



Report from event supported by RadioNet

TITLE *EAST ASIA TO ITALY: NEARLY GLOBAL VLBI – EATING VLBI WORKSHOP 2019*

DATE: *15-17 APRIL 2019*

LOCATION: *BOLOGNA, ITALY*

MEETING WEBPAGE: *<https://sites.google.com/a/inaf.it/eating-vlbi-workshop-2019/home>*

HOST INSTITUTE: *INAF ISTITUTO DI RADIOASTRONOMIA*

RADIONET BENEFICIARY / NO: *TO BE FILLED BY MANAGEMENT*

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Report:

1 SCIENTIFIC SUMMARY

<https://sites.google.com/a/inaf.it/eating-vlbi-workshop-2019/>

1.1 SCIENTIFIC SUMMARY

This was the fourth time that the Italian and East Asian communities got together, after the previous successful events in Bologna (2012, 2014) and Jeju (2017). Despite only 1.5 years have gone by since the last meeting, a lot of development has occurred both in science and technology. First, the workshop took place just after the public release of the Event Horizon Telescope (EHT) results on the imaging of the black hole shadow with VLBI. The workshop therefore opened with a presentation of these results, in which many of the participants had a direct interest or involvement. In terms of science, several other new topics have been discussed, mainly in the field of transient astrophysical sources, such as mergers of compact objects producing gravitational waves, gamma-ray bursts, fast radio bursts, most of which represent ideal targets for joint radio observations between Europe and East Asia. In terms of technology, many reports have provided details mostly about the high radio frequency domain, in particular with the design for new compact multi-frequency receivers, and the report on the latest successful joint observations between Italian (INAF) and East Asia (EAVN) radio telescopes in VLBI mode. On the more managerial side, exciting news have been announced, including a significant grant from the Italian government for the funding of development towards the operation at high frequency of the Sardinia, Medicina and Noto radio telescopes, and the official start of activity of the East Asia VLBI Network.

1.2 RADIO NET RELEVANCE

The topics of the workshop in general were of great relevance to the RadioNet infrastructures, with reports of results involving the EVN and VLBI arrays in general, as well as single dishes, the two participants that received travel grants from RadioNet in support of their participation focused in particular on RadioNet facilities, reporting recent results on the multi-frequency radio properties of FR0 radio galaxies and proposing prospects for the study of the flaring activity of the microquasar Cygnus X-3, a system that would be ideal to be explored with the EVN.

1.3 IMPACT

The communities involved in the workshop have historically a strong tradition in radio astronomy with European facilities. Sharing the science results and discussing the future perspectives among the participants has been a very beneficial effect of getting the attendees together in Bologna. Young researchers as well as scientists without a strong background in radio astronomy have also been involved in the event, and it is to be expected that they will become potential users of European radio observatories in the near future.

2 AGENDA OF THE EVENT

Day 1 - Monday, 15 April

- 09:00 Marcello Giroletti (Italy): Logistics*
- 09:05 Tiziana Venturi (Italy): Welcome from IRA Director*
- Session 1 - EHT results and related Eating VLBI activities; Chairperson: K. Hada*
- 09:10 Mareki Honma (Japan): Black hole observations with EHT and EAVN*
- 09:30 Elisabetta Liuzzo (Italy): First results of EHT observations and related Eating VLBI activities*
- 09:50 Guangyao Zhao (Korea): Multi- λ VLBI view of Sgr A**

