STUDIES

SCUBA-2 Ultra Deep Imaging EAO Survey

Wei-Hao Wang (王 為豪, ASIAA)
and STUDIES Team
Outline

- Survey description
- Scientific goals
- Progress
- Preliminary results
STUDIES in a nutshell

- One of the seven EAO JCMT Large Programs.
- A confusion limited SCUBA-2 450 μm map, deepest ever far-IR sensitivity limit.
Survey Description

- Pointing center: 10:00:30.7, +02:26:40.0 (center of COSMOS, norther edge of the CANDELS region)
- 330 hr of observations under the best submillimeter weather of Maunakea.
- Single Daisy pointing ($D = 3'$ ultradeep core, $D = 10'$ deep outer region)
- $\sigma_{450\mu m} < 0.6$ mJy in the ultradeep core, $\sigma_{450\mu m} \approx 1$ mJy full map.
- Execution period: 2015–2019
Scientific Background

- The optical and IR backgrounds have comparable strengths.
- Half of the activities (star formation + black hole accretion) in the universe are hidden in dust.

Dole et al. (2006)
STUDIES: The First Confusion Limited 450 μm Survey

- STUDIES will detect the most typical members in the dusty galaxy population, key star formers in the history of the universe.

- STUDIES will significantly overlap, for the first time, with the SFR range probed by optical surveys.
Current Status

- > 100 team members signed up.
- A wiki page is used for internal communication, document/data distribution.
- 129 hr (out of 330 hr) of data obtained, 39% complete.
- no progress since May 2016.
- data fully reduced, analyses and science studies underway.
Current Status

98 sources at > 4 \sigma
> 200 expected at full depth

central rms < 9 mJy
Power of SCUBA-2

Herschel 500 μm

STUDIES 450 μm
Followup of High-z Candidates
Followup of High-z Candidates

Awarded SMA and NOEMA time for high-res imaging
One more thing.....
Summary

- The 1-yr STUDIES data have excellent quality.
- Project ~40% complete so far.
- Statistical analyses of the counts and luminosity functions are underway. Number count paper to be submitted in April.
- Multi-band analyses conducted by various team. High-z candidates are selected and followed up by interferometers.
- Another paper is drafted, and perhaps will be submitted before the number count paper.