

FP7- Grant Agreement no. 283393 – *RadioNet3*

Project name: Advanced Radio Astronomy in Europe

Funding scheme: Combination of CP & CSA

Start date: 01 January 2012

Duration: 48 month



Deliverable D14.1

**Providing access of 257 hours to the
e-MERLIN infrastructure**

Due date of deliverable: 2013-06-30

Actual submission date: 2013-06-26

Deliverable Leading Partner: THE UNIVERSITY OF MANCHESTER (UMAN)

1 Document information

Document name: Providing access of 302 hours to the TNA e-MERLIN in the period 01/01/2012 – 30/01/2013

Type **Other**

WP 14

Authors Rob Beswick (UMAN)

1.1 Dissemination Level

Dissemination Level		
PU	Public	X
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

1.2 Content

1	Document information	2
1.1	Dissemination Level	2
1.2	Content.....	3
2	TNA deliverable.....	4
2.1	Information about the TNA e-MERLIN	4
2.2	Information about the provided access in the period 01/01/2012 – 31/01/2013.....	4
2.3	Information about the EC financial contribution to the travel.....	6

2 TNA deliverable

2.1 Information about the TNA e-MERLIN

e-MERLIN is an array of seven radio telescopes across the UK, connected to a central correlator at Jodrell Bank Observatory (JBO) and operated as a dedicated radio interferometer to produce high-resolution images. With a maximum baseline length of 220 km, MERLIN provides a unique capability for radio imaging at 0.01-0.15-arcsec resolution at frequencies of 1.5, 5 and 22 GHz (L, C and K bands). The e-MERLIN project has resulted from a major upgrade involving the installation of new receivers, analogue and digital electronics, optical-fibre links to each telescope and a new correlator at JBO. This upgrade has increased the useable bandwidth by more than two orders of magnitude, and hence the continuum sensitivity by more than 10 times. In addition, the increase in bandwidth will dramatically improve aperture coverage for continuum observations resulting in enhanced image fidelity together with simultaneous spectral-index imaging. First fringes between nearby telescopes using a prototype correlator were achieved in April 2009, fringes from all remote telescopes were obtained in autumn 2010, and the full network with the complete correlator has been available to international users from 2012 onwards.

2.2 Information about the provided access in the period 01/01/2012 – 31/01/2013

All e-MERLIN observing time is competitively allocated on the basis of scientific merit and proposals are reviewed by an independent Time Allocation Group. Throughout the reporting period e-MERLIN observations have been split into three categories a) ongoing instrumental verification and commissioning work related to the upgrade of e-MERLIN, b) e-MERLIN observations as part of the e-MERLIN legacy programme and b) PATT (Panel Allocation of Telescope Time) proposals. Observing time in this reporting period (1st Jan 2012 - 31st Jan 2013) has been split equally between these three principle areas. In addition to formal TAG approved programmes e-MERLIN is open to Director's Time observations which can be triggered for exceptional events that are unpredictable at the time of open proposal deadlines – such request are open to all and are rapidly scrutinised on scientific merit.

Nature of programmes and selection procedures:

- 1) e-MERLIN legacy programme observations comprise of large consortia backed projects which have been allocated significant observing time to be spread over a number of years. These allocations have been competitively reviewed and allocated by an internationally appointed team of external expert scientists following an open round for proposals. In total, 12 e-MERLIN legacy projects have been allocated; of which 2 of these projects meet the requirements of TNA eligibility.
- 2) Proposals for PATT allocated programmes are accepted at regular (approximately biannually) proposals deadlines that are widely advertised amongst the international astronomical community. All proposals are assessed by an independently appointed Time Allocation Group and all proposals are externally reviewed by experts drawn from the astronomical community. Time is allocated on scientific merit alone.

During this reporting period two deadlines have occurred Cycle-0 on the 26th January 2012, and Cycle-1 17th July 2013. During cycle-0, 64 individual projects were proposed for from all nations, representing an oversubscription rate of ~4. Observations for Cycle-0 open-time projects commenced in spring 2012 and were ongoing until May 2013. At the time of writing statistics on cycle-1 proposals are unavailable.

