European VLBI Network Newsletter

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Online version

Contents

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Message from the Chairman of the EVN Board of Directors

Dear VLBIers,

I am delighted to report that the process of creating JIVE as a European Research Infrastructure Consortium (ERIC) came to a successful conclusion at the end of last year, with a positive decision by the European Commission to establish it, announced on 12 December. An Inaugural Symposium was held in Dwingeloo on 20-21 April this year, with an Inaugural Ceremony on 21st April. The new formal name of the institute is Joint Institute for VLBI ERIC, but JIVE remains the preferred designation for all normal use.

Photographs from the first meeting of the EVN Consortium Board of Directors held on 12 February 1985 in Bonn

On 12th May this year the EVN Consortium Board of Directors held its 62nd meeting in Bonn, exactly 30 years and 3 months after its first meeting, also held in Bonn, on 12 February 1985 (see the 2 photographs taken by MPIfR photographer G. Hutschenreiter on that occasion). A number of decisions were taken at the May meeting. These include:

1) Specification of rules for "correlator-only" proposals. These are proposals to use the EVN correlator at JIVE for processing VLBI data not scheduled as an EVN observation.

2) Agreeing on a document giving advice on press releases resulting from EVN observations

3) Agreeing on a revised text for the EVN Standard Acknowledgement, to be quoted in publications resulting from EVN observations. The new text recognises the ever increasing global nature of the EVN array of telescopes: "The European VLBI Network (www.evlbi.org) is a joint facility of independent European, African, Asian and North American radio astronomy institutes. Scientific results from data presented in this publication are derived from the following EVN project code(s):.... "

All these will be made available in the EVN "Guidelines for Proposal Submission" on the JIVE wiki: http://www.jive.eu/jivewiki/doku.php?id=evn:guidelines

Finally I note that this was the last CBD meeting which I chaired, and this my last column introducing the EVN Newsletter. Rene Vermeulen (Dwingeloo) was confirmed as the new CBD Chair in the meeting, effective from 1 July 2015; John Conway (Onsala) was appointed the new Vice-Chair.

It remains for me to thank everyone involved in running the EVN during my 2 year period of office, who have helped to ensure that the EVN retains its high standard of excellence. Special thanks are due to the EVN Officers for their diligence in executing their tasks: Tom Muxlow (PC Chair), Michael Lindqvist (TOG and PC Chairs), Alastair Gunn (Scheduler) and Pablo de Vicente (TOG Chair). And lastly I thank Richard Porcas for acting as CBD Secretary and Andrei Lobanov for editing the EVN Newsletter.

Anton Zensus,
Chairman, EVN Consortium Board of Directors

Call for the EVN Proposals

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European VLBI Network
Call for Proposals
Deadline 1st February 2015
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This text is also available on the web at http://www.oso.chalmers.se/evn/call.txt

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New features for the upcoming Call for Proposal include:

* Disk recording at 2 Gbps
* Introduction of a new e-VLBI class, automated generic e-VLBI trigger observations

See section Features for the Next Standard EVN and e-VLBI Sessions below for more details.
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Observing proposals are invited for the EVN, a VLBI network of radio telescopes spread throughout Europe and beyond, operated by an international consortium of institutes (http://www.evlbi.org/).

The observations may be conducted with disk recording (standard EVN) or in real-time (e-VLBI).

The EVN facility is open to all astronomers. Use of the Network by astronomers not specialised in the VLBI technique is encouraged.

The Joint Institute for VLBI ERIC (JIVE) can provide support and advice on project preparation, scheduling, correlation and analysis. See EVN User Support at http://www.jive.eu.

Future Standard EVN Observing Sessions (disk recording)

2015 Session 3 Oct 15 - Nov 05 18/21cm, 6cm ...
2016 Session 1 Feb 18 - Mar 10 18/21cm, 6cm ...
2016 Session 2 May 26 - Jun 16 18/21cm, 6cm ...

Proposals received by 1st June 2015 will be considered for scheduling in Session 3, 2015 or later. Finalisation of the planned observing wavelengths will depend on proposal pressure. The dates for 2016 are as yet provisional.

Future e-VLBI Observing Sessions (real-time correlation)

2015 Sep 15 - Sep 16 (start at 13 UTC) 18/21cm, 6cm, 5cm or 1.3cm
2015 Oct 06 - Oct 07 (start at 13 UTC) 18/21cm, 6cm, 5cm or 1.3cm
2015 Nov 17 - Nov 18 (start at 13 UTC) 18/21cm, 6cm, 5cm or 1.3cm
2015 Dec 01 - Dec 02 (start at 13 UTC) 18/21cm, 6cm, 5cm or 1.3cm

Please consult the e-VLBI web page at http://www.evlbi.org/evlbi/e-vlbi_status.html to check for possible updates, and for the available array.

