

COMMISSION J: Radio Astronomy (November 2020 – May 2023)

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Activity of meetings

- **VLBI Consortium Symposium 2019: VLBI Crosses National Borders**

Date: Nov. 16th-17th, 2020 : Online meeting

The content of discussions by the VLBI Future Planning Working Group, which was established in response to last year's discussions, and future visions from various perspectives were discussed intensively to explore and share the future of VLBI throughout the community.

- **Japan Radio Astronomy Forum Symposium 2020: Radio astronomy that opens up with extreme performance**

Date: Dec. 21st-22nd, 2020 : Online meeting

Japan Radio Astronomy Forum is an organization that represents the radio astronomy community in Japan. As part of its activities, a symposium is held every year for the purpose of sharing the science and observation technology of radio astronomy and discussing future plans. At the symposiums of the last two years, we have held multifaceted discussions over two days, focusing on technological development that will support future radio astronomy and future science in collaboration with other wavelengths and fields. Based on these achievements, this meeting focused on various "extreme performances" regardless of projects and existing telescopes, to explore science that can only be done by radio astronomy and new methods to realize it in the entire community.

- **FY2020 ALMA/45m/ASTE Users Meeting**

Date: Jan. 5th-7th, 2021 : Online meeting

- **Submm single dish JCMT with maximum aperture in the Northern Hemisphere & very fulfilling focal plane devices - Let's use JCMT!**

Date: Jan. 5th-7th, 2021 : Online meeting

In conjunction with the ALMA / 45m / ASTE User's Meeting (January 5-7, 2021 morning), this meeting was held with the purpose of promotion of research using JCMT.

- **ngVLA Science WG Day3**

Date: Jan. 15th, 2021 : Online meeting

The National Astronomical Observatory of Japan ngVLA Study Group has formed a Science Working Group (SWG) with the community to embody participation in the ngVLA project. In December, debriefing sessions for galactic objects (Day 1) and extragalactic objects (Day 2) were held, respectively. In response to this, the entire joint meeting was held as Day 3.

- **SKA-Japan Webinar series "Construction finally started! SKA and 10 sciences"**

Date: Jan. 27th, Feb. 5th, 12th, 19th, Mar. 2nd, 2021 : Online meeting

The next-generation centimeter-wave telescope SKA (Square Kilometer Array) will be under construction in 2021 after a long preparation period. Taking this opportunity, SKA-Japan has decided to plan a total of five webinar series in order to convey the appeal of the SKA project and its science to the astronomy community. In this series, 10 typical scientific topics that are being considered in Japan and abroad and the technologies that accompany them were explained.

- **Research of star formation using ALMA high frequency band**

Date: Mar. 2nd, 2021 : Online meeting

This meeting was held to take a bird's-eye view of the research related to star formation / interstellar phenomena in the ALMA high-frequency band (Band 8/9/10) currently being conducted in Japan, and to discuss future observation strategies in related communities.

- **13th East Asian VLBI Workshop 2021**

Date: Mar. 2nd-5th, 2021 : Online meeting

In this workshop, the fresh scientific results obtained with VLBI were presented. The latest update on developments for radio astronomy in South-East Asia and in the world to establish so-called a "Global VLBI Network" were also discussed.

- **The 21st mm/submm receiver Workshop**

Date: Mar. 8th – 9th, 2021 : Online meeting

This workshop was held to create cutting-edge technologies, innovative applications, and expansion of basic technologies related to ultra-high-sensitivity receivers for millimeter, submillimeter, and terahertz waves. The purposes of this workshop were to provide a place for people to gather and discuss the latest information freely and openly, and to further improve Japan's international competitiveness and driving force, improve development efficiency, and to expand/inherit the base of basic technological capabilities.

- **Unsolved problems of astronomy challenged with innovation of (sub)millimeter-wave single**

dish telescopes

Date: Mar. 29th-31st, 2021 : Online meeting

This meeting was held to discuss prospects of new science to accelerate the realization of large submillimeter-wave single dish telescope.

- **Science lecture commemorating retirement of Prof. Tetsuo Hasegawa**

Date: Apr. 2nd, 2021 : Online meeting

- **East Asia SKA workshop 2021**

Date: May 26th -28th, 2021 : Online meeting

This workshop was held to advance our SKA-related activity in East Asia. In oral sessions, invited speakers introduced the SKA project and SKA precursor/pathfinder activities. Scientific review talks and many contributed talks covering diverse topics were also presented. Poster presentations and breakout discussion to encourage conversations to kick off practical collaborations in future were also organized.

