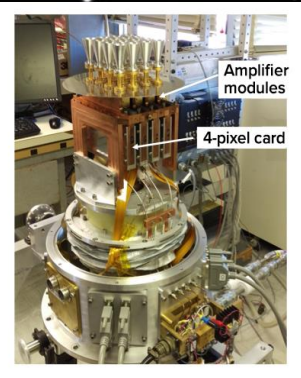


The Instrument:



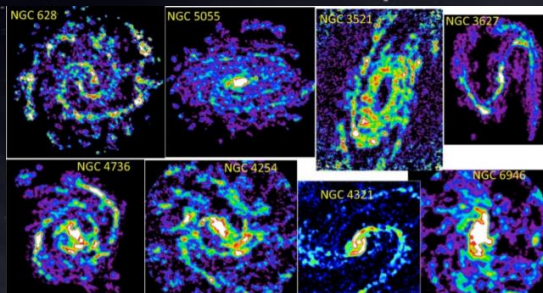
The Green Bank Observatory plans to construct a 144-element radio camera for spectroscopic studies in the 3mm band. The outstanding factor of this instrument is its resolution ranging between 6.5-10 arcseconds which will allow the telescope to make widefield observations of the molecular clouds in interstellar medium and plane of our galaxy to know more about the process of star formation and the astrochemistry associated with it. The GBT with Argus-144 will be unequalled worldwide for wide-area 3mm spectroscopic mapping, and will be a critical complement to ALMA, which has high angular resolution but a small field of view.

Science Goals at 3-millimeter Wavelength:

① Wideband Galactic Surveys:

Young galaxies, rich in gas and dust, were first discovered at sub-millimeter wavelengths from their dust continuum emission.

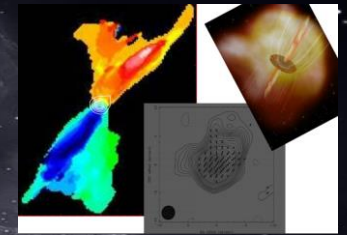
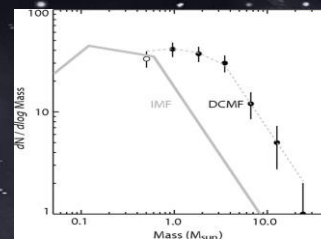
- Broad, modest depth surveys to identify primary chemistry.
- Broad spectral surveys of nearby galaxies.
- Spectral line studies of high-Z objects.



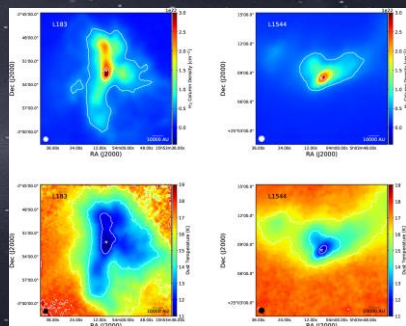
② Star Formation in our Galaxy:

Stars form in molecular gas clouds of our galaxy. Their formation is a messy affair involving turbulent magnetic fields, accretion of gas onto the forming star and ejection of gas at 10-100 km/sec in polar jets

The widefield view of the Argus Instrument will give much better understanding of the molecular gas clouds in the ISM that are the result of this stellar activities.



③ Study of Pre-Stellar Core Evolution:



Cold dark clouds represent a very unique environment to test our knowledge of structures that ultimately led to life. In particular, pre-stellar cores which are dynamically evolved starless cores represent the first phases of the star formation process and breeding grounds of chemical complexity. The physical and chemical conditions of PSCs have been probed over the past years by many molecular features, spanning from simple diatomic species to ions, and more recently to large organic molecules.

References:

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- 5) Argus+: Wide-Field, High Resolution 3-mm Molecular Imaging- David Fryer // greenbankobservatory.org