Successful proposals with an e-VLBI component submitted by the June 1 deadline will be considered for scheduling in the above e-VLBI sessions starting from September 15 2015.

Note that only one wavelength will be run in each e-VLBI session, depending on proposal priorities.

See http://www.jive.eu/jivewiki/doku.php?id=evn:guidelines for details concerning the e-VLBI observation classes and observing modes.

Features for the Next Standard EVN and e-VLBI Sessions

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* Recording at 2 Gbps is available at C-, X-, K- and Q-band at a subset of the EVN telscopes. The remaining telescopes will record at 1 Gbps (mixed mode observation). The current status is given here: https://deki.mpifr-bonn.mpg.de/Working_Groups/EVN_TOG/2Gbps

The first 2 Gbps user projects would be eligible for scheduling in session 3, 2015. Use of this data rate should be clearly justified and limited to projects which really need it.

* A new e-VLBI class is introduced, automated generic e-VLBI trigger observations. It is an observation to be scheduled automatically during an e-VLBI run only if a specific set of triggering criteria is met. The expected response time to execute a new program is about 10 minutes. For details see http://www.jive.nl/jivewiki/doku.php?id=evn:guidelines#generic_e-vlbi_trigger_observations.

* Both Jb1 and Jb2 will be available for EVN recording. At the moment, testing to incorporate the e-MERLIN stations as individual antennas within an EVN observation is ongoing. For updated information please consult the web at: http://www.e-merlin.ac.uk/vlbi/.

* Please consult http://www.evlbi.org/evlbi/e-vlbi_status.html and the EVN User Guide http://www.evlbi.org/user_guide/user_guide.html for updates on the current EVN and e-VLBI array, availability of different stations per observing band and for the dates of the e-VLBI observing sessions.

Global VLBI Proposals

* Global proposals can be proposed up to 1 Gbps including VLBA, GBT and the JVLA.

* Some modes may require different bandwidth channels from EVN & NRAO telescopes; correlation at JIVE can handle this.

* JIVE support staff and Amy Mioduszewski at Socorro will assist during the scheduling process of such observations.

* Global observations will be correlated at the SFXC correlator at JIVE (default) or at the DiFX correlator in Bonn or at the DiFX correlator in Socorro (if appropriate justification is given in the proposal).

RadioAstron Observations

* Proposals requesting the EVN as ground array support for RadioAstron AO3 observations in the period 15 October 2015 to 30 June 2016 may be submitted at this deadline

Large EVN Projects

* Most proposals request 12-48 hrs observing time. The EVN Program Committee (PC) also encourages larger projects (>48 hrs); these will be subject to more detailed scrutiny, and the EVN PC may, in some cases, attach conditions on the release of the data.

Availability of EVN Antennas

* The Sardinia 64 m telescope (Sr) has completed its VLBI commissioning phase and will be available in "shared risk mode" from Session 2, 2015, at L-band, M-band (6.7 GHz) and K-band.

* From September 2015, the WSRT will be participating with a single telescope, equipped with dual circular polarization receivers. The frequency coverage will remain the same. Pending characterization of the new receiver, proposers who wish to use the EVN Calculator, should select "W1" instead of "Wb".

* Tm65 is the 65 m telescope at Tianma, about 6 km away from the 25 m Seshan telescope (Sh). The 2-letter abbreviation for Tm65 telescope is T6. Both of these telescopes can observe at 21, 18, 13, 6, 5, 3.6, and 3.6/13 cm. Tm65 is the default telescope; Sh will be used if the Tm65 is not available for some reasons. If you select both, you should also discuss the motivation for the very short baseline in the proposal.

* The Robledo 70 m and 34 m telescopes are occasionally available for EVN observations. See http://www.evlbi.org/user_guide/EVNstatus.txt.

Use of Korean VLBI Network Antennas
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* The Korean VLBI Network (KVN) is an Associate Member of the EVN. KVN telescopes may be requested for EVN observations at 1.3cm and 7mm wavelengths. For more details regarding the KVN, see: http://kvn-web.kasi.re.kr/en/en_normal_info.php.

