

Jumping JIVE, WP9 – ‘Capacity for VLBI in Africa’

Minutes of kick-off Telecom (D9.1) – 10:00GMT, 9th February 2017

Present: Rob Beswick (RJB, UMAN – WP9 lead), Melvin Hoare (MH, Leeds – DARA** PI), Zsolt Paragi (ZP, JIVE, The Netherlands), Michael Lindqvist (ML, Onsala, Sweden), Trish Grant (TG, Leeds – DARA project manager)

Apologise: Anita Loots (SKA-SA), Tiziana Venturi (TV, INAF, Italy)*

Minutes: RJB

* A follow-up telecom was held between RJB and TV at 11:00GMT 9th February 2017 to report on outcomes of this telecom. For completeness comment from TV regarding elements discussed in the main telecom have been included in the following minutes.

** DARA = Development in Africa with Radio Astronomy, is a UK/SA Newton funded programme which will work in coordination with Jumping JIVE WP9. For a further description see minutes below.

1) Intro to purpose of WP9 J-Jive - RJB

Following introductions from all members on the telecom RJB provided a short description to the overall purpose of the WP9 within Jumping JIVE (JJ). This work package’s overarching objective is to provide expand and support on-going (DARA programme - see below for more details) scientific and technical human capital training initiatives within African nations in support of the development of the African VLBI Network (AVN) were described. This work will support development of the AVN as a new VLBI instrument by training potential users and technically orientated people within the AVN host countries thus aiding in the provision of a skilled local pool of people. This will contribute to the sustainability of the AVN project as well as the wider-effort to expand SKA (during phase2 – 2023-2030) to include outstations within partner African countries.

This JJ WP9 will operate in very close collaboration with the on-going (and recently expanded) DARA project which has a series of related objectives. JJ WP9 will in a cost effective way provide significant added value to the DARA programme by incorporating high-level technical and scientific expertise within the partner-EU countries, whilst building upon the existing organisation and networks that DARA developed within African partner countries.

Within JJ WP9 four key areas of contribution have been identified:

- Mobilize EU-experts (especially VLBI-expertise) from JJ partner countries to contribute to as expert tutors to contribute in country (African) training.
- Support EU-scientists to tour institutes with African countries, and in particular AVN partners to advertise, and develop interest in Radio Astronomy.
- Support a small number of short term visits/placements for African personnel at European institutes.
- Support the setting-up of an AVN technical and support forum.

- a copy of the WP9 description was circulated to all partners in advance of this telecom.

2) Overview of Background to DARA - MH

2a) Expanded DARA plans (2017++)

2b) Linkages/coordination between JJ + DARA - MH/RJB

MH gave an overview of the previous and future structure of the DARA. Original DARA was initiated in 2015 as an ambitious human capital development programme funded within the UK-South African partnership funded by the UK's Newton programme to develop high tech skills through radio astronomy in a number of African countries. This programme which built upon an on-going Royal Society programme in Ghana provided 4 training modules to training around 10 students from each of 3 individual countries (Zambia, Kenya, and Namibia). These students would be trained in Astronomy and related techniques. Following from this original DARA project, MH has recently obtained a 6-fold increase in funding via a new Newton DARA proposal which will commence in April 2017 with a 4 yr duration. This programme's timing matches with the JJ workplan duration. This extended DARA will provide continued training for new cohorts of students from existing partner countries and extend this to a number of new countries.

The current UK organisations involved in, and providing personnel contributions are the universities of Leeds (PI), Manchester, Oxford, Hertfordshire, central Lancashire (UCLAN) and Bristol. DARA also incorporates South African institutes and Universities including the SKA-SA. Within the DARA project these UK and South African partners are each providing significant numbers person-months of efforts to this project.

A draft copy of the extended DARA proposal outlining all activities in this project was circulated to WP members by MH for further details.

All WP members agreed that the use of JJ WP9 to enhance and add value to the existing DARA framework, and hence utilize the exist contacts and material being brought together under DARA, was the most effective way for this WP to operate and would provide the most added benefits.

3) Course structures (Combined DARA/JJ) - Melvin/Rob

MH described the structure of the DARA unit training. Within this framework JJ WP9 will aim to contribute a number of experienced tutors to enhance and aid this training exercise. It was noted by various WP members that the level of workload involved in preparing and delivering each unit was considerable. MH/RJB both commented that a significant number of people from the UK and SA, DARA partners, are contributing time for various course units and as such load on individual institutes or people would be minimised. Additionally as part of the DARA units extensive material was being created and shared upon which each course unit could be based. This is essential to both provide consistent training at different sites but also reduce preparatory workloads on individual teachers/tutors.

