



European VLBI Network Newsletter

Number 8

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ANNOUNCEMENTS:

13. [7th EVN Symposium \(Toledo 12-15 Oct\)](#)
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1. Call for Proposals - Deadline 1 June 2004

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 EVN 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>.

EVN Observing Sessions in 2004-2005

2004 Session 2	May 20 - Jun 10	30cm (UHF), 18/21cm, 6cm (+MERLIN)
2004 Session 3	Oct 21 - Nov 11	90cm, 18/21cm, 6cm, 5cm (+MERLIN)
2005 Session 1	February/March	18/21cm (+MERLIN), 6cm, 1.3cm, +...

Proposals received by 1 June 2004 will be considered for scheduling in Session 3, 2004 or later. Finalisation of the planned observing wavelengths will depend on proposal pressure.

Further information can be found at: <http://www.obs.u-bordeaux1.fr/vlbi/EVN/call.html>

2. Message from the Chairman

On 28 April the JIVE team and collaborators at Jodrell Bank, Onsala, and Westerbork achieved a VLBI breakthrough by doing the first real-time VLBI imaging experiment using the EVN correlator at JIVE. After a series on internet-based data transfer experiments by groups at JIVE and Haystack, this experiment was a milestone for real-time VLBI and showed that this operational mode has a future. Congratulations to the team.

The Board of Directors of the EVN Consortium met on 14 –15 May in Onsala. The Board heard reports on the increasingly higher quality of EVN operations and the higher data quality, as reported by the TOG Chairman

Walter Alef (MPIfR), the continued proposal pressure reported by the PC Chairman Patrick Charlot (Bordeaux), and the plans for 6 GHz and UHF observing in the future sessions by the EVN Scheduler Richard Porcas (MPIfR). In addition, the Board also discussed a number of forward-looking issues. In particular, the possibilities of real-time VLBI were discussed and pro's and con's were considered. It was decided to execute a real-time science experiment before the October EVN 2004-3 session in order to define operational procedures and to give recommendations for establishing real-time VLBI (mini-) sessions. The Board also considered aspects of a Vision for EVN-2010. Technological opportunities have presented themselves that may significantly improve EVN sensitivity and operational procedures. A subgroup has been presented under the Chairman to propose a Vision for EVN-2010 to the next meeting.

There was general praise for the performance of the Mk VA units that have been installed at JIVE and at the various stations. In EVN 2004-2 a total of 7 stations will have Mk V only recording. On the other hand, concerns were also expressed about the uncertainty on the promised compatibility and performance of the Mk VB system.

In separate action, the Consortium Board decided to go forward with the development of digital BBC's. A project team has been set up with Gino Tuccari (IRA Noto) as Project Manager and Walter Alef (MPIfR Bonn) as Project Engineer. A program plan will be finalized by the end of June. The project will solicit input from the geodetics community and from other Network experts in the USA, Korea, Japan and Australia. This project envisions the production prototype units by the middle of 2006 and will incorporate operational milestones with scaled-down versions of the system. It is envisioned that these dBBC's together with the Mk VB recorders will provide an affordable replacement of the current VLBI backends and that more existing telescopes can participate in VLBI.

The Board meeting in Onsala had an upbeat atmosphere and generally reflected the enthusiasm and positive feeling each participant had on the performance of the EVN and about the scientific impact of the EVN.

Willem Baan Chairman, CDB of the EVN (baan@astron.nl)

3. EVN Data Access Policy

The policy described below will come into force on 1 June 2004. It is the policy of the European VLBI Network's (EVN) Consortium Board of Directors (CBD) that the investigators named on an EVN or global VLBI proposal have the sole right of access to the data obtained for that proposal for 12 months after the distribution of the data to the PI. If the proposal comprises multiple observations (i.e., separately scheduled experiments in one or more network or ad-hoc sessions), then the 12 month period begins from the distribution of the final experiment associated with the proposal. For proposals fully distributed prior to 1 June 2004, the 12 month period begins from that date. Following this proprietary period, the data will be publicly accessible.

One month prior to the public release of new data, JIVE will inform the PI of the proposal, at the last known address, about the impending action. Under exceptional circumstances the PI can request a short delay in the release date. All such requests should be made to the Chairman of the EVN Programme Committee.

It is the intention of the CBD that all data correlated at the EVN Data Processor at JIVE, will be placed into the EVN archive. This archive will contain the raw FITS format data, calibration tables, various diagnostic plots, calibrated visibility data and, when possible, pipelined images. The images will be preliminary; in many cases further editing, self-calibration, or other refinements may be required to bring out particular features of interest. All data and images will be FITS format.

The archive will be populated in two stages:

(i) immediately after correlation, the archive for a particular project will include for all sources (including the targets): correlator diagnostic plots, ANTAB & UVFLG files and the a-priori amplitude calibration (CL) table. Plots and further CL (SN) tables generated by the pipeline (including fringe-fitting results) will all be downloadable. In this first stage, images of the calibrator sources will be generated but images of target sources will not be made without the expressed consent of the PI. JIVE will ask the PI prior to correlation how to treat each source in the schedule. Calibrated visibilities for the calibrator(s) but not the target(s) will also be made available.

(ii) Once the proprietary period elapses, images of the target will also be generated (where possible) and this, together with the calibrated visibilities of the target, will be made publicly available within the EVN archive.

If you or your colleagues subsequently publish or use EVN data, including that obtained from the EVN archive, we request that you use the standard EVN acknowledgment: 'The European VLBI Network is a joint facility of European, Chinese, South African and other radio astronomy institutes funded by their national research councils.'