Use of Australian VLBI Network Antennas
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* Some Australian Long Baseline Array (LBA) time will be made available for simultaneous scheduling with the EVN, thus enabling the possibility of joint LBA/EVN observations. The easternmost stations of the EVN are in a similar longitude range to the LBA telescopes, and for sources in equatorial regions, baselines to western European stations are also achievable. Joint LBA time is likely to be heavily oversubscribed, and authors are requested to note whether they are prepared to accept scheduling without LBA antennas being present.

Any proposals for joint EVN+LBA observations submitted to the LBA by its 17 June 2015 deadline should also be submitted to the EVN by the 1 June 2015 deadline and will first be eligible for scheduling in EVN Session 3/2015.

For more details regarding proposing time on the LBA, see: http://www.atnf.csiro.au/observers/apply/avail.html & http://www.atnf.csiro.au/vlbi/index.html.

EVN+LBA observations should be possible at all principal EVN wavebands from 21 cm to 1.3 cm. See: (http://www.evlbi.org/user_guide/freq_cov.html) and http://www.evlbi.org/user_guide/EVNstatus.txt.

Out of Session Observing

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* Out-of-Session observing time (up to a maximum of 144 hours/year), is now available to all proposals (disk recording or e-VLBI). Proposals requesting Out-of-Session observing time must provide full scientific (and technical if appropriate) justification as to why observations must be made outside standard sessions. Out-of-Session observing blocks should be no less than 12 hours in duration (although individual observations can be shorter), and occur no more than 10 times per year. Proposals should specify which dates/GST ranges are being requested and indicate the minimum requirement in terms of numbers of telescopes (and any particular telescopes). Proposals will only be considered for dates occurring after the regular EVN session that follows EVN proposal review. Observations requiring much shorter lead times should be submitted as "Target-of-Opportunity" (ToO) proposals.

How to Submit

All EVN and Global proposals (except ToO proposals) must be submitted using the NorthStar on-line proposal submission tool. Global proposals will be forwarded to NRAO automatically and should not be submitted to NRAO separately. New proposers should register at http://proposal.jive.nl.

The SCIENTIFIC JUSTIFICATION MUST BE LIMITED TO 2 PAGES in length. Up to 2 additional pages with diagrams may be included.

When specifying requested antennas from the LBA, please specify 'LBA' under the "other" row in the telescope-selection box -- this selects all that are available for joint observations.

The deadline for submission is 23:59:59 UTC on 1st June 2015.

Additional information

Further information on EVN, EVN+MERLIN, Global VLBI and e-VLBI observations, and guidelines for proposal submission are available at: http://www.jive.eu/jivewiki/doku.php?id=evn:guidelines.

The EVN User Guide (http://www.evlbi.org/user_guide/user_guide.html) describes the network and provides general information on its capabilities.

The current antenna capabilities can be found in the status tables. For the standard EVN see http://www.evlbi.org/user_guide/EVNstatus.txt.

For the e-EVN array see http://www.evlbi.org/evlbi/e-vlbi_status.html.

The On-line VLBI catalogue (http://db.ira.inaf.it/evn) lists sources observed by the EVN and Global VLBI.

Michael Lindqvist, Onsala Space Observatory, EVN PC Chairman

EVN Scheduler's Report

Time allocations and resources used for recent EVN, Global VLBI, and e-VLBI observations:

2015 Session 1: 26 February – 19 March

Wavelengths: 18/21, 6, 5cm

Number of different user experiments observed: 20

Session Duration: 21.0 days Efficiency: 43.3%

Breakdown of observations by type and correlator. TBYTES indicates the estimated disk usage (in TB) at EVN telescopes.

may14	N-OBS	HOURS	DAYS	T-BYTES
TOTAL	24	218.0	9.1	773.4
EVN-only	19	194.0	8.1	674.7
Global	1	13.0	0.5	51.4
Short Obs.	0	0.0	0.0	0.0
Tests	4	11.0	0.5	47.3
EVN Correlator	22	200.0	8.3	734.6
Bonn Correlator	2	18.0	0.8	38.8
VLBA Correlator	0	0.0	0.0	0.0
eEVN Correlator	0	0.0	0.0	0.0
Other Correlator	0	0.0	0.0	0.0
CAL-only	3	12.0	0.5	0.0
MERLIN	2			
Arecibo	2			
VLBA	1			
GBT	0			
VLA	0			
Robledo	2			
Goldstone	0			
RadioAstron	0			

Alastair Gunn, University of Manchester, EVN Scheduler

EVN Science Highlights

A Quick EVN View of A Newly Discovered Radio Quasar at $z = 5.18$

High-redshift ($z > 4.5$) quasars are of major importance since they can provide information on the growth of the supermassive black holes and the evolution of active galactic nuclei (AGN) in the early Universe. The mere existence of black holes with a few million solar masses (or more) at $z \sim 6$ constrains the black hole growth and the accretion process. Among the high-redshift quasars, the radio-loud ones constitute a very attractive subsample, since their radio jets can be studied with the highest angular resolution with VLBI.

