European VLBI Network Newsletter

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Contents

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Message from the Chairman of the EVN Board of Directors

Dear Colleagues in the European VLBI Network,

Mike Gallard (in the center), late director of Heartebeesthoek Radio Observatory, at the ceremony of signing a cooperation agreement between the HartRAO and the JIVE represented by Huib van Langevelde and Hans Oloffsson.

We are saddened to hear from our colleagues in South Africa of the passing of Mike Gaylard. As Director of Hartebeesthoek Radio Observatory he worked with us in the EVN CBD and JIVE Board since our 2011 meetings in Torun until this year. At that time he requested full membership for HartRAO in the EVN. The photo shows him on the occasion of signing the participation of HartRAO in JIVE, in Bonn in 2012. In his place, Prof. Ludwig Combrinck (ludwig@hartrao.ac.za) has been appointed as Acting Managing Director of HartRAO until further notice.

Now that the summer break is over a series of important EVN and other VLBI events awaits us. First, of course, is the 1 October deadline for submitting EVN proposals; the PC Chair, Tom Muxlow, has already distributed the Call for Proposals. After this the focus moves to Cagliari, Sardinia, where the Technical and Operations Group (TOG) has its meeting on 6th October. The rest of us are probably only just arriving on this date to be in time for the 12th EVN Symposium, which starts on 7th October. Note the EVN Users' Meeting on Thursday 9th October; the CBD would welcome input from EVN Users and encourages all Symposium participants to take part in this. For those still hungry for more VLBI there is an EATING meeting (East Asia to Italy) in the following week (13th-14th) in Bologna!

In November we go again to Italy, to Bologna for the EVN Consortium Board of Directors Meeting on the 5th, followed by the JIVE Board meeting on the 6th. The EVN Program Committee also plans to meet in Bologna on this date. In the same week there is a special meeting for DiFX correlator operators/users in Bologna. And then some must rush up to Groningen (The Netherlands) in the following week for the 3rd International VLBI Technology Workshop.

In case anyone thinks that the EVN and VLBI consists of only meeting and eating, it's worth pointing out that in the same period there are two e-VLBI sessions (8/9 October and 18/19 November) and, of course, EVN Session III (16 October to 6 November) which this time has projects scheduled at 7mm and 3.6, 5, 6 and 18cm, including one observation together with RadioAstron.

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 October 2014

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This call is also available on the web at

http://www.jb.man.ac.uk/~vlbi/EVN/call-oct14.txt

&

http://www.jb.man.ac.uk/~vlbi/EVN/call-oct14.pdf

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 in Europe (JIVE) can provide support and advice on project preparation, scheduling, correlation and analysis. See EVN User Support at http://www.jive.nl.

Future Standard EVN Observing Sessions (disk recording)

2015 Session 1 Feb 26 - Mar 19 18/21cm, 6cm ...

2015 Session 2 May 28 – Jun 18 18/21cm, 6cm ...

2015 Session 3 Oct 15 - Nov 05 18/21cm, 6cm ...

Proposals received by 1st October 2014 will be considered for scheduling in Session 1, 2015 or later. Finalisation of the planned observing wavelengths will depend on proposal pressure.

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

2014 Nov 18 – Nov 19 (start at 13 UTC) 18/21cm, 6cm, 5cm or 1.3cm

2014 Dec 02 – Dec 03 (start at 13 UTC) 18/21cm, 6cm, 5cm or 1.3cm

2015 Jan 13 – Jan 14 (start at 13 UTC) 18/21cm, 6cm, 5cm or 1.3cm

2015 Feb 10 – Feb 11 (start at 13 UTC) 18/21cm, 6cm, 5cm or 1.3cm

2015 Mar 24 – Mar 25 (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 October 1st deadline will be considered for scheduling in the above e-VLBI sessions starting from Nov 18th 2014.

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

See http://www.e-merlin.ac.uk/vlbi/evn_docs/guidelines.html for details concerning the e-VLBI observation classes and observing modes

Features for the Next Regular EVN and e-VLBI Sessions

* Both Jb1 and Jb2 will be available for EVN recording, as will simultaneous EVN+e-MERLIN operations with home-station EVN recording. For such simultaneous EVN+e-MERLIN operations, VLBI data from Cm will be made available at up to 512 Mbps (e.g. 64 MHz in both hands of circular polarization) on a best efforts basis.