Philip Diamond
Jodrell Bank Observatory, pdiamond@jb.man.ac.uk

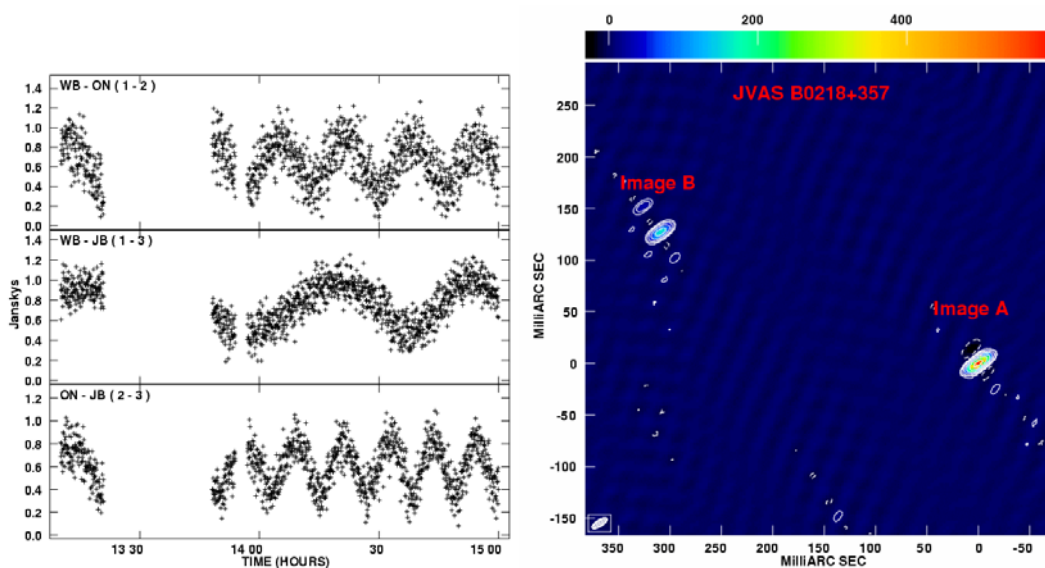
4. Report on eVLBI

On 28 January 2004, participants of the EVN-NREN project met again at Schiphol Airport. One year into the project, the meeting agreed that the project was well on-schedule, especially following the recent announcement of the first European eVLBI Image (reported as breaking news in the last newsletter). The meeting ended with revised goals and renewed commitment from the NRENs to support the project for another year and probably beyond into 2005.

Since then progress has been rapid. At the end of March, Haystack released a version of the Mark5 software that could handle servo commands whilst running in net2out mode. This enabled JIVE to complete development of correlator synchronisation, as needed for real-time operation. On 23rd April 2004 the image in fig X, of the gravitational lens system JVAS B0218+357, was produced from data transferred directly from telescope to data processor and correlated in real-time. Participating telescopes were Onsala, Jodrell Bank and Westerbork. Data from all three telescopes were transferred, via GÉANT and the European Research Networks (SURFnet, UKERNA, NORDUnet and SUNET), to the EVN VLBI data processor at JIVE. Time synchronisation between incoming data and the correlator observe-time clock was achieved in two stages. First the observe-time clock was set to UT minus a few seconds. Fine tuning was then implemented using the normal servo system operating between the Mark5 output buffer and the Station Unit. No intermediate recording of the data was used. Good quality data were received from all three telescopes throughout the 1.5 hours of observation.

In this experiment, the modest data rate of 32Mb/s was determined by the lower bandwidth link to Jodrell Bank. In a real-time test between Onsala and Westerbork carried out a few days before, fringes were detected at 64Mb/s. The data path has also been simulated in the laboratory at up to 256Mb/s. Work continues to identify bottlenecks and improve throughput for higher rate experiments.

Further details can be found at <http://www.evlbi.org/evlbi/te017/te017.html>.



Steve Parsley Head of the Technical Operations and R&D group at JIVE (parsley@jive.nl)

5. TOG meeting highlights

On the 1st and 2nd April the TOG (Technical and Operations Group) meeting was held at Wettzell geodetic observatory in Bavaria (Germany). More than 50 people attended, and there were representatives from the geodetic and astronomical VLBI community, as well as representatives from the USA (NRAO, JPL and Haystack), Asia (Shanghai) and Africa (Hartebeesthoek). The main items included

Introduction of Mark5A

Both the geodetic community and astronomical are almost ready to completely discard tape recording and move to the Mark5A disk-packs. The VLBA has not yet transferred to disk-packs (see below) so tapes are still needed for a limited number of experiments to be correlated in Socorro. Already 1Gbit/s data recording rate has been achieved with Mark5A.

Developments towards Mark5B

Haystack is making a prototype for the Mark5B recording system. This will work with the VSI hardware interface and no longer need an external formatter. The prototype should be ready by the end of 2004 and first systems available in the field in 2005. There will be an upgrade kit from Mark5A to Mark5B available with estimated price tag of \$4000.

Digital BaseBand converters

The current Mark4 and VLBA baseband converters (which take IF signals and mix them down to video so that they can be easily recorded) are obsolete. A new project has been started to replace them with more flexible digital versions which can be directly connected to a Mark5B recorder. There is a provisional specification, but a detailed specification was still being worked on

Calibration quality

A notable improvement in the quality of calibration data has been seen.

eVLBI

The Mark5A hardware allows a standard network connection to be made for the VLBI data stream. Already some tests have been made for VLBI fringe tests to be done, even on intercontinental baselines. During the meeting JIVE, Haystack and Metsähovi presented current results

Tony Foley (ASTRON, foley@astron.nl)

6. Scheduler's Diary - 2

February 2: Again, 23 proposals received for the February deadline, slightly above the long-term average of 20.3 per deadline, recently determined by the EVNPC Chairman. There is the usual haggling from some quarters about the definition of the EVN deadline when the advertised day is at the weekend. It is UT 23h59m59s on 1 February (or June or October), although proposals received in the "grace period" between then and the start of work on the next working day at MPIfR will be accepted - provided they are complete and print without problems. (Of course, I understand that desperate need to know "to the minute" how late one can delay writing one's proposal, since I am a sometime proposal-writer myself. The phrase "poacher turned gamekeeper" springs to mind !) Regrettably there are no new UHF proposals, so this part of the May/June session will be short. There are 4 proposals requesting 1 Gb/s recording, following our special announcement of this capability.

February 5: Sent out the final version of the February session schedule, including some final details of the UHF and 5cm test observations arranged by Zsolt Paragi and some of the observatories.

February 10: Following a quick reading of the proposals I email the PIs of those where there seem to be possible technical difficulties or where information is missing. This time there are a number of spectral line proposals which explore the edges of the EVN's 18/21cm receiver capabilities - of course, different for each observatory. I notice that Antonis Polatidis has recently updated the EVN Status Tables with useful information on this topic. I email the relevant technical friends and get detailed responses which will help the referees review the proposals in the Program Committee Meeting. The introduction of MK5A disk recording at the EVN Observatories makes the choice of correlator more critical, since the VLBA correlator cannot yet play back such recordings. Use of the VLBA correlator forces EVN observatories to use their ageing tape drives, which are becoming increasingly difficult to maintain in good working order. Proposers of EVN/Global projects are thus encouraged to use the EVN correlator at JIVE unless there is a sound scientific reason why they cannot (e.g. need to use pulsar gating). A related issue is the need for 3 correlation passes at JIVE if the number of (simultaneous) telescopes requested exceeds 16; clearly, this use of resources needs to be carefully justified - a point to be discussed in the EVNPC meeting.

