Mandate for the ET Organisation

(general terms of a more detailed mandate)

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ET Coordinators, ET Annual Meeting, November 10-14, 2025

Status

- On behalf of the Einstein Telescope (ET) Board of Governmental Representatives (BGR) and as stated in their Terms of Reference, the ET Coordinators lead the establishment of the ET Research Infrastructure and its governance.

- For the Design and Preparation Phase of the European ET project, the ET Coordinators appointed **two Directors of the ET Organisation (ETO) to provide all relevant information to enable the BGR to make a well-informed decision on the start of the Implementation Phase of the project**.
    - An overall timeline towards decisions has been agreed by the BGR (next slide).

- The ETO Directors report to the ET Coordinators, who are consulted by the BGR on progress and deliverables.

ET timeline set by BGR

Date	Action
28-29 Jan. 2026 *tbc*	BGR meeting (BE)
Early May 2026	**Report on site selection criteria by SiSe WG**
29-30 June 2026 *tbc*	BGR meeting (DE) *tbc*
End Sept./early Oct. 2026	**Geometry comparison report by ETO** Bidbook template
26-27 Oct. 2026	BGR meeting (ES or IT)
Dec. 2026	**Open of call for tenders**
June 2027	**Closing of call for tenders (or earlier if all sites are ready earlier)**
Q3 2027	**Site selection decision (after review by international panel)**

Mandate for the ETO – *General Terms*

- Through this updated Mandate, the ETO, under the leadership of the ETO Directors, is authorised by the ET Coordinators to be **the central and unique organisation in the European ET project to steer the acquisition of information from all stakeholders** in order to coherently and sufficiently inform the ET Coordinators, and therefore the BGR, on all aspects relevant to the decision-making process of the BGR.

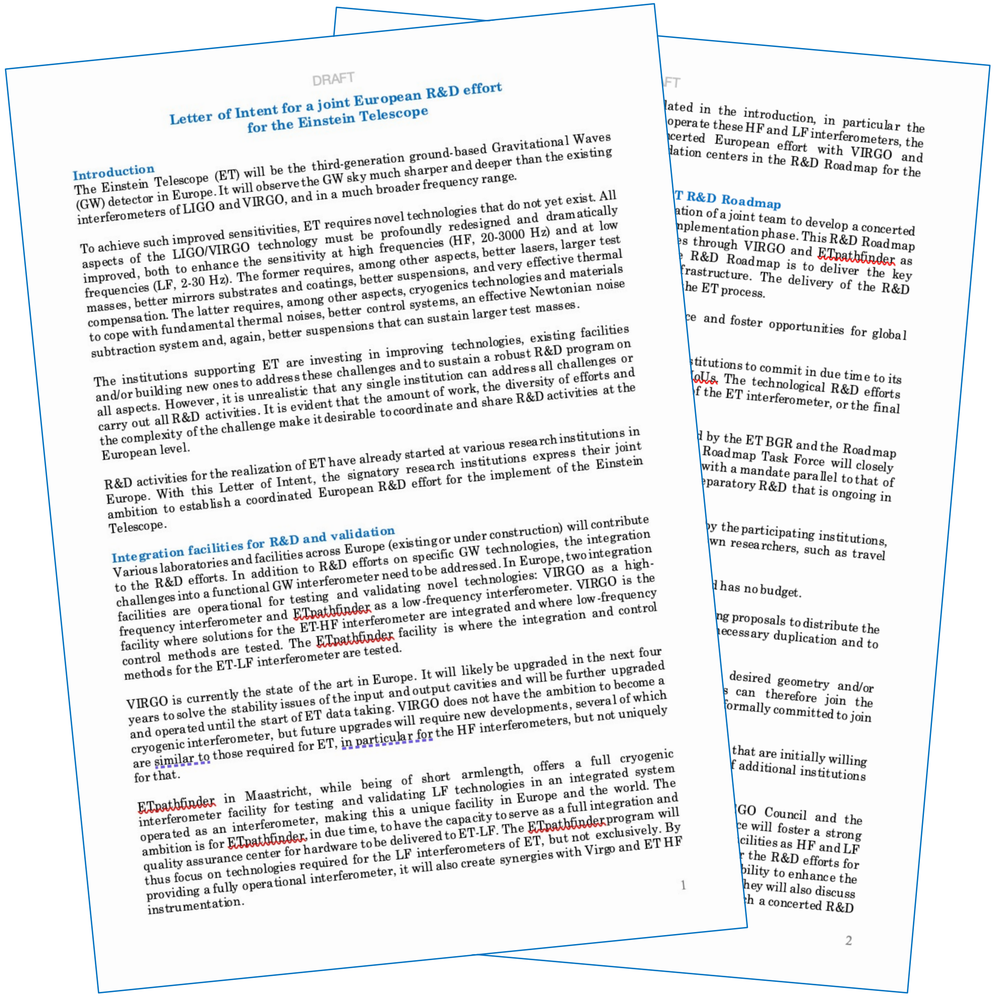
- However, we clarify what is NOT part of the ETO mandate:
  - ETO's authority does not extend to political or financial decision-making, which remains the responsibility of the national ministries – through the BGR - and relevant national agencies.
  - ETO's authority does not extend to the scientific coordination of the ET research, which remains the responsibility of the ET Collaboration.
  - ETO's authority does not extend to the execution of feasibility studies and the preparation of infrastructure documentation that are relevant for the bids to host ET, which remains the responsibility of the Host Consortia.
  - ETO will not act as a legal entity.

