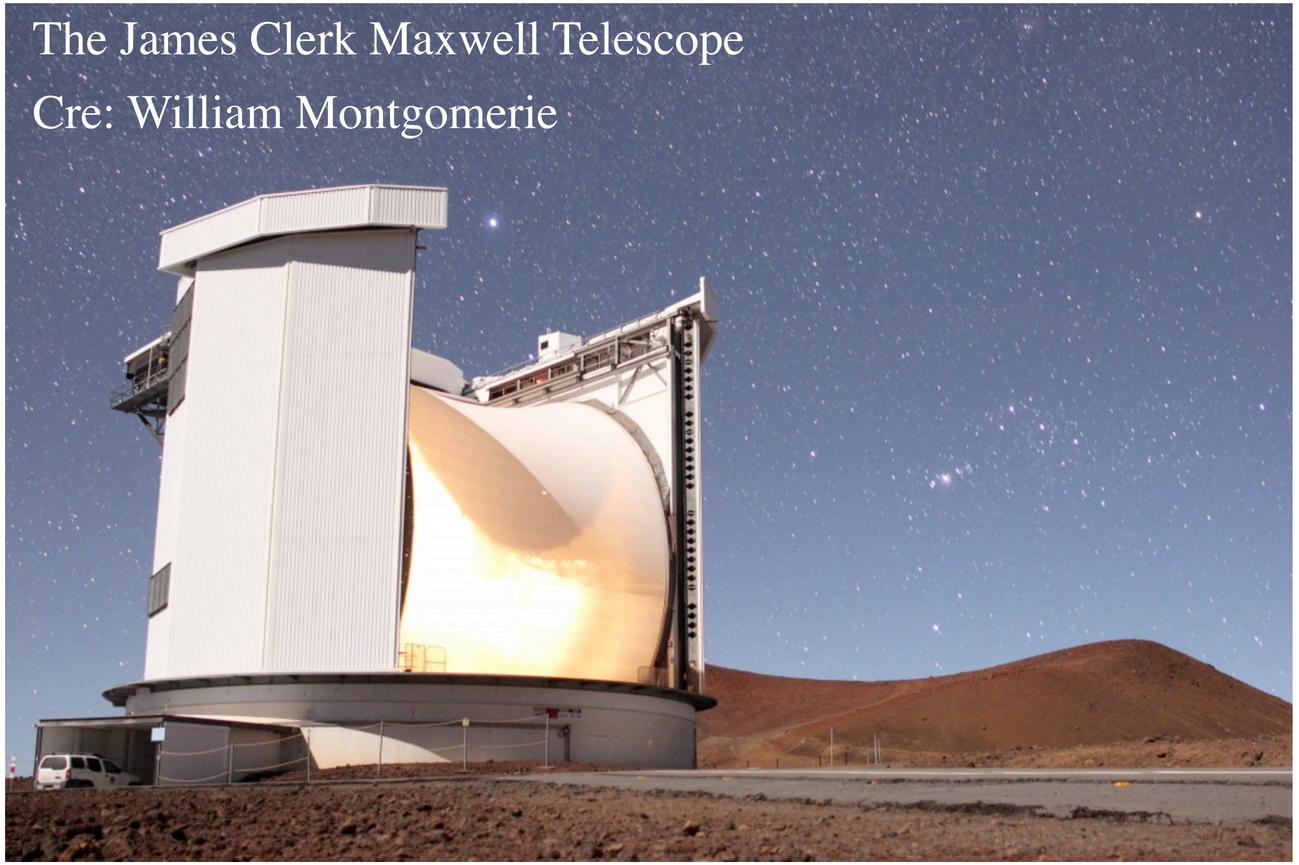
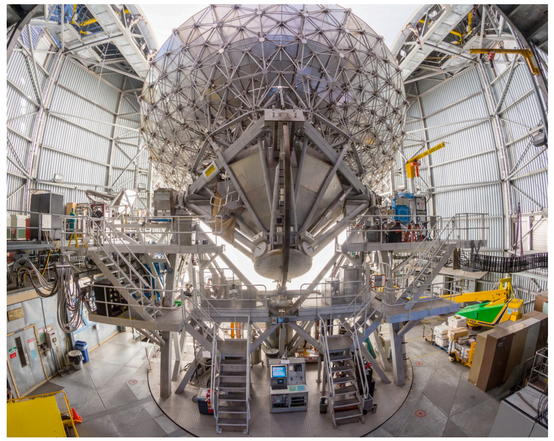
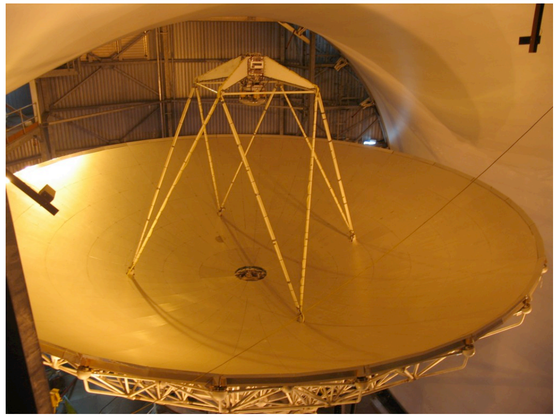
Millimeter/Sub-millimeter Astronomy with James Clerk Maxwell Telescope (JCMT)

