Future prospects for the JCMT

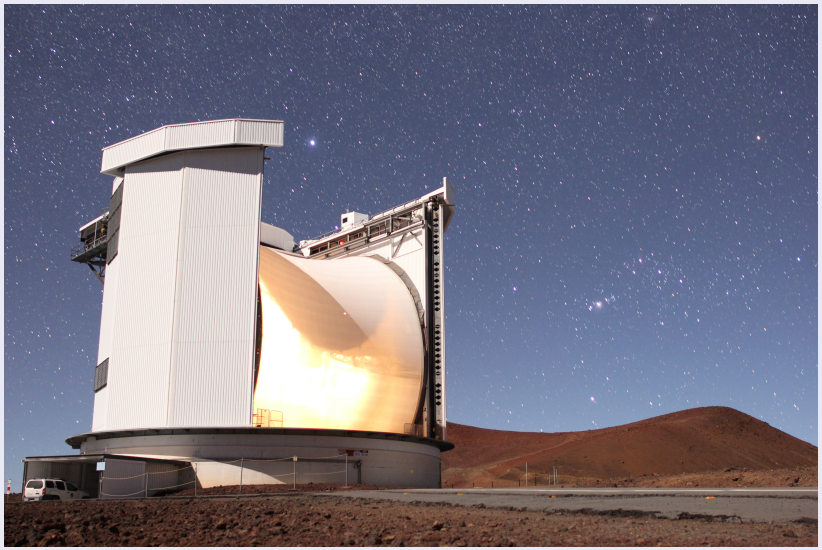
Ciska Kemper (ASIAA)

January 31, 2018

Brief outlook

TMT

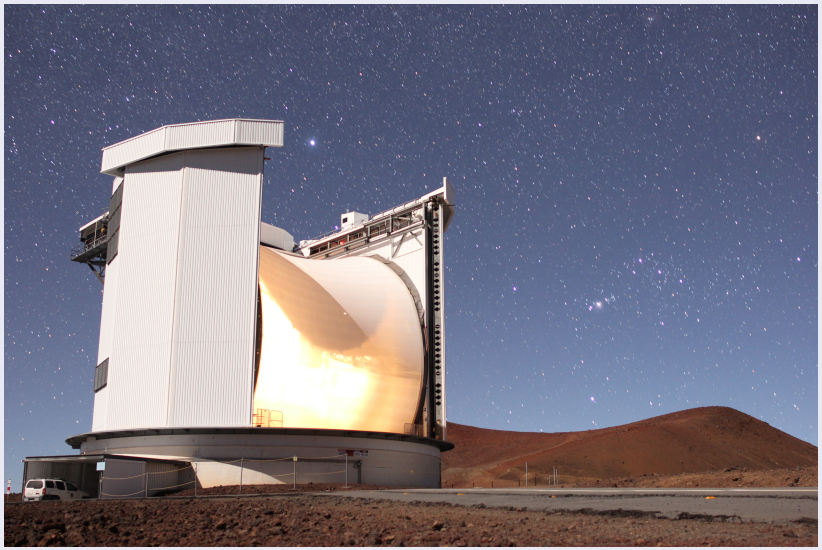
- 3 telescopes to be decommissioned
  - CSO
  - UH-teaching
  - UKIRT?
- pending approval incoming IfA director



Brief outlook

TMT

- 3 telescopes to be decommissioned
  - CSO
  - UH-teaching
  - UKIRT?
- pending approval incoming IfA director



