

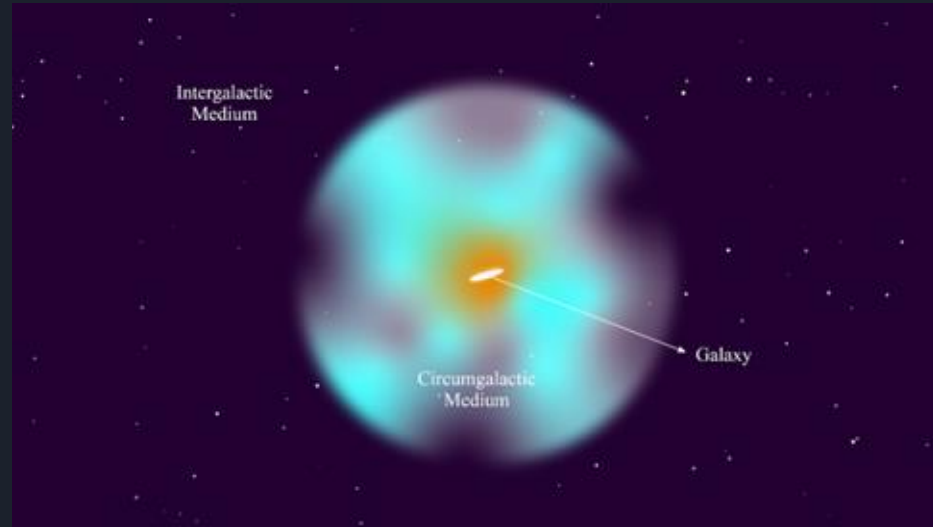


CGM & KCWI Data Cubes

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What is the CGM?

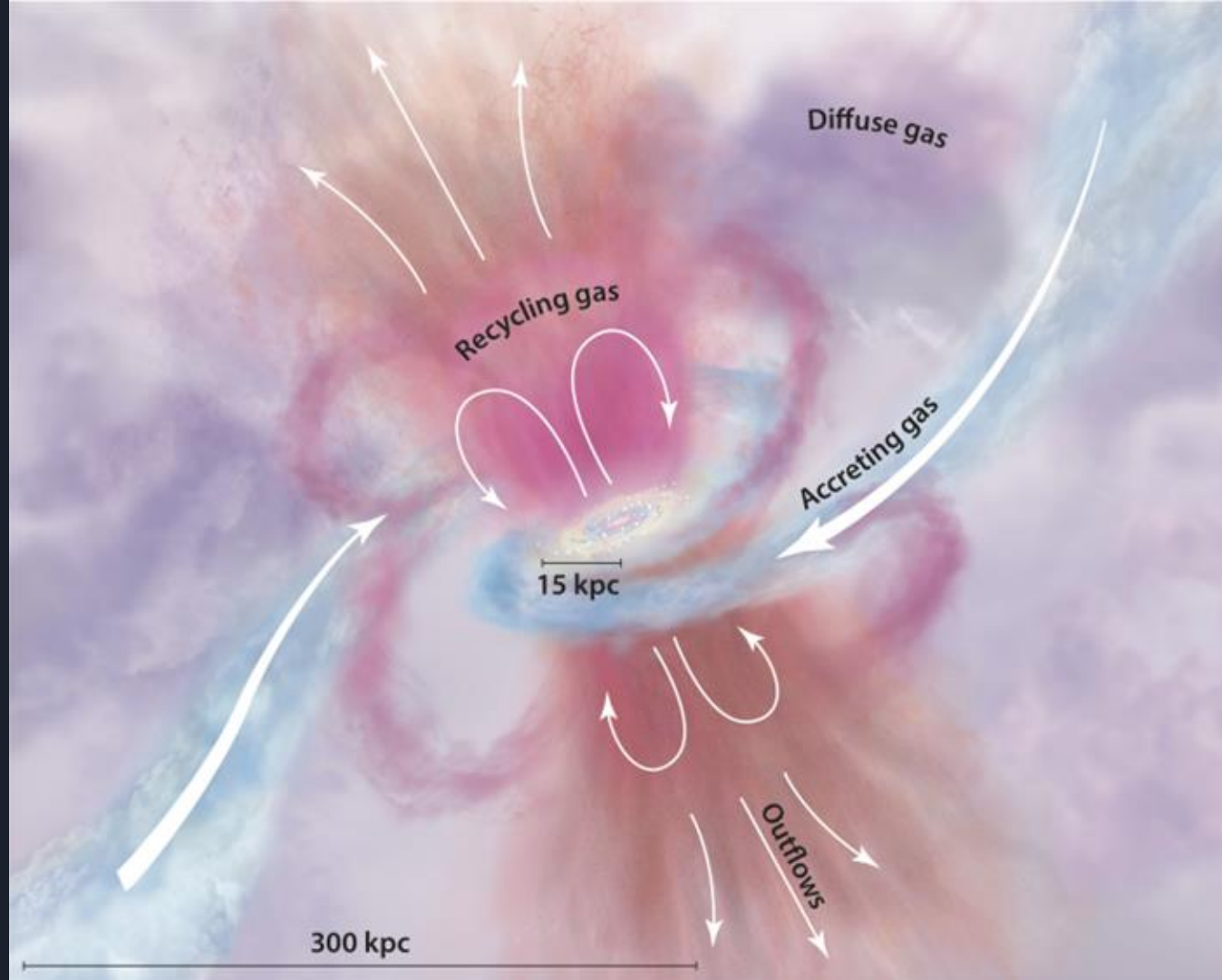
- Circumgalactic medium
- Giant atmosphere surrounding a galaxy
 - CGM often is thousands of times more volume than the stellar disk of a galaxy
- Mainly comprised of diffuse gas
 - Ranging from 10^4 - 10^7 K
- Recycles gas through the galaxy
- Fuels star formation in the galaxy