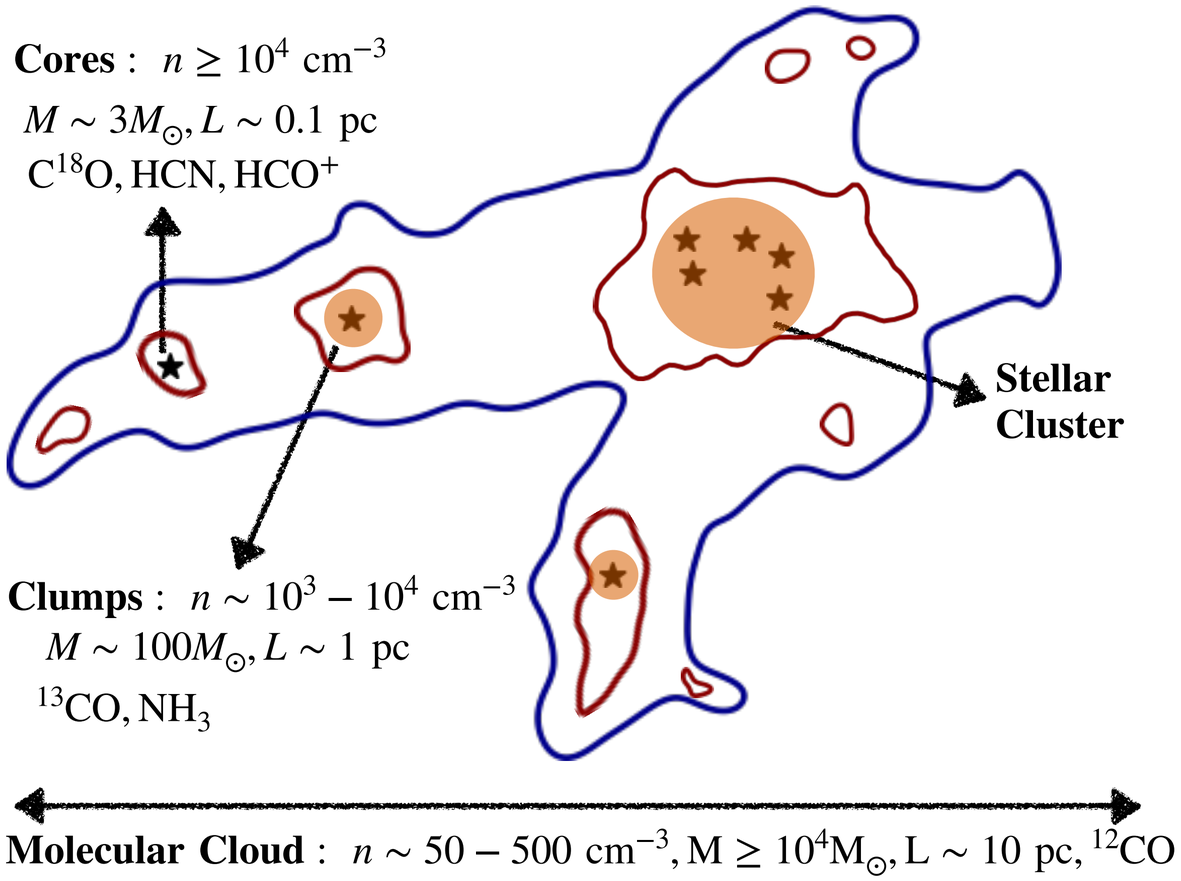






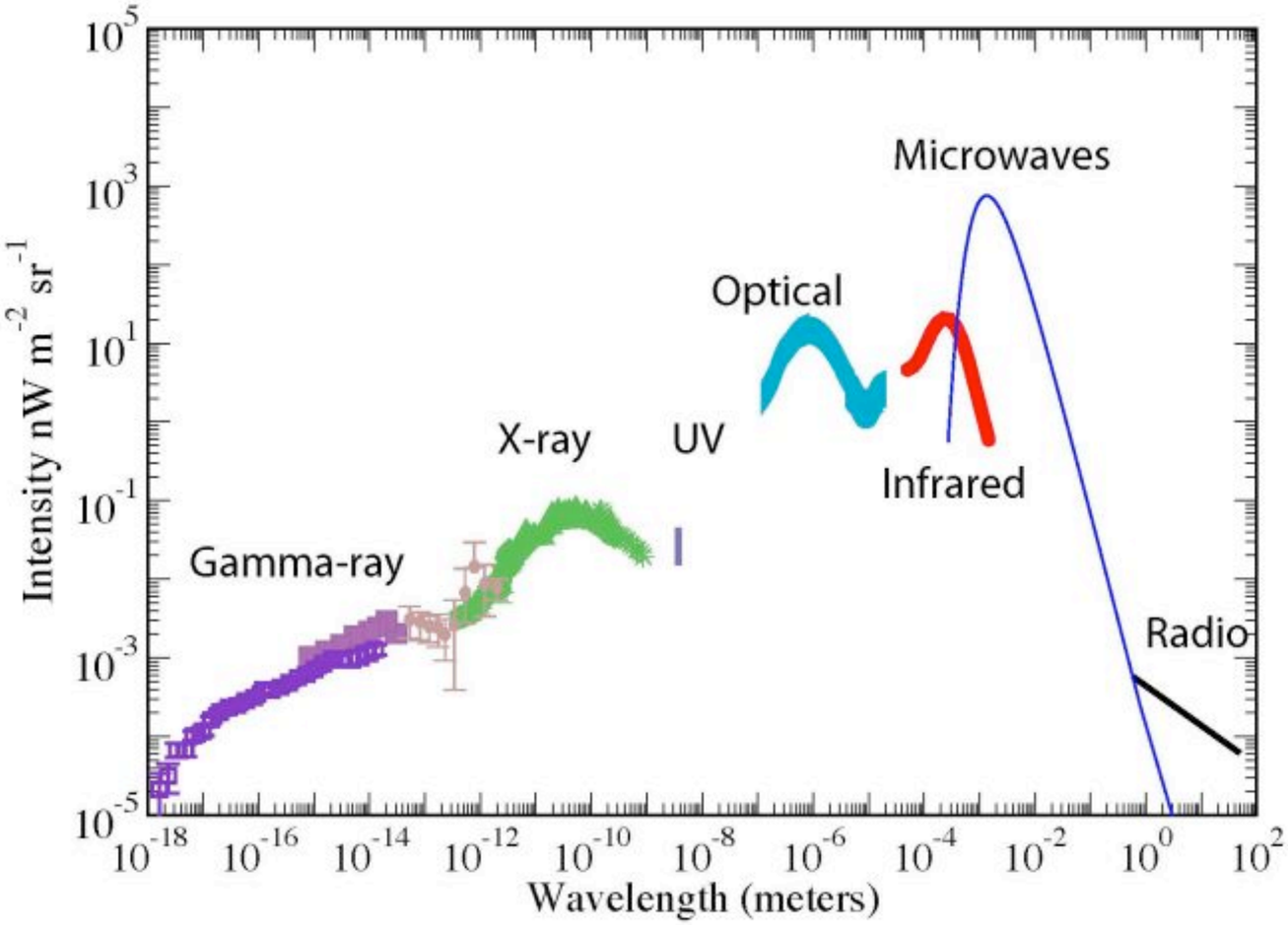
Ngân Lê
Simons Astrophysics Group at ICISE (SAGI),
Institute For Interdisciplinary Research in Science and Education (IFIRSE)/ICISE

Molecular clouds - the stellar nurseries



- Star formation occurs in cold and dense parts of molecular clouds, which consist of filaments, clumps, and dense cores.

Why mm/sub-mm Astronomy?



- One of the most important tools to study the birth of stars, star formation in galaxies

See also lecture by Nguyen Thi Phuong on Wednesday

Image of B68 in different range of wavelength

M. Nielbock + 2012 A&A 547, A11

Why mm/sub-mm Astronomy?