March 2: I ask Ute Runkel to send copies of the proposals to the last of the 3 new EVNPC members who has agreed to serve on the committee. They are all "at large", meaning that they are at institutes which are not part of the EVN Consortium (in this case the Universities of Cork in Ireland and Jaen in Spain, and Arcetri Observatory in Florence, Italy).

March 15: Received an email from Phil Diamond, MERLIN Director, to point out that they do not now expect the MERLIN antennas to be equipped for 5cm (methanol line) observations in the May/June session. Sounds like a further postponement will be necessary, unfortunately.

March 18: I attend the EVNPC meeting at Bordeaux Observatory, the home territory of the Chairman. I have arrived indirectly, taking in sight-seeing tours of the corridors of London's Heathrow and Gatwick airports, saving somebody somewhere quite a bit of money but allowing me to browse in English book and video shops. Three of us also had our own special free tour of Bordeaux, courtesy of the airport bus driver who was

apparently unaware that the bus stop outside "Maison du vin" is known locally as "Maison du vin". Perhaps he is confused by the construction of the city's new tramway which, unusually, gets its electric power from a "third rail" between the wheel tracks, since overhead lines are deemed to be too unsightly. (Yes, we also wondered how they prevent the population getting fried, but the locals don't seem to be too charred !) On the eve of the meeting the PC members prepare themselves for the ordeal ahead by sampling the local wine (under the expert guidance of the cellar owner), together with a choice of around 200 different cheeses. I had not realized before that in order to get the best signal-to-noise ratio on the bouquet one should only sample with a single nostril ! The meeting itself passes without great incident. We agree to postpone the 5cm session until October, and to limit the number of telescopes to 16 for projects correlated at JIVE, unless there is some special justification. Some 18 of proposals are approved, with varying grades, 2 are rejected, and for 3 a resubmission is requested. Of course, EVN approval for Global projects is only half the story; I will not know which of them are eligible for scheduling until the VLBA scheduling committee meets next month.

March 29: The EVN Technical and Operations Group (TOG) will be meeting on Friday at Wettzell, the site of the German geodetic VLBI station in the Bavarian forest. I attend a pre-meeting held in Bonn, where a number of issues related to technical developments are discussed with representatives from NRAO, Haystack and Noto. NRAO hopes to move towards implementation of MK5B disk recording, the next step after the MK5A which the EVN observatories and correlator are acquiring. There is one-way compatibility; MK5B recordings can be replayed at MK5A correlators such as at JIVE and Bonn, but not the other-way round. An upgrade from MK5A to MK5B will be necessary at EVN observatories if we wish to regain the capability of correlating EVN recordings at the VLBA correlator.

April 1: I attend the TOG meeting in Wettzell. There is an amazingly large attendance of 52 representatives from EVN observatories and other institutes involved in VLBI. There is, as usual, much concern about late deposit of observing schedules on the Bologna server, and also faulty schedules. There is a suggestion to require PIs to deposit schedules 3 weeks before the session start (instead of the present 2), giving an extra week for the schedules to be checked before the observatories retrieve them. I point out that this will be unworkable in the upcoming May-June session (starting on May 20) since there will be insufficient time between the first possible appearance of the block schedule and the new deadline date of 29 April. The TOG decides to introduce the new rule for the October-November session. I discuss this afterwards with Bob Campbell, Head of the JIVE user support services. I suggest that for the May-June session I could give "advanced notice" of scheduling to the PIs of technically demanding schedules (e.g. spectral line observations) together with a strong recommendation for them to contact JIVE as soon as possible to get assistance in making the observing schedule. We agree to try that.

April 2: Provoked by the TOG discussions, I start to think about the logistics of the next observing session, during my 6-hour train journey back to Bonn. Sometimes my first worry is about the numbers of tapes available for recording, but a quick check of the requested resources shows that this will not be the limitation this time. I have 2 main concerns. One is to choose the order of the 3 wavelengths in a way which maximizes the number of projects scheduled, whilst satisfying all the receiver-change constraints (and taking into account that at least one of the eligible projects requires simultaneous use of the 18/21cm receivers at some observatories and the 30cm in Effelsberg). The other is the growing realisation there there is extreme "GST-bunching" amongst the projects. For instance, of the 25 projects, eligible from the EVN point of view, there are 22 days needed for the GST range 16h-17h, but only 5 for the range 07h-08h - and this for a session with only 21 days, some of which must be used for receiver changes ! In order to proceed I need to make an "Ansatz" - a word which my German maths lecturer at University claimed had no counterpart in English but, from the context in which he used it, I deduced meant "an intelligent guess" or, in his case, having the foresight to know the answer already.

April 13: Back to work after the Easter break. Barry Clark has sent me the results of the VLBA scheduling committee and I have replies from Arcibo and the DSN about available time. Time is short because we must get a first version of the schedule out soon. (I make a note that I should try and get session 2 in 2005 moved a little later in the year to avoid repeating this rush.) The most convenient order of the wavelengths emerges as 6/30/18. All but one of the projects with reasonable "global" grades can be scheduled; the GBT again proves to be difficult to schedule, due to daytime maintainance in May. Unfortunately, it seem that not all EVN stations can guarantee to have a sufficient supply of MK5A disk-packs in time for the session, and I reluctantly decide not to include the two well-rated 1Gb/s projects this session.

April 23: Jodrell Bank informs me that the Lovell Telescope wheel girder is showing signs of a fatigue crack. Although observations with the LT will still be possible in the upcoming session, there will be a restriction on the frequency of source changes which will affect phase-reference observations. The Jodrell MK2 telescope can be used for these experiments if desired. A pity.

April 26: Finally I send out the Version 1 block schedule. There has been a previous iteration (version 0) with NRAO and the observatories, and some additional observations (NME monitors, fringe test, Gb/s test) have been added. Fortunately the under-used part of GST-space is in the daytime in Europe - the best time for tests and receiver checks.

May 6: Today is the deadline for submitting reports to Tiziana Venturi, who organizes their distribution before the EVN Consortium Directors' Meeting. I submit a short EVN Schedulers Report, with details of the 2004 sessions so far, and suggestions (agreed with the EVN PC Chair) for the frequencies to run in session 3. I make

suggestions for session dates in 2005. Not only is it desirable to move Session 2 later, but next year the Chinese New Year falls on 9 February, making it difficult for the Easternmost extremity of the EVN to observe on the "traditional" dates. I suggest a later period for session 1 also.