Gas Cycle in CGM

1. Cool gas falls into galaxy from CGM or IGM
2. Gas is used to fuel star formation
3. Stars explode as supernovae and eject heated “metals” back into CGM
 - i. Black holes also eject heated “metals” with jets and winds
4. Gas cools in CGM



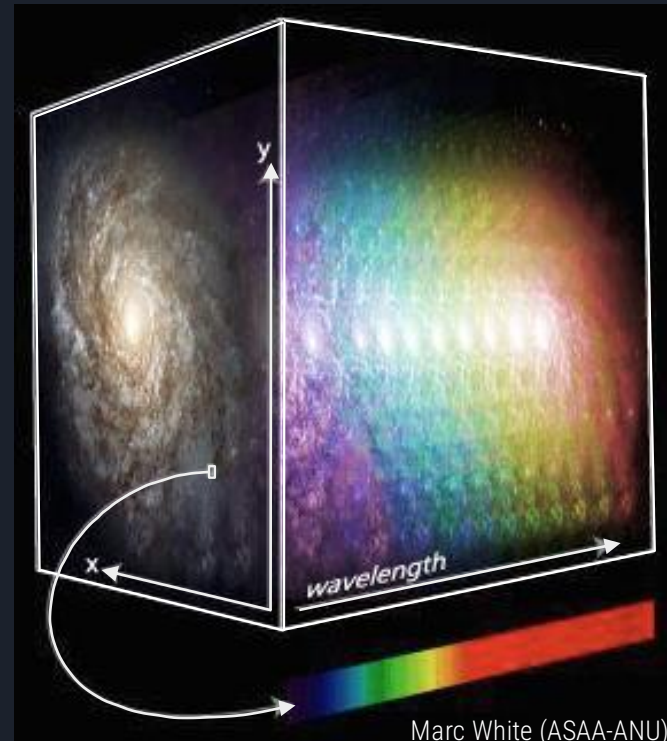
What is KCWI?