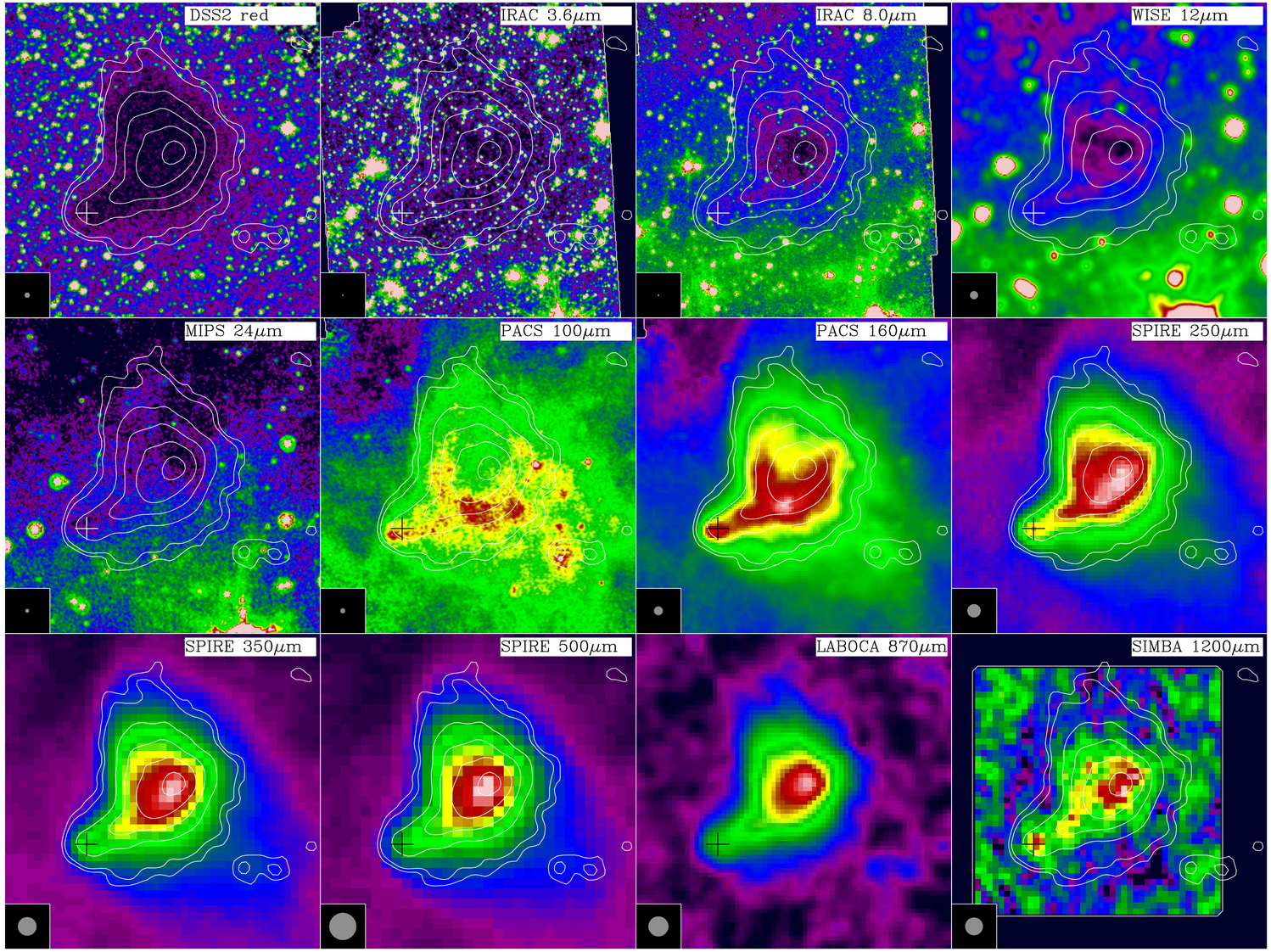


Image of B68 in different range of wavelength

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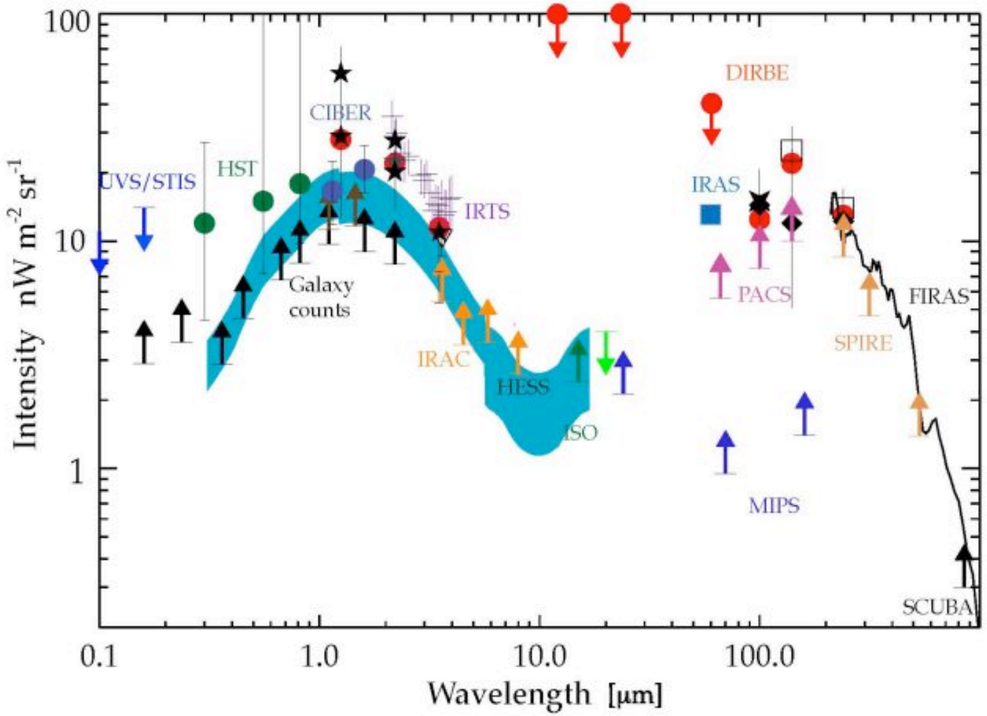

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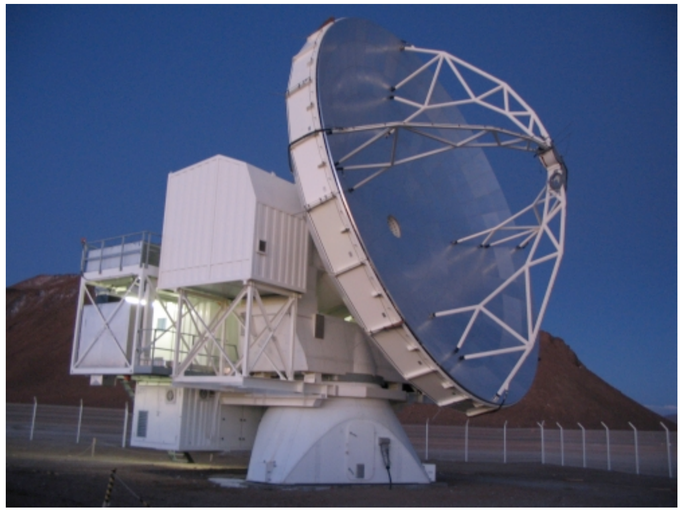


