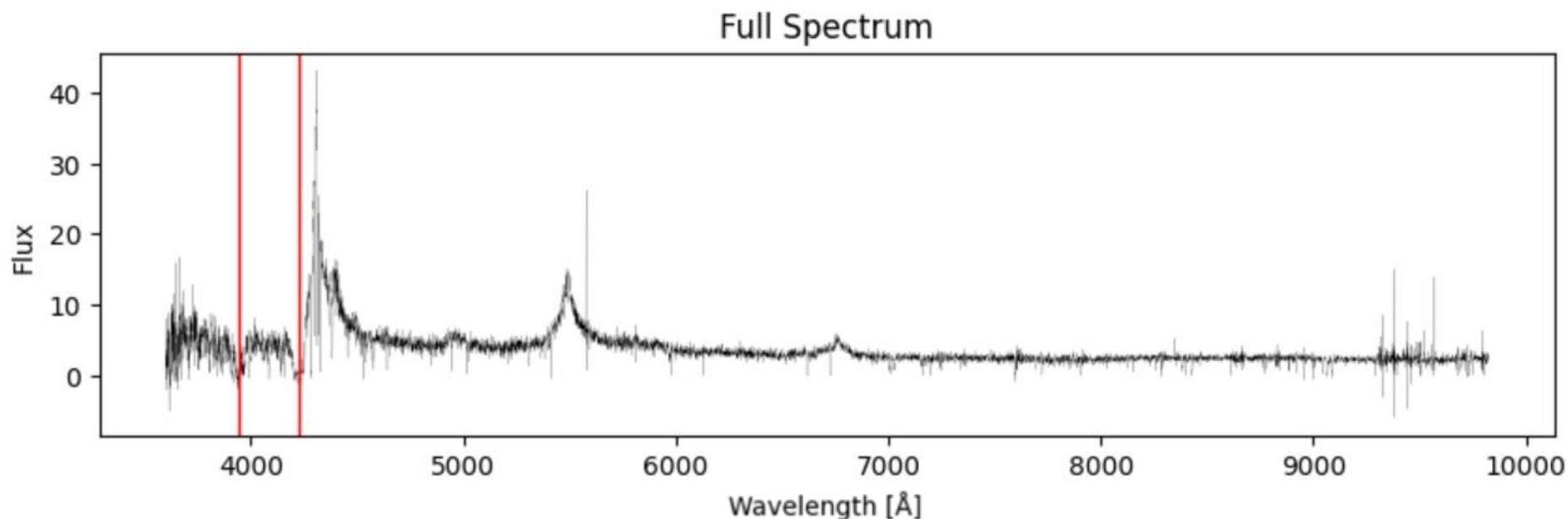
Quasars

- Quasars are luminous active galactic nuclei (AGN)
- Quasar spectra have a peak at the Lyman-alpha transition – the Hydrogen transition from $n = 2$ to $n = 1$
- 1216 angstroms at $z = 0$ (no redshift)



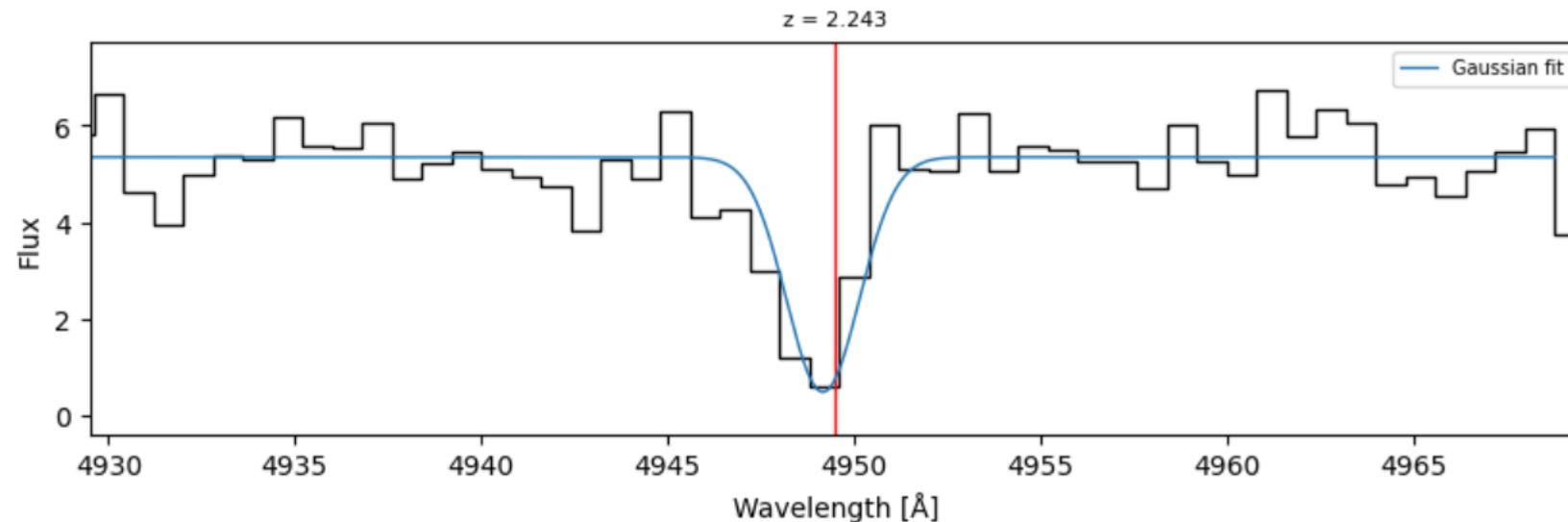
Damped Lyman-Alpha Systems

- Damped Lyman-alpha (DLA) systems are areas of high absorption of Lyman-alpha radiation
- Dips in flux to the left of the spectrum are typically caused by galaxies
- 1216 angstroms redshifted depending on how far the galaxy is



Silicon Absorption

- Absorption lines of metals lie on the right of the quasar spectrum
- Absorption means the metal is present in the galaxy
- Redshifted based on the redshift of the galaxy



Future Steps

- Used a catalog of DLAs from the DESI survey to map the presence of Si absorption in galaxies
- Will use the absorption to calculate the metallicity of the galaxy
- Determine any correlations between metallicity and other properties (presence of DLAs, redshift, etc.)
- Helps us tell if the current sample of DLAs is representative of the universe as a whole