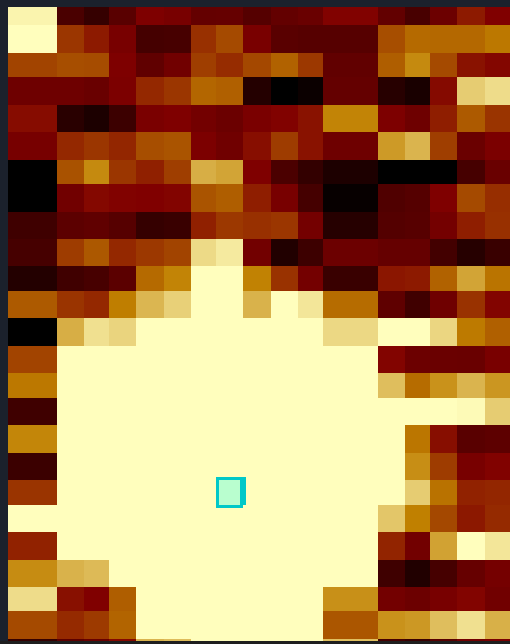
- Keck Cosmic Web Imager
 - Keck Observatory in Hawaii
- Integral field spectrograph
 - produces a spectrum at every point across an image
 - Creates data cubes
- These spectrums help astronomers study faint gas across galaxies and the cosmic web



What are Data Cubes (from KCWI)?

- Data in the dimensions of two spatial dimensions and one spectral dimension (x, y, wavelength)
- Provides a full spectrum for every position in an image
- Can find emission and absorption lines of elements
- Can measure inflows and outflows of the CGM

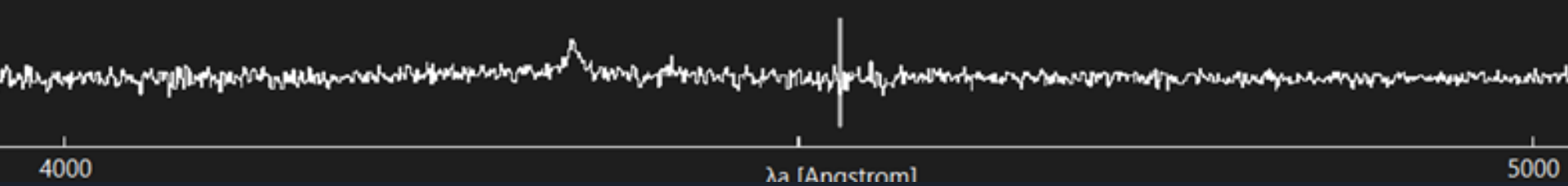




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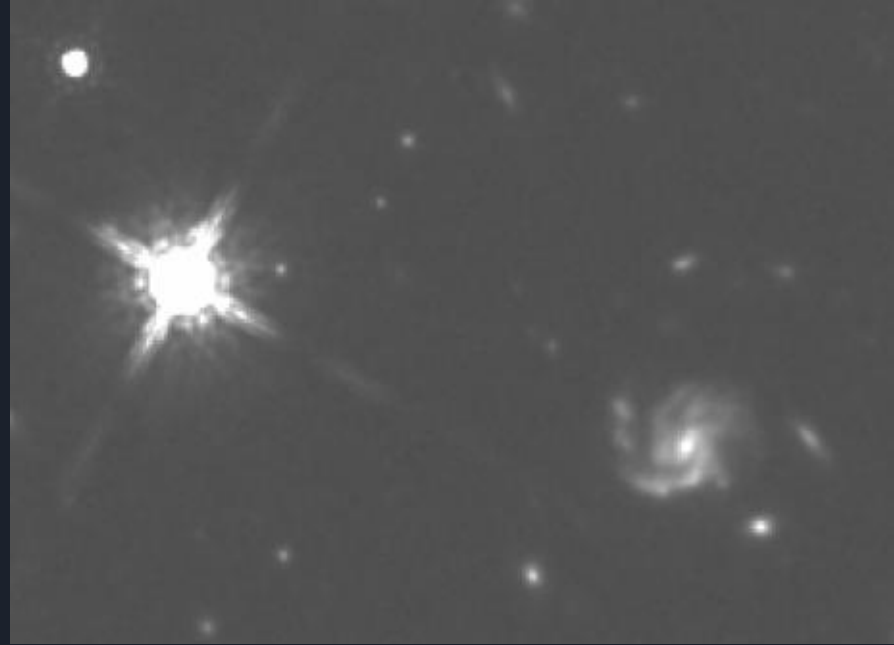
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Goal with REU Research

- Study inflows and outflows of gas for both QSO and Galaxy
- Measure elemental components, velocities, and flow rates of the gas
- Plot spectrums for both QSO and Galaxy to find absorption lines for certain elements
- Understand why galaxy is so massive and





Questions?