Richard Porcas, EVN Scheduler (p222rwp@mpifr-bonn.mpg.de)

7. Launch of "A Radio Telescope for Ireland"

The project "A Radio Telescope for Ireland" (ARTI) had its official fundraising launch on March 25 at the Royal Irish Academy in Dublin. The project aims to find funding to construct and operate a state-of-the-art 32-m radio telescope in Birr, Co. Offaly on a site provided by the Earl of Rosse. The launch was attended by Dr. Phil Diamond (MERLIN), Sir Bernard Lovell, and Lord Rosse, as well as radio astronomers, engineers, administrators, educators and postgraduate students from about a dozen Irish universities, institutes of technology and governmental organizations.

Once built, the Birr radio telescope will conduct both stand-alone observations and interferometric observations with MERLIN, the EVN and the global VLBI array. It is also expected that the telescope will play a significant educational role in Ireland at all levels, including primary and secondary school. Various research groups on the island of Ireland are interested in using the telescope for radio studies of the Sun (Armagh Observatory, Queen's University Belfast), pulsars and supernovae (NUI - Galway), the interstellar medium (NUI - Galway, QUB), radio-emitting stars and stellar systems (Dublin Institute for Advanced Studies, University College Dublin, Armagh Observatory), and active galactic nuclei (University College Cork, Cork Institute of Technology). There is also considerable interest in the ARTI project by Irish engineering groups, most notably at NUI - Maynooth and University College Dublin.

Because of Ireland's location on the northwestern edge of Europe, adding a telescope in Birr to the existing European EVN will substantially increase the resolution that can be obtained; the longest baseline within Europe itself will run between Birr and Noto. The increase in resolution for joint Birr+MERLIN observations is especially impressive, about a factor of three, with the baseline-coverage plain virtually completely filled out to the maximum baseline due to the wide-bandwidth multi-frequency synthesis that will be possible with the upgraded MERLIN array.

In addition, radio interferometry is now rapidly moving toward "e-VLBI," in which the data are transported to a central processing facility along optic fibres in near-real time. Information and communication technology is currently a targeted area for funding within Ireland, and the launch of the ARTI project is well timed for the project to benefit from these exciting and challenging new technological developments in VLBI.

A site for the radio telescope has tentatively been identified, and plans are being formulated to carry out a geological survey to determine its suitability as the site for a large construction such as the proposed telescope. The site is a short walk from the historical "Leviathan" optical telescope, built by the Third Earl of Rosse in the nineteenth century, which was in fact the largest optical telescope in the world for some 50 years.

The radio telescope is planned to have a diameter of 32m and a design similar to those of other currently operating telescopes of this size, such as those at Cambridge, Torun and Noto. The telescope will be fully steerable and frequency flexible, with receivers operating at least between 1.6 and 22 GHz, possibly as high as 43 GHz.

So it all sounds grand, and the only thing between Ireland and her first astronomical radio telescope is a mere 10 million Euro - the estimated cost of building and equipping the telescope. Possible sources of funding include the European Regional Development Fund (Birr is an objective 1 region), Science Foundation Ireland (whose funding is targeted in part at research connected with information and communication technology), and corporate and private donors.

For further information, see the ARTI website, <http://www.arti.ie>, or get in touch with Denise Gabuzda (University College Cork, gabuzda@phys.ucc.ie) or Aaron Golden (NUI - Galway, agolden@it.nuigalway.ie), who are currently the ARTI Project Coordinator and Project Scientist.

Denise Gabuzda
Cork University (gabuzda@phys.ucc.ie)

8. Availability of local WSRT synthesis data during EVN sessions

The data acquisition system of the WSRT permits local synthesis observations to be carried out, simultaneously with phased array VLBI observations. Indeed, during the entire VLBI session for each project, data from WSRT local synthesis correlation are recorded and archived. These data are now made available to the community.

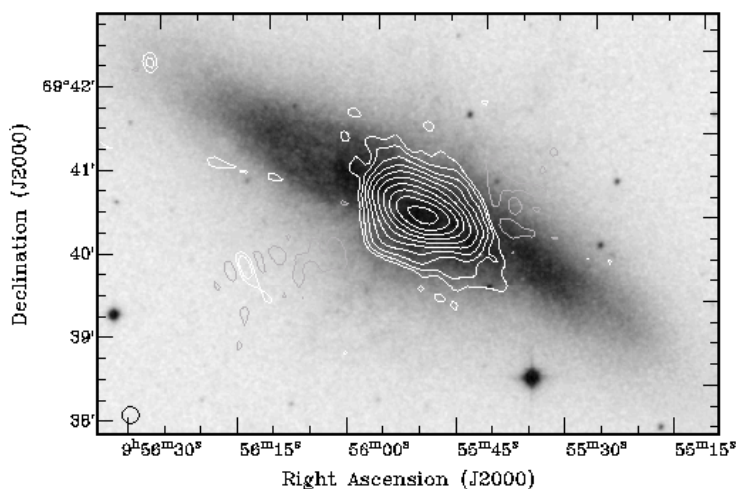
For long experiments (ideally more than about 8h), the WSRT data can provide an image of the observed field that can be used, for example, to investigate the large scale structure of the observed object, or to measure

the large-scale flux density of the object of interest. The typical resolution at L-band is about 12 arcsec. Spectroscopic use of the WSRT data may also be possible, depending on the correlator configuration. More information about the capabilities of the WSRT can be found in the "Guide to Observations" (<http://www.astron.nl/wsrt/wsrtGuide>).

PI's who would like to obtain the WSRT local synthesis data in addition to their EVN data should request these data on their EVN proposal form (by including few words of justification in the text and indicate "WSRT synthesis data" in item 11, i.e. "Non-VLBI Instruments"). Requested WSRT data taken with approved EVN proposals have the standard EVN proprietary period of one year after export of the VLBI data. Exception to this is the case where there is a conflict (e.g. observations of the same object) with a "regular" WSRT programme (i.e. a programme which has gone through the WSRT PC review), which will then take precedence. If no explicit request is made, the local WSRT synthesis data will become public straight after observation, unless release would compromise the proprietary rights of an independent WSRT programme. Astronomers interested in WSRT data taken in parallel to the VLBI session should contact the Telescope Astronomer (Rene Vermeulen, rvermeulen@astron.nl). There is a new WSRT project administration tool, which handles local synthesis measurements obtained during VLBI observations as well, and will soon have browsing functionality for astronomers at large.

WSRT data can be exported as UVfits files and calibrated and analysed using different packages (Classic AIPS, Miriad, Newstar). Information about how to reduce the data can be found on the web pages: <http://www.astron.nl/p/observing.htm> under "Analysis of WSRT data". As for normal WSRT observations, user support to help with the data reduction can be provided by the WSRT system scientists.

