

# Continuum Discussion Session

## Capabilities

*What instrumentation and facilities do we currently have access to?*

## Demands

*In the next 5-10 years:*

*What instruments/facilities are needed for the science goals?*

## Advancements

*In the next 5-10 years:*

*What instruments/facilities are we building?*

*What instruments/facilities can we get involved with?*

# Capabilities

*What instrumentation and facilities do we currently have access to?*

## Current Facilities:

JCMT, POL-2 SCUBA-2, we have access at both 850 and 450 currently, 450 would require time and money. Give us money! or be patient. Second instrument - 450 copy of 850. Should be faster once we have the first - if the science demands it.

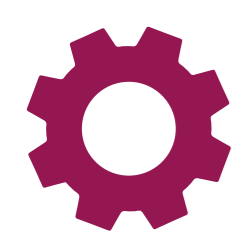
FTS-2 - on JCMT but not commissioned - needs work. need to remove FTS for the new 850 camera. FTS (scanning spectrometer - not a detector operates with SCUBA-2). Is there a science demand for FTS otherwise it will need to be moved. limited to 2 sub-arrays at 450 and 850 (not the best sub-arrays 2/3 of one sub-array). If demand is there then need new optics for FTS but not optimized for larger FOV. - do not have the



# Capabilities

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What other wavelength will help - collaborate with toltech for wavelength range.



## Demands - need to work on the White paper

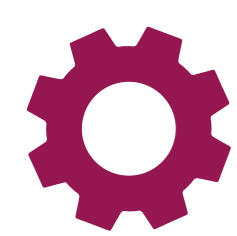
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*What instruments/facilities are needed for the science goals?*

Need to ensure we do due diligence and we have the timelines and costs associated with adding the 450um into a new instruments.

Fraction of time, fraction of papers... at that point really, community needs to build the science case.

450um might do better with spectral line observing for the atmospheric window.



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Is there a need for the 450 micron, if discussing the next 5-10 years then yes. we can have the 850um camera and then after the 450.

Science driver for FTS - community focused on available instruments. If good sensitivity (as promised) then demand there.

We need to be aggressive in our science choices! When FTS dropped in priority we did not get community backlash (if we are wrong - give us money!).

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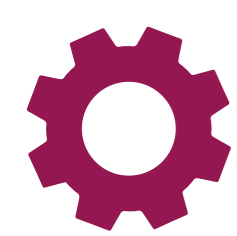
*What instruments/facilities are needed for the science goals?*

Niche for next generation of new facilities will likely be 450um,

Maunakea - 850 is our working wavelength.

ASTE, GLT, Chile, 450um

- if we remove our 450um capability then if demand is there EAO needs to expand access to new/other facilities.



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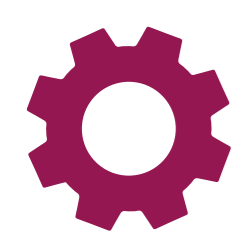
*What instruments/facilities are needed for the science goals?*

Need to be focused: Magnetic Fields , Transient Events , Sub-mm Galaxies , are these the right science cases, we should stay focused.

What about imaging of star forming regions - more to do there.

Magnetic fields in external galaxies? yes! but hard - time consuming, and technical issues. Look and compare to Planck results both in MW and beyond. POL-2 can contribute to establishing B fields in MW to assist with understanding B fields to understand better the CMB. - Diffuse dust more important.

450um, BISTRO results - differs 10-30deg, interesting  
**Dust grain properties -**



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**Future instrument - on chip band filtering not dealing with dichroic, on chip spectrometer, advantage of this design can swap in and out (with some caveats).**

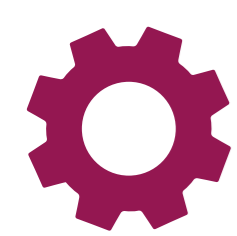
**community requests for known costs, for better feel for time scales. science cases if you had “all the money and all the time”.**

**White papers - think not just on JCMT, think about prototype for the next set of facilities. Don't be limited by a 15m dish. Not limited by Maunakea weather. BE AMBITIOUS.**

**450 is important for SMGs at peak of star formation. But if delays then maybe drive for the 850 and then push for a follow on 850. 850 looking for the detections, then 450 for source identification. to have a 450um driven Large Program would be excellent.**

**we want our toys - first go at 850.. and then built up to be 450 capable - for multi-chroic SUCBA-2 delays until after Hershel hit our science. TIME is critical and is a driver to keep JCMT and our community competitive.**





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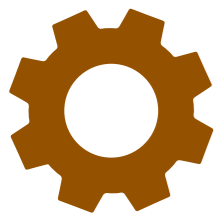
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**Leave room in the cryostat for the future possibilities and for possible new/change to the optics - esp. read out. But be careful - don't want to have large periods of downtime without overlapping in capabilities. Could keep SCUBA-2 around for good years for 450 if demand/swapping inserts. Original plan to have sc2 working in addition.**

**At some point will need to decide.**

**We invite community to contribute additional white papers, perhaps we approach the Large Program Teams. Transient teams and SCOPE teams combine efforts.**



## Advancements

*In the next 5-10 years:*

*What instruments/facilities are we building?*

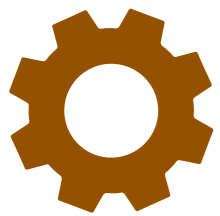
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Demand is there for next generation for spectral lines (in terms of FTS). large fast mapping is key. Which technology for spectral lines needs to be discussed.

new 850camera - large field of view - fast deep wide maps for transients.

Magnetic fields - we are complementary to other facilities.

For SMGs we need to map for ALMA - maybe we do this along with other facilities. Large Surveys in Herschel Fields. 850um good, esp for high z galaxies. fast, wide and deep. Confusion limited. Toltech - focused on longer wavelengths - getting to higher redshifts, be careful with SMG science case we have many programs focused already at 850 - maybe be cautious.



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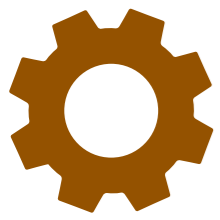
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For Herschel fields - better to focus on 450um, limited by confusion limit, and combine with other surveys, as 850um close to 1mm, 450 to 1mm gives wider coverage in freq. Severely limited by Maunakea weather - longer (weather not instrument limited) to get to useful depth.

Need same order of improvement at 450 as you get at 850 \*at least\* to justify. Also need to remember we are a common use telescope - appeal to a larger audience.

To get this funded - science that is - complementary, interest, high impact.



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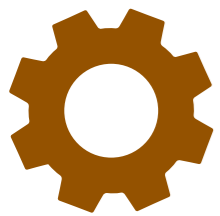
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**Critical** to ensure this new instrument is sensitive to faint extended structure.

Good case for 850um is nearby galaxies - JINGLE, rare extreme dust models with excess emission at 850microns. Low surface brightness galaxies.



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### **Timeline and specifics for white papers:**

**1) designate lead for each white papers, and sign up,**

**2) timeline**

**- we (EAO) will add these to the EAO wiki**

**What do you want? and what are the science priorities once we have the instruments for ~10years with a new 850 camera. Where will the impact come from.**

**Membrane is a big impact for our polarimetry - should replace, and/or better characterize for removal, replacement is reasonable cost. It is on the list. It is important.**