The ERIS Organisers' guide

A living document for the ERIS Organisers developed by RadioNet project

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1 ERIS History and Raison d'être

The European Radio Interferometry School (ERIS) provides a week of lectures and tutorials on how to achieve scientific results from radio interferometry. The purpose of the school is to present the basic principles of radio interferometry techniques and data analysis, covering general aspects common to all observations but also specialised topics including high and low-frequency, polarimetry, spectroscopy and high resolution (VLBI) observations. This currently includes use of interferometer arrays which have European involvement or are internationally important, such as e-MERLIN, WSRT, ALMA, NOEMA, LOFAR, the European VLBI Network (EVN) and the VLA, and provides preparation for users of the next generation of arrays, notably the SKA.

These guidelines are also useful for planning similar events, in particular, in all cases please see below 4.5 below for conditions of RadioNet support.

Similar schools have, of course, been held previously but the first ERIS supported by RadioNet, took place in 2005 in Manchester (organised from Jodrell Bank Observatory, UK) followed by 2006 Grenoble (IRAM, France); 2007 Bonn (MPIfR, Germany);   2008 Grenoble (IRAM, France); 2009 Oxford (Oxf. Astrophysics/JBCA, UK); 2010 Grenoble (IRAM, France); 2011 Rimini (INAF/IRA Bologna, Italy);   2012 Grenoble (IRAM, France);   2013 Dwingeloo (ASTRON/JIVE, The Netherlands); 2015 Garching (ESO, Germany); 2016 Grenoble (IRAM, France); 2017 Dwingeloo (ASTRON/JIVE, The Netherlands); 2018 Grenoble (IRAM, France). Originally, the annual Schools alternated between cm- and mm-wave astronomy, but new instruments are evolving to provide almost continuous frequency coverage from metre to sub-mm wavelengths, and whilst there are still alternating emphases, the techniques taught and in some cases the examples cover most radio wavelengths. The present challenge is the lowest frequencies/widest fields, owing to the enormous data volumes, which are not extensively covered by ERIS, nor is Solar radio astronomy - so far.

The school is addressed both to early-career radio astronomers, and to astronomers and support scientists already working at other wavelengths or in e.g. software or engineering, who wish to broaden their knowledge and skills. Expert lecturers provide an overview of the scientific potential and techniques of radio interferometry, and the capabilities of current and future facilities, complemented by hands-on data reduction sessions led by experienced tutors. These include the use of common data reduction package(s) to process raw data through to final images or other products, plus the associated analysis of these products in order to tackle real astrophysical problems. Participants are introduced to the 'life cycle' of an experiment, from proposal-writing and planning observations, through to making their results accessible and retrievable via data archives.

By the end of the week, participants know where to start when they receive a delivery of interferometry data, what software to use and what manuals and other resources to consult. They understand the basic processes leading from raw visibility data to images, the range of possible products and how to recognise problems. Those starting with a little more experience also expand their skills through specialist sessions such as on polarimetry or more advanced VLBI and spectral line techniques. An on-line library of course materials, references and recipes for ongoing consultation and wide dissemination is made available. ERIS also provides valuable teaching experience for PDRAs and other interferometry specialists, as tutors and lecturers, and networking opportunities for all involved.

1.1   Reasons to become a ERIS organizer and how to become one

The 21st century is seeing a great expansion in the range and capabilities of radio arrays, meaning that a majority of astronomical research can now benefit from a radio dimension. Whilst the new facilities are well-documented and provide pipelined data, further processing is usually necessary, and a basic understanding of calibration and imaging is needed to make full use of telescope capabilities. If your institute runs an observatory, or has research groups using radio data, ERIS provides the training for the next generation of radio astronomers who will use the facilities and bring expertise to the research groups. Scientists developing hard-/soft-ware, who want to see how their work is used for astronomical objectives, are also welcome. ERIS provides a foundation for astronomers who go on to more specialised courses and become the next generation of observatory staff and experts, and provides networking and exposure to different techniques even for students from universities who provide radio astronomy courses.

