Activity Report of Commission J
April 2015 to July 2015

July 28, 2015

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ALMA project

- Latest scientific topics from ALMA press release:

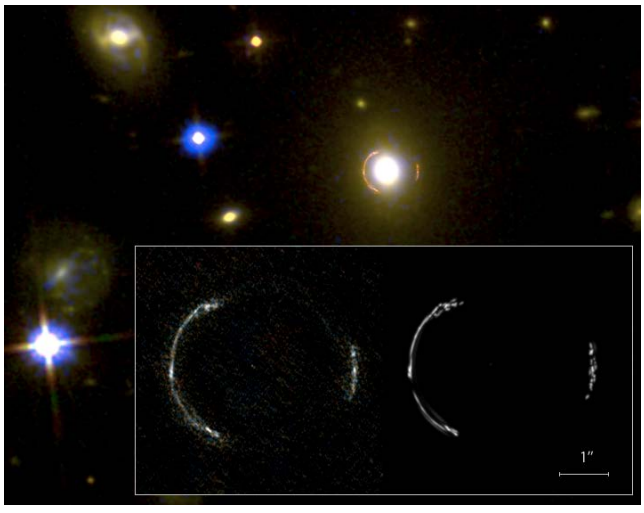
  Jun 09, 2015 ALMA uses 'Natural Telescope' to Image Monstrous Galaxy near the Edge of the Universe

  For centuries cartographers were fond of depicting monsters along the edges of their maps. Now, researchers have depicted a monstrous galaxy near the edge of the charted Universe with unprecedented detail using the Atacama Large Millimeter/submillimeter Array (ALMA) with the assistance of a 'natural telescope' known as a gravitational lens. The team modeled the lensing effects and corrected for them to reveal the distribution of huge stellar cradles in the monstrous galaxy. As a bonus, the same model indicates, for the first time, the existence of a supermassive black hole at the center of the foreground galaxy.

  The figure below shows ALMA image of SDP.81 overlaid on a near-infrared image taken by the NASA/ESA Hubble Space Telescope. The inset shows a close up of the ALMA image (left) and the simulation produced by the model (right). The reader can see that the model accurately reproduces the observed Einstein ring.

  (This press release was issued by The University of Tokyo on June 9th, 2015 in Japanese. English version is translated by the National Astronomical Observatory of Japan.)

  Credit: Y. Tamura (The University of Tokyo)/ALMA (ESO/NAOJ/NRAO)



Activities of meetings

- **ALMA Cycle3 Town Meeting in Mitaka Second circular**

  Date: April 8th

  Venue: Conference Room, National Astronomical Observatory of Japan

  We are happy to announce that Atacama Large Millimeter submillimeter Array (ALMA) call for proposal for Cycle 3 has been released. The deadline is scheduled for 23rd of April, 15:00UT,

2015. ALMA proposals are prepared and submitted by using unique software, ALMA Observing Tool (OT). To encourage users in East Asia to make use of the ALMA facility, we, East Asian ALMA Regional Center (EA ARC), would like to organize Town Meeting to introduce ALMA Cycle 3 policies and capabilities, and to demonstrate various tools.

- **“KaVA Science Working Group meeting” and “The 8th East Asia VLBI workshop 2015”**

  Date: 6 - 10 Jul 2015

  Venue: Hokkaido University Conference Hall

  A lot of notable progress on VLBI and related activities has been achieved recently in East Asia. In Japan, VERA has been continuously producing progressive results in astrometry and astrophysics, while the Japanese VLBI Network (JVN) has achieved regular operation of high-sensitivity array including several 30-m class telescopes. In Korea, the Korean VLBI Network started open-use observations. Furthermore, the joint VLBI array, KVN and VERA array (KaVA), started open-use observations. Now, VERA, KVN and KaVA are open for all the astronomers in Korea, Japan, China and Taiwan. Large science project with KaVA, in addition, have also kicked-off for extensive studies in star-formation, AGNs, astrometry and evolved stars. In China, Tianma 65-m telescope, which will be a key station of Chinese VLBI Network (CVN), has already started scientific observation. In addition to the Greenland telescope project promoted by ASIAA in Taiwan, the East Asian Core Observatory (EAO) has recently started operation of the James Clerk Maxwell Submillimetre Telescope (JCMT). These telescopes will play a key role in future submillimeter VLBI project in East Asia. In this workshop, future collaborations in East Asia region to enhance VLBI and related activities including these current / new telescopes will be discussed, based on latest scientific results and technical achievements/developments.

- **14th IVS Technology Development Center Symposium**

  Date: June 25, 2015

  Place: National Institute of Information and Communications Technology, Kashima Space Technology Center

  Developments of antenna and observation system based on the VGOS specification of the next-generation broadband geodetic VLBI system promoted by IVS is advanced in each country now (the U.S., Germany, Spain, Japan, Russia, etc.).

  In the last year Geographical Survey Institute, an antenna with new VGOS specification was installed in Ishioka, Ibaraki, and observations have been started.

  In NICT, development of the broadband VLBI system (Gala-V) based on VGOS has been made. The wideband receiving system which can observe 6.4 to 15 GHz was installed in Kashima 34-m radio telescope, and it was succeeded in the VLBI observation with 8GHz bandwidth with Ishioka. This bandwidth is the world record now. Another activities such as collaboration of VERA (Japan) and KVN (Korea), or 230 GHz VLBI test observation are ongoing. The scope of

this symposium is from the development of such a new observation system, a new technical development concept and a geodetic survey, astronomical researches, GNSS technology, and space geodesy technical based on VLBI and related techniques.

- **SNR Workshop 2015**

  Date: June 18-19

  Venue: Nagoya University

  Scientific rationale: Supernova remnants (SNRs) are the most energetic objects in the Galactic disk, and have been observed at various wavelengths from radio to γ rays. One of the most spectacular features of SNRs is the fast moving expanding shells whose velocity is measured to be 3000-5000 km s^{-1}. Recent observations of the shells in X rays as well as radio continuum emission have provided a wealth of information on their physical/kinematical properties. It is also remarkable that the dense interstellar medium interacting with the shells is likely playing a key role to produce X rays and γ rays as shown by comparisons with HI/CO and dust emission. Theoretical works on cosmic-ray acceleration/escaping in SNRs are unveiling details of cosmic-ray acceleration/propagation by magneto-hydro-dynamical numerical simulations which will be compared with observations. In this 2-day workshop, we invite observers and theorists in order to stimulate active interaction and exchange of ideas on SNRs.