The DARA basic units are as follow

- **Unit 1 : Astrophysics** - a series of introductory astrophysics lectures to lay a foundation for the subsequent training. No previous astrophysics experience is assumed, although students are required to have knowledge of physics equivalent to a first degree level. This unit comprised a 2-week long which is delivered in the partner African country (Zambia, Kenya etc) with students typically drawn from across that country.
This unit is typically delivered by an academic staff member with relevant teaching experience, such as introductory astrophysics courses at undergraduate level.
- **Unit 2 : Technical Training** – This training is undertaken at either HartRAO in South Africa, or the first converted AVN dish at GSSTI in Ghana. Cohorts from 2 of the partner countries will be brought together at these to training locations and provided intensive technical training on a variety of areas relevant for radio astronomy and the operations of radio telescopes. This unit is delivered via lectures and hands-on training modules. *This unit is run back to back with unit 3.*
- **Unit 3 : Radio Astronomy Observations** - Training in observational astronomy taught via a combined lecture series with hands-on observing experience. This unit will follow-on directly with unit 2 and deliver training at the same location, either HartRAO or GSSTI, Ghana.

Typically the combined Unit 2/3 will be delivered over a ~3 week period, and will involve both technical staff (e.g. from HartRAO) and tutors with relevant experience from either JJ partners or DARA partners. The number of tutors to deliver these units is ~4-6 people, not all of which will be present for the whole period of the course.

The next of these planned units 2/3s is planned to occur in Ghana in Apr/May 2017, with 2 training events held in HartRAO per year. MH noted that these units are time efficient in the delivery of material. However there is currently a need of additional available tutors to volunteer – this is both true for Ghana and HartRAO.

Action (ALL): to consider identify any potential tutors that would be able/willing to contribute to these units (this is true for both 2017 and future trips).

Action: MH to circulate examples of previously used course material.

DONE

→ <http://avntraining.hartrao.ac.za/index.php/schools/2016-february>

Example of training material used for Unit2/3 as delivered in HartRAO in Feb 2016.

- **Unit 4 : Radio Astronomy Data Reduction and Analysis** - This is a 2-week long course which will be again delivered within the partner country in the same way unit 1 was delivered. This unit specifically trains students in the techniques of data reduction and analysis of VLBI and other long-baseline array data. This unit will use computing facilities set up at the lead institute for each partner country and supplied by the DARA project, or AVN, Royal Society funding. *JJ will not be required to purchase this computing infrastructure and associated JJ activities will be able to use the existing facilities funded via other related schemes.*

This training module typically trains a cohort of ~10 students per country and requires at least 2 tutors to work together with the students and provide a blend of Lecture material and hands-on tutorials. The basic course structure for this unit follows on from utilizes material and demonstrations from other similar international radio interferometric schools, such as the RadioNet-supported ERIS school.

The course structure and material for each of these units has been developed under the pre-existing DARA programme and is continuously being updated. However, it was noted that each of the set of tutors will want to amend and revise the course material they are delivering, however that by providing a repository of material delivered in previous units (all 4 units have been delivered in 4 countries in 2015/16) along with a basic course structure this would minimise the load on individual tutors.

These 4 units will be delivered for each partner African country by the DARA training team along with contributions by the JJ WP members each year (4-yr programme). As a consequence there will be multiple trips and opportunities to provide expertise and the idea would be to spread the workload over as many potential contributors as possible.

MH noted that with the expanded programme (now 6 countries) a total of 60 students will be trained each year, with a number of these also entering further advanced training modules (e.g. funded PhDs/MScRs in the UK and SA). These advanced trainees will potentially provide future VLBI infrastructure users.

4) *Personnel and skills resources available to JJ* - ALL

MH/RJB led discussions amongst the group regarding to which areas in this programme the JJ partners had the most expertise (and willing and available resources) that could contribute to these course units by providing Tutors/teachers.

ZP noted that at JIVE they do not operate telescopes and hence would probably not be in a position to help with units 2/3, but do have ample expertise within the Unit 4 area. MH commented that the Unit 2/3 material is quite broad and there may be some areas that people could contribute to, noting that there would be a team of tutors delivering these units with some tutors only contributing to a subset of the course. MH circulated the course material provided for these units at HartRAO (from Feb 2016) to although all WP members to gain a better insight into the level and content (see link above).

ML: noted that OSO have expertise in many of these areas – and will explore potential options.