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- 10:10 Evgeniya Kravchenko (Italy): *Locating the region of TeV gamma-ray emission in radio galaxy M87*
- 10:25 Yuzhu Cui (Japan): *EAVN observations along with EHT for M87 in 2017 (keynote)*
- 10:40 Coffee break
- *Session 2 - Blazars: VLBI & MWL-MM connection; Chairperson: G. Giovannini*
- 11:10 Jongho Park (Korea): *Faraday Rotation in the Jet of M87 Inside the Bondi Radius: Indication of Winds from Hot Accretion Flows Confining the Relativistic Jet*
- 11:30 Carolina Casadio (Germany): *The magnetic field structure in CTA 102 from high-resolution mm-VLBI observations during the flaring state in 2016-2017*
- 11:45 Jee Won Lee (Korea): *Multi-wavelength study of flares in S5 0716+714*
- 12:00 Rocco Lico (Germany): *Radio and gamma-ray emission connection in blazars*
- 12:20 Filippo D'Ammando (Italy): *The gamma-ray properties of a sample of low-redshift BL Lacs*
- 12:35 Hongmin Cao (China): *Blazars with VLBI - along the way from the local Universe to the highest redshifts*
- 12:50 Giacomo Principe (Italy): *The first catalog of Fermi-LAT sources below 100 MeV*
- 13:05 Lunch
- *Session 3 - Misaligned sources: young radio sources, FR0s, giant radio galaxies; Chairperson: M. Orienti*
- 14:20 Alessandro Capetti (Italy): *Exploring the properties of FR0 radio galaxies*
- 14:40 Ranieri Diego Baldi (UK): *The multi-frequency radio properties of FR0 radio galaxies*
- 14:55 Xiaopeng Cheng (China): *VLBI observations of FR0 radio galaxies*
- 15:15 Giulia Migliori (Italy): *Radio and high energy properties of young radio sources*
- 15:35 Hiroshi Nagai (Japan): *Circumnuclear Region of NGC 1275 Probed by VLBI and ALMA Observations*
- 15:50 Paola Castangia (Italy): *Extragalactic water masers and VLBI: the case of IRAS 15480+0534*
- 16:05 Coffee break
- *Session 4 - Results from recent Eating VLBI observations of AGNs; Chairperson: C. Casadio*
- 16:30 Kazuhiro Hada (Japan): *Results from recent EATING VLBI observations (I)*
- 16:50 Bong Won Sohn (Korea): *The results from recent EATING VLBI observations of AGNs (II)*
- *Session 5 - Star formation, stellar evolution; Chairperson: M. S. Kim*
- 17:10 Tomoya Hirota (Japan): *Progress of Italy-Japan collaboration on high-mass star-formation studies*
- 17:30 Luca Moscadelli (Italy): *The POETS survey*
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- *Day 2 - Tuesday, 16 april*
- *Session 6 - Transients: GW and GRBs, microquasars, and more; Chairperson: M. Giroletti*
- 09:00 Giancarlo Ghirlanda (Italy): *Gamma Ray Bursts: studying relativistic jets in the radio band*
- 09:20 Jun Yang (Sweden): *Surprises in the VLBI Observations of Radio Transients*
- 09:40 Marta Burgay (Italy): *Pulsars and Fast Radio Bursts as probes of fundamental physics*
- 10:05 Jeong-Sook Kim (Korea): *Flaring Activity of Microquasar Cygnus X-3 and the Prospect of Wide-band recording observation in KVN, VERA and KaVA*
- 10:25 Elise Egron (Italy): *Single-dish and VLBI observations of the microquasar Cyg X-3*
- 10:40 Coffee break
- *Session 7 - Arrays and coordination; Chairperson: B. W. Sohn*

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- 11:10 Govoni Federica (Italy): *Status of the radio astronomical facilities in Italy*
- 11:30 Rusen Lu, on behalf of Zhiqiang Shen (China): *Status of the East-Asian VLBI Network (EAVN)*
- 11:50 Guangyao Zhao, on behalf of Taehyun Jung (Korea): *Simultaneous multi-frequency mm-VLBI activities in East Asia and the Extended-KVN project*
- 12:10 Liu Xiang (Oral): *Urumqi 26m telescope and research activity (China)*
- 12:25 Maria Rioja (Australia): *Astrometric VLBI in the SKA Era*
- 12:40 Richard Dodson (Australia): *Advances in Source Frequency Phase Referencing*
- 12:55 Lunch
- 14:45 Departure for social trip from CNR main entrance
- 15:30 Guided tour of medieval Dozza castle and town
- 17:00 Free time and possibility to visit the regional winery
- 18:45 Departure for social dinner
- 19:30 Social dinner at Terantiga Varignana
- 22:00 Return to Bologna, with one stop downtown (Piazza VIII agosto) and one at CNR
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- Day 3 - Wed, 17 April
- Session 8 - Receivers, dishes, backends, correlators & connection to industries; Chairperson: G. Surcis
- 09:00 Alessandro Orfei (Italy): *Developments towards 3 mm range at the Italian radio telescopes*
- 09:20 Kotaro Niinuma (Japan): *Development of NRO 3mm VLBI system*
- 09:35 Andrea Melis (Italy): *Digital acquisition systems at Italian Radio Telescopes: status and ongoing development*
- 09:50 Kazi Rygl (Italy): *CASA for VLBI*
- Session 9 - VLBI clock timing; Chairperson: R. Ambrosini
- 10:05 Takefuji Kazuhiro (Italy): *Wide bandwidth synthesis on Italy and Japan baseline*
- 10:25 Monia Negusini (Italy): *VLBI for Time & Frequency applications*
- Session 10 - Outreach; Chairperson: R. Ambrosini
- 10:45 Stefania Varano (Italy): *Astronomy beyond*
- 11:05 Coffee break
- 11:30 Breakout sessions
- Room 216, conference center: *Future science opportunities in the field of VLBI, SKA, EHT, and more; future funding opportunities. Chairing persons: Monica Orienti, Bong Won Sohn*
- Room Padrielli, Institute of Radioastronomy: *Definition of standars for setups/templates for joint observation; how to streamline operations for ToOs/DDTs. Chairing persons: Kazuhiro Hada, Gabriele Surcis*
- 13:00 Monica Orienti, Bong Won Sohn, Kazuhiro Hada, Gabriele Surcis: *Reports from breakout sessions*
- 14:50 Marcello Giroletti: *Closing remarks*
- 13:30 Lunch
- 14:30 Rooms remain available for continued discussion
- 16:00 Coffee break