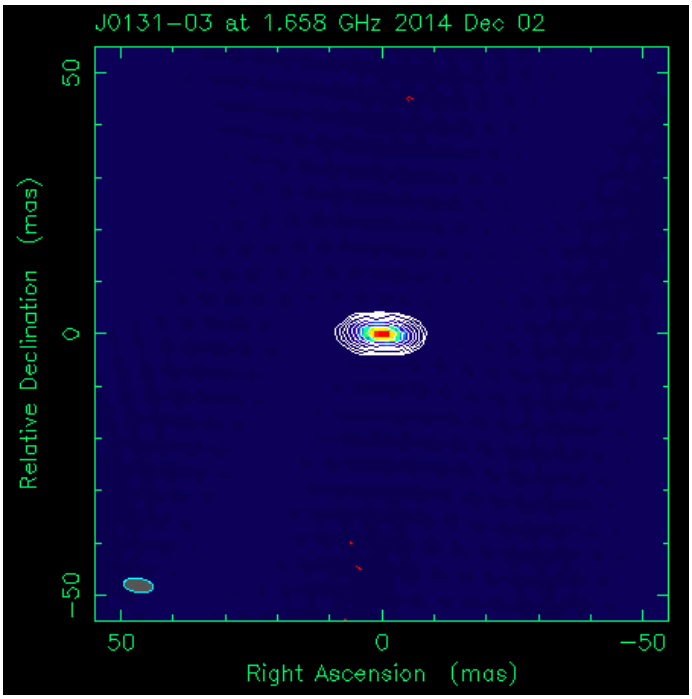

Figure 1. EVN image of J0131-0321 at 1.6 GHz. The restoring beam is 5.71 x 2.64 mas, with major axis oriented at a P.A. of 82.4°. The map peak is 52 mJy/beam, and the contours are drawn at -1, 1, 2, 4, 8, 16, …, 128 x 0.2 mJy/beam.

The high-redshift, radio-bright quasar, SDSS J013127.34−032100.1 (J0131−0321, hereafter) was discovered by Yi et al. (2014), its redshift is 5.18. At that time the Universe was just slightly more than one billion years old. We observed the source in L-band with the EVN (see Fig. 1) in an exploratory e-EVN mode, since the discovery paper became public on arXiv a week after the EVN proposal deadline.

Recent Swift X-ray observations of the source were analyzed by Ghisellini et al. (2015). They concluded that J0131-0321 is a blazar, a radio-loud quasar whose jet is inclined at very small angle to the line of sight (3-5 degrees). This is supported by our EVN measurement.

Yi et al. derived a black hole mass of 10^9 solar masses for the supermassive black hole in J0131-0321, similarly to the currently known three other $z > 5$ blazars. Ghisellini et al. arrived to an even larger black hole mass of 10^{10} solar masses. Such values pose a challenge to Eddington-limited black hole growth model. Either a highly spinning black hole with low accretion disk efficiency (Ghisellini et al. 2015) or larger seed black hole (10^2-10^5 solar masses (Wyithe & Loeb 2012) is needed to explain the existence of such massive black holes at early cosmological epochs.

References: (1) Gabanyi, Cseh, Frey, Paragi, Gurvits, An, Zhang (2015) MNRAS vol. 450 L57. (2) Ghisellini, Tagliaferri, Sbarrato, Gehrels (2015) MNRAS vol. 450 L34. (3) Wyithe, Loeb (2012) MNRAS vol. 425 pp. 2892. (4) Yi, Wang, Wu, Yang, Bai, Fan, Brandt et al. (2014) ApJ vol. 795 L29

Krisztina Gabanyi, Institute of Geodesy, Cartography and Remote Sensing, Satellite Geodetic Observatory, Budapest, Hungary

EVN and *Chandra* Discover an Intermediate Mass Black Hole in NGC 2276

Supermassive black holes a billion times more massive than the Sun have been found at the center of galaxies when the Universe was only 800 million years old. How these monsters have reached their mass in such a short time is still puzzling. One possibility is that they grow from seed black holes a thousand times more massive than the Sun but a thousand times less than supermassive black holes. Such seed black holes are hence called intermediate-mass black holes, and very recently one of them has been discovered thanks to combined radio and X-ray observations with the EVN and the Chandra X-ray satellite. The work, led by was published in the April edition of MNRAS.