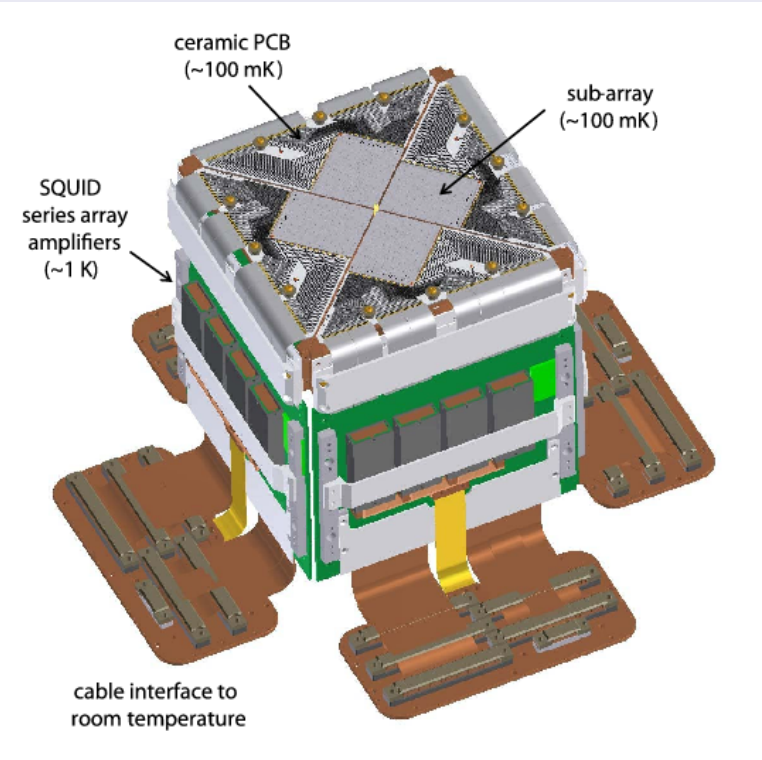
Funding

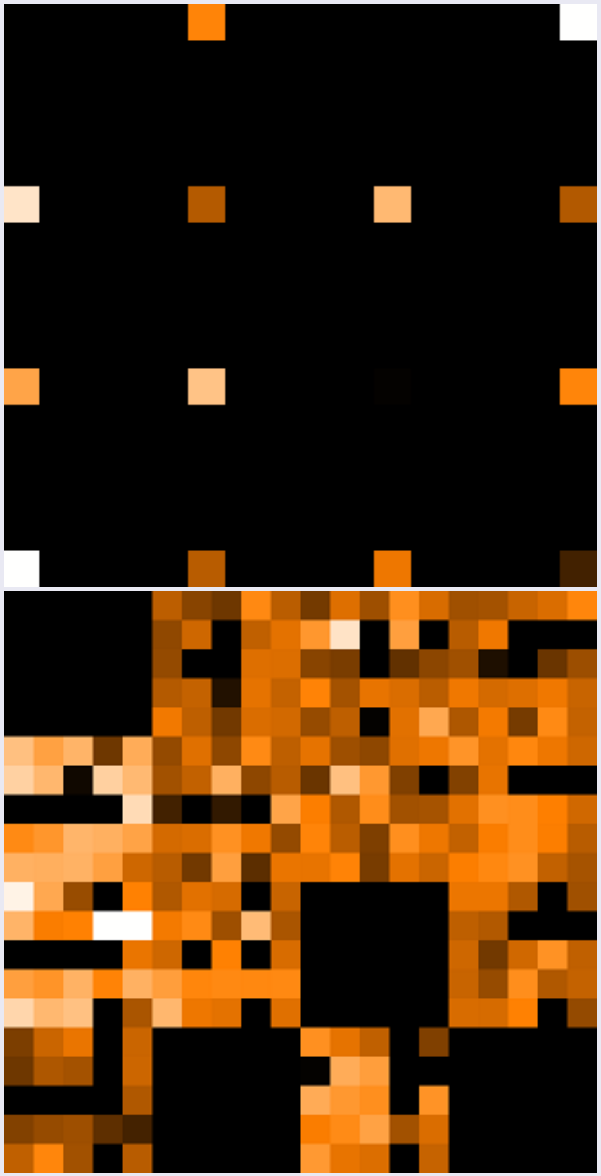
- 2 years + 5 years pending
- EAO, UK, Canada
- VLBI
- UKIRT
- Vietnam, Thailand, Australia

Single-dish submm astronomy in the era of interferometry

Instrumentation

- multipixel
- complexity
- testing for e.g. ALMA
- no funding in baseline





Planned instrumentation upgrades

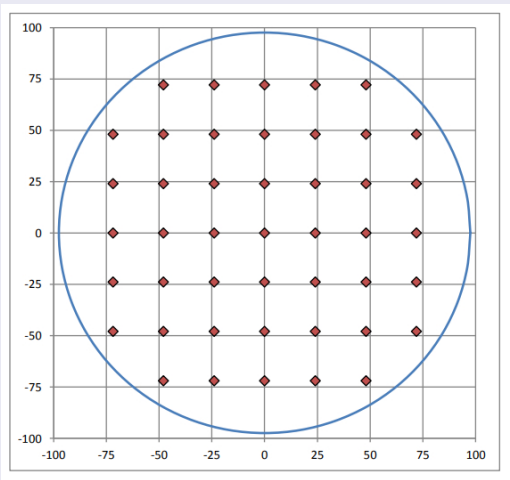
Heterodyne

RxA

- new dewar / VLBI receiver
- 3 slots

HARP-B

- 4x4 pixels, 2/3 not working
- fix pixels?
- New, larger array?