An example of an image obtained from the data recorded during the VLBI experiment "M82 OH-masers" (EB026; Argo M., Beswick R. et al.) in session Feb04 is shown below. The experiment used eight 20-MHz bands (of which only four were used to make this image) with frequencies ranging between 1611 and 1707 MHz (and 64 channels for each band). About 4h of the observations were "on source", spread over the full 8h VLBI experiment (resulting in good, although incomplete uv coverage for the WSRT). The resulting image has a rms noise of about 0.35 mJy/beam (uniform weighting) and has been restored with a beam of 12 arcsec. The first contour is 2 mJy/beam.



Raffaella Morganti
(ASTRON, morganti@astron.nl)

9. Polarized emission in the central parsecs of FRI radio galaxies

Magnetic fields are likely to play a crucial role in the formation and collimation of jets in Active Galactic Nuclei (AGNs) and are a tracer of the underlying hydrodynamics of the jet, showing the effects of oblique shocks, boundary layer interactions, shear, turbulence, and cloud interactions. The technique of VLBI polarimetry (VLBP) provides information about the ordering of pc-scale magnetic fields, their orientation and the Faraday depth along the line of sight to, and within, the jets. VLBP studies have been made for the radio-powerful and 'beamed' AGNs, *viz.*, the radio-loud quasars and the BL Lac objects.

Only a handful of their plane-of-sky 'unbeamed' counterparts, the FRII and FRI radio galaxies, have so far been observed with VLBP and fewer still have shown polarization, most of which happen to be the radio-powerful FRIIs. The lack of detectable polarization in radio galaxies has been attributed to the presence of depolarising material, either in the form of a molecular torus with an inner ionised edge or broad and narrow-

line clouds.

We have observed four FRI radio galaxies as a part of a pilot study to determine the detectability of pc-scale polarization in radio galaxies. The observations were made in March 2002 at 8.4 GHz using a global VLBI array in dual-polarization mode. The array comprised of five EVN telescopes along with the ten VLBA antennas and the data were correlated with the EVN MkIV Data Processor at JIVE. All the telescopes except Onsala and Yebes recorded both right and left circular polarizations (RCP and LCP). The calibration and imaging of the data were done using the AIPS package.

We detected polarization from the pc-scale cores and/or inner jets of *all* the FRI radio galaxies. In two out of the four sources, the presence of EVN's Effelsberg antenna was elemental in the detection of polarization. Figure 1 shows the rich polarization structure observed in the FRI radio galaxy 3C264. A region with polarization electric vectors χ roughly transverse to the VLBI jet direction is visible in the innermost jet; since this region is probably optically thin, this implies a longitudinal B-field. At a distance of 5-6 mas, the inferred B-field is longitudinal at the edge of the jet, possibly suggesting jet interaction with the interstellar medium. If the core polarization is dominated by the contributions of optically thick regions, the inferred B-field is transverse to the jet direction. Two other FRIs show a transverse B-field geometry in their inner jets, similar to that observed in BL Lacs, consistent with the predictions of the Unified Scheme.

The fourth FRI shows polarization only in its core and none in its jet.

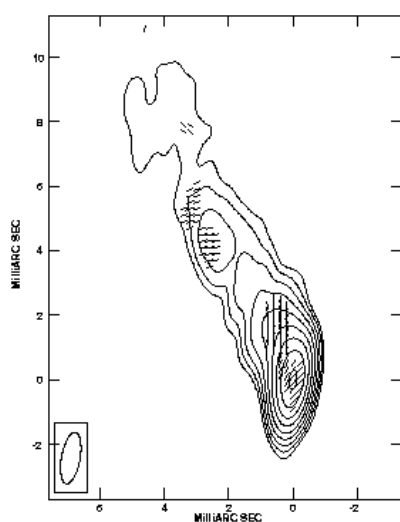


Figure 1 - Total intensity map of 3C-264 with χ vectors superimposed. Peak surface brightness = $136.3 \text{ mJy beam}^{-1}$. Contours are in percentage of the peak and increase in steps of x2, lowest contour = -0.35% of peak.

P. Kharb(1), P. Shastri(1) and D. Gabuzda(2)

(1)Indian Institute of Astrophysics, Bangalore, India (rhea@iiap.res.in,pshastri@iiap.res.in)

(2)Department of Physics, University College Cork (gabuzda@phys.ucc.ie)

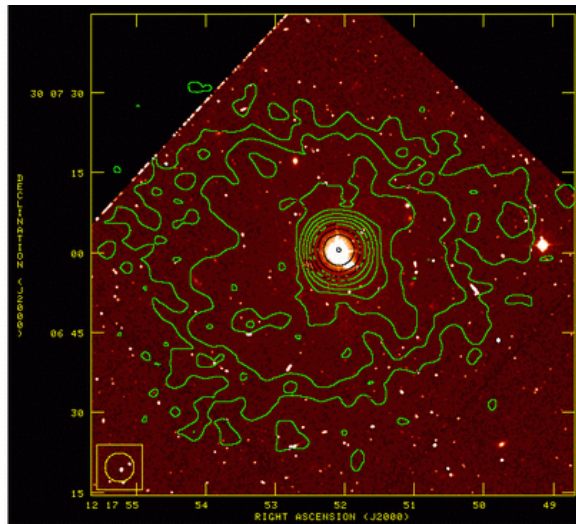
10. EVN+Merlin observations of the low redshift BL Lac 1215+303

The BL Lac 1215+303 ($z=0.130$) is part of a sample of 30 nearby ($z < 0.2$) BL Lac objects, that we are studying with radio interferometers at arcsecond and milliarcsecond angular resolution, and for which high quality Hubble Space Telescope optical images are available (Scarpa et al. 2000). The superimposition of the FIRST (Faint Images of the Radio Sky at Twenty cm) contours to the HST image reveals a diffuse halo (of about 60 arcsec diameter), dominated by a central unresolved 350 mJy core, coincident with the optical active nucleus (top panel in the figure below).

We have observed the source with the combined EVN+MERLIN array at 5 GHz (bottom panel in the figure), obtaining images with resolution as small as 10 pc (i.e. about 5 mas HPBW with EVN only data). The EVN stations involved in the experiment were Effelsberg, Medicina, Noto, Onsala, Shanghai, Torun, and the WSRT, plus the telescopes in Jodrell Bank (MkII) and Cambridge, which are common to the MERLIN array as well. The data reveal a core-jet morphology, with the jet emerging in PA 140 degrees and maintaining the same direction up to a (projected) distance of about 500 mas, where it becomes too faint and confused with the noise (0.35 mJy/beam). The large jet/counterjet ratio ($R > 150$) argues for a significant Doppler beaming taking place in this source; from this and other arguments, we estimate that the jet axis is oriented at 15 ± 5 degrees to the line of sight, and that it has a bulk Lorentz factor of about 3.8.