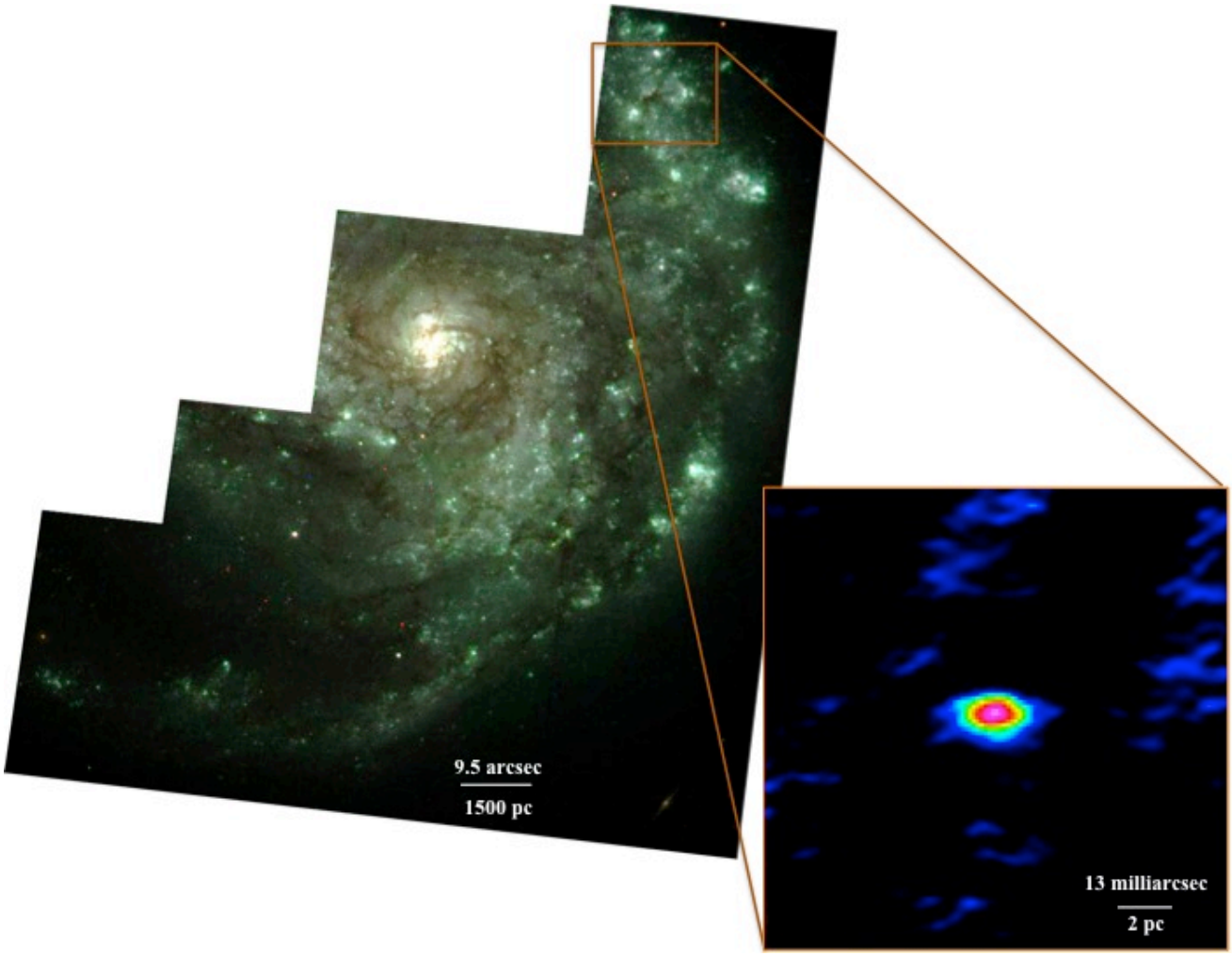

Figure 2. Three-color image of the western arm of the galaxy NGC 2276 where the intermediate-mass black hole is located. The image has been created using three filters of the Wide Field Planetary Camera 2 of the Hubble Space Telescope: F814W in red (8 microns), F606W in green (6 microns) and F550W in blue (5.5 microns). The inset shows the EVN radio image at 1.6 GHz, which reveals the presence of a radio structure coincident with the position of the X-ray source. The off-source noise in the EVN image of NGC2276-3c has an r.m.s. σ = 8 μJy/beam. The radio structure is detected at a 9σ level.