Continuum

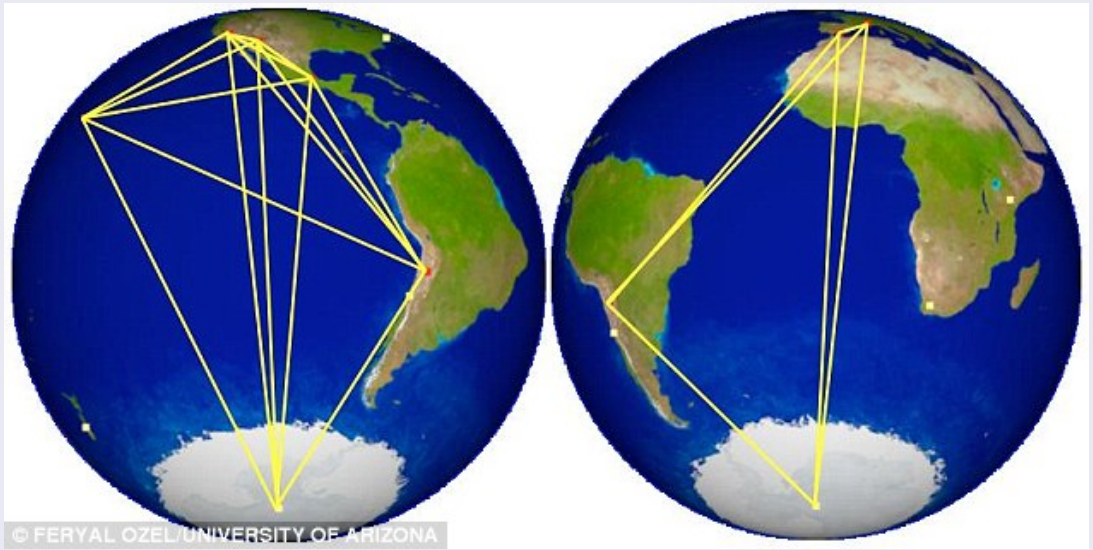
SCUBA-2:

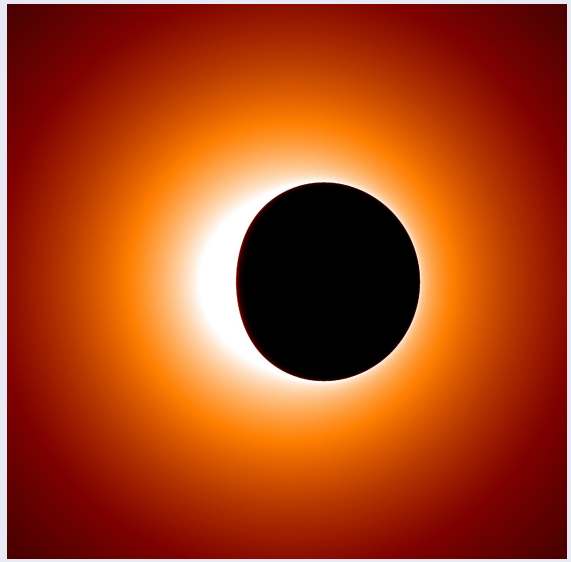
- 10,000 pixels

SCUBA-3

- efficient mapping
- 15' FOV
- 100,000 pixels
- no polarization
- 850 only

VLBI and the Event Horizon Telescope





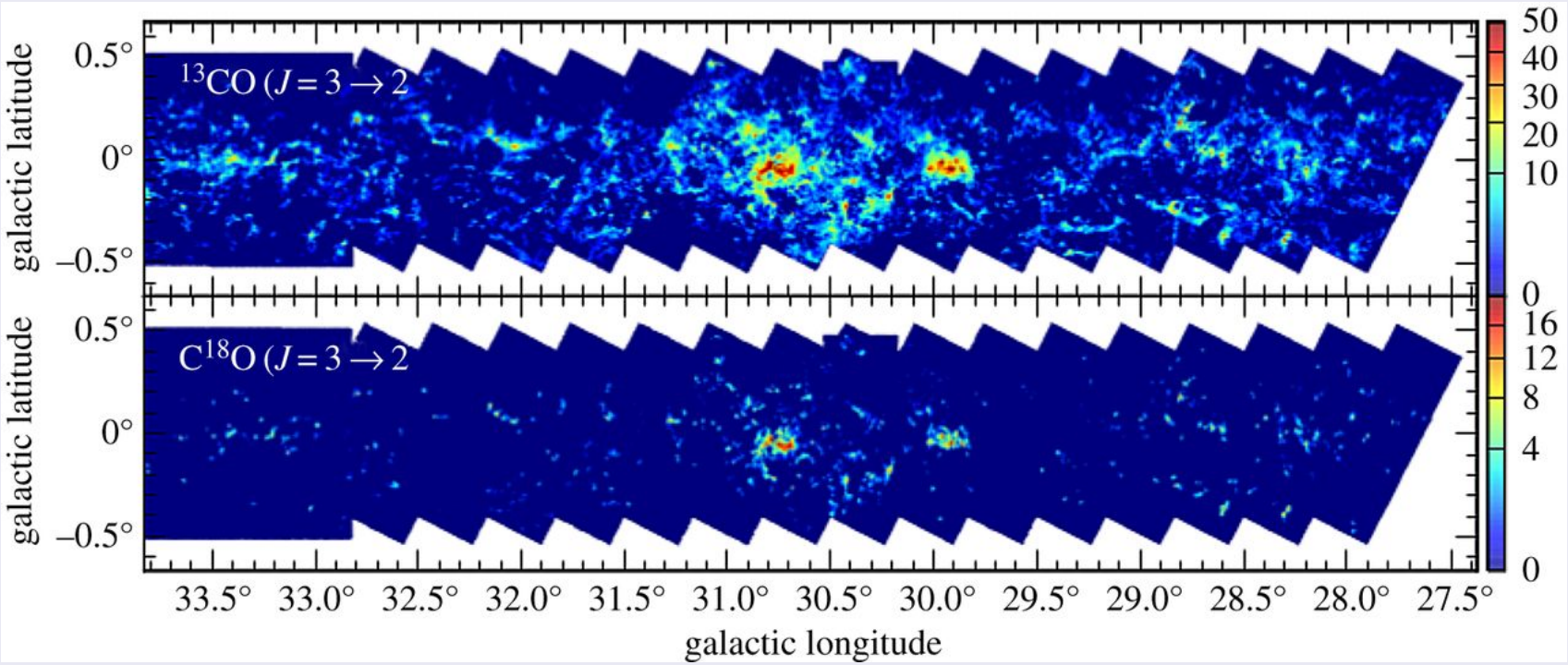
JCMT is part of the EHT.
The primary goal is to image the black hole shadow of Sgr A* or M87.

Surveys & Mapping

Single dish lends itself very well for mapping large areas.

Can be enhance with multipixel instruments:

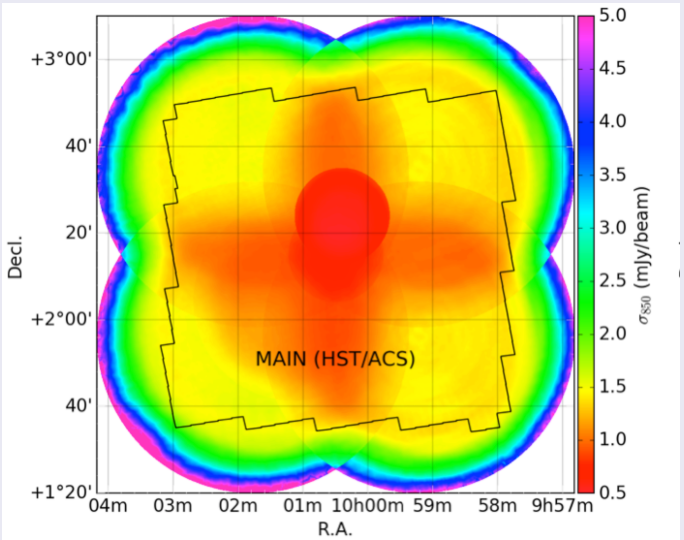
- HARP-B
- SCUBA2
- future



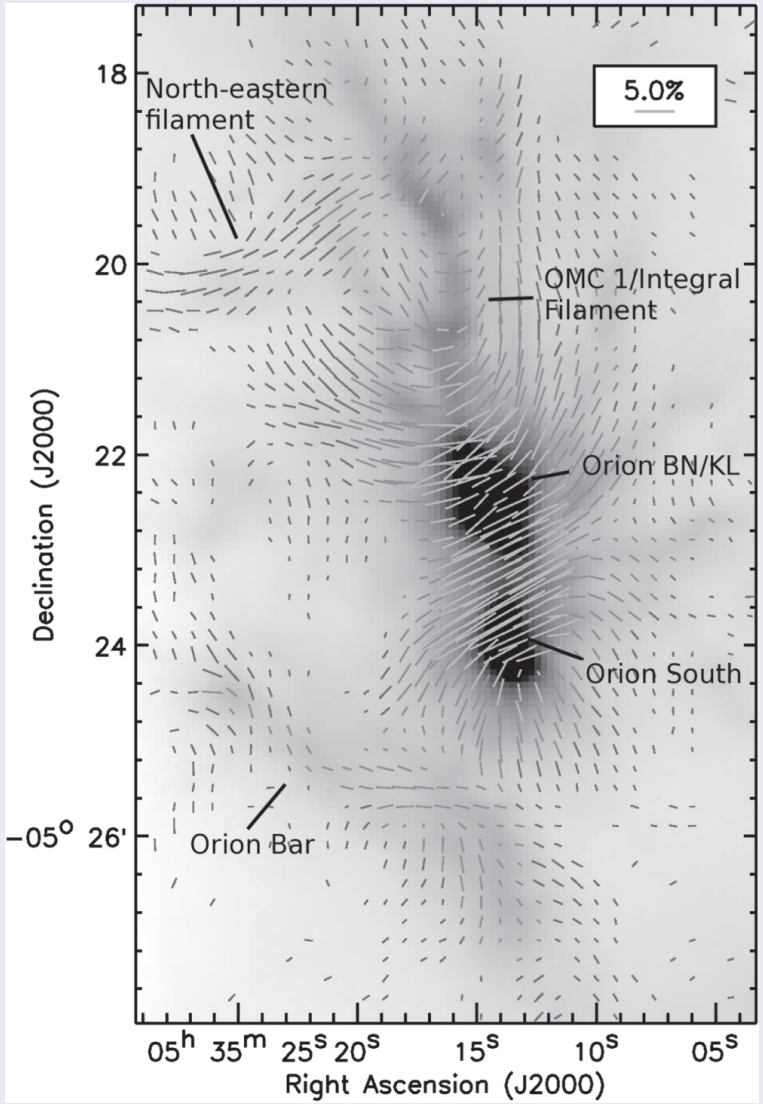
(CHIMPS; Rigby et al. 2016)

Science goals

- Galactic structure:
  - Milky Way
  - external galaxies
- large scale structure in ISM
- deep fields
- polarization maps

