

## Activity Report of Commission J December 2014 to April 2015

April 10, 2015

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### ALMA project

- Latest scientific topics:

*Feb 26, 2015 ALMA Revealed Surprisingly Mild Environment around a Supermassive Black Hole*

A research team led by Shuro Takano at the National Astronomical Observatory of Japan (NAOJ) and Taku Nakajima at Nagoya University observed the spiral galaxy M77, also known as NGC1068, with the Atacama Large Millimeter/submillimeter Array (ALMA) and discovered that organic molecules are concentrated in a region surrounding a supermassive black hole at its center. Although these molecules around a black hole are thought to be dissociated by strong X-rays and UV photons, the research results indicate that some regions are shielded from X-rays and UV photons due to a large amount of dust and gas. These results, which were made possible by the high sensitivity and wideband observing capability of ALMA, will be a key to understanding the mysterious environment around supermassive black holes.

Right is the central part of the galaxy M77, also known as NGC1068, observed by ALMA and the NASA/ESA Hubble Space Telescope. Yellow: cyanoacetylene (HC<sub>3</sub>N), Red: carbon monosulfide (CS), Blue: carbon monoxide (CO), which are observed with ALMA.

(Credit: ALMA (ESO/NAOJ/NRAO), S. Takano et al., NASA/ESA Hubble Space Telescope and A. van der Hoeven)



### Activities of meetings

- **Radio Science Forum Symposium 2014 - Prospects for the radio astronomy of 2020 to 2030 –**

Date: 27-28, December 2014

Venue: Conference Room, National Astronomical Observatory of Japan

The prospects for the radio astronomy of 2020 to 2030 is discussed in this symposium focusing on the future large projects and developing scientific fields.

- **The 3rd workshop on Large Aperture mm/submm Telescopes in the ALMA era**

Date: March 10 - 11, 2015

Venue: COSMOS Lodge, Conference Room, National Astronomical Observatory of Japan

<http://www.ioa.s.u-tokyo.ac.jp/~ytamura/WS/LSTWS2015/>

The main topic of this workshop is a large millimeter/sub-millimeter wave telescope in ALMA age. This telescope would have a large diameter single dish, having the wide view and a wide wavelength coverage which is complementary with ALMA.

The main topics are; a review of outcomes by millimeter/sub-millimeter wave wide field survey observation, future plans of large projects, scientific requirements for the next-generation telescope and the observation system and detection technology, collaborating study with other wavelengths and theoretical studies.

- **Workshop on our Galaxy 2015**

Date: 23-24 March, 2015

Venue: University of Tokyo, Faculty of Science, No.1 Bldg. 1043

<http://stella.astron.s.u-tokyo.ac.jp/mw2015/>

Many studies have been made actively from theoretical and observational sides on the Milky Way galaxy. Researchers of the various fields gather at this workshop and discuss on the current state of the study about the Milky Way galaxy as a common target of the research.

- **ALMA workshop - the Mass Loss Mechanism and Dust Formation –**

Date: 26-27, March 2015

Venue: ISAS/JAXA Sagami-hara Campus

Evolved stars and their envelope contain rich molecule and dust, and they are one of main targets of radio astronomical observation. ALMA's high sensitivity and high-angular resolution let us study the fine structure and the small amount molecules of circumstellar envelope. This would be used for a study of a mass-loss mechanism and a chemical evolution in the universe.

It's expected that proposals of many researcher will be accepted by the Cycle 3 of ALMA Call for Proposals through this workshop. The results obtained by ALMA are reviewed and analyzed, and directionality of stellar study using ALMA is discussed. Ideas of each observation plan are presented and discussed, and the purpose of each study is clarified. Throughout this workshop, each researcher can make a draft of observation plans in detail in this way. Main research subjects are dust formation in various circumstellar environments, acceleration mechanism of stellar wind, the relation between the stellar evolution and the dust stellar wind.

**Business Meeting**

● **General Meeting of Radio Astronomy Forum of Japan**

Date 19 March, 2015

Venue: Osaka University

Topics:

1. Activity report
2. Report on Radio Astronomy Forum Symposium 2014
3. Revision of the regulations
4. Others

NRO User's Meeting

URSI activity

Radio Frequency Committee

SKA

● **URSI Japan Commission J Meeting**

Date 19 March, 2015

Venue: Osaka University

Topics:

1. Election of Chairman of Commission J
2. Others