Mandate for the ETO – *General Terms*

- This updated mandate entrusts the ETO Directors with the **execution of activities to deliver**, in general:
  - a coherent and professional project framework for ET;
  - key documentation for the BGR-decision making process;
  - coordinated responses to European calls supporting ET developments as an ESFRI infra.

- Concretely, the ETO is tasked to (in blue, the short-term priorities):
  - to **deliver a Geometry Comparison Report** on five site-independent elements (by Oct 2026);
  - to deliver the **cost estimate of the instrument**, for both geometries (by Oct 2026);
  - to deliver the **costing and financial methodologies** towards the bid books (by Oct 2026);
  - to establish and manage **stakeholder interfaces** with the ET Collaboration and the Host Consortia, including regular meetings and with a view to collaborate on the ETO deliverables;
  - to **deliver the templates and processes to complete the ET Technical Design Reports** for the detector, the technical infrastructures and the civil engineering;
  - to support the ET Coordinators and the BGR for **external communication and relations**.

Letter of Intent – R&D Roadmap



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Letter of Intent for a joint European R&D effort for the Einstein Telescope

Introduction

The Einstein Telescope (ET) will be the third-generation ground-based Gravitational Waves (GW) detector in Europe. It will observe the GW sky much sharper and deeper than the existing interferometers of LIGO and VIRGO, and in a much broader frequency range.

To achieve such improved sensitivities, ET requires novel technologies that do not yet exist. All aspects of the LIGO/VIRGO technology must be profoundly redesigned and dramatically improved, both to enhance the sensitivity at high frequencies (HF, 20-3000 Hz) and at low frequencies (LF, 2-30 Hz). The former requires, among other aspects, better lasers, larger test masses, better mirrors substrates and coatings, better suspensions, and very effective thermal compensation. The latter requires, among other aspects, cryogenics technologies and materials to cope with fundamental thermal noises, better control systems, an effective Newtonian noise subtraction system and, again, better suspensions that can sustain larger test masses.

The institutions supporting ET are investing in improving technologies, existing facilities and/or building new ones to address these challenges and to sustain a robust R&D program on all aspects. However, it is unrealistic that any single institution can address all challenges or carry out all R&D activities. It is evident that the amount of work, the diversity of efforts and the complexity of the challenge make it desirable to coordinate and share R&D activities at the European level.

R&D activities for the realization of ET have already started at various research institutions in Europe. With this Letter of Intent, the signatory research institutions express their joint ambition to establish a coordinated European R&D effort for the implement of the Einstein Telescope.

Integration facilities for R&D and validation

Various laboratories and facilities across Europe (existing or under construction) will contribute to the R&D efforts. In addition to R&D efforts on specific GW technologies, the integration challenges into a functional GW interferometer need to be addressed. In Europe, two integration facilities are operational for testing and validating novel technologies: VIRGO as a high-frequency interferometer and ETpathfinder as a low-frequency interferometer. VIRGO is the facility where solutions for the ET-HF interferometer are integrated and where low-frequency control methods are tested. The ETpathfinder facility is where the integration and control methods for the ET-LF interferometer are tested.

VIRGO is currently the state of the art in Europe. It will likely be upgraded in the next four years to solve the stability issues of the input and output cavities and will be further upgraded and operated until the start of ET data taking. VIRGO does not have the ambition to become a cryogenic interferometer, but future upgrades will require new developments, several of which are similar to those required for ET, in particular for the HF interferometers, but not uniquely for that.

ETpathfinder in Maastricht, while being of short armlength, offers a full cryogenic interferometer facility for testing and validating LF technologies in an integrated system operated as an interferometer, making this a unique facility in Europe and the world. The ambition is for ETpathfinder in due time, to have the capacity to serve as a full integration and quality assurance center for hardware to be delivered to ET-LF. The ETpathfinder program will thus focus on technologies required for the LF interferometers of ET, but not exclusively. By providing a fully operational interferometer, it will also create synergies with Virgo and ET HF instrumentation.

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- R&D activities for the realization of ET have already started at various research institutions in Europe.
- There is a growing ambition to establish a coordinated European R&D effort for the implement of the Einstein Telescope.
- The intention of the ET Coordinators is to bring together research institutions/agencies to create a joint Roadmap Task Force to develop together a concerted R&D Roadmap in Europe to be executed during the implementation phase.