1.2   The ERIS format and practical requirements

Typically, ERIS lasts for 5 days, for 60 to 100 participants and 10-20 lecturers and tutors. ERIS is usually over-subscribed and the relatively large size allows a wide range of techniques to be covered. Additional smaller events are also valuable but are not a substitute. Participants are expected to have at least started a relevant PhD or MSc, or to have equivalent experience e.g. as observatory staff. The format of ERIS evolves in response to telescope and information technology, so these notes reflect the situation in 2018. The agenda is about 50:50 lectures and hands-on data reduction, illustrated by the schedules of recent ERIS (www.astron.nl/eris2017/, www.iram-institute.org/EN/content-page-331-7-67-331-0-0.html, www.eso.org/sci/meetings/2015/eris2015.html). A collaborative exercise is usually included, e.g. participants break into small groups to write the technical justification of observing proposal on their favourite topics. Initial planning, including setting up an SOC and LOC, is similar to any conference; some particular issues are listed below but these are guidelines, the only fundamental requirement being the provision of effective training.

- Participants need their own laptops to run tutorials, which must be compatible with the data reduction packages, e.g. a recent LINUX or MAC o/s for CASA. Laptops need enough space for data processing, currently 20-50 G. Ideally, a few spares are available.
- Main meeting room, large enough capacity, ideally with room for tutors to reach all participants, with sufficient power sockets for all participants to use laptops, internet desirable (if not, provide data/packages on USB drives to pass round).   Two projectors to allow an overview or instructions to be displayed at the same time as 'live' data reduction. Breakout rooms for specialised sessions and proposal-writing groups.
- Sufficient lecturers and tutors for the talks/tutorial leads and for about 1 tutor per 20-30 students (more in the early sessions). A few IT experts available in breaks early in the school to help participants with problems installing software.
- Lecturers and tutors provide material in advance, to unify notation or at least note equivalences, and for all tutors to become familiar with/troubleshoot tutorials. *Our experience shows that it is vital that someone other than the author of a tutorial, tests it in advance from end to end on a laptop similar to those of participants, including downloading any material required.* Hard drives with the material needed should also be available.
- Affordable accommodation is needed (see Finances below).
- Traditionally, a half-day or evening trip to a local telescope or free time to visit local attractions, a conference dinner, and an after-dinner talk - there is no need to make these expensive as long as they are entertaining.

2   Time Plan

ERIS is usually held in September or October, and at least a year's advance planning is usually needed to apply for funding, book cheap accommodation etc. so in the table below 12 corresponds to September the previous year, 8 corresponds to the January RadioNet proposal call, etc. The time plan below is flexible (apart from funding organisation deadlines), but leaving things later will increase the expense and make it difficult for some partipants/lecturers to book the time, get visas, cheap travel etc..

Time till event (months)	12	11	10	9	8	7	6	5	4	3	2	1	0
Host institute decided, pre-announcement	x												
Determine SOC, LOC, draft budget	x	x	x	x	x								
Ask for funding at various agencies	x	x	x	x	x	x	x						
Identify conference site/ lodging	x	x	x	x	x								
Invite lecturers/tutors, outline lectures/tutorials			x	x	x								
Web site, announcements for registration, visas etc.				x	x	x	x	x	x				
Application deadline										x	x		
Advise students what software/data to download											x	x	
Deadline for cancellations, finalise catering etc.												x	
School! Curate web site, complete report/claims													x

3   Finances

The ERIS organizers are expected to pay for the local expenses: overheads, lecture rooms and equipment, lunch and coffee breaks, excursions. Basic B&B accommodation for participants is covered in the registration fee (e.g. youth hostel, university halls of residence or twin rooms in budget hotel), and, if necessary, bus/rail ticket or bicycles for commuting (plus suitable arrangements for any participants with mobility restrictions). Travel, board and lodging expenses should be offered for invited speakers and tutors but with a ceiling and encouragement to claim as much as possible from their own grants.