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 Gb/s including VLBA,GBT,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 (if appropriate justification is given in the proposal).

RadioAstron Observations

* Proposals requesting the EVN as ground array support for RadioAstron proposals for the latter part of the AO2 period (1 July 2014 - 30 June 2015) may still be submitted at this deadline

Large EVN Projects

* Most proposals request 12-48hrs 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

* Medicina and Urumqi should return to the EVN from Session 1, 2015 onwards. The Sardinia 64m telescope (SRT) remains in a commissioning phase but is available on a "best efforts" basis from Session 1, 2015. Robledo 70m telescope is occasionally available for EVN observations. From Session 1, 2015, the availability of WSRT as a phased array is not certain and WSRT may be participating with a single telescope.

* The new 65m Tianma (Shanghai) telescope will become available for EVN operations from Session 1 2015. See the EVN Status Table for details.

Use of Korean VLBI Network Antennas

* The Korean VLBI Network (KVN) has now become an Associate Member of the EVN (as from January 2014). 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

* It is planned that starting in Session 1 2015, 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 in that and future disc sessions. 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. Proposals for joint LBA/EVN observations in session 2/2015 must be submitted separately to both the LBA and EVN:

LBA in their 15 Dec 2014 deadline.

EVN in either their 1 Oct 2014 or 1 Feb 2015 deadlines.

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).

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. Proposals requesting Out-of-Session observing time must provide full scientific (and technical if appropriate) justification as to why observations must be made outside regular 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 (up to a maximum of 144 hours). 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 the proposal deadline. Observations requiring much shorter lead times should be submitted as "Target-of-Opportunity" 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.

When specifying your "Recording format" for Global modes in the EVN proposal tool, select 32. 64. 128, 256, 512, or 1024 Mbps from the "Specify aggregate bitrate (use network defaults)" menu.
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 October 2014.

Additional information

Further information on Global VLBI, EVN+MERLIN and e-VLBI observations, and guidelines for proposal submission are available at: http://www.e-merlin.ac.uk/vlbi/evn_docs/guidelines.html.

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.

Tom Muxlow, University of Manchester, EVN PC Chairman

EVN Science Highlights

EVN and eMERLIN constrain the progenitor system and environs of SN 2014J

Type Ia supernovae (SNe) are the end-products of white dwarfs with a mass approaching the Chandrasekhar limit, which results in a thermonuclear explosion of the star. In addition to their use as cosmological distance indicators Type Ia SNe are a major contributor to the chemical evolution of galaxies. It is therefore unfortunate that we do not yet know what makes a SN Ia. This lack of knowledge makes it difficult to gain a physical understanding of the explosions, so that we can model possible evolution, which compromises their use as distance indicators. It also means we do not fully understand the timescale over which SNe Ia turn on, adding a large uncertainty to our understanding of the chemical evolution of galaxies.

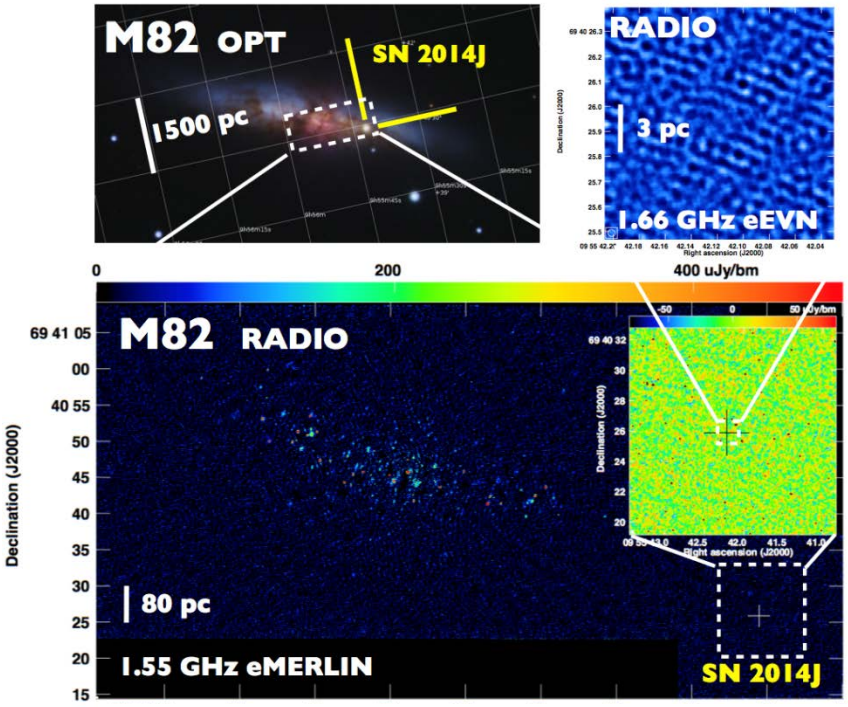

Figure 1. eEVN and eMERLIN images of SN 2014J in M82, combined with an optical image of the host galaxy.

