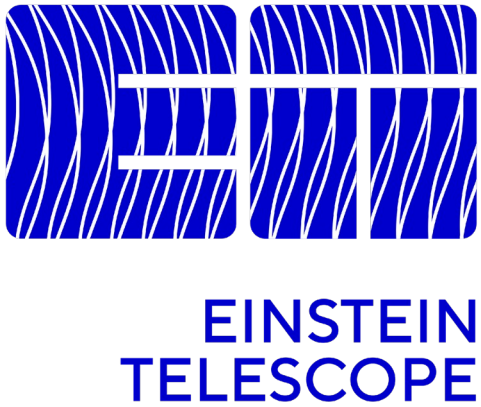


Status update on the ET Collaboration

Michele Maggiore

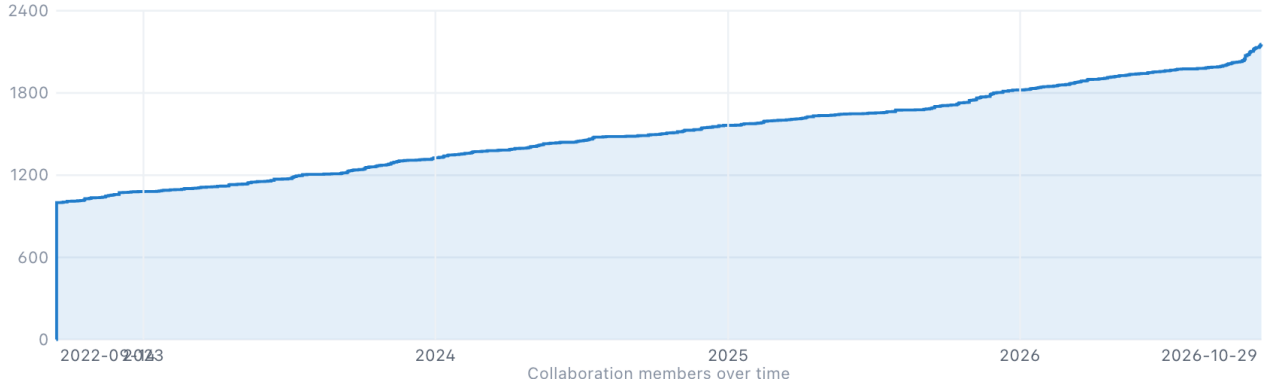
ET-Spain, Barcelona, 4-5 Nov. 2026

Summary

- ETC news
  - some updated statistics
  - core/community membership
  - core program
  - AI-for-ET
  - R&D Coordinator
- ETC and the GCR

Some updated statistics – 1/3

2193 members, 317 Institutions, 99 RU, 34 Countries (as of Nov. 1, 2026)



Number of ETC members over time since its foundation

Testifies the extraordinary appeal of ET within the scientific community

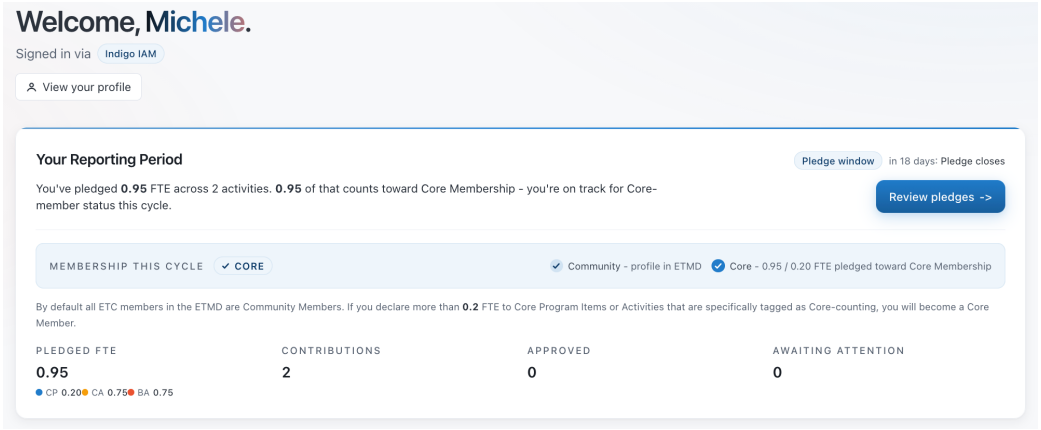
- Women represents 23% of ETC and hold 25% of responsibility roles
- Early Careers represents at least 35 % of ETC