Participants normally pay for their own travel and evening meals apart from the conference dinner etc. The current typical registration fee is €150-200. Additional financial support may be offered to participants but for all participants it is useful to require some guarantee of attendance/timely notification of withdrawal, such as registration payment regardless of possible later reimbursement and/or recommendation from their supervisor/line manager/head of department.

Part of the funding may be requested from the **RadioNet,** currently up to about €15,000. Note that RadioNet rules are quite strict regarding financing conference dinners or social events, see https://radiowiki.mpifr-bonn.mpg.de/doku.php?id=na:training:schools. The RadioNet contribution typically covers half the total cost so please apply for additional funding from national funding agencies, from foundations or your institute. There may be special possibilities from other funding organisations for support for participants from less well-off institutes (e.g. collaborations with the African VLBI Network countries). The current RadioNet offers the posibility of financial support by issuing calls for support twice a year close to January 1st and June 1st.

ERIS organisers should apply to the appropriate RadioNet funding proposal call (currently workpackage 3.1 Training) in enough time to allow planning, e.g. no later than the January call for a September event. Prospective ERIS organisers are welcome to contact informally the Workpackage leader or the RadioNet office at any time if they have queries, for example a more detailed financial breakdown example. ***Also please see below 4.5 below for conditions of RadioNet support***.

4   Organization

4.1   Scientific and Local organising committees/lecturers

The SoC and invited lecturers/tutorial leaders should cover expertise in a range of arrays and basic techniques. It may be useful but is not obligatory to include some previous ERIS organisers and one or more members of the RadioNet training workpackage. RadioNet can help identify experts if necessary. It is useful to include a local administrator on the LoC.

4.2   Tutorials and tutors

The initial tutorials usually trace a single data set from a convenient point in raw data processing (some pre-averaging, flagging, instrumental calibration etc. might be needed) to initial imaging. This should be reasonably typical of (possibly a subset of) current interferometry data from an array with European involvement. Additional data sets are used to illustrate more specialised techniques but it makes it easier for all concerned to keep the number of data sets to a minimum and to use a single package wherever possible (currently CASA). PDRAs from the host institute often make up most of the tutors (in addition to the lecturers) but again RadioNet can help find people if necessary. They should get access to the tutorials/data before the event, in order to debug instructions/become familiar with the scripts, especially for new tutorials or tutors.

4.3   Sending out the advertisements/applications

ERIS can be advertised as widely as possible; although the majority of participants should be Europe-based there are no geographical restrictions. Most organisations including RadioNet do not provide contact lists due to data protection, but will circulate the announcements for you. Some participants, including non-EU nationals working/studying in European countries, may need to apply for visas 3 months or even more in advance, so early announcements should ask such people to contact you specifying what details are needed in their letter of invitation. Also provide a section for participants to indicate any mobility or dietary restrictions. ***See Section 4.5 for conditions for individual funding.***

4.4   Diversity

Please refer to the RadioNet Diversity Charter https://www.radionet-org.eu/radionet/diversity-charter/ and endeavour to provide good representation with respect to gender, ethnic origin, geographical distribution etc., for lecturers/leaders as well as participants. Please also draw the attention of presenters to this or a similar statement.

4.5   Eligibility for RadioNet support and management of the meeting

The conditions of RadioNet ssupport under Horizon2020 mean that the training should be devoted to equipping radio astronomers and engineers with the skills which are essential to take full advantage of RadioNet infrastructures. This should explicitly include some or all of (EVN, *e*-MERLIN, NOEMA, IRAM-30m, LOFAR, Effelsberg, APEX and ALTA) and/or technical developments (AETHRA, BRAND EVN and RINGS). You will have been sent information about RadioNet accounting requirements. At present the main points are: A RadioNet partner institute should handle organisational claims such as catering and claim back from RadioNet (see Guide for organisers).

RadioNet can normally provide financial support only to RadioNet beneficiaries as organisers, tutors/lectures or trainees. Exceptionally RadioNet can also support travel expenses of trainees from non-RadioNet affiliates upon prior approval. In all cases where participants are to be supported individually, a list and motivation, must be submitted in advance.