- **Japan SKA Consortium Science Strategy Workshop 2021**

Date: Jul. 12th-14th, 2021

Location: National Astronomical Observatory of Japan and Zoom

Square Kilometre Array (SKA) is next generation radio interferometer which has been constructing in Australia and South Africa by international collaboration. The construction of SKA Phase 1 started this year and scientific operation will start in the late 2020s. This workshop was held to share the policy of access to scientific outputs by SKA and discuss the priority of science goals.

- **ngVLA-J Development Days 2021**

Date: Jul. 15th, 16th, 2021 : Online meeting

NAOJ established the NAOJ ngVLA Study Group in FY2019 to consider and plan with NRAO a possible contribution from Japan to the development, construction and operations of ngVLA. In these initial 2 years, the Study Group has progressed in the discussion with NRAO and other prospective international partners and started some initial development studies based on the know-how acquired by ATC and the ALMA Project during the construction and operations of ALMA. This meeting was held to share the technical concept of ngVLA with the Japanese Community and report on the progress and technical achievements in these 2 years. The workshop covered topics related to frontend, cryogenics, time/freq distribution, fabrication and mechanical design, and computing.

- **Radio Astronomy Future Plan Review Symposium 2021**

Date: Jul. 31st, 2021 : Online meeting

At this symposium, representatives of the future plans for the field of radio astronomy, who submitted the LoI (Letter of Intent) to Master Plan 2023, gave lectures on their future plans. The purpose of this symposium was to deepen the community's understanding of the proposed plan and to solicit opinions from the community.

- **Radio/Interferometer summer school**

Date: Sep. 16th, 17th, 21st, 22nd, 24th, 2021 : Online meeting

- **ALMA workshop: Cold outflows near and far: crossroads of our current understandings**

Date: Nov. 1st - 2nd, 2021 : Online meeting

This workshop was held to review recent findings on outflows (observed by ALMA) found on various astronomical scales from protostars to distant galaxies and to deepen their understanding of their properties.

- **Linking the science of large interferometers in the 2030s**

Date: Nov. 30th - Dec. 1st, 2021 : Online meeting

The goals of this workshop are to (1) identify scientific synergies between future large interferometers, SKA and ngVLA, and their synergies with current facilities such as ALMA and VLBI collaborations, (2) discuss the future science landscape with large interferometers (ALMA, VLBI, SKA, ngVLA) for the Japanese community in the 2030s and beyond.

- **VLBI Consortium Symposium 2021: Know the current location of domestic VLBI**

Date: Dec. 2nd–4th, 2021

Venue: National Astronomical Observatory of Japan (Mitaka) and online

At the symposium, the specific activities that are currently underway were reported, and shared and discussed the status of activities within the community. In addition, while deepening these discussions, the research plans of the VLBI community in Japan in collaboration with astronomical research, geodesy research, and technological development research were discussed.

- **FY2021 ALMA/45m/ASTE Users Meeting**

Date: Dec. 14th, 16th, 21st, 2021 : Online meeting

- **ALMA workshop: Science of mm/submm VLBI with ALMA**

Date: Dec. 20th, 22nd, 2021 : Online meeting

The ALMA workshop was held to discuss science by millimeter/submillimeter wave VLBI. At the workshop, science that cannot be achieved by the current VLBI in the cm/mm band, but is made possible only by millimeter/submillimeter VLBI observations with ALMA was discussed.

- **Black Hole Astrophysics with VLBI 2022**

Date: Feb. 7th – 9th, 2022 : Online meeting

The accretion flow, jet wind, and black hole, were discussed focusing on VLBI high-resolution observations and theories, including the Event Horizon Telescope and the East Asian VLBI network.

- **The 22nd mm/submm receiver Workshop**

Date: Feb. 21st - 22nd, 2022 : Online meeting

This workshop was held to create cutting-edge technologies, innovative applications, and expansion of basic technologies related to ultra-high-sensitivity receivers for millimeter, submillimeter, and terahertz waves. The purposes of this workshop were to provide a place for people to gather and discuss the latest information freely and openly, and to further improve Japan's international competitiveness and driving force, improve development efficiency, and to expand/inherit the base of basic technological capabilities.

- **Radio Astronomy Consortium Symposium 2021**

Date: Mar. 7th-8th, 2022 : Online meeting

The primary purpose of this year's Radio Astronomy Consortium Symposium was to return to its original purpose and share the latest achievements in each of Japan's wide-ranging radio astronomy fields.

- **East Asian ALMA Development Workshop 2022**

Date: Mar. 9th-10th, 2022 : Online meeting

The main topic of this year was future of Science Archive. Improvements to ALMA Science Archive is one of the key development items for the success of ALMA in the era of 2030 as discussed in ALMA Development Road Map.