There are 10 identified eligible user groups and associated e-MERLIN projects which have been approved through open time applications. They are a mixture of TAG allocated cycle-0 approved programmes, observations within existing e-MERLIN Legacy Programmes, and separate e-MERLIN observations associated with successful VLBI proposals. Observations made for instrumental commissioning (some of which have been made on behalf of TNA eligible groups) are not included. All classes of observations are ongoing in this period and projects identified with no current eligible hours remain available for dynamical scheduling during later observing periods, and additional observations may be made for any project dependent on the scientific completeness of observations made to date.

e-MERLIN TNA eligible science programmes comprise:

Project acronym	Name of the TNA user group leader	Number of the TNA users**	Provided access [hours]
TNA eligible e-MERLIN TAG allocated open-time proposals (Cycle-0):			
12A032	A. Sanchez-Monge (Arcetri, IT)	4 (4)	12
12A042	M. Bethermin (Saclay, FR)	5 (5)	18
12A040	D. Engels (Hamburg, DE)	0	0*
12A009	M. Argo (ASTRON, NL)	3 (3)	18
12A043	P. Barthel (Groningen, NL)	2 (3)	45
12A006	M. Argo (ASTRON, NL)	1 (2)	41
12AT004	M. Perez-Torres (Granada, ES)	4 (7)	10
TNA eligible e-MERLIN Legacy programme observations (this period only):			
12A-LIRGI-A	J. Conway (OSO, SE)	14 (21)	57
12A-LIRGI-B	M. Perez-Torres (Granada, ES)	14 (21)	89
12A-LIRGI-C	J. Conway (OSO, SE) & M. Perez-Torres (Granada, ES)	14 (21)	12
Total projects 9		Total users 61 (87)	Total access 302

* No observations made due to technical issues.

** TNA eligible investigator, total number of investigators (TNA and non-TNA eligible) are listed in brackets.

In total 302 hours of telescope access hour have been delivered in this period, for 9 projects, including a total of 87 investigators. Of these many TNA users are involved in multiple projects, a total of 61 TNA investigators against projects. Of these there are 32 unique TNA-enabled user associated with TNA eligible projects. The total number of users and delivered hours significantly exceeds (**117%**) the agreed deliverable (257hrs). Note that several projects, including the large legacy projects, have continuing programmes with further associated observations extending into future deliverable periods; only hours provided in this reporting period are listed.

The number of individual deliverable projects is marginally smaller than expected, 9 versus 15. This short fall is primarily due to the receipt of several large (both in user numbers and allocation) individual projects. A proportion of these large projects that are TNA enabled is

typical compared with proportions of smaller projects as evidenced by the number of delivered access hours and users.

The eligible user groups contain both established workers in the field and young researchers. In recent years a significant effort has been made to advertise and attract new research groups from Europe and the UK. RadioNet activity has undoubtedly helped in this regard. Future proposals for e-MERLIN post commissioning and present proposals for VLBI are handled by the NorthStar web-based proposal tool which is common to a number of European telescopes. This facility was developed under the RadioNet (FP6) Synergy Networking Activity.

The detailed information about the committee providing access, projects and selection is given in the TNA database of the 1st reporting period.

2.3 Information about the EC financial contribution to the travel

All eligible user groups were identified and sent targeted emails inviting them to consider sending personnel to Jodrell Bank Centre for Astrophysics for observational analysis, indicating that travel and subsistence funding was available for such visits. Such emails were sent to all the eligible user groups.

To date one group (12A032) has travelled to Manchester directly under TNA support to benefit from expert assistance, several other TNA-enabled group (12A042 & 12A043) have also been assisted during face-to-face visits (but used their own travel funds), and numerous other groups have benefited from remote assistance through all stages of their projects provided by e-MERLIN support staff. The RadioNet3 TNA travel budget is allocated by the RadioNet3 beneficiary No. 5 (JIVE) and therefore, the exact numbers will be presented by JIVE.