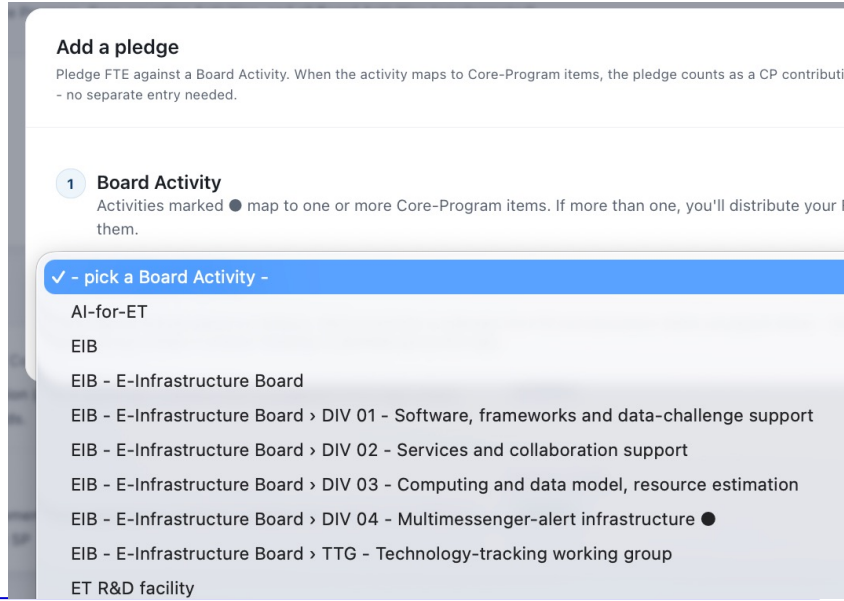
core/community membership

- approved by the Collaboration Board in July, now effective

  the first pledge period should have closed on Oct. 31, but deadline extended 1 week

  (ET Member Database extensively modified)