- **ALMA workshop: Synergies between ALMA and wide-field high-cadence multi-wavelength surveys**

Date: Mar. 28th – 30th, 2022 : Online meeting

This workshop was held to discuss synergies between ALMA and the ongoing and future

surveys in the space, time, and energy (i.e., wavelength) domains, such as those with HSC/PFS at opt/NIR wavelength, the CMB surveyors (e.g., LiteBIRD, PolarBear), and those from SKA1/ngVLA.

- **SKA-precursor ISM-WS 2022**

Date: Jun. 27th-28th, 2022

Venue: National Astronomical Observatory of Japan (Mitaka)

This workshop was held for the purpose of comprehensively studying the research results of MeerKAT and ASKAP, learning how to handle data, and discussing interstellar matter research that should be promoted in the SKA era.

- **ngVLA community meeting**

Date: Oct. 10th-19th, 2022: Online

This meeting was held to report to the community on the progress of ngVLA in Japan and overseas, the composition of the SWG and future plans, and to receive opinions.

- **Examination of science developed by centimeter wave observation using Fukui University of Technology 10m antenna**

Date: Nov. 16th-17th, 2022

Venue: Fukui University of Technology

The purpose of this meeting is what kind of science can be developed by taking advantage of the characteristics of Fukui University of Technology's 10m antenna.

- **The 23rd East Asia Submillimeter-wave Receiver Technology Workshop**

Date: Dec. 14th – 15th, 2022

Venue: RIKEN

This meeting was held to discuss research and development in the millimeter wave and terahertz wave regions, thereby promoting mutual development and technical and human exchanges.

- **The international conference “A half-century of millimeter and submillimeter astronomy: Impact on astronomy/astrophysics and the future”**

Date: Dec. 15th- 18th, 2022

Venue: Miyakojima, Okinawa

The purpose of this meeting was to review the scientific achievements over the past decades, to discuss the prospects for future research, and to look ahead to the future direction of

development of radio astronomy through lectures and presentations on a wide range of scientific fields from stellar/planetary to cosmological scales, including observational instruments.

- **FY2022 ALMA/45m/ASTE Users Meeting**

Date: Dec. 20th, 21st, 2022 :

Venue: National Astronomical Observatory of Japan (Mitaka) and Online

- **VLBI Consortium Symposium 2022: VLBI Changes for the Next Decade**

Date: Dec. 23rd – 25th, 2022

Venue: Tohoku university and online

At the symposium, new policies for the VLBI community in line with the accelerating changes in the research environment was discussed.

- **The international conference “Black Hole Astrophysics with VLBI 2023”**

Date: Feb. 6th- 8th, 2023

Venue: National Astronomical Observatory of Japan (Mitaka)

The purpose of the workshop is to have an opportunity for intensive overviews of new advances in BH astrophysics using VLBI and other state-of-the-art instruments, discuss various perspectives, and inspire the next research ideas of each participant.

- **East Asian ALMA Science Workshop 2023**

Date: Feb. 14th, 17th, 2023

Venue: New Taipei City, Taiwan

The annual East Asian ALMA Science Workshop serves as a forum to exchange and discuss new and exciting scientific results obtained with ALMA, new ideas for future projects, and new proposals for the upcoming cycle 10.

- **SKA Japan workshop 2022**

Date: Mar. 7th-9th, 2023

Venue: National Astronomical Observatory of Japan (Mitaka)

The purposes of this workshop are followings:

- Based on the full-scale operation of the preceding aircraft, discussion of science with an eye to the initial scientific operation of SKA1
- Research presentations by young researchers active in the SKA era
- Discussion on a system in which NAOJ and universities participate in close scientific and technical cooperation

- Discussion of strategies for participation in large-scale survey observation projects by the international community

- **ALMA workshop on Dusty Star-Forming Galaxies**

Date: Mar. 7th – 10th, 2023

Venue: National Astronomical Observatory of Japan (Mitaka) and Online

The workshop was held to explore the current status and future exploitation of the large spectroscopic samples (50~100 sources) of distant dusty galaxies, especially of the UK-Japanese Herschel-selected ALMA BEARS spectroscopic redshift program (Urquhart+2022, Bendo+2023, Hagimoto+subm.).

- **Radio Astronomy Consortium Symposium 2021**

Date: Mar. 27th-28th, 2023

Venue: National Astronomical Observatory of Japan (Mitaka) and Online

The purpose of this symposium was to review the observational results of ALMA over the past 10 years, share the latest results, taking into account the observation results and development achievements of related instruments, and discuss the future of radio astronomy in the 2030s.

- **ngVLA Joint Science Working Group**

Date: Mar. 29th, 2023

Venue: National Astronomical Observatory of Japan (Mitaka) and Online

Two years ago, the ngVLA-J Science Working Group met several times to discuss science cases. This meeting was held for the purpose of updating the science that has been proposed so far and soliciting new ideas.