The intermediate-mass black hole, called NGC2276-3c, has a mass of 5,000 times that of the Sun and is located in the spiral arm of a nearby galaxy. The galaxy seems to have undergone a merger with another galaxy of lower mass, suggesting that the intermediate-mass black hole is the nucleus of the dwarf galaxy whose galaxy body

has been stripped-off during the collision. The EVN observations reveal that NGC2276-3c possesses a 1.8 pc radio jet as powerful as those observed in supermassive black holes, which are able to clear out a cavity in the galaxy and suppress star formation. A region of ~300 pc along the jet devoid of young stars could provide observational evidence of intermediate-mass black holes having a large impact on their surroundings, as supermassive black holes do, which has strong implications for studies of supermassive black hole growth.

References: (1) M. Mezcua, T.P. Roberts, A. P. Lobanov, A. D. Sutton 2015, MNRAS 448, 1893. (2) A. Wolter, P. Esposito, M. Mapelli, F. Pizzolato, E. Ripamonti 2015, MNRAS, 448, 781. (3) *Chandra* Press Release. (4) *Chandra* Image Gallery. (5) MPIfR Press Release.

Mar Mezcua, Harvard-Smithsonian Center for Astrophysics, Boston, MA, USA

EVN/JIVE Technical Developments

Inauguration of JIVE as an ERIC

On 20 and 21 April 2015 an international symposium was held in conjunction with the inauguration of JIVE as a European entity. Around 100 scientists from around the world came to Dwingeloo to discuss past and future developments of VLBI, taking advantage of the new auditorium in the ASTRON building that was recently formally opened. The Monday started with several historic reviews, highlighting how VLBI astronomy in Europe came to flourish. A number of science highlights were covered in the course of the day, from star formation to cosmology. The high-pitched symposium programme was put together by Leonid Gurvits and Zsolt Paragi and

During the symposium, Richard Schilizzi highlighted the establishment of JIVE, while Colin Lonsdale made a special effort to outline the path ahead.

covered all ingredients for a discussion on the future of VLBI in a truly global sense. On Tuesday morning the visions on American and African VLBI were presented, as well as a very interesting discussion on which technological developments are going to be game changers in the coming years. Prof. Malcolm Longair concluded the symposium by encouraging the community to be more outgoing and making sure VLBI results were recognised in the rest of the astronomy field. The presentations (and some footage) of the symposium can be found at http://www.jive.eu/jive-eric-symposium.

Marcello Giroletti discussing Black Holes with the host Jan Douwe Kroeske; in the end the plaque commemorating the ERIC status is handed over.

Representatives of the new JIVE council in front of the new logo

In the afternoon the formal inauguration of JIVE as an ERIC took place. About 200 guests witnessed an interactive programme in which the chairs of the new JIVE council and the EVN board, as well as delegates from the Dutch hosting organisation NWO and the Dutch ministry expressed their view on the relevance of JIVE and its transition into a European Research Infrastructure Consortium (ERIC) in particular. The host also involved previous directors Richard Schilizzi and Mike Garrett, director of the host institute ASTRON, in the discussion. SKA director Phil Diamond explained the historic links between the VLBI family and the SKA development. The programme also contained interviews with EVN users, who had an opportunity to explain their recent results with a single image.

Finally, Robert-Jan Smits, head of the Directorate General for Research and Innovation of the EC, took the stage and highlighted the value of JIVE, the tenth ERIC. He signalled that this European status is recognition of the scientific excellence of our research infrastructure. He then handed over the formal plaque that states that JIVE is an ERIC to the director, Huib Jan van Langevelde. This was not quite the end of the festivities, as –after a short focus on the correlator and the new map of the world display– the new logo for JIVE was hauled from the basement and displayed for the first time. The organization will thus continue its activities as 'Joint Institute for VLBI ERIC', which can be simply abbreviated as JIVE. The new JIVE council met for the first time the day after.

Pictures of the events can be found under http://www.jive.eu/jive-media.