Atacama Pathfinder Experiment telescope (APEX)/ Chile

Arizona Radio Telescope (ARO)/South Arizona

IRAM 30m Telescope

Nobeyama Radio Telescope

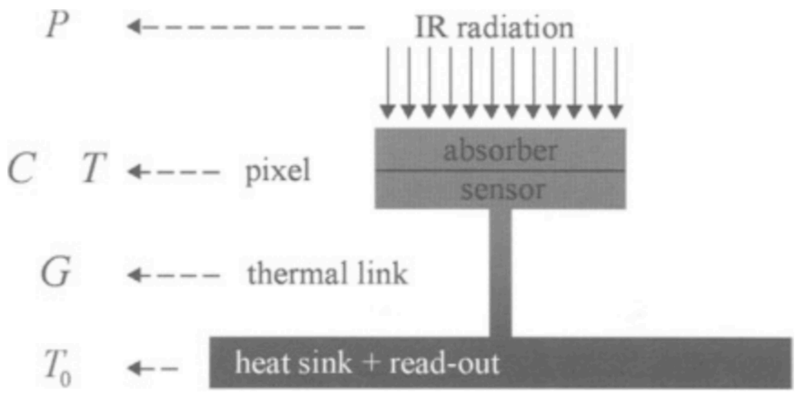
..and many more..

James Clerk Maxwell Telescope (JCMT)

- Bolometer (Continuum) receiver:

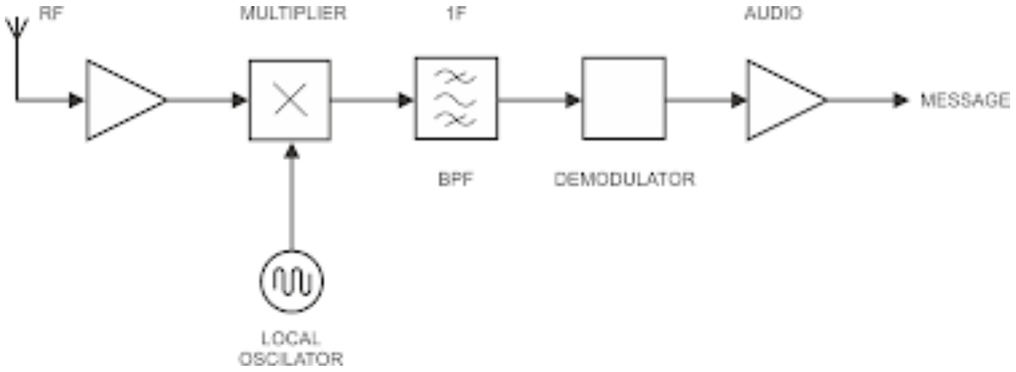
  SCUBA-2: 7.9” (450um) and 13” (850um) primary beam —> Continuum emission

  POL-2: polarimeter in conjunction with the SCUBA-2 —> Thermal dust polarization



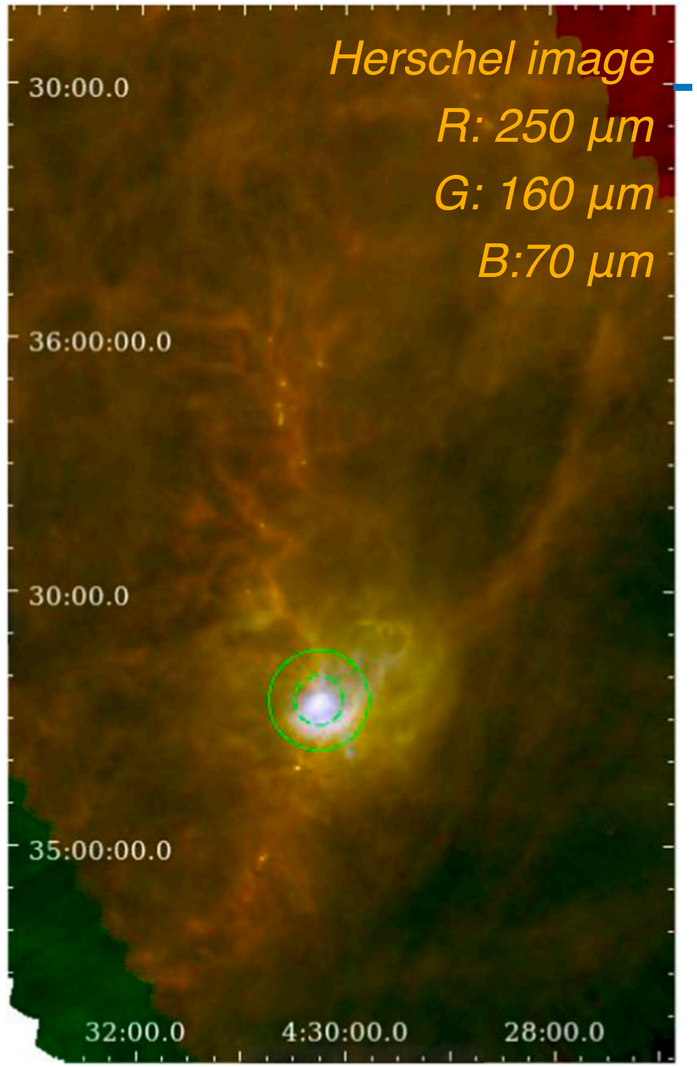
- Heterodyne receiver:

  HARP 6” pixels —> Molecular line emission



- More details about the Telescope at: https://www.eaobservatory.org/jcmt/public/jcmt/

James Clerk Maxwell Telescope (JCMT)



LkHα 101/ Auriga–California cloud

Ngoc et al 2021, ApJ 908 10

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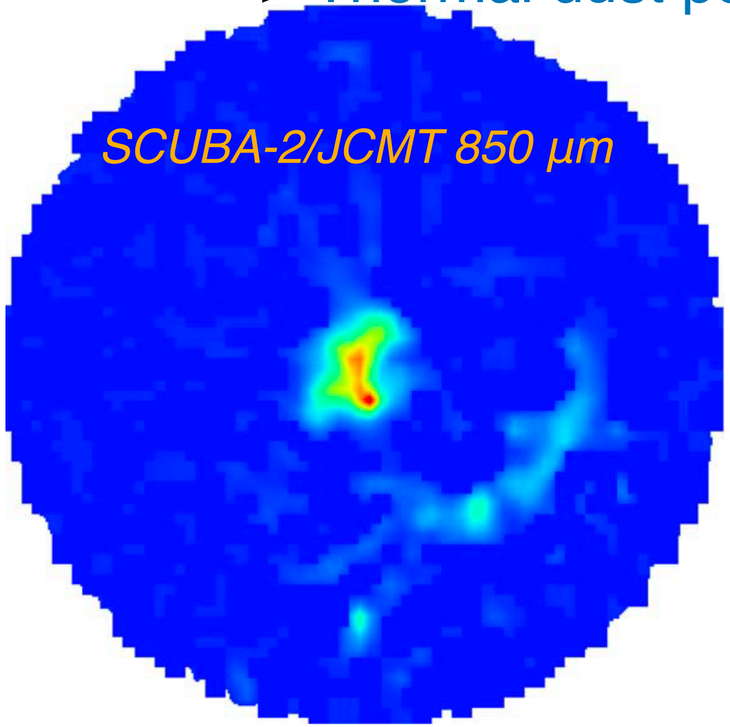
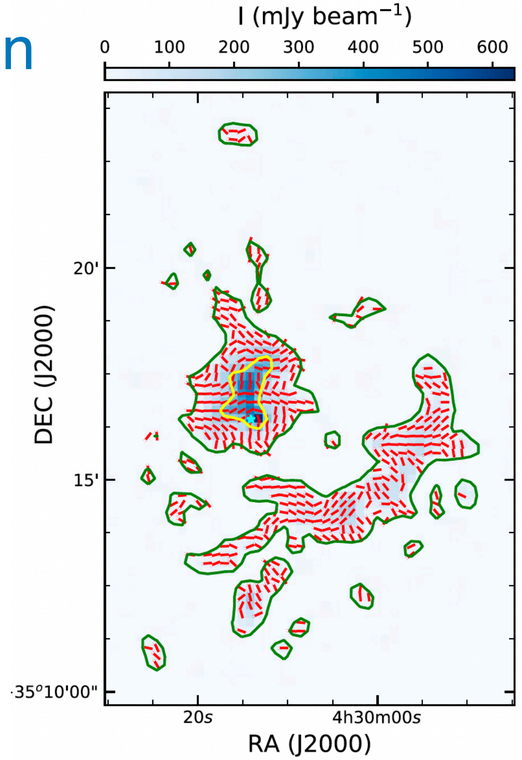


Total intensity map of LkHα 101



Magnetic fields morphology map of LkHα 101

James Clerk Maxwell Telescope (JCMT)

