

Future science directions at the JCMT

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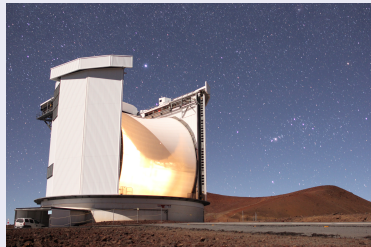
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A competitive JCMT in the era of ALMA

- JCMT has been around for 25+ years, originally run by the UK, Canada & the Netherlands
- PI proposals have been main observing mode
- Handed over to EAO, UK & Canada in 2015
- SCUBA2 is state-of-the art; HARP and RxA are aging
- Single dish, large beam size and small collecting area compared to ALMA
- Cannot compete with ALMA on certain topics, e.g. detailed disk evolution and planet formation

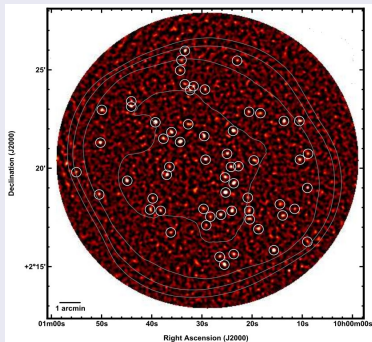


ALMA



JCMT

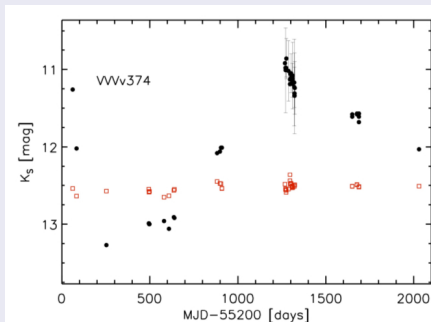
Surveys (Large Programs)



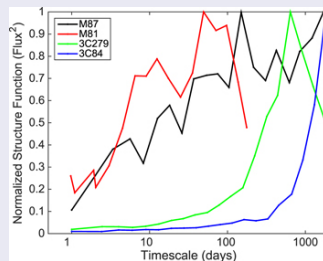
COSMOS 450 μ m field

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

Time domain astronomy

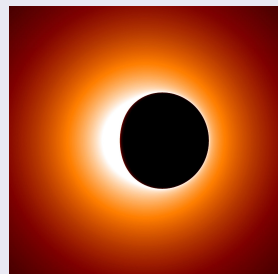
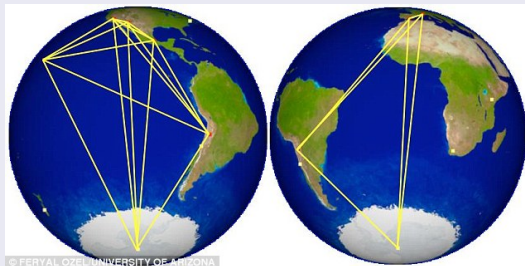


Monitoring surveys such as TRANSIENTS will reveal variability on different time scales. See examples ATLASGAL (left) and SMA observations of quasars (right).



- Time domain astronomy is relatively unexplored in the submm
- Monitoring on different time scales
- Quick follow-up on trigger events

VLBI and the Event Horizon Telescope



JCMT has joined the EHT, initially with only CARMA and SMT, but the network is expanding.

The primary goal is to image the black hole shadow of Sgr A* or M87, but other science goals are also feasible, e.g. jet launching mechanisms

Opportunities for development

Asia-Pacific partners

- Australia
- Vietnam
- Thailand
- Hong Kong

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Young astronomers

- Observing / training
- Internships / research projects
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Guest instruments

Testing site for interferometric facilities such as ALMA

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