



e-MERLIN/VLBI National Radio Astronomy Facility  
[www.e-merlin.ac.uk](http://www.e-merlin.ac.uk)

## Invitation for proposals: Cycle-13

**Deadline for Receipt of Proposals: 23:59:59 UT on 27<sup>th</sup> October 2021**

e-MERLIN requests proposals from the international astronomical community for observations to be made during *Cycle-13*. Proposals are competitively peer-reviewed under standard STFC rules by the e-MERLIN PATT Time Allocation Committee. Awards will be made on the basis of scientific merit and technical feasibility alone.

The *enhanced Multi Element Remotely Linked Interferometer Network* provides high resolution (12-150 mas), high sensitivity (microJy) imaging at cm wavelengths as well as spectroscopy, astrometry and polarimetry. e-MERLIN is an 'SKA-pathfinder' instrument providing observations with angular resolutions and frequencies comparable to those that will be provided by SKA1-mid.

### Cycle-13 e-MERLIN Observations:

**[February 1<sup>st</sup> to July 31<sup>st</sup> 2022]**

Continuum observing frequencies available:-

- L-Band: Continuous 512 MHz Band: 1.25 GHz to 1.75 GHz (RFI notch filtering fitted)
- C-Band: Continuous 512 MHz Band distributed between: 4.3 GHz to 7.5 GHz
- K-Band: Continuous 512 MHz Band distributed between: 19 GHz to 25 GHz

System parameters for observations of a continuum source in optimum conditions:-

Observing Bands	1.25 - 1.75 GHz (L-band)	4.3 - 7.5 GHz (C-band)	19 - 25 GHz (K-band)	
Maximum angular resolution	~150	~40	~12	(milliarcsec)
<sup>§</sup> RMS level for 8 hours on-source (Briggs robust=0.5 CASA weighting)	~24/12*	~17/10*	~130**	(μJy/beam)
<b>Elapsed time includes phase-calibration overheads—typically 12-hr elapsed results in ~8-hr on-source</b>				
Maximum bandwidth/polarisation	512	512†	512†	(MHz)

<sup>§</sup> L-Band operations have recently been affected by additional legal transmissions (including 4G+ signals) within the e-MERLIN observing band. Additional flag-masks and in-line filters are being deployed to address these issues. The quoted sensitivities at L-Band in this call and in the e-MERLIN Sensitivity Calculator, assume the filter/flag-mask installation is complete by the start of Cycle-13. *Briggs robust=0 CASA weighting* has an optimal mix of resolution and sensitivity. *Natural* has greater sensitivity, but with lower resolution

\* The use of the Lovell telescope at L-Band, and at C-Band with updated receiver systems reduces the r.m.s. noise levels in the central part of the field of view by ~50% compared with the array not including the Lovell Telescope.

\*\* The sensitivity of e-MERLIN K-band observations is weather and elevation dependent. K-band observations will be dynamically scheduled to optimise for the most ideal weather conditions.

† Frequency flexibility allows the positioning a number of 512MHz sub-bands within the frequency ranges shown for C- and K-Band. This may be used to observe with increased fractional bandwidth and/or spectral coverage at the expense of required observing times since only a single 512 MHz sub-band may be observed at any one time.

**For Detailed Observation Planning** - See The e-MERLIN Sensitivity Calculator & Observing Page:

<http://www.e-merlin.ac.uk/calc.html>

Proposals should be submitted via the e-MERLIN web-based *NorthStar* Proposal Tool: <http://proposal.merlin.ac.uk> which opens for proposal submission from **22<sup>nd</sup> September 2021**.

- Proposers must make a detailed case for the inclusion of the Lovell telescope in their proposal.
- Proposers should consult the allocated e-MERLIN Legacy Programmes to avoid conflicts. In cases where PATT proposals directly replicate portions of allocated legacy projects, legacy projects will normally be given priority. For details please contact [emerlin.support@jb.man.ac.uk](mailto:emerlin.support@jb.man.ac.uk)
- Spectral line configuration details are available at <http://www.e-merlin.ac.uk/observe.html>
- **e-MERLIN user support:** Support is available throughout the full life-cycle (proposal to publication) of projects for all users via both face-to-face and remote assistance; and online tools. The e-MERLIN science support team is happy to tailor levels of assistance dependent on the requirements of individual users or projects.
- **Access and financial support for e-MERLIN Scientists and Users:** e-MERLIN is one of the participating infrastructures in the European Union's Horizon 2020 research and innovation programme, and the OPTICON-RadioNet PILOT support project was launched on March 1<sup>st</sup> 2021. This programme will provide facility access and financial support for users from eligible projects. If your project is eligible, you will be contacted by the e-MERLIN support team. For further information please contact [emerlin.support@jb.man.ac.uk](mailto:emerlin.support@jb.man.ac.uk).

**e-MERLIN Science:** e-MERLIN observations address a broad range of scientific questions. Its unique combination of angular resolution and micro-Jansky sensitivity provide crucial insights in multiple science areas. See <http://www.e-merlin.ac.uk/science.html> for further details.

**e-MERLIN Transient Science:** Enhanced ToO availability has been introduced to provide additional ToO programmes which may not require all antennas, or have more relaxed trigger cadences. A new RRT (Rapid-Response Time) category is to be introduced before Cycle-13 for urgent transient programmes which are not suitable for ToO submission. Where there is a direct clash between RRT & ToO programmes, ToO will take precedence. RRT proposals will be submitted via a pro-forma web-based application form. *Details to be distributed at the RRT launch.*

#### **e-MERLIN+EVN Observations:**

The full integration of e-MERLIN telescopes within the European VLBI Network (EVN) is also available for proposals. This mode of observations provides a 'short-spacing' (10-200 km spacing) component to the EVN. This allows imaging of a wider range of spatial scales. Proposals for EVN+e-MERLIN observations should be made via the EVN-Programme Committee.

- During Cycle-13 the VLBI disk-recording sessions are 24<sup>th</sup>Feb-17<sup>th</sup>Mar & 26<sup>th</sup> May-16<sup>th</sup> Jun 2022 during which time e-MERLIN is available for joint EVN/e-MERLIN observations. These e-MERLIN+EVN proposals should be submitted to the EVN Programme Committee. Details for proposing for e-MERLIN+EVN can be found via the EVN web pages (<http://www.evlbi.org>).
- The current EVN Call for Proposals (including combined e-MERLIN + EVN observations) is at <https://www.evlbi.org/>. The current deadlines for upcoming EVN+e-MERLIN proposals are **1<sup>st</sup> October 2021 and 1<sup>st</sup> February 2022**.

For assistance or you have any queries please contact [emerlin.support@jb.man.ac.uk](mailto:emerlin.support@jb.man.ac.uk).

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