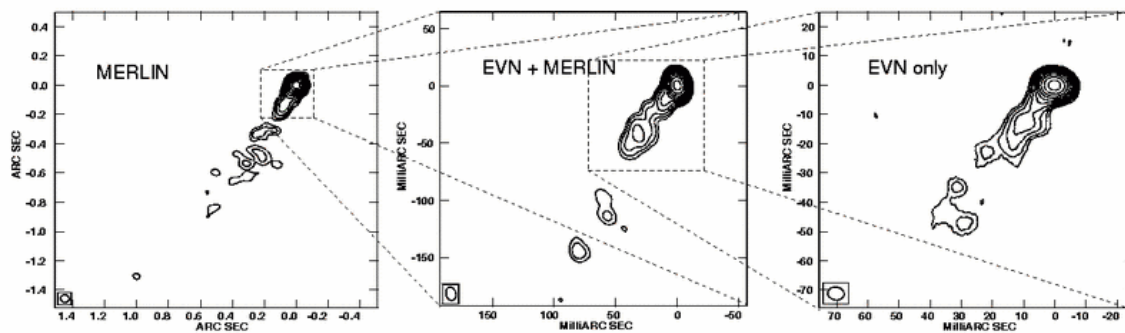
The viewing angles obtained for 1215+303 and for the other objects in the sample are consistent with the hypothesis that BL Lacs are radio galaxies seen end on. In particular, the resulting Doppler factors imply de-

beamed, intrinsic radio powers typical of type I Fanaroff-Riley radio galaxies (FR I). In agreement with this interpretation, the halo visible on kpc scale can be explained as the projection of a large lobe. Finally, the straightness of the jet in this source from the innermost EVN region out to the largest scale MERLIN image is a remarkable feature of 1215+303, common to other sources in the present sample as well. Differently from more powerful sources (see e.g. the 1 Jy sample, Cassaro et al. 2002), the objects in our sample of low redshift BL Lacs present evidence for little or no bending from the parsec scale to the outermost regions of the jet. This is in agreement with the similar behaviour found for four extreme High-energy peaked BL Lacs (Rector et al. 2003), suggesting that weak objects tend to possess intrinsically straight jets.



Left: radio contours from the FIRST survey, overlaid to the Hubble Space Telescope image of 1215+303.

Below (left to right): MERLIN, combined EVN+MERLIN, and EVN only images of 1215+303.



Marcello Giroletti

Istituto di Radioastronomia CNR, Via Gobetti 101, 40129 Bologna, Italy (giroletti@ira.cnr.it)

11. EVN observations of H₂O masers towards the high-mass young stellar object in AFGL 514

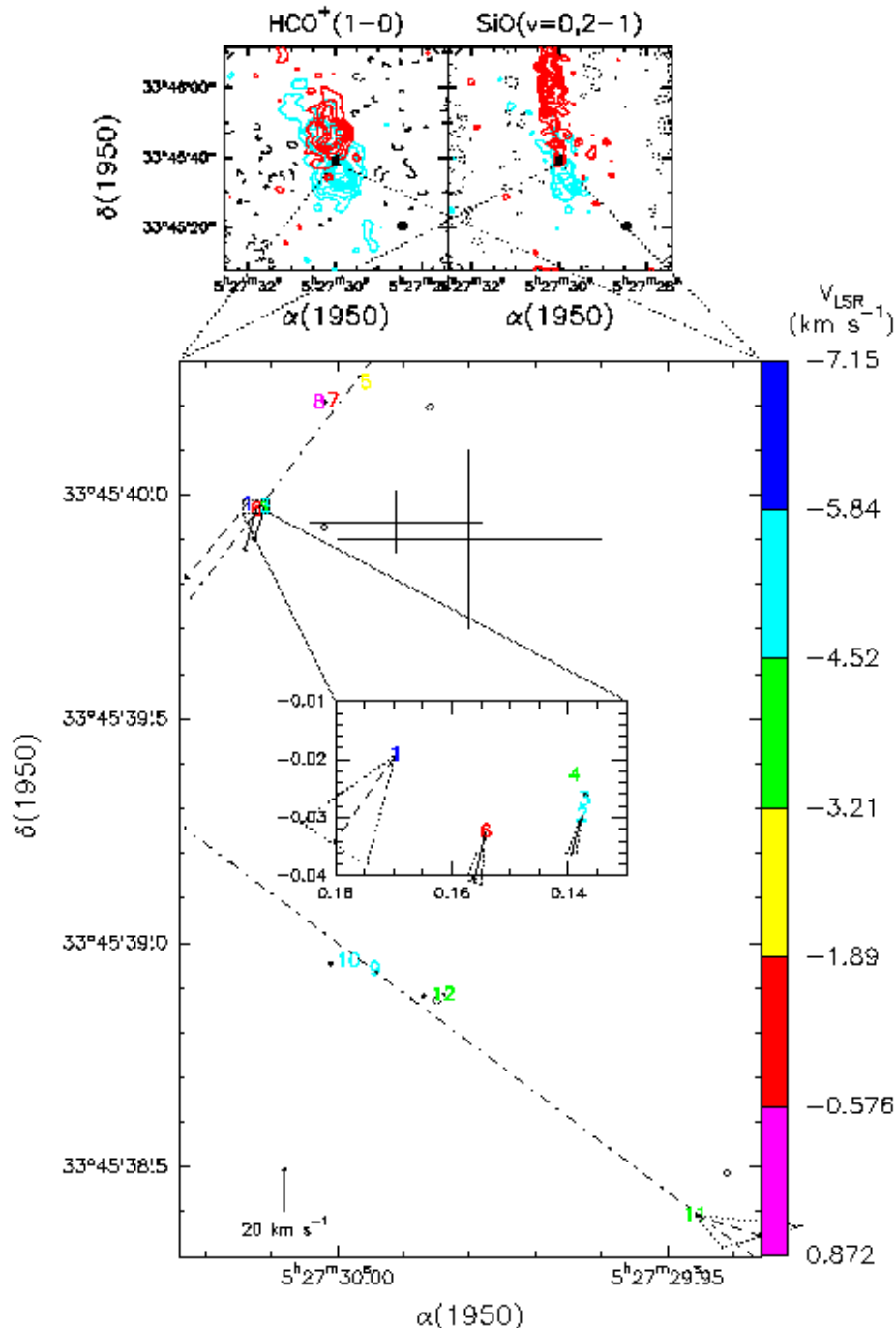
We have conducted multi-epoch EVN observations of the 22.2 GHz water masers towards the high-mass young stellar object in AFGL 5142. With four observing epochs, spanning a time of 1 year, 12 distinct maser features have been detected, 7 of which were detected in more than one epoch. The enclosed Fig. compares our VLBI results with previous interferometric observations. Top panels show the high-velocity molecular outflows seen in HCO⁺ and SiO with OVRO (Hunter et al., 1999, AJ, 118, 477). The area comprising the 22.2 GHz water maser emission detected by our VLBI observations is indicated by a small filled rectangle at the centre of the field of view. This area is expanded in the lower panel of the Fig., which shows the spatial distribution of the VLBI maser features (indicated by identification label numbers) superimposed on top of the distribution of the VLA emission centers found by Hunter et al. (1995, A&A, 302, 249; 1999, AJ, 118, 477) at two different epochs (indicated by dots and open squares). The positions and velocities of the VLBI features agree well with those of the VLA emission centres.