Unveiling the progenitor scenario for SNe Ia is difficult because white dwarfs (WDs) can, theoretically, reach their fatal Chandrasekhar mass in many ways, and disentangling which is the correct one (if there is just one), is challenging from an observational point of view. Nonetheless, there are two basic families of models leading to a SN Ia, the single-degenerate model (SD) and the double-degenerate model (DD). In the SD scenario, a WD accretes mass from a hydrogen-rich companion star before reaching a mass close to the Chandrasekhar mass and going off as supernova. In the DD scenario, two WDs merge, with the more-massive WD being thought to tidally disrupt and accrete the lower-mass WD.

Observations can potentially discriminate between the progenitor models of SNe Ia. For example, in all scenarios with mass transfer from a companion, a significant amount of circumstellar gas is expected, and therefore a shock is bound to form when the supernova ejecta are expelled. The situation would then be very similar to circumstellar interaction in core-collapse SNe, where the interaction of the blast wave from the supernova with its circumstellar medium results in strong radio and X-ray emission. On the other hand, the DD scenario will not give rise to any circumstellar medium close to the progenitor system, and hence essentially no radio emission is expected.

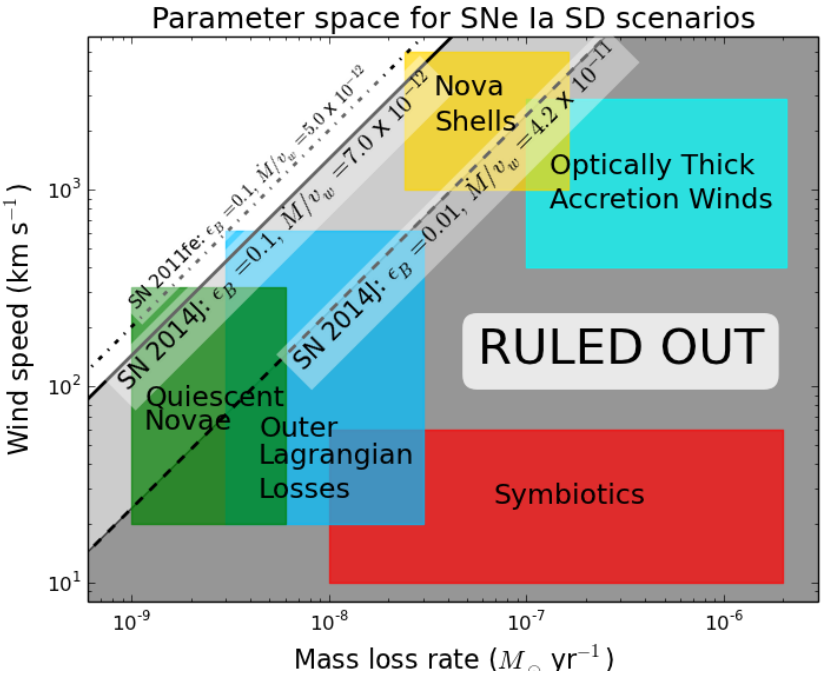

Figure 2. Constraints on the parameter space (wind speed, v_w, vs. mass-loss rate, $\dot{M}$) for single degenerate scenarios for SN 2014J. The progenitor scenarios are plotted as schematic zones, and we indicate our 3σ limits on $\dot{M}/v_w$ assuming two different fractions of the energy density in magnetic fields to the total post-shock supernova energy density, namely $\epsilon_B = 0.1$ (solid) and the conservative case of $\epsilon_B = 0.01$ (dashed). Mass loss scenarios falling into the gray shaded areas should have been detected by our deep radio observations, and therefore are ruled out for SN2014J. For a comparison, we include our reassessed limit for SN 2011fe (dash-dotted line) for the same choice of parameters as the solid line for SN 2014J, which essentially leaves only room for quiescent nova emission as a viable alternative among the SD scenarios for SN 2011fe.