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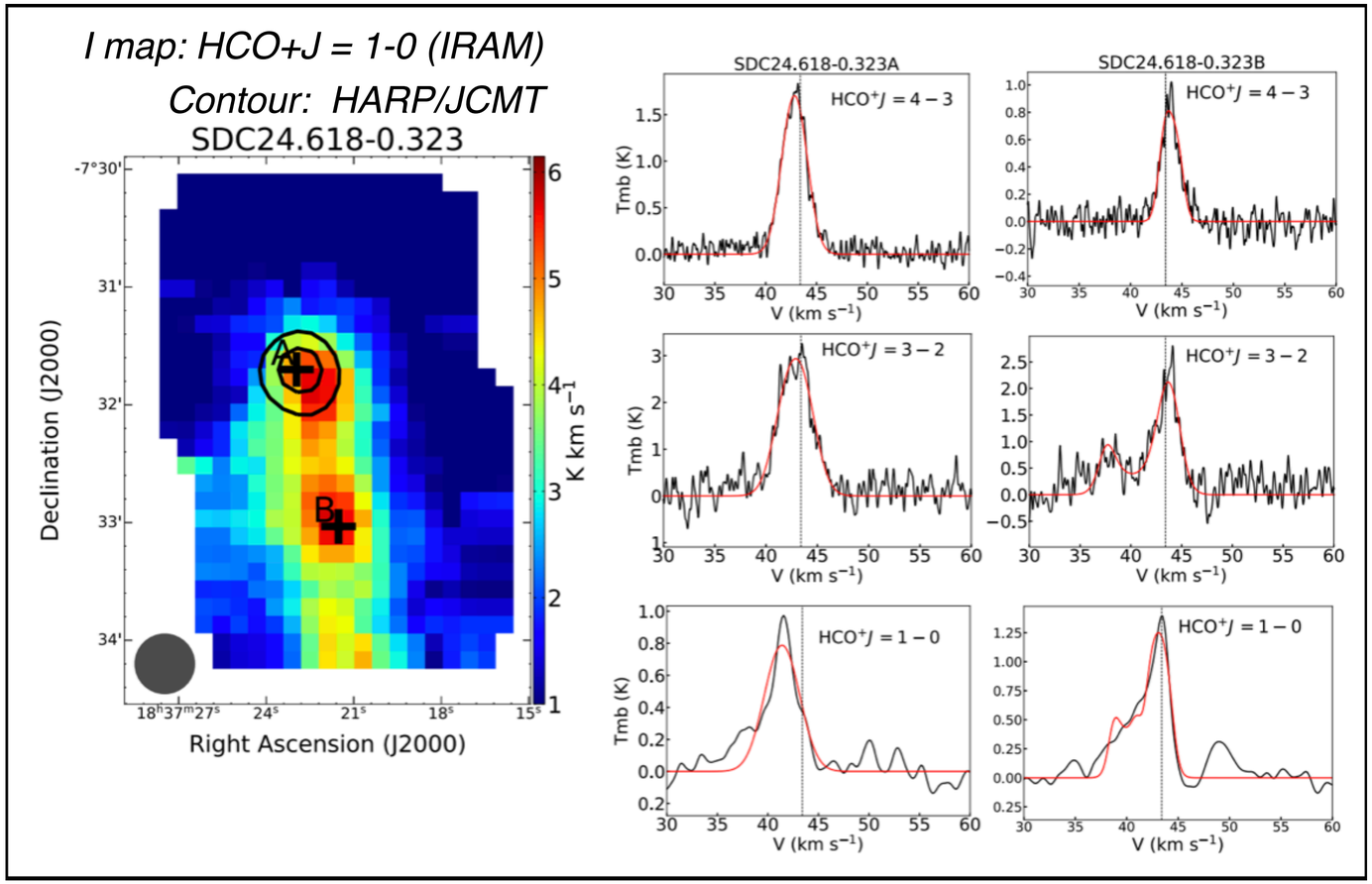
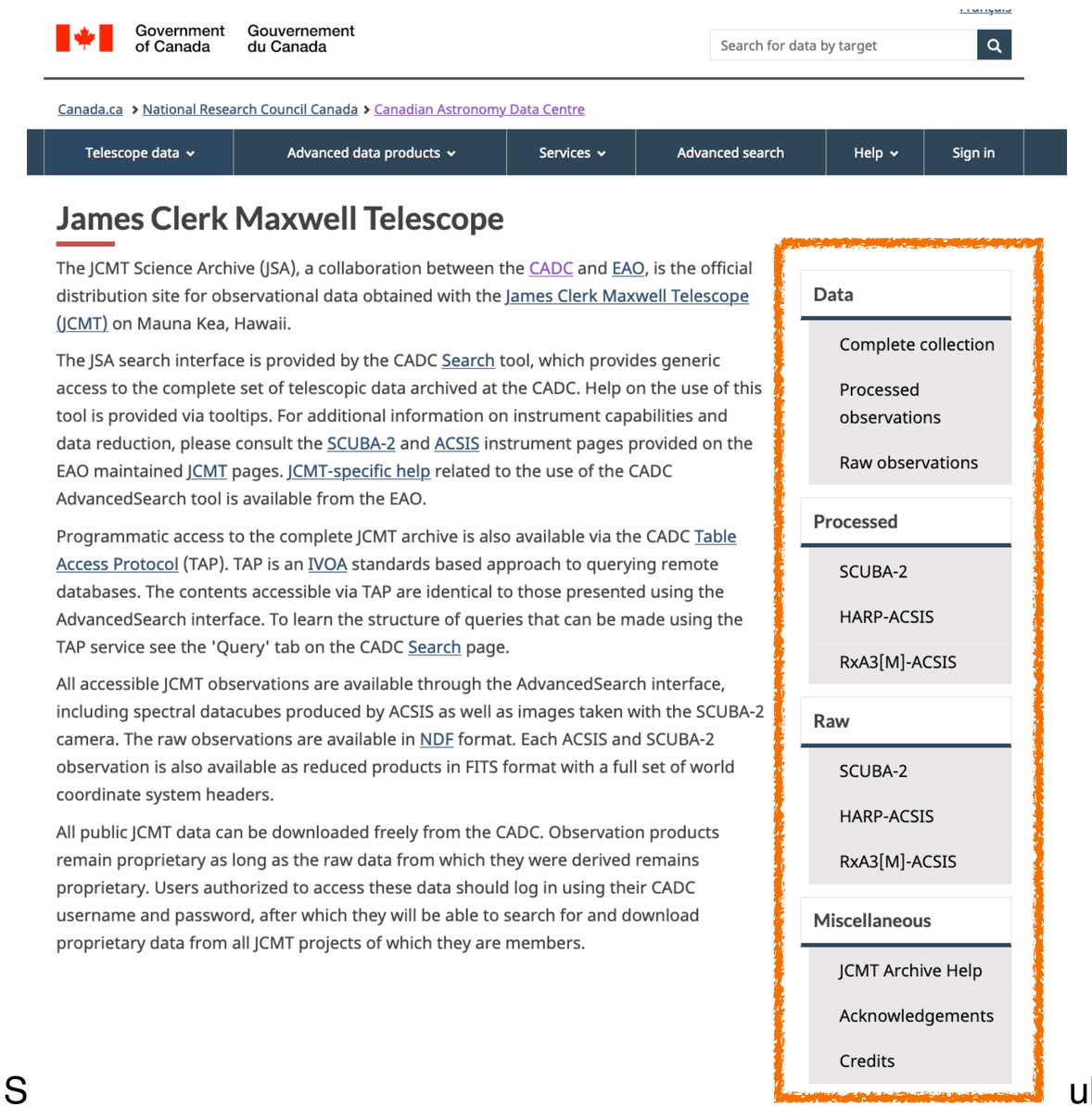