For a few features, persistent over three or four epochs, accurate values of the proper motions are derived (indicated by the arrows). The observed proper motions have an amplitude of 15-20 km/s, significantly larger than the range of variation of the line-of-sight velocities (\sim 4 km/s around the systemic velocity). On the basis of their spatial distribution, the observed maser features can be divided into two groups. A model fit to the positions and velocities of the maser features of Group I, detected in the same region (within 500 mas) where the massive YSO should be located (whose position is individuated by the big and the small crosses in the Fig., giving the position uncertainties of two continuum sources, detected respectively with the VLA at 8.4

GHz and with OVRO at 88 GHz), demonstrates that these might arise on the surface of a nearly edge-on Keplerian disk, rotating around a massive young stellar object.

The maser features of Group II, found at large distances from the YSO ($> 1''$), have positions and line-of-sight velocities in agreement with the blue-shifted lobe of a large-scale molecular outflow (traced by the HCO⁺ and SiO emission), and might result from the interaction between the gas flowing away from the young stellar object and the ambient gas of the progenitor molecular core.

This paper has been accepted by Astronomy&Astrophysics.



C. Goddi (1), L. Moscadelli (1), W. Alef(2), and J. Brand (3)

(1) INAF, Osservatorio Astronomico di Cagliari, Loc. Poggio dei Pini, Str. 54, 09012 Capoterra (CA), Italy

(2) Max-Planck-Institut für Radioastronomie, Auf dem H^ugel 69, D-53121 Bonn, Germany

(3) Istituto di Radioastronomia CNR, Via Gobetti 101, 40129 Bologna, Italy

12. Report on the European Workshop 2004 on Astronomical Molecules: Dense Molecular Gas around Protostars and in Galactic Nuclei

From February 17-20, a meeting was held in the town of Zwolle in the Netherlands with about 50 astronomers from a dozen countries. Most of them were from European Institutes, but some came from Australia, South Africa, and USA. The Workshop program only had oral sessions with 41 talks and ample time for public and private discussion.

The objective of the Workshop was to explore molecular research in terms of the diagnostic tools it provides for stellar environments and for galactic nuclei. The meeting provided a platform for a meeting of theory and interpretation, and observations. The atmosphere of the workshop was very congenial and the meeting was full of young scientists that were eager to enter into discussions with the more 'established' participants.

Photos of the workshop as well as links to presentation files can be found at the web page of the meeting (<http://www.jive.nl/molecules2004>)

Beside the scientific sessions, the LOC hosted a Workshop Dinner at a historical site just outside Zwolle. LOC members N. Csonka (ASTRON) and M. Tibbe (JIVE) did an outstanding job for the organization of the Workshop. The financial support from the RadioNet Consortium for the Workshop is gratefully acknowledged.



Y. Hagiwara
(ASTRON, hagiwara@astron.nl)

ANNOUNCEMENTS

13. The 7th European VLBI Network Symposium on New Developments in VLBI Science and Technology

The Observatorio Astronómico Nacional (OAN) of Spain, together with the European VLBI Consortium and RadioNET, hosts the 7th European VLBI Network Symposium on New Developments in VLBI Science and Technology and celebrates the construction of the new 40-meter radiotelescope at Yebes (Guadalajara), 25 years of radioastronomy in Spain, 100 years of astronomy at the Instituto Geográfico Nacional (IGN), and 200 years of the first astronomical observation at Real Observatorio Astronómico de Madrid with the Herschel 25-foot telescope.

The symposium will take place on October 12-15 2004 in the historic city of Toledo, Spain. The conference sessions will take place at Hotel Beatriz****, situated at 45 minutes from Madrid and its airport ("Barajas"). The EVN Users Meeting will be held during the conference.

The scientific program is being organized in sessions devoted to galaxies (AGN and their environment, variability, gravitational lenses, megamasers), stars (circumstellar AGB envelopes, star-forming regions,

masers, supernovae, microquasars), instrumentation (VLBI software and hardware, telescopes, new data transport infrastructures and e-VLBI). and techniques (Geodetic VLBI, astrometry and phase-referencing, wide-field mapping, mm-VLBI). Of special importance are the contributions from young astronomers and students.

Confirmed speakers include Javier Alcolea (OAN, ES), Walter Alef (MPIfR, DE), Daniele Dallacasa (IRA, IT), Jose Luis Gomez (IAA, ES), Rüdiger Haas (OSO, SE), Liz Humphreys (CfA, USA), Hans-Rainer Klöckner (RUG, NL), Maria Marcha (Obs.Lisboa, PT), Enrico Massaro (U.Roma, IT), Maria Massi (MPIfR, DE), Raffaella Morganti (ASTRON, NL), Miguel Angel Pérez Torres (IAA-CSIC, ES), and Maria Rioja (OAN, ES).

Updated information on the symposium scientific program and logistics may be obtained on the web pages:

<http://www.oan.es/evn2004/>

or contacting the LOC at the email address: evn2004@oan.es

Francisco Colomer

Observatorio Astronomico National, Spain (f.colomer@oan.es)

14. Multiband Approach to AGN (Bonn 30 Sep - 2 Oct)

We are pleased to announce the RadioNet Scientific Workshop "Multiband approach to AGN". The workshop will be held on 30 September - 2 October at the Max-Planck-Institut for Radioastronomy in Bonn. This meeting is the second one in the series of the scientific workshops sponsored and organized by the EU Consortium RadioNet within the Sixth Framework Program of the European Commission.

