

# WP3.1 Training - Astronomical / Engineering Schools

This activity will foster the skills needed for exploitation of European radio astronomy facilities by researchers worldwide. It will enable radio astronomers to take advantage of global best practices and research opportunities and help newcomers to radio astronomy to learn current state-of-the-art techniques, and encourage them to stay in the field. The events are aimed at astronomers and engineers in order to communicate, and indeed develop techniques needed to plan observations, reduce and interpret data from present and next-generation facilities. This ensures that there will be sufficient experts in the market to support their communities in making use of new opportunities (ALMA, EHT and SKA, and the other rapidly-evolving RadioNet facilities).

## Guidelines on the level of support

The Support Requests, circulated every 6 months, and the forms sent to successful applicants, contain full details of the funding conditions, including a report template. The total budget for this workpackage is 150k Euro over 4 years, and in order to ensure a fair distribution we adopt the following guidelines (although any requests will be considered within the rules of allowable expenditure):

- About half or less of the total cost of an event will be supported, and the level of support will not exceed the equivalent of 30 Euro per attendee per day (not necessarily spent individually).
- Specific amounts are earmarked for named deliverable events such as the European Radio Interferometry Schools, Radio-focussed Solar events and hands-on Single dish Schools, see the [workpackage description](#).
- In other cases the amount allocated will not normally exceed a few K Euro.
- In most cases, the larger part of support allocated is used to enable the attendance of participants, but it can also be used, for example, to invite radio-specialist tutors to a general school.
- Events must be openly advertised and accessible to the entire community, although the imposition of transparent selection criteria is acceptable.

We welcome informal inquiries; please contact the workpage leader [a.m.s.richards@manchester.ac.uk](mailto:a.m.s.richards@manchester.ac.uk) or the RadioNet office.

## Teaching Material

The teaching materials, including the lecture notes, tutorial guides and datasets used for the school are archived on the school website, which provides an additional route for the transfer of knowledge to students that were unable to attend the school and will form the basis for the material used at future events. Web resources are also listed below:

1. **ALMA community days and workshops** - these are partly based on tools, data and material

- available via the ALMA science portal and CASA guides, additional material at [Community Days 2017](#) and [ALMA conference](#)
- 2. **VLBI tools in CASA** - these have now been released in [CASA 5.3](#)
- 3. **ASTA** - advanced software tools are curated by individual ARC nodes (see [listing of tools](#) and [links to ARCNodes](#). Presentations are [here](#)
- 4. **Self-calibration and advanced imaging** talks and tutorial materials are [here](#)
- 5. **ERIS** talks and tutorials [ERIS 2017](#), [ERIS 2019](#) which form an introductory radio interferometry course. [ERIS manual for organizers](#)
- 6. **Submillimetre Single-dish Data Reduction and Array Combination Techniques** materials have been published via Zenodo and are available under [link](#)
- 7. **LOFAR** materials are at [5th LOFAR Data Processing School](#) and [High resolution Surveying with International LOFAR](#)
- 8. **IRAM**-led schools provide mm-wave [interferometry](#) and [single dish](#) teaching materials.
- 9. The **Dublin interferometry data processing school** [scripts and data](#) are especially relevant for e-MERLIN and ALMA.
- 10. The **CESRA** materials are at [2018 school](#)