TV (in follow-up telecom): was enthusiastic about INAF contributing to these units and has identified two staff members (Marcello Giroletti, and Gabrielle Sucris) who have extensive VLBI experience and would be very willing to participate in Unit 4 especially.

Action (ALL): To investigate potential people at JJ partner institutes that would be willing and able to contribute to any of the 4 training units outlined. **Please pass on potential tutor names, along with a note on expertise areas to Trish Grant (P.Grant@leeds.ac.uk), Melvin Hoare (M.G.Hoare@leeds.ac.uk) & Rob Beswick (Robert.beswick@manchester.ac.uk) who will coordinate this with DARA.**

Please note that this is a multi-year programme (4yrs currently) and multiple opportunities will arise. We aim to collect as wide as possible pool of 'potential tutors' so that we can spread the load and coordinate with the tutors availability and other work commitments.

5) JJ-funded seminars EU--> Africa - ALL

RJB noted that with JJ WP5 we also have a funding scheme to support scientists from EU countries and in particular JJ partners to travel to AVN and potential AVN countries to deliver seminars. This scheme is open to all.

Action (MH/RJB/TG): Via contacts established within the existing DARA identify potential countries/institutes in Africa that would like to receive such seminars. Distribute this list to JJ/DARA partners to explore potential speakers and destinations.

5) JJ-funded short term placements - Africa --> EU/or SA - ALL

As noted in the introduction this WP also can provide a limited number of trips by African (DARA/JJ Trainees) to undertake short placement trips to EU institutes. It was discussed within the group that this could, maybe ideally, involve combining trips with other relevant activities, such as ERIS or TOW meetings. Also it was noted that this could involve more technically orientated African personnel travelling to operational EVN stations.

ML noted that the TOW meeting which occurs every 2-yrs would be a good meeting for a technically orientated person to attend and this scheme could aid this participation.

It was noted that this activity would ideally be target at staff working to commission/develop new AVN dishes (e.g. in Ghana) or excellent students that have passed through the basic course and are continuing to be actively involved. This may mean that this action is deferred to later in the programme (e.g. yr 3/4).

Action (ALL+ wider DARA/JJ teams): To identify potential candidates who would benefit from this scheme.

As noted above additional support to set up an AVN equivalent of the EVN TOG . This was agreed as a good idea, but may require further development of AVN facilities and personnel. Further discussion on this was deferred.

7) AOB + future meetings/telecoms

RJB noted that he had sent an email in January to a number of DARA and likely JJ WP9 related people, regarding the potential for constructing science proposals for future EVN deadlines related to DARA. He noted that these proposals would need to be led by JJ/DARA tutors, who were experience scientist, and these proposals would be assessed on their science merit. But if approved, the students of future/current cohorts can use these data in future Unit 4 training and then can get their names included on any resultant scientific papers, thus helping their prospects in applying for PhD/Masters positions. This also opens opportunities for co-supervision of students, as the Kenyans have previously expressed interest, or for Masters/PhD projects that are funded by DARA/Jumping JIVE, if these are feasible of course. ML/ZP both noted that the timescales for getting data would be prohibitive for immediate training units, and that large volumes of potential training data was available via eMERLIN/EVN archives. RJB agreed to both of these point but argued that such data sets may be useful in the future, plus it would potentially help to expand the EVN proposal userbase, as well as open up potential use of RadioNet TransNational Access funding for the trainees in the future if they were to advance beyond the initial training units.

RJB noted that all members on the telecom would be present at the JJ Kick-off meeting later in February in Leiden, where further discussion on all areas can be continued.

Telecom end : 10:45 GMT.

Summary of actions:

Action (ALL): to consider identify any potential tutors that would be able/willing to contribute to these units (this is true for both 2017 and future trips).

Action: MH to circulate examples of previously used course material.

DONE

Action (ALL): To investigate potential people at JJ partner institutes that would be willing and able to contribute to any of the 4 training units outlined. **Please pass on potential tutor names, along with a note on expertise areas to Trish Grant (P.Grant@leeds.ac.uk), Melvin Hoare (M.G.Hoare@leeds.ac.uk) & Rob Beswick (Robert.beswick@manchester.ac.uk) who will coordinate this with DARA.**

Action (MH/RJB/TG): (regarding Seminar trips to EU) Via contacts established within the existing DARA identify potential countries/institutes in Africa that would like to receive such seminars. Distribute this list to JJ/DARA partners to explore potential speakers and destinations.

Action (ALL+ wider DARA/JJ teams): (Regarding potential Short term placements in the EU). To identify potential candidates who would benefit from this scheme.