

Activity Report of Commission J
November 2012 to February 2013

February 26, 2013

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Japan Radio Astronomy Forum Symposium

--- Middle scale project in Japanese radio astronomy ---

Date : 2012 / 12 / 21 - 22

Venue: Lecture room at NAOJ Mitaka

URL: <http://alma-intweb.mtk.nao.ac.jp/~udencon/symp/symp2012/2012.htm>

Aim of the workshop: The Atacama large millimeter/submillimeter array (ALMA) has started the observation. It is the time to set forth the new research program which clears next-generation radio astronomy now.

It does not need to say that in international national project, such as ALMA and SKA, support and participation of a researcher community have a large importance. Also in a middle-scale project, in order to make a research program fruitful in the present condition of the limited budget, it is required to have had an earnest discussion in the researcher community and to have supported of the community.

The radio astronomy forum symposium in the last year discussed on the five middle-scale projects. At this symposium here, middle-scale future plans are reviewed deeply so that to realize some of them in ten years after.

In addition, from the Science Council of Japan astronomy and astrophysics subcommittee, there was a request so that the middle-scale future plan excellent in the radio astronomy forum to be recommended. The discussions of this symposium would be reflected on the report to a science council.

Topics:

- A-1 "Lite BIRD" Lite(light) S atellite for the studies of B-mode polarization and Inflation from cosmic background Radiation Detection
- A-2 "CARAVAN-submm" An Imaging telescope for the blackhole in our galaxy
- A-3 ALMA extension project
- A-4 Ultra-wide-field large telescope for submm observation
- A-5 10-m THz telescope in Antarctica
- B. SKA--- project and future ---

ALMA project

- Project

One of the major radio astronomy projects in the world is ALMA (Atacama Large Millimeter and sub-millimeter Array) project. The ALMA Project is a global partnership among East Asia (led by Japan), Europe, and North America in cooperation with the Republic of Chile to construct and operate a high performance radio telescope consisting of 66 element antennas at an altitude of 5000 meters in the Chilean Andes. The construction of ALMA is going on; the number of the antennas is 45 now.

- Latest scientific topic:

Jan 04, 2013 ALMA Sheds Light on Planet-Forming Gas Streams

- Tantalising signs of flows feeding gas-guzzling giant planets

Astronomers using the Atacama Large Millimeter/submillimeter Array (ALMA) telescope have seen a key stage in the birth of giant planets for the first time. Vast streams of gas are flowing across a gap in the disc of material around a young star. These are the first direct observations of such streams, which are expected to be created by giant planets guzzling gas as they grow. The result is published on 2 January 2013 in the journal Nature.

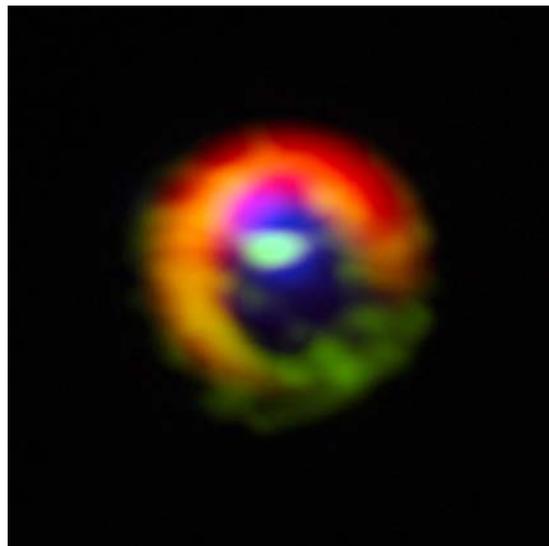


Figure: Gas and dust disk observed by ALMA. Credit: ALMA (ESO/NAOJ/NRAO), S. Casassus et al.

Activities of meetings

- **East-Asian sub-mm VLBI workshop**

*** From East-Asia to super-massive black holes ***

Date : 10/Dec/2012 10:00-17:00

Venue: Lecture room at NAOJ Mitaka

URL: <http://www.miz.nao.ac.jp/submilli/node/42>

Aim of the workshop: Event Horizon Telescope (EHT), an international collaboration to build the unique world array of sub-mm VLBI, has been pioneering study of super-massive black holes with ultra-high resolution. In order to summarize the related activities in East Asia and to promote effective collaborations toward their ultimate project goals, we would like to hold a one-day workshop, where researchers working on mm/sub-mm VLBI and/or black hole science in EA region gather, exchange information and thoughts, and discuss the future directions.

Topics: BH science with sub-mm VLBI, New telescope, New technology

Talks:

Opening remarks, Mareki Honma (NAOJ)

Event Horizon Telescope project, Shep Doeleman (MIT Haystack)

Micro arcsecond structures of FSRQs NRAO 530 and 3C 279 revealed by EHT observations, Kazunori Akiyama (U Tokyo/NAOJ)

M87 observations: recent results, Kazuhiro Hada (INAF/IRA)

VHE phenomena inside M87 core, Motoki Kino (ISAS/JAXA)

A future prospect of imaging the core of M87, Akihiro Doi (ISAS/JAXA)

Exploring M87 with Sub-mm VLBI: How Can We Test Theories ?, Masanori Nakamura (ASIAA)

Various relativistic effects to be seen with future VLBI, Shin Mineshige (Kyoto U)

Observable which determines black hole parameters with no dependence on black hole environment, Hiromi Saida (Daido U)

Monitoring of Gamma-ray bright AGNs with KVN, Sohn Bon Wong (KASI)

Greenland Telescope project, Keiichi Asada (ASIAA)

New 65m telescope at SHAO and future space-VLBI, Zhiqiang Shen (SHAO)

Proposal of Photon Counting VLBI Technology, Hiroshi Matsuo (NAOJ)

Super-resolution imaging with compressive sensing, Mareki Honma (NAOJ)

- **NAOJ Science Meeting: Direct Detection and Imaging of Terrestrial Exo-Planets with Future Telescopes**

Date: 2013 / 1 / 24 – 25

Place: NAOJ Mitaka seminar room

Aims: “Direct Detection and Imaging of Terrestrial Exo-Planets with Future Telescopes” must be one of the main targets of the astronomy in the 21st century. We held here a science meeting on the science and technology including ground-based and space telescopes.

- **ALMA Workshop 2012: ALMA Observation and Basic parameters of the Galaxies**

Date: 2013 / 2 / 25 - 26

Place: National Astronomical Observatory of Japan

Aims: Open use observation of the ALMA telescope is started. This workshop about the Galaxy science using the ALMA was planned for the researcher in the stage one step before making a concrete proposal, and the researcher who wants to make new field of observation. What can he understand about the Galaxy with the amount of observations obtained by the millimeter and submillimeter wave observation using the ALMA telescope? Are an interesting phenomenon and an unsolved problem solvable by the observation through the ALMA telescope? This workshop aims that many competitive unique observations are created from our community, break through a severe international competition, and excellent results comes to be obtained.