Huib Jan van Langevelde JIVE, Dwingeloo, The Netherlands

News from EVN Observatories

Long and sensitive baselines now a reality thanks to Sardinia and Tianma radio telescopes

The European VLBI Network has expanded significantly in the last years with the addition of new stations, which helped the overall sensitivity and the image fidelity thanks to a better coverage of the u,v plane. A traditional major point of strength of the EVN has been in the triangle of very sensitive baselines between the 100m dish in Effelsberg, the Westerbork Synthesis Radio Telescope, and the 76m Lovell telescope at Jodrell Bank, particularly at low frequency (<= 5 GHz). Despite being very sensitive, the mutual baselines between these stations are however relatively short (<700 km); even in the presence of significant emission on these baselines, the lack of long and similarly sensitive baselines may therefore prevent astronomers from imaging, if not even detecting, faint sources at high angular resolution. In some sources, this problem can be addressed thanks to the long sensitive baselines to Arecibo, but this is limited to a relatively small fraction of the sky, to short total integration times, and in any case to a maximum observing frequency of 8 GHz (the highest frequency receivers nominally available at Westerbork and Arecibo, with the Lovell further restricted to 5 GHz).

The recent addition to the EVN of the new 60-m class radio telescopes in China and Italy, equipped with receivers up to 22 GHz, is therefore a blessing for the network, as it provides very sensitive baselines also on long spacings and operating at high frequency. The Sardinia radio telescope (EVN code: Sr) is a 64-m fully steerable antenna, located in Sardinia island in Italy. It is funded by the Italian Ministry of Education, Universities and Research, the Italian Space Agency, and the Autonomous Region of Sardinia and is operated by the Italian National Institute for Astrophysics (INAF). It is a quasi-Gregorian dish antenna and, at present, it can operate at 18/21 cm, 5 cm, and 1.3 cm; future receivers will extend the frequency coverage to the 6 cm and 7 mm bands; 3 mm observations will also be feasible, thanks to the active surface, composed by more than 1100 actuators which adjust the profile of the primary mirror to recover the ideal shape, as well as to the excellent surface accuracy. The Sardinia radio telescope is the second southernmost station of the EVN in Europe, providing improved resolution in north-south (e.g., the Sr-On baseline is nearly 2000 km long). It also forms a national network of three stations with Medicina and Noto, which can complement the EVN for specific projects on sources with simple structure.

The Tianma radio telescope (EVN code: T6) is a 65-m parabolic reflector, located in the western suburbs of Shanghai, Sheshan town, at a distance of about 6 km from the older 25 m dish. It was jointly funded by the Chinese Academy of Sciences (CAS), Shanghai Municipality, and the Lunar Exploration Program. The Tianma radio telescope is also fully steerable, with active surface system. It is currently equipped with L, S/X, C, Ku and X/Ka-band receivers, granting the possibility to observe in a wavelength range between 21 and 1.7 cm; cryogenic K- and Q-band receivers are planned to be installed in end of 2015 or early 2016. At 6 cm, visibilities between Tianma and Effelsberg can reach a sub-mJy 1-sigma sensitivity on a baseline longer than 8000 km (assuming 1 minute integration in a 16 MHz wide baseband channel). At the same time, thanks to the recent inclusion of the Korean VLBI Network stations in the EVN, the Tianma radio telescope will also form short baselines useful for calibration accuracy and recovery of extended structure.

Both the Sardinia and the Tianma radio telescopes have been successfully tested with the rest of the network in 2014 and are already scheduled to participate in user experiments. Moreover, the inclusion of Sr and T6 in the network occurs at the same time when improved bandwidth is being tested for the EVN. Users can therefore start planning experiments for science cases requiring at the same time an unprecedented combination of high sensitivity, high angular resolution, and high frequency.

Marcello Giroletti, INAF-IRA, Bologna Italy; Carlo Migoni, INAF-OAC, Cagliari, Italy; Tao An, Shanghai Observatory, China; Andrea Melis, INAF-OAC, Cagliari, Italy

WSRT transformation to a single-dish multi-frequency VLBI telescope, along with the upgrade to the APERTIF phased-array system.

In 2015 work on the upgrade of the WSRT to the phased-array Apertif system has progressed. As of January 2015, the Apertif project has passed the CDR and orders were placed for rollout of Apertif-6 (involving the first 6 WSRT dishes). A decision on the full Apertif system, aiming to outfit 12 dishes, is being prepared, with the intention to have the full complement of hardware available at the end of 2015, ready for commissioning and early science in 2016, and aimed at full production surveying in 2017 through 2020.

In anticipation thereof, all required preparations for Apertif rollout in 2015 are proceeding.

The WSRT will continue to support EVN/Global observations at the standard MFFE frequencies with up to 6 dishes until the end of June 2015 when work will commence in the control building, to phase-out the old Tied Array hardware and install the Apertif-related backends.