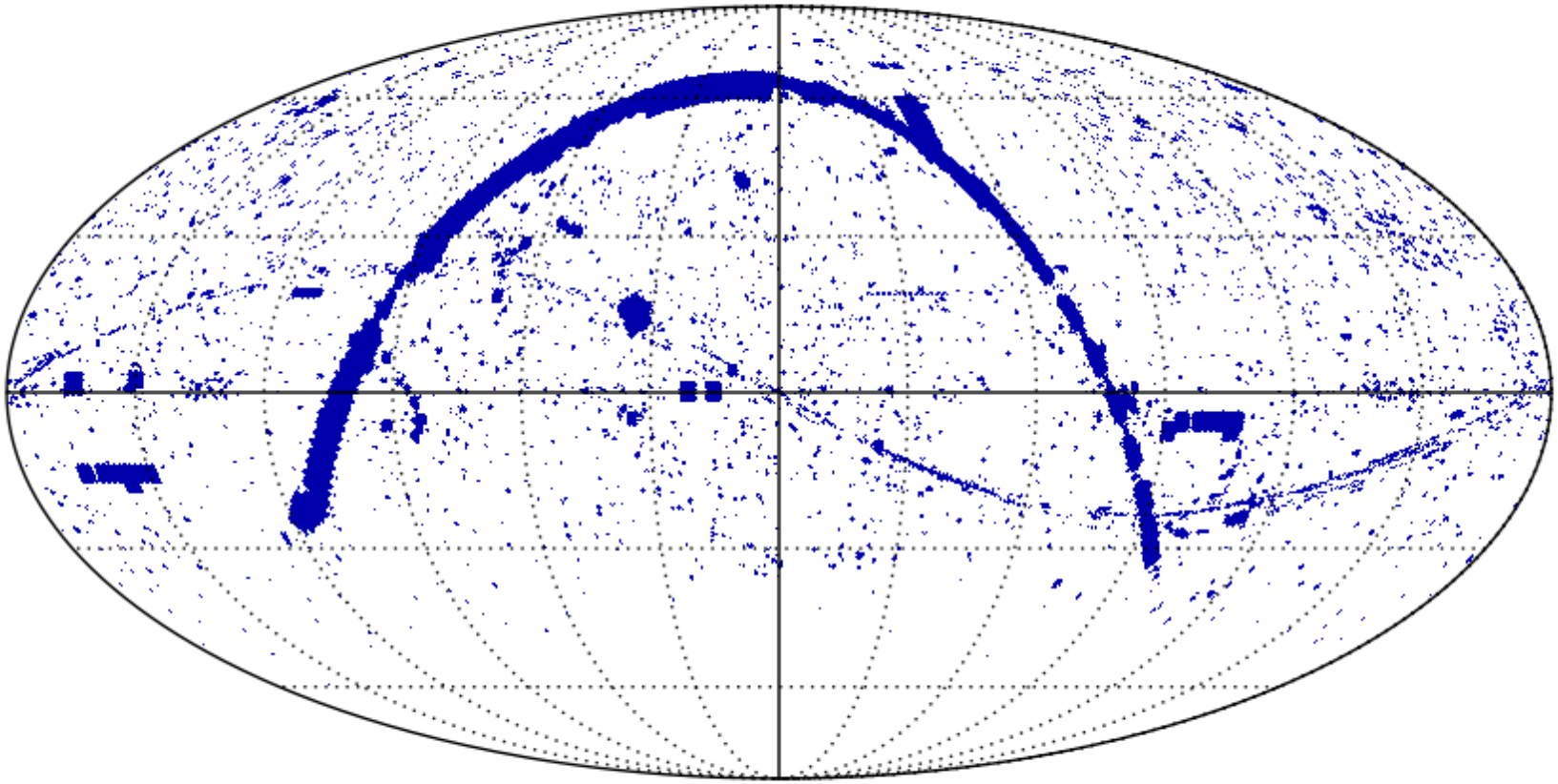


S2COSMOS

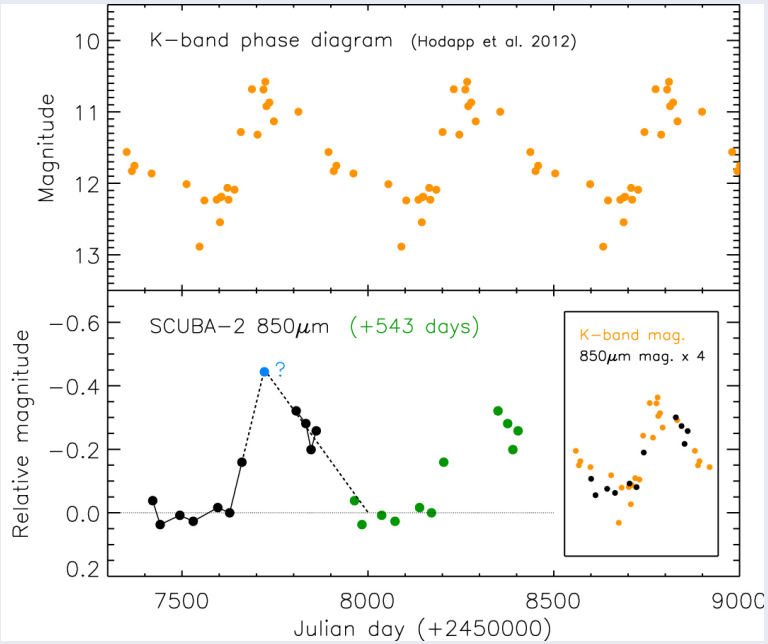


(Ward-Thompson et al. 2017)

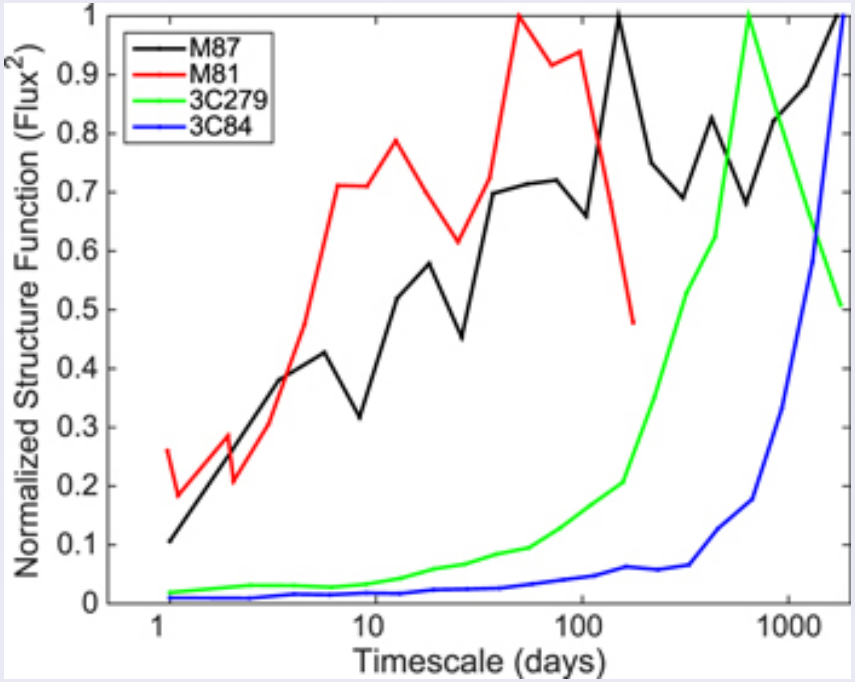
Sky coverage of existing SCUBA2 observations