SN 2014J in M82 (D=3.5 Mpc) has brought us a unique opportunity to severely constrain the plethora of theoretical models proposed as potential progenitor systems for Type Ia SNe.

We observed SN 2014J with the eMERLIN array on 28-30 Jan 2014 at 1.6 and 6.2 GHz, and with the EVN on 4 Feb 2014 and 19 Feb 2014, at a frequency of 1.7 GHz. Our observations towards the position of SN 2014J were the deepest ever realised with those arrays, yet resulted in non-detections of the SN (see Fig. 1).

Our radio data and modeling allow us to place a tight constraint on the mass loss rate from the progenitor system of SN~2014J. Namely, if the exploding WD was surrounded by a wind with a density profile $\rho \propto r^{-2}$, as expected for a SD scenario, then our upper limit to the mass-loss rate is $\dot{M} = 7 \times 10^{-10}\ M_{\rm sun}/{\rm yr}$, for a wind speed $v_{\rm w} = 100$ km/s.

If, on the contrary, the circumstellar gas has a constant density, as expected to be the case for the DD scenario (but also in a small region of the parameter space of SD scenarios), then our modeling yields an upper limit on the gas density, such that $n_{\rm ISM} \leq 1.3\ {\rm cm}^{-3}$.

Our stringent upper limits to the circumstellar density around SN~2014J allow us to exclude completely symbiotic systems and the majority of the parameter space associated with stable nuclear burning WDs, as viable progenitor systems for SN 2014J.

For the case of recurrent novae with main sequence or subgiant donors, we cannot rule out them completely, yet most of their parameter space is also excluded by our observations for the standard assumption of $\epsilon_{\rm B} = 0.15$, where $\epsilon_{\rm B}$ is the ratio of magnetic energy density to post-shock thermal energy density.

Reference: Pérez-Torres, Lundqvist, Beswick et al. (2014), ApJ, vol. 792, p. 38

Miguel Angel Pérez-Torres (Instituto de Astrofísica de Andalucía, Granada; Centro de Estudios de la Física del Cosmos de Aragón, Teruel, Spain)

EVN/JIVE Technical Developments

The JIVE UniBoard Correlator (JUC)

Over the past few years, the SFXC software correlator at JIVE has taken over all EVN correlation. In fact, earlier this year the MarkIV hardware correlator was dismantled and removed. A number of correlator boards were shipped to Hawaii, as spare parts for the SMA.

Although not yet generally in operational use, most EVN stations now have digital baseband converters, while the VLBA has completed its upgrade to RDBEs. This is opening the way to increase the bandwidth of EVN and combined EVN-VLBA observations beyond the current 1 Gbps limit. 4 Gbps operations, both recorded and real-time, were successfully demonstrated last year with Effelsberg, Onsala, Metsahovi, Yebes and Hartebeesthoek, showing that technically the EVN is quite ready.