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3 PARTICIPANTS

The event was attended by 61 participants, about evenly distributed between Italy and foreign countries. Among the foreign countries, East Asian were of course the most represented (21 in total, with 8 participants from Korea, 7 from Japan, and 6 from China), and a few other countries have also been represented (a total of 6 participants from Australia, Germany, Sweden, and the UK). One third of the participants were female, a fraction that is below what we would like to achieve as a goal but that is significantly above the traditional balance in this field.

We include below the conference picture and the attendance list, signed by the main organiser since it was not practical to collect all participant signatures.



Roberto Ambrosini, INAF - Istituto di Radioastronomia
Ranieri Diego Baldi, University of Southampton
Gianni Bernardi, INAF - Istituto di Radioastronomia
Marta Burgay, INAF - Osservatorio Astronomico di Cagliari
Alessandro Capetti, INAF - Osservatorio Astrofisico di Torino
Carolina Casadio, Max-Planck-Institut für Radioastronomie
Viviana Casasola, INAF - Istituto di Radioastronomia
Paola Castangia, INAF - Osservatorio Astronomico di Cagliari
Xiaopeng Cheng, Shanghai Astronomical Observatory, CAS
Yuzhu Cui, NAOJ
Filippo D'Ammando, INAF - Istituto di Radioastronomia
Richard Dodson, ICRAR-UWA
Elise Egron, INAF - Osservatorio Astronomico di Cagliari
Daniele Gallieni, A.D.S. International Srl
Giancarlo Ghirlanda, INAF - Osservatorio Astronomico di Brera
Gabriele Giovannini, University of Bologna
Marcello Giroletti, INAF - Istituto di Radioastronomia
Federica Govoni, INAF - Osservatorio Astronomico di Cagliari

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Tomoya Hirota, NAOJ
Cao Hongmin, Shangqiu Normal University
Mareki Honma, NAOJ
Park Jongho, Seoul National University
Taehyun Jung, Korea Astronomy and Space Science Institute
Oh Junghwan, Korea Astronomy and Space Science Institute
Jeong-Sook Kim, Korea Astronomy and Space Science Institute
Minsun Kim, Korea Astronomy and Space Science Institute
Evgeniya Kravchenko, INAF - Istituto di Radioastronomia
Jee Won Lee, Korea Astronomy and Space Science Institute
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Loris Rota Martir, COSPAL Composites srl
Kazi Rygl, INAF - Istituto di Radioastronomia
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Bong Won Sohn, Korea Astronomy and Space Science Institute
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Guang-Yao Zhao, Korea Astronomy and Space Science Institute

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4 RADIO NET FINANCIAL CONTRIBUTION

The RadioNet financial contribution was used to support the participation of two researchers, Ranieri Baldi from the UK and Jeong-Sook Kim from Korea.

5 PUBLICATIONS

- In case of future publication - please provide additional information: place & date. Remember to insert the acknowledgment of the RadioNet support:

The project leading to this publication has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 730562 [RadioNet]

6 CONFIRMATION

Following the Regulation (EU) 2016/679 - General Data Protection Regulation-, we confirm that RadioNet is allowed to publish this report, incl. participants lists, statistic's details, pictures, etc..

A handwritten signature in black ink, appearing to read 'Ranieri Baldi'.