Time domain astronomy

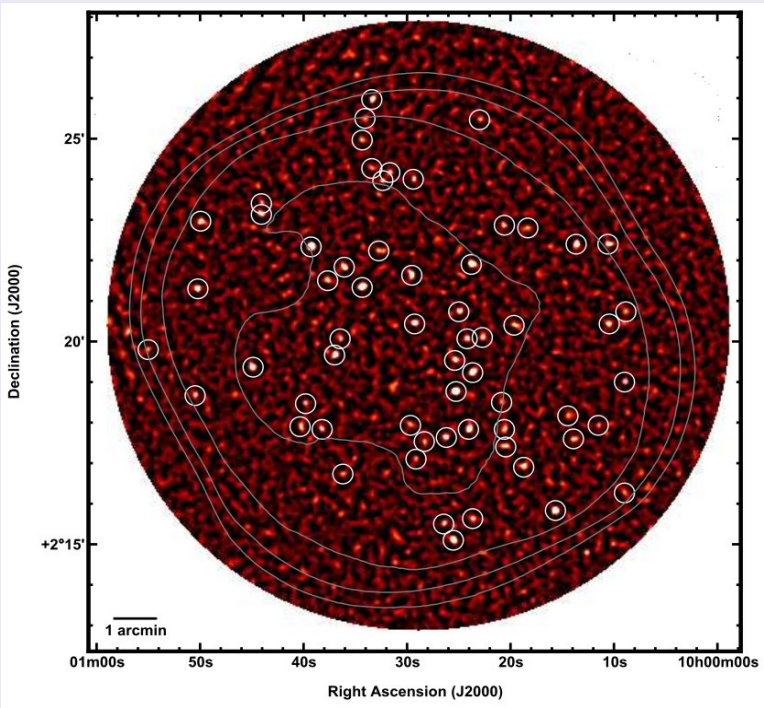


A variable YSO in TRANSIENTS (Yoo et al. 2017)



- relatively unexplored
- different time scales:
  - follow-up on trigger events
  - longer time series
- talk by Sofia Wallström and poster by Thavisha

Large programs



COSMOS 450 micron field

- Large beam-size: low spatial resolution, but easy to cover larger areas
- Multi-pixel receivers allow for fast mapping
- Different kind of science than PI projects: Statistics
- Better return rate in terms of number of papers
- Beneficial for small partners

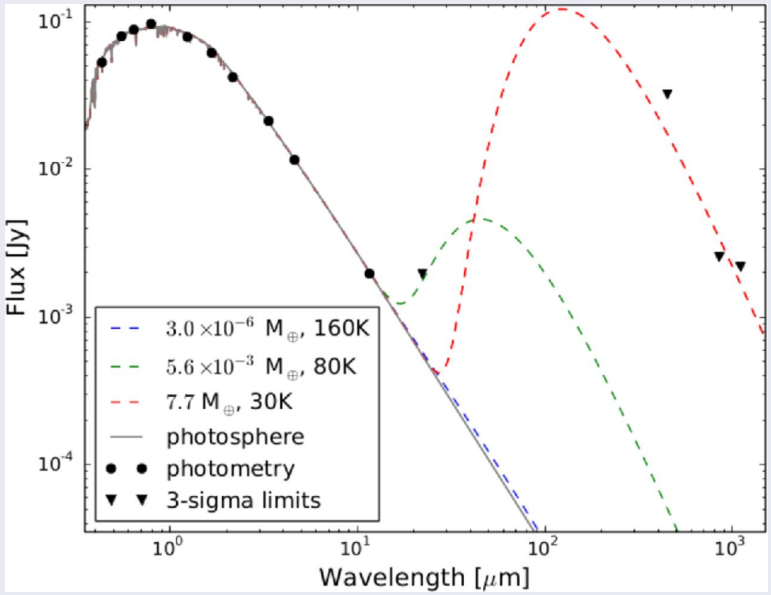
LAP are successful:

- participation
- EAO vs Canada, UK
- publications

PI programs

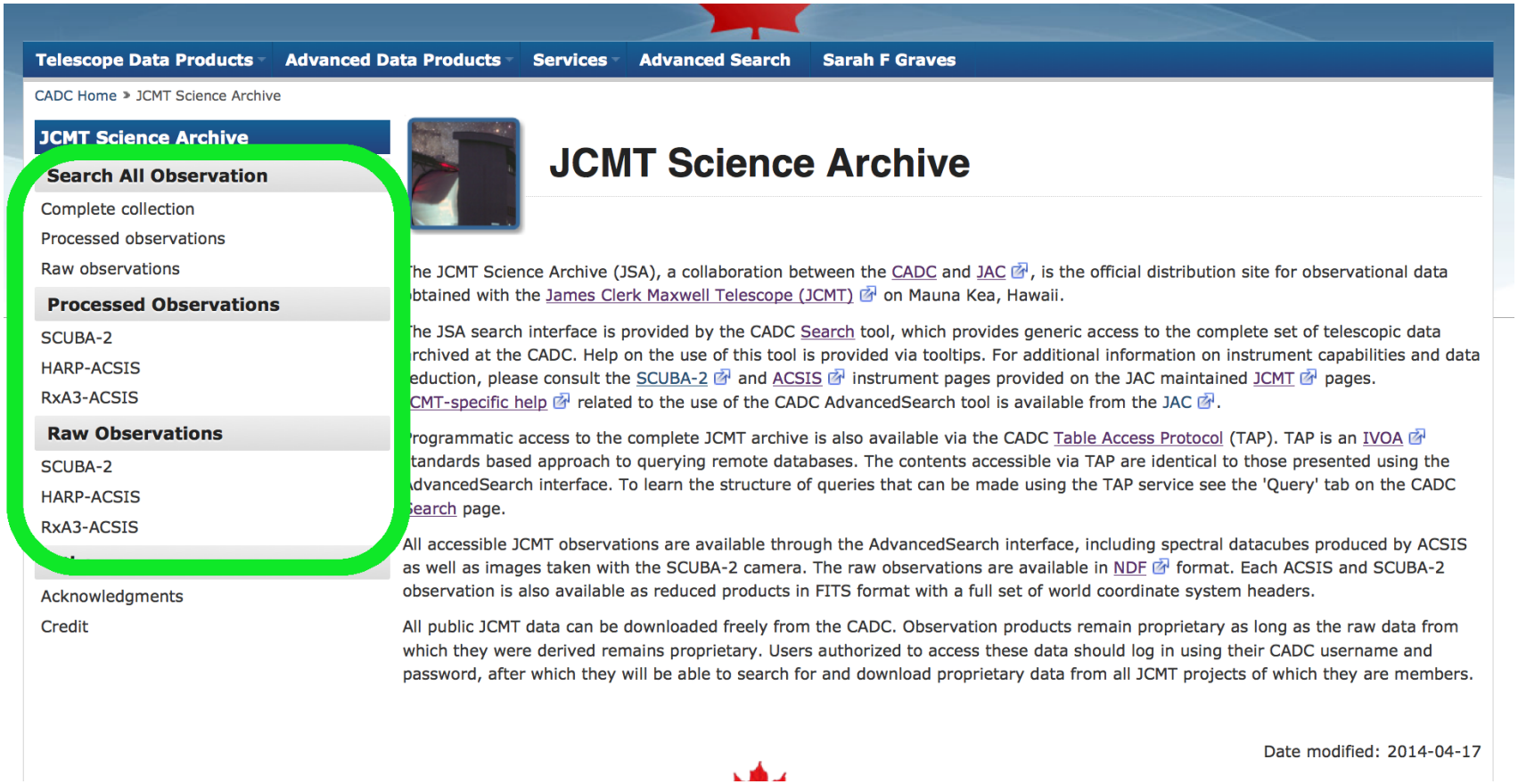
- ToO
- Solar System
- "Unique" objects
- New observational methods, techniques, strategies
- Pilot programs
- Completion/follow-up of large programs

Ruling out mega-structures



(Thompson et al. 2016)

The legacy of JCMT



`http://www.eaobservatory.org/jcmt/science/archive/guide/`

The JCMT data archive for the virtual observer

Training and development

young astronomers

- observing / analysis
- internships
- instrumentation

instruments

- test site for e.g. ALMA

new communities

- EAO countries
- beneficial to UK and Canada
- expansion into east-asia

Conclusions

In the era of large submm interferometric arrays, JCMT has to build on its strengths:

- Collaboration within and between the regions
- Large programs targeting relatively large areas
- Updating the instrumentation to improve mapping speed, both for bolometer and heterodyne receivers
- Time domain astronomy
- Participation in VLBI and EHT
- Further development of upcoming communities in astronomy
- Training of students and post-docs in observational astronomy and instrumentation

Cosmic Dust: origin, applications & implications

11 - 15 June 2018

Copenhagen

http://cphdust2018.nbi.ku.dk/

Registration opens tomorrow: 1 February 2018

Abstract submission deadline: 5 March 2018