Figure 3. JUC UniBoards

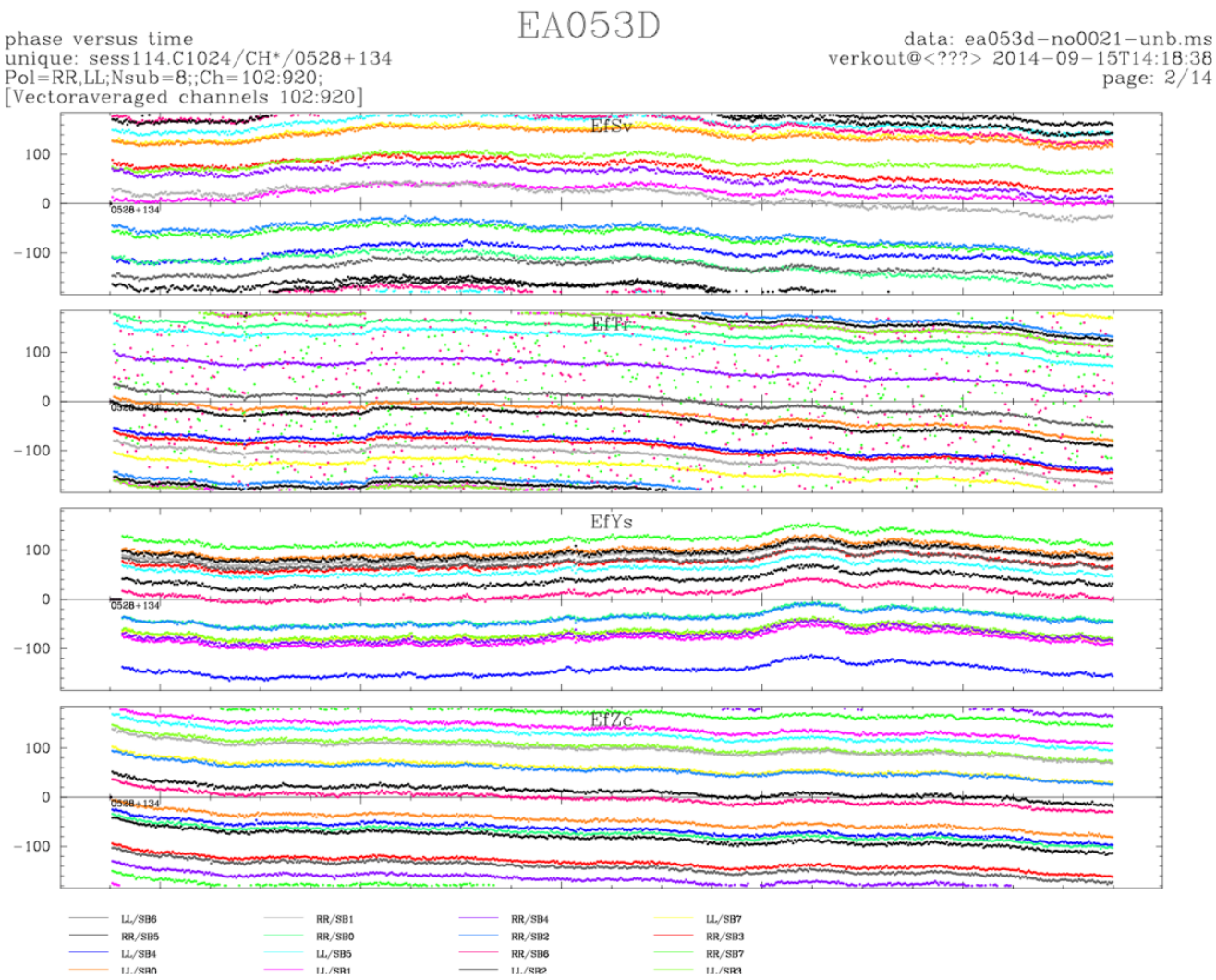

Figure 4. JUC phases versus time.

While extremely versatile and flexible, the SFXC is limited in its capability to handle a large number of stations at high bandwidths in real time. Implementing a 16-station 4 Gbps real-time correlator would involve a considerable investment in hardware. And while this situation is bound to improve as

Moore's law progresses, an FPGA-based correlator could be a powerful, cheap and power-efficient alternative for quite some years to come.

The UniBoard project, a JRA in Radionet FP7, was instigated by JIVE with just this idea in mind. Its aim was to build an FPGA-based high-performance generic computing platform, along with several firmware personalities. The development of a UniBoard-based VLBI correlator by JIVE was further strengthened by funding from NWO and partly through the follow-up UniBoard2 project in RadioNet3.

At this time, the JUC has evolved into an operational correlator, which is now being debugged/commissioned. Recent improvements were the increase of the precision of the delay coefficients and the fixing of several elusive bugs, which have greatly improved the stability of the system. While many interesting problems remain, it has reached the point where an operator can mount disk packs in Mark5 units, select one or more scans of a

project and run a correlation job, which then can be further processed in much the same way the SFXC output is handled. Currently the JUC consists of two UniBoard units (Figure 3). In this configuration the JUC can process up to 32 stations, two polarizations and 128 MHz bandwidth (1 Gbps). Once the 32 MHz-subband mode is verified, it will also be able to correlate 16 stations at 256 MHz (2 Gbps) or 8 stations at 512 MHz (4 Gbps).

Note that the two UniBoards together consume a total of about 0.5 kW. Were we to scale both the JUC and the SFXC hardware to 16 stations at 4 Gbps, the JUC would consume 1 kW, in contrast to 30 kW for SFXC.