SCIENTIFIC OBJECTIVES

The meeting in Bonn is aimed at bringing together scientists involved in AGN studies in different spectral bands, and discussing the nuclear activity in galaxies from different perspectives and in connection to similar processes occurring in galactic objects (X-ray binaries and "microquasars"). The workshop should set a stage for exchange of ideas and enhancing connections between various fields of astrophysical research addressing the problem of understanding the AGN at large. Critical aspects of AGN and XRB research will be highlighted in a small number of invited reviews, and further explored in the contributed talks and discussion forums. The workshop will be focused on three broadly defined areas in which various fields of the AGN research intersect with each other and with the studies of the XRB.

* AGN across the bands. Different "viewpoints" on AGN, ranging from the radio to the Gamma-ray band. Latest developments in the radio studies of AGN and in the emerging fields of jet and supermassive black hole studies in the optical, X-ray and Gamma-ray domains.

* AGN across the luminosity range. Reviewing the recent advances in studies of nuclear activity in Seyferts and LINERs and comparing these to the activity observed in powerful AGN. Connection between the accretion process and the BH mass/luminosity relation. Production of relativistic outflows and their role in the AGN. Theoretical modelling and connection between AGN and XRB. Searching for a common phenomenology and physics spanning across orders of magnitude in the parameter space.

* AGN across the Universe. Co-evolution of AGN and their host galaxies. Connecting the mainstream AGN studies to the galaxy formation and evolution, galaxy and black hole mergers and cosmology issues. Role of supermassive binary black holes in the evolution of AGN.

The workshop attendance will be limited to about 50 participants. Partial financial support from the RadioNet funding will be available for the invited speakers, young scientists and students.

PROGRAM OF THE WORKSHOP

The workshop will have eight 30 minute review talks covering the main areas of AGN research and setting the stage for about 20 contributed presentations. A modest number of posters can be accommodated in the main hall of the MPIfR. Each working day of the meeting will be concluded by a joint discussion. Because of the time and space limitations, attendance of the workshop is limited to 50 participants.

SCIENTIFIC ORGANIZING COMMITTEE

Frank Bertoldi (MPIfR, Bonn), Daniele Dallacasa (IRA, Bologna), Denise Gabuzda University of Cork), Heino Falcke (ASTRON, Dwingeloo), Rob Fender (University of Amsterdam), Andrei Lobanov (MPIfR, Bonn), Maria Marcha (University of Lisbon), Raffaella Morganti (ASTRON, Dwingeloo), Tiziana Venturi (IRA, Bologna).

THE WEBSITE OF THE SYMPOSIUM

Online registration forms and further information about the workshop are available at the meeting website:
<http://www.mpifr-bonn.mpg.de/bonn04>

The contact email address of the symposium: bonn04@mpifr-bonn.mpg.de

Andrei Lobanov
MPIfR, Bonn (alobanov@mpifr-bonn.mpg.de)

15. 2004 Young European Radio Astronomer's Conference

The Young European Radio Astronomer's Conference (YERAC) has been occurring nearly yearly for more than thirty years, at a wide range of institutions across Europe. The main idea behind YERAC is to bring together between 50 and 70 students and young postdocs working in radio astronomy, and allow them to get to know each other, exchange their knowledge, and experience the atmosphere of an informal inter-national conference. For many of the participants, YERAC is their first international meeting, and it provides them with a good opportunity to get practice giving talks about their research.

We are extremely pleased to announce that the XXXIV YERAC will be held in Ireland for the first time, at University College Cork. The conference will take place from August 30 -- September 3, 2004. The 2004 YERAC at UCC is being funded by the EU FP6 RadioNet Network and the UCC Physics Department. This funding will cover the local expenses of all participants, and can provide a limited number of travel grants as well.

Traditionally, participation in YERAC is by invitation. An announcement has recently been sent out to various European institutions and universities, asking for nominations of undergraduate/postgraduate research students or young postdocs to attend the meeting. If your institution did not receive an announcement, but you would like to nominate a young researcher for participation in the 2004 YERAC, please contact Denise Gabuzda (gabuzda@phys.ucc.ie).

Each of the participants will present a short talk about their research. The programme will also include several review talks by Not Quite So Young European Radio Astronomers from around Ireland. Information about the programme of talks and talk abstracts will be posted on the YERAC 2004 web page (<http://www.physics.ucc.ie/YERAC>) sometime this summer.

Cork has a population of about 200,000, and is well known for its many good restaurants and pubs. You may think of Guinness when you think of Irish stout (dark beer), but if you ever come to Cork, make sure to try one of the local stouts -- Murphy's and Beamish. The historic city centre is about a 20 minute walk from UCC. Two branches of the River Lee flow through the central part of the city, and many of the streets, such as Patrick Street, which is the main street, actually follow old waterways. As long as it doesn't rain the whole week, it should be a great place for the 2004 YERAC!

Denise Gabuzda
Department of Physics, University College Cork (gabuzda@phys.ucc.ie)

16. PhD Position at University College Cork

PhD Position at University College Cork Funding is available for a PhD student in the Radio Astronomy group at University College Cork, working under the supervision of Dr. Denise Gabuzda. The PhD project will be connected with searches for observational evidence of toroidal or helical magnetic field associated with the parsec-scale jets of Active Galactic Nuclei, as well as modeling of the observational results. Part of the project will involve the analysis of new multi-frequency VLBA polarization data currently being obtained especially for this project.

The PhD work could begin as early as October 2004, but a somewhat later start date is also possible. Students of all nationalities are eligible to apply. The stipend awarded will be in approximately 11,000-14,000 Euro for students who are citizens of EU countries, depending on age and prior experience, and probably somewhat lower for non-EU students. Both students who will have received a Master's degree or equivalent before starting the PhD and those who have only finished their university degree are eligible to apply.

To be considered for this position, please send a CV, list of publications, and statement describing any previous research, and arrange to have two letters of reference sent to: Denise Gabuzda, Department of Physics, University College Cork (Cork, Republic of Ireland), email: gabuzda@phys.ucc.ie. Full attention will be given to all applications until the position is filled. For some additional information about the Radio Astronomy group at UCC, see <http://www.physics.ucc.ie/staff/dgabuzda.html>.

Denise Gabuzda

Department of Physics, University College Cork (gabuzda@phys.ucc.ie)

The European VLBI Network (EVN) website (<http://www.evlbi.org/>) is hosted by the Joint Institute for VLBI in Europe (<http://www.jive.nl/>).