e-MERLIN/VLBI National Radio Astronomy Facility
www.e-merlin.ac.uk

Invitation for proposals: Cycle-19

Deadline for Receipt of Proposals: 13:59:59 UT on 24th October 2024

e-MERLIN requests proposals from the international astronomical community for observations to be made during *Cycle-19*. Proposals are competitively peer-reviewed under standard STFC rules by the e-MERLIN Time Allocation Committee (TAG). Awards will be made on the basis of scientific merit and technical feasibility alone.

The ***e****nhanced* ***M****ulti* ***E****lement* ***R****emotely* ***L****inked* ***I****nterferometer* ***N****etwork* 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 SKA-mid.

Cycle-19 *e*-MERLIN Observations: [February 1st to July 31st, 2025]

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)
§RMS level for 8 hours on-source (Briggs robust=0.5 CASA weighting)	~24/12*	~17/10*	~130**	(μJy/beam)
Elapsed time includes phase-calibration overheads–typically 12-hr elapsed results in ~8-hr on-source				
Maximum bandwidth/polarisation	512	512†	512†	(MHz)

§ L-Band operations have been affected by additional legal transmissions within the e-MERLIN observing band. Additional flag-masks and in-line filters have been deployed to address these issues. The quoted sensitivities at L-Band in this call and in the e-MERLIN Sensitivity Calculator, reflect changes resulting from the filter/flag-mask installation.
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 are 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 the required observing time 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:
https://www.e-merlin.ac.uk/calc.html
https://www.e-merlin.ac.uk/observe.html

e-MERLIN proposals must follow dual-anonymisation guidelines.

Proposals should be submitted via the updated *e*-MERLIN web-based *NorthStar* proposal tool from **2nd October 2024.** An *Additional Information file* is now required as part of all e-MERLIN proposals. Tex-based templates for the *Additional Information file* and for e-MERLIN proposals are now available for download from https://www.e-merlin.ac.uk/observe.html

- Proposers requesting inclusion of the Lovell telescope must provide a detailed supporting case. 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 consult the *Science Research with e-MERLIN* webpage (https://www.e-merlin.ac.uk/science.html) or contact emerlin.support@jb.man.ac.uk.
- Spectral line configuration details are available at https://www.e-merlin.ac.uk/observe.html
- ***e*-MERLIN User Support:** Support is available throughout the full lifecycle (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. The OPTICON-RadioNet PILOT programme provides 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.
- **Russian Affiliated Scientists**: STFC strongly condemn the Russian government's invasion of Ukraine. In line with the UK government's response e-MERLIN is unable to accept proposals from projects including researchers affiliated with Russian Institutes at this time.

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 https://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. An RRT (Rapid-Response Time) category is now available for urgent transient programmes not suitable for ToO submission. For any direct clashes between RRT & ToO programmes, ToO take precedence.

- **e-MERLIN+EVN Observations:** The full integration of *e*-MERLIN within the European VLBI Network (EVN) is also available for proposals. This mode of observations provides a shorter spacing (10-200 km) component to the EVN which allows imaging of a wider range of spatial scales. Proposals for EVN+e-MERLIN observations should be submitted via the EVN-Programme Committee. https://www.evlbi.org During Cycle-19 the VLBI disk-recording sessions are from 20th February – 13th March and from 29th May – 19th June 2025, during which time e-MERLIN is available for joint EVN/e-MERLIN observations. *e*-MERLIN + EVN proposals should be submitted to the EVN Programme Committee. Details can be found via the EVN web pages (https://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: **1st October 2024, 1st February 2025, & 1st June 2025.**

For assistance or you have any queries please contact emerlin.support@jb.man.ac.uk

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