You will have been sent information about RadioNet accounting requirements. At present the main points are: A RadioNet partner institute should handle organisational claims such as catering and claim back from RadioNet (see Guide for organisers). All participants who have been approved by the RadioNet workpackage leader in advance should get the organising institute or their home institute to pay for travel (under the rules of the institute); the institute then claims from RadioNet. Alternatively, they may claim directly from RadioNet in which case the rules of the MPIfR host of Radionet apply. All claims must be submitted to RadioNet after the event and not later than 6 months. Please consult the RadioNet office for any queries about the claim process.

Using a conference management system such as INDICO (free; developed at CERN) makes things easier (such as management of registrations and abstracts, preparing badges etc., and track payment of conference fees, if needed). If your institute does not have a good system already, contact RadioNet.

Please consider some form of feedback collection, which could include any of an open discussion session, a questionnaire or on-line questionnaire, etc. Ultimately we need to assess the contribution ERIS makes to use of, and publications from, RadioNet infrastructures and technical development, in order to motivate continuing support for this kind of event, as well as improving the presentation, effectiveness and relevance of ERISs.

4.6   The program

As mentioned in 1.2, suggestions for the program are best illustrated by links to previous agendas. You are welcome to re-use previous material (suitably credited). Points to remember are that all talks should contain the acknowledgments required by RadioNet and any other sponsors, and all lecturers and tutors should make their material available for curation.

The required logos and statement, and templates, are available from
https://www.radionet-org.eu/radionet/event-organiser-help/

5   After the event

Complete the report required by RadioNet and ensure that all claims are submitted on time.

Feed back any comments or suggestions to improve this guide for future ERIS organisers.

Provide a web site which will be stable for several years (if possible longer) to link the lectures and tutorial material; this is one of the deliverables, to provide a resource for the community including future ERIS organisers. It is helpful if someone remains responsible for this and responds to feedback, updates if there are any major changes in software, etc. After a few years material may become obsolete, hopefully replaced by future ERISs. Please contact the WP leader or the RadioNet office if you need us to provide a web host.

Appendix

Conduct of training schools and workshops

We strongly advise that all ERIS workshops adopt policies which promote considerate behaviour, a harassment-free meeting environment for everyone and full inclusivity. This could be a reference to the RadioNet Diversity Charter https://www.radionet-org.eu/radionet/diversity-charter/ and any Code of Conduct of the host institute.

These are intended to promote consideration and inclusivity, not increase anxiety. Some more points are worth considering when organising events for people from all over the world, especially students and early-career scientists. In all interactions, whether between lecturers, tutors or trainees, please be aware that:

- Different levels of asssertiveness or formality are normal in different cultures - don't be offended by a blunt disagreement, answer it courteously; conversely, be sensitive to a tentative query which may be a deeply serious point.
- In some regions it is normal for more senior (or apparently more senior) staff to be very abrupt with their colleagues. Please try to be polite, and don't make assumptions about someone's level of experience. However, please don't take offence at criticism or blunt instructions; start by assuming that it is well-indended and respond courteously (even if you are disgreeing). If there is a serious problem, consult the workshop/school organiser, or the RadioNet contact or the RadioNet office.
- Don't interrupt a colleague's presentation or undermine them. If you think that they could be doing better, offer (not force) constructive feedback afterwards, tactfully. If they miss out something you think is important, save it for your own work or bring it up in discussion afterwards (after students have had a chance to ask questions). If something is really badly wrong (like the wrong data set being used for a demo, or slides with writing too small to read), wait for a suitable moment to suggest a break 'to tackle a technical problem' or 'to allow us to catch up' and have a quiet word with the presenter.
- The commonest problem is presenters going too fast. Different groups can turn out to have different levels of experience and it is worth being sensitive to this and being prepared to slow down or split a session. Build some slack into the agenda, or have parellel sessions where an advanced subject is on offer but a different group can have intensive help to catch up on the basics.
- You might want to include a gathering of lecturers and tutors where everyone can, first, say what they think went well or could be improved in their *own* session, and then get constructive feedback from their colleagues, in a way which builds confidence and allows everyone to be open to friendly criticism.