

Activity Report of Commission J
July 2013 to November 2013

Nov 26, 2013

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ALMA project

- Nov 01, 2013 Successful Interferometer Test with Japanese Band 10 Receiver -- Birth of Highest Frequency Radio Interferometer

On October 26 (Chilean Time), the Joint ALMA Observatory (JAO) successfully detected interference fringes from Callisto (a satellite of Jupiter) and Orion KL at 863 GHz and 806 GHz respectively in an interferometer test with two Band 10 receivers developed by the National Astronomical Observatory of Japan (NAOJ). This is the highest frequency ever achieved by an interferometer.

- Latest scientific topics:

Oct 24, 2013 Unique Chemical Composition Surrounding Supermassive Black Hole -- A Step toward Development of New Black Hole Exploration Method

An international research team led by Takuma Izumi, a second-year master's student of science at the University of Tokyo, and Kotaro Kohno, a professor at the University of Tokyo, successfully captured a detailed image of high-density molecular gas around an active supermassive black hole at the center of a galaxy called NGC 1097 at the highest sensitivity ever achieved. The observation result shows that there is a unique chemical composition characterized by enhancement of hydrogen cyanide (HCN) around the black hole, which would be caused by high temperature heating of the environment surrounding the black hole. It is expected that this new method focusing on the difference of emission frequencies from molecules uniquely found around black holes may open the way for "the search for a hidden black hole" which is overcast with dust particles and optically invisible.

The research findings are presented in the article "Submillimeter ALMA Observation of the Dense Gas in the Low-Luminosity Type-1 Active Nucleus of NGC 1097" published in the Publication of the Astronomical Society of Japan, Vol. 65, of October 25, 2013.

Activities of meetings (1) ALMA workshops

- **East-Asian ALMA Science Workshop 2013**

Date: 2-4 September, 2013

Venue: Academia Sinica Institute of Astronomy and Astrophysics, Taipei, Taiwan

URL: <http://events.asiaa.sinica.edu.tw/workshop/20130902/>

Aims and Scope: This is the joint ALMA science workshop among the three East-Asian countries, Japan, Taiwan, and Korea, organized by ASIAA (<http://www.asiaa.sinica.edu.tw>), National Astronomical Observatory of Japan (NAOJ: <http://www.nao.ac.jp/en>), and Korea Astronomy and Space Science Institute (KASI: <http://www.kasi.re.kr/english/>). The goal of this joint workshop is to promote scientific collaborations among the East-Asian ALMA communities in preparation for the upcoming and future ALMA proposal calls.

In this workshop, the latest status of the ALMA project will be reported, and invited reviews of the following research fields will be given:

- Cosmology and the high- z universe
- Extragalaxies
- High-mass star formation and astrochemistry
- Low-mass star formation
- Circumstellar disks

In addition, ample breakout sessions will be scheduled during the workshop for brainstorming and discussing ALMA science in various subfields.

- **ALMA workshop for nearby galaxies**

Date: 30 September 2013

Place: National Astronomical Observatory of Japan, Mitaka

Overview: This ALMA workshop focuses on the observational study plan with ALMA for nearby galaxies. The main topics are:

- ALMA performance at cycle 2
- Review of the recent results
- Proposals for the cycle 2 observation
- Future plans.

- **ALMA workshop – Dynamics of the mass-loss process of stars –**

Date: 22-23 October 2013

Place: National Astronomical Observatory of Japan, Mitaka

Overview: This ALMA workshop focuses on the observational study of the mass-loss process of evolved stars which is best suitable target to ALMA observation.

- **ALMA workshop: ALMA deep survey study**

Date: 24 October 2013

Place: National Astronomical Observatory of Japan, Mitaka

Overview: This ALMA workshop focuses on the possible deep survey and expected scientific outcomes.

- **ALMA workshop for the Galactic Plane Survey**

Date: 8 November 2013

Place: National Astronomical Observatory of Japan, Mitaka

Overview: This ALMA workshop focuses on the NRO Galactic plane survey and collaboration with ALMA observation.

- **ALMA Polarization Meeting**

Date: 19 November 2013

Place: National Astronomical Observatory of Japan, Mitaka

Overview: ALMA's polarization (limited) capability is to be opened for next Call for Proposals Cycle 2, as to be announced on Oct 24. Polarimetric data at mm/submm wavelengths will provide us the opportunity to investigate the magnetic field properties in various astronomical objects. East Asian ARC will host this meeting to discuss sciences done with polarization observations with ALMA. We will give you the specifications of the ALMA's polarization observations for this call Cycle 2 and to guide you how you prepare your polarization observations with ALMA. We first discuss sciences using polarization data with ALMA. After the science session, the details of the ALMA's polarization capability are to be explained specifically for this call for proposals (Cycle 2). This includes the tutorial session for the setting of polarization observations using the Cycle 2 Observing Tool (OT).

- **ALMA Galactic Center workshop 2013**

Date: 26-27 November 2013

Place: Keio University, Hiyoshi

Overview: This ALMA workshop focuses on the observational study of the Galactic Center region with ALMA cycle 2.

Activities of meetings (2) General Meetings

- **VERA User's Meeting**

Date: 2-3 October 2013

Place: National Astronomical Observatory of Japan, Mitaka

- **NRO User's Meeting**

Date: 24-25 July 2013

Place: Nobeyama Astronomical Observatory

- **The formation and evolution of disk galaxies**

Date: 26-28 September 2013

Place: National Astronomical Observatory of Japan, Mitaka

- **The 9th East Asian Meeting of Astronomy (EAMA9)**

Date: October 14-17, 2013

Place: National Central University, Taoyuan, Taiwan

Overview: The EAMA, East Asian Meeting on Astronomy, has more than two decades of history in the promotion and organization for the cooperation of astronomical efforts in the East Asian region. Since the formation of EACOA, the East Asian Core Observatories Association in 2005, EAMA is one of our principal sponsored activities. During the past eight EAMA meetings, fruitful discussions and interactions among regional astronomers have greatly promoted the astronomical research, education, and public outreach in East Asia. The 9th-EAMA meeting is being held in Taiwan, and we look forward to further growth in our cooperation and collaborations.