Infrared Dark Cloud SDC24.618-0.323

Jin-Jin Xie et al 2021, RAAS

JCMT Archival data

- Check out the website: https://www.cadc-ccda.hia-iha.nrc-cnrc.gc.ca/en/jcmt/



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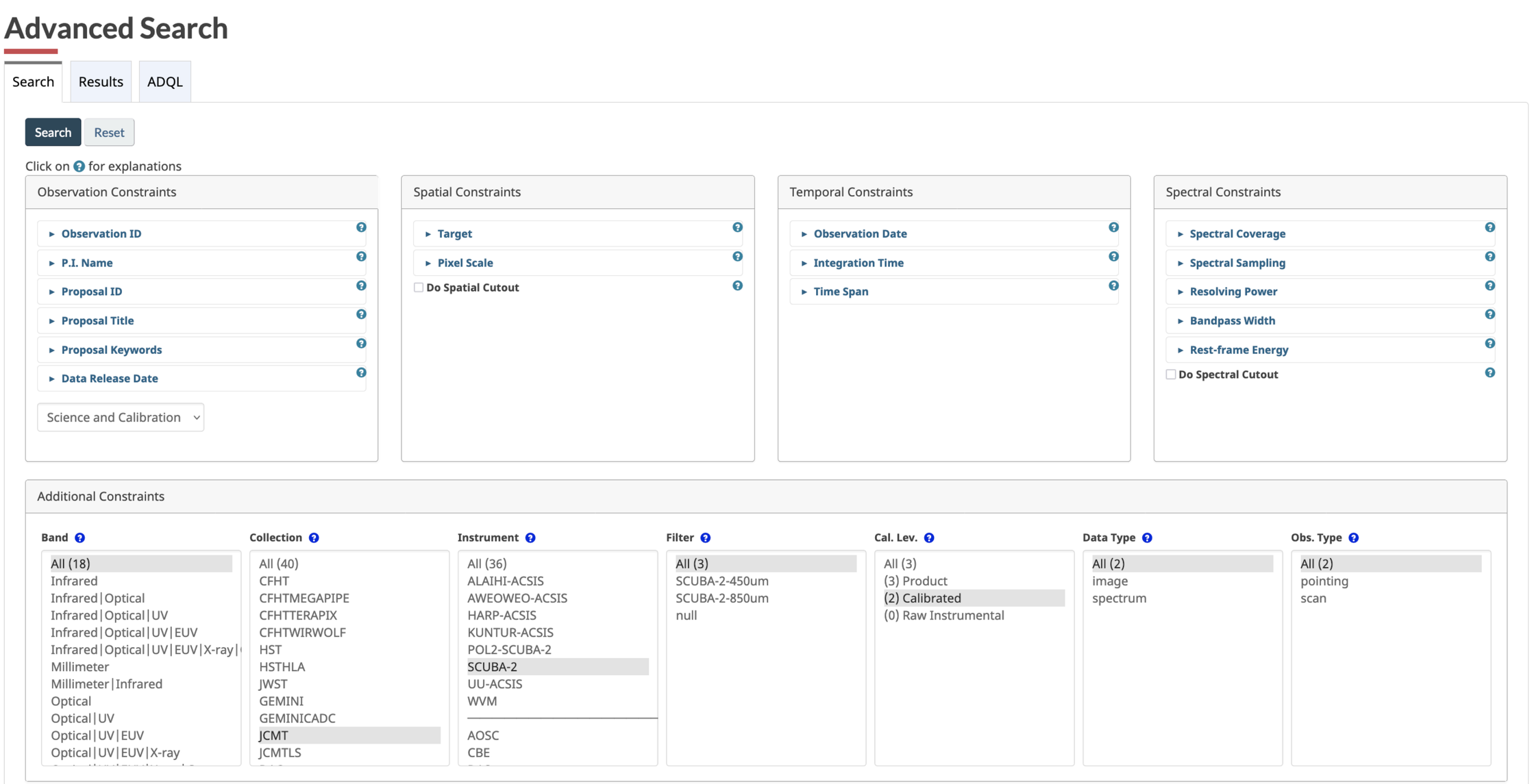

Vietnam

More details about the basics in radio/(sub)mm astronomy can be found at:

https://www.cv.nrao.edu/~sransom/web/xxx.html