## Supported training events

Event				Organiser		EVENT
No	Date	Place/Country	Event Title	Organiser	Place/Country	Report
25	2-6.11.2020 Virtual	Dwingeloo/NL	Interactive CASA VLBI workshop	JIV-ERIC	Dwingeloo/NL	<a href="#">Report</a>
24	September 2020 - CANCELLED	Dwingeloo/NL	6th LOFAR data processing school	ASTRON	Dwingeloo/NL	CANCELLED
23	24-28.8.2020 CANCELLED	Prague/CZ	CESRA Summer School	Czech Academy of Sciences	Prague/CZ	CANCELLED
22	24-26.6.2020 - virtual	Dwingeloo/NL	<a href="#">LOFAR Polarization Busy Days</a>	Dwingeloo/NL	virtual meeting	
21	22-26.6.2020 CANCELLED	Rome/IT	Introduction to RA	INAF	Rome/IT	CANCELLED
20	24-29 May 2020 POSTPONED to 2021	Turku/FI	North-European Radio Astronomy School	UTU	Solvalla, Espoo/FI	CANCELLED
19	8-9.4.2020 POSTPONED	Glasgow/UK	Sub-Second structures in low frequency solar radio observation	UNIGLAS	Glasgow/UK	POSTPONED
18	2020 Virtual November	Lisbon/PT	Exploiting Archives for RA in SKA ERA	PACE	PT	<a href="#">report</a>
17	2-6 March 2020	OBSPARIS/FR	<a href="#">Summer School Spectrum Management for Radio Astronomy</a>	STIAS	Stellenbosch/SA	<a href="#">Report</a>

Event				Organiser		EVENT
No	Date	Place/Country	Event Title	Organiser	Place/Country	Report
16	21-25.10.2019	Dwingeloo/NL	<a href="#">LOFAR solar and space weather KSP busy week, Solar KSP home pages</a>	ASTRON	Dwingeloo/NL	<a href="#">Report</a>
15	7-11.10.2019	Gothenburg/SE	<a href="#">ERIS</a>	CHALMERS	Gothenburg/SE	<a href="#">Report</a>
14	6-13.9.2019	Granada/ES	<a href="#">9. IRAM 30m Summer School and lectures</a>	IRAM	Granada/ES	<a href="#">Report</a>
13	1-5.10.2018	IRAM/FR	<a href="#">10th Millimetre Interferometry School</a>	IRAM Grenoble	FR	<a href="#">Report</a>
12	10-12.09.2018	Dublin/IR	<a href="#">Interferometric Data Processing Workshop for eMERLIN &amp; ALMA</a>	UMAN	UK	<a href="#">Report</a>
11	10-14.09.2018	Royal Obs./BE	<a href="#">CESRA Summer School</a>	Royal Obs. Belgium	Brussels	<a href="#">Report</a>
10	17-21.09.2018	ASTRON/NL	<a href="#">LOFAR data processing school</a>	ASTRON	Dwingeloo/NL	<a href="#">Report</a>
9	19-23.03.2018	Lotenz Centre, Leiden	<a href="#">High-resolution surveying with international LOFAR</a>	UOXF	Leiden/NL	<a href="#">Report</a>
8	15.-16.03.2018	Garching/DE	<a href="#">APEX &amp; ALMA Single-dish training workshop</a>	ESO	Garching/DE	<a href="#">Report</a>
7	16-21.10.2017	ASTRON/JIVE/NL	<a href="#">ERIS2017</a>	ASTRON	Dwingeloo/NL	<a href="#">Report</a>
6	11-13.12.2017	Bologna/IT	<a href="#">Self-calibration and advances imaging workshop-Ed Fomalont</a>	INAF	Bologna/IT	<a href="#">Report</a>
5	5-7.12.2017	Lisbon/PT	<a href="#">ALMA Data Processing Workshop</a>	Portuguese ALMA Centre for Expertise	Lisabon	<a href="#">Report</a>
4	28-30.11.2017	Gothenburg/SE	<a href="#">ASTA-Advanced Software Tools for ALMA</a>	OSO	Onsala/SE	<a href="#">Report</a>
3	2.-6.10.2017	Dwingeloo/NL	<a href="#">Introducing VLBI tools in CASA</a>	JIV-ERIC	Dwingeloo/NL	<a href="#">Report</a>
2	3-4.4 & 7.4.2017	Torun/PL & Prague/CZ	<a href="#">Joint preCycle 5 ALMA workshop</a>	Czech Academy of Science & UMK	Prague/CZ & Torun/PL	<a href="#">Report</a>
1	27-28.3 & 03.4.2017	Bonn/DE & Bern/CH	<a href="#">ALMA Community Days 2017</a>	Uni Bonn	Bonn/DE	<a href="#">Report</a>

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