The current parameters of the JUC correlator are listed in Table 1. Figure 4 shows phases versus time on several baselines of experiment EA053D, demonstrating how well the interferometric phase is tracked.

Table 1. JUC Specifications

	Supported in June 2014	**Planned**
Stations	32	32
Polarizations	2	2
Bandwidth (real time)	64MHz (1 UNB)	64n MHz (n UNBs)
Sub-bands (real time)	16MHz, 32MHz under test	1, 2, 4, 8, 16, 32, 64MHz
Input resolution (max)	2 bits	1, 2, 4, 8 bits
Integration time (all products)	0.022s – 1s	0.022s – 2s
Correlation points	2112 including cross, auto, and cross-polarization	2112
Frequency resolution	15.625kHz	<1kHz spectral line mode >125kHz continuum mode
Data Input Format	VDIF	VDIF mixed frame sizes

Arpad Szomoru (JIVE) for the JUC Team

EVN Scheduler's Report

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

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2014 Session 2: 29 May – 19 June
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Wavelengths: 18, 0.7, 6, 5, 90, 1.3cm
Number of different user experiments observed: 29
Session Duration: 21.6 days        Efficiency: 52.6%

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                 39         272.5      11.4       989.1

EVN-only              18         176.0      7.3        641.4
Global                11         74.5       3.1        292.5
Short Obs.            0          0.0        0.0        0.0
Tests                 10         22.0       0.9        55.2

EVN Correlator        38         259.0      10.8       962.9
Bonn Correlator       1          13.5       0.6        26.2
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              5          20.0       0.8        0.0

MERLIN                5
Arecibo               8
VLBA                  11
GBT                   1
VLA                   4
Robledo               0
Goldstone             0
RadioAstron           1
-----------------------------------------------------------------

2014 e-VLBI Observations
------------------------
                                e-VLBI   PROPOSAL   TYPE
RUN    DATE     WTH    HRS   Normal  Short  Disk  ToO   Trigger

14e06  24JUN14  6cm    24    1       1      -     1     0 sched 0 trig
14e07  CANCELLED
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Alastair Gunn, University of Manchester, EVN Scheduler

Reports from EVN Institutes

The New Radome for the Onsala Space Observatory 20-m Telescope

During August and September the OSO 20 m telescope is being treated to a newly renovated home. The old radome which hosts the telescope inside it, was installed at the same time as the 20 m telescope almost 40 years ago, in 1975.

Figure 5. First Light' for the Onsala 20m telescope. The original radome (built 1976) of the Onsala 20m diameter telescope is in the process of being replaced. This picture, from 26th August, was taken during the critical operation of replacing the zenith cap. Since the telescope panels were assembled after the erection of the radome in 1976, these few hours represent the first time the telescope has been exposed to the open and hence the 'first light' of the telescope. For more pictures see https://www.flickr.com/photos/onsala/sets/72157646515111850. (Image credit: Roger Hammargren, Onsala Space Observatory).

It was finally decided last year that it had deteriorated to the extent that the installation of a new one was unavoidable. The radome is exchanged by replacing a top cap consisting of 50 panels in one go (see Picture), while the remaining 570 panels are changed one by one. The complete new radome is expected to be finished before the end of September, weather permitting. This will provide the 20 m telescope with a radome having similar transmission properties (for radio waves) as the original one and, of course, protect the telescope for decades to come.

Michael Lindqvist, Onsala Space Observatory, Sweden

Recent and upcoming meetings

YERAC-2014: The 44th Young European Radio Astronomers Conference

The YERAC 2014 was held in Torun between 8 and 12 September. Thirty-eight participants came from Europe, Asia and Africa to take part in the 44th meeting of young radio astronomers. Three busy days enabled all participants to present the results of their researches. The conference dinner, barbecue, took place at the Torun Centre for Astronomy Observatory in Piwnice. Although it showered a little, good moods kept our spirits high. As an additional entertainment traditional gingerbreads were baked at the Gingerbread Museum since "toruńskie pierniki" are famous all over the world. Enthusiasm of youth has encouraged everyone for future fruitful studies of the Universe. All informations can be found at: http://yerac2014.astro.uni.torun.pl

The conference costs were supported by Torun Centre for Astronomy and RadioNet3 (FP7, contract no. 283393)