From session 2015-3 the WSRT will participate in the EVN as a single-dish multi-frequency VLBI facility, which will make use of one of the remaining non-Apertif dishes, RT0 or RT1, on the west side of the array, equipped with one of the current Multi- Frequency-Frontends (MFFEs) modified to circular polarization, or the 5cm receiver. The backend will consist of a DBBC, which was delivered in January 2015, and a Mark5B.

Commissioning of this single-dish multi-frequency VLBI facility is ongoing. It should then be available for participation in all appropriate VLBI observing projects for at least the remainder of the decade.

Tied array VLBI capability at L-band (12 dishes, 300 MHz instantaneous bandwidth, dual polarization) is planned to be regained in 2016. This will coherently add the central on-axis beam delivered by the Apertif frontends in each of the dishes.

Antonios Polatidis, WSRT, ASTRON, Dwingeloo, The Netherlands

New Kvarz H-masers at Aalto University Metsähovi Radio Observatory

Metsähovi has purchased two Kvarz H-masers via Russian debt conversion, which enables purchasing Russian products for scientific use. The new type CH1-75A masers arrived in January, 2015, and were taken in use in February, 2015. They replaced our old two Kvarz masers, which were of earlier type, CH1-75, and had started to malfunction. The old masers have been in use for 13 years, even though only 10 years of use was promised. After refurbishing they should still work for some years.

Figure 3. Metsähovi's four H-masers. On the left the old type CHI-75 masers, on the right the new type CH1-75A masers. The one on the far right, is now the house maser. Picture credit: Merja Tornikoski.

Minttu Uunila, Aalto University Metsähovi Radio Observatory, Finland

Upcoming Meetings in 2015

A number of scientific conferences and workshops which are planned to be held in 2015 will provide ample opportunities for presenting and discussing results from VLBI studies of a broad variety of astrophysical phenomena. A subset of these meetings, covering the first half of 2015, is briefly introduced below:

22-26 June: The European Week of Astronomy and Space Science (EWASS-2015) will be held in La Laguna (Spain), with a number of meetings and splinter sessions on topics in which VLBI studies provide strong impact. EWASS-2015 will also host a meeting of the European Interferometry Initiative (EII) Science Council Meeting, which focuses on long baseline interferometry in the optical regime, which may have interesting potential synergies with long baseline studies in the radio. The ASTRONET 2015-2025 discussion at EWASS-2015 will present another potentially important forum for reviewing the prospects for the European astronomy.

19-21 August: The 45th Young European Radio Astronomers Conference 2015 (YERAC 2015) will be organized in Ventspils, Latvia. This meeting will continue the long tradition of YERAC bringing together students and young scientists from various institutes across Europe and the world. It will be an important event for the Ventspils International Radio Astronomy Centre (VIRAC), which celebrated 20 years of existence in 2014.

24-27 August: The SKA Key Science Workshop will be held in Stokholm, Sweden. This four day workshop will explore the capabilities of SKA Phase 1 within the context of notional 'Key Science Projects', large scale collaborative projects addressing key scientific questions with significant legacy value. VLBI observations with the SKA will be one of the specific topics discussed at the meeting.

6-10 September: The Sixth European Radio Interferometry School (ERIS) will be hosted by the European Southern Observatory in Garching, Germany. The school will provide 5 days of lectures and tutorials on how to obtain scientific results from radio interferometry at metre to sub-millimetre wavelengths. The EVN will be one of the instruments brought in the specific focus of the school, together with eMERLIN, JVLA, LOFAR, ALMA, and NOEMA.

5-7 October: A RadioNet3 ERATec Workshop on Multi-Frequency mm-wave Radio Telescopes & Other Software Controlled Operations will be held in Florence, Italy. This meeting is a continuation of a series of technical workshops combining several aspects of engineering and operational issues at European radio observatories. It provides the unique opportunity to cross border the different communities and to learn what 'the others' are doing and enhance communication between engineers, scientists and operators. Furthermore the conjunction with the international symposium of antenna related topics provides the unique chance to communicate with colleagues outside the radio astronomy technology and to bring our forum to a wider community.

30 November – 2 December: A workshop 'Dissecting the Universe – Results from High Resolution VLBI' will be organized at the MPIfR in Bonn, Germany. The workshop will focus on recent results and perspectives in space VLBI and millimeter VLBI observations targeting the innermost regions of extragalactic relativistic jets, and the extreme vicinity of supermassive black holes in galactic nuclei.