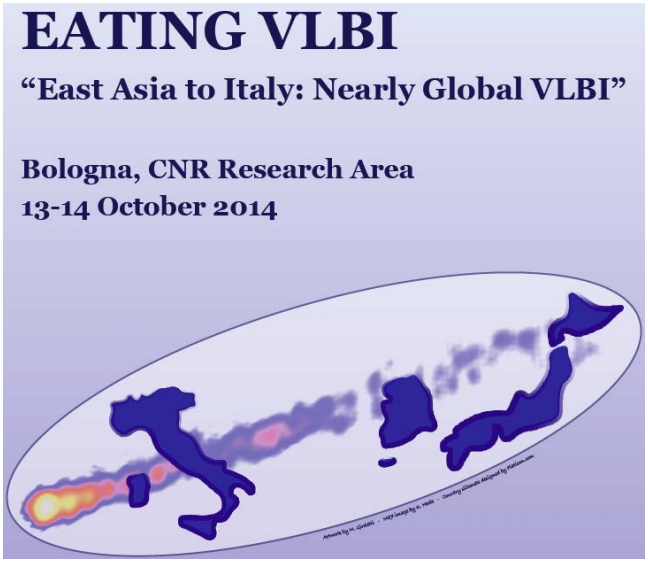
Anna Bartkiewicz (Torun Centre for Astronomy, Poland)

Figure 6. Photographs from the YERAC-2014 in Torun. The conference photon (top left), science session at the conference (top right), the visit to the TCfA (bottom left) excursion in Torun (bottom right).

The 12th EVN Symposium and Users Meeting (Cagliari, 7-10 October 2014)

On October 7-10, the Istituto di Radioastronomia (IRA) and the Osservatorio Astronomico di Cagliari (OAC) of the Istituto Nazionale di Astrofisica (INAF), on behalf of the European VLBI Consortium, will host the 12th European VLBI Network Symposium and EVN Users Meeting from October 7th to 10th, 2014. Principal sponsors of the event are RadioNet3 and INAF. The Symposium will be held in Cagliari, on the South coast of the island of Sardinia. At this conference the latest scientific results and technical developments from VLBI, and, in particular, e-VLBI and space-VLBI (RadioAstron) results will be reported. The scientific sessions will cover a variety of topics, including low-luminosity AGN, powerful jets, gamma-ray emission, supernovae, star formation, and current and future technical developments and collaborations. The timing of this meeting coincides with the first successful observational tests of the Sardinia Radio Telescopes within the EVN, and with a number of results from new and upgraded radio facilities around the globe, such as e-MERLIN, ALMA, and the SKA pathfinders. This meeting will also incorporate the EVN Users meeting.Further details about the Symposium are available on the conference website: http://evn2014.oa-cagliari.inaf.it/EVN2014/

East Asia to Italy: Nearly Global VLBI-2014 (Bologna, 13-14 October 2014)



Immediately after the 12th EVN Symposium, the INAF Institute of Radioastronomy in Bologna will host a meeting developing collaborative VLBI projects between Italy, Japan, and Korea. This is the second meeting discussing the collaborative projects between the three countries. After reviewing the status of VLBI developments in Italy, Japan, and Korea, the meeting agend will focus on recent results from a number of collaborative projects and plans for future developments of the joint research.

The meeting is supported by the Italian Ministry for Foreign Affairs, the Department of Physics and Astronomy of the University of Bologna, and RadioNet3. Further information about the meeting can be found at its website: http://www.ira.inaf.it/meetings/EatingVLBI/2014/Eating_VLBI_2014/Welcome.html.

3Rd International VLBI technology Workshop (Groningen, 10-13 November 2014)

Continued discussion of VLBI technology development will find its next venue on November 10-13 in Groningen, where the third international VLBI technology workshop and a special session on RadioNet3 ERATec engineering will be held. This workshop has grown out of the highly successful 10-years series of e-VLBI meetings which laid the groundwork of cooperation and development in the field of real time VLBI. The present series of workshops expands the scope of discussion to all areas of hardware and software development in VLBI, focusing in particular on the development of global e-VLBI framework for scientific observations.

The third workshop in this series will review progress in receivers, digital backends, recording equipment, and e-transport. Specific attention will be given to discussion of frequency and clock transfers over public networks and current and future data transport challenges. At the last day of the workshop, a half-day NREN - radio astronomy session will be held, organised and sponsored by GÉANT, the pan-European research and education network.
Detailed information about the meeting can be found on a website at http://www.jive.nl/IVTW2014/index.php.