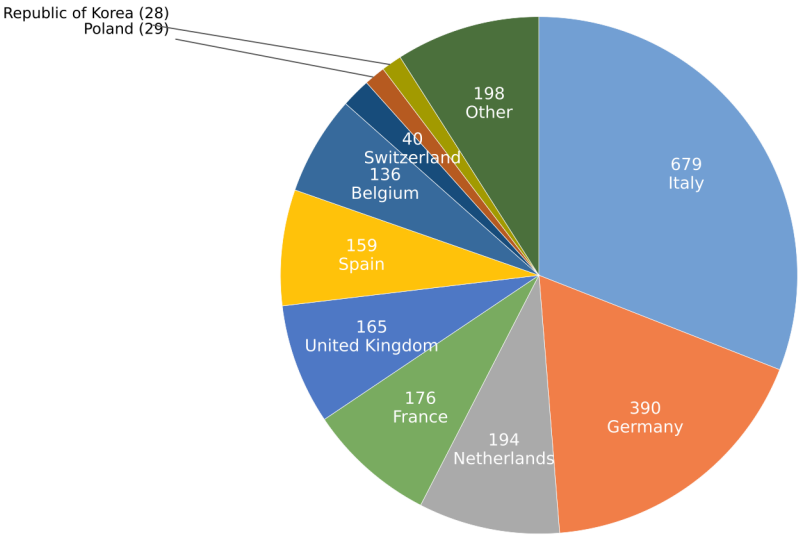




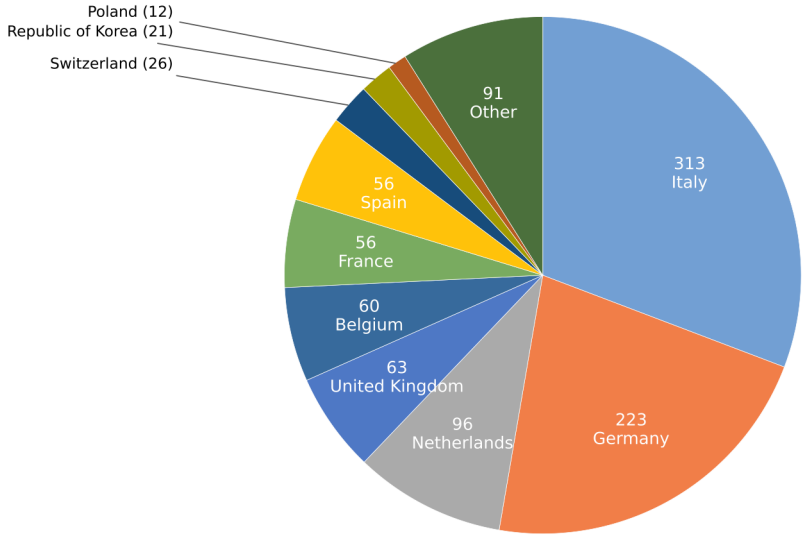
Some updated statistics – 2/3

as of Nov. 1, 2026

all members (2193)



pledged for Core members (1017)



"Other" includes ETO, 30 members, 3 cores

updated statistics 2/3 – Spain

Research Units

99 ETC RU | Include ETO & ETPF in the list

RUs are the organisational unit of the ET Collaboration. Each RU has a Leader; membership is via RU affiliation.

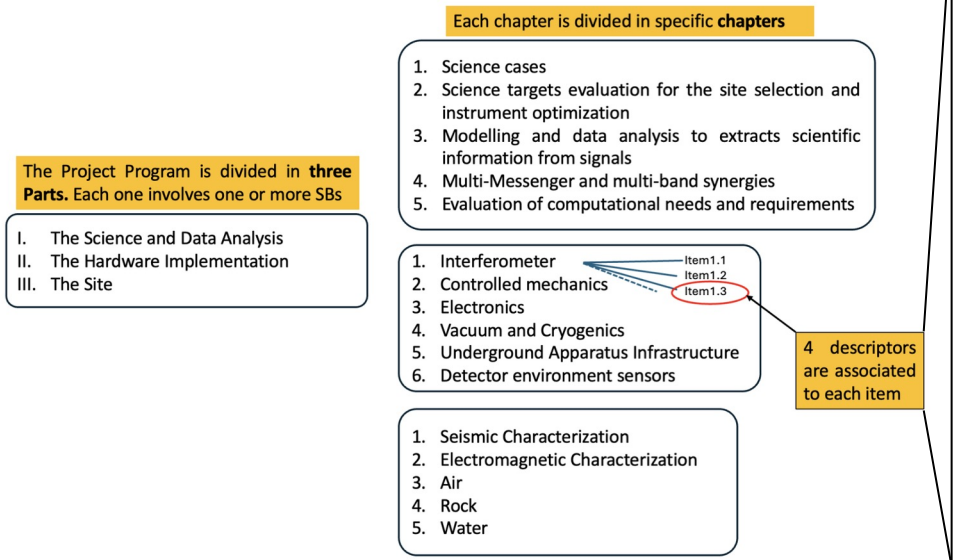
Spain | Show RU that are no longer active | Reset

Note: not much point in putting people at 0.15 FTE. Below 0.20 they do not count as core members, and count 0.00 for their RU

RESEARCH UNIT	COUNTRY	LEADER	MEMBERS	CORE FTE
CIEMAT-FP	Spain	Nicanor Colino	5	0.20
CSIC	Spain	Carlos Fernández Sopuerta	33	2.44
ET - IFT Madrid	Spain	Juan Garcia-Bellido	7	-
GRAVITY-UIB	Spain	Alicia M Sintes	25	4.94
ICCUB-Barcelona	Spain	Hristijan Kochankovski	19	0.90
Institut de Fisica d'Altes Energies	Spain	Lluïsa-Maria Mir	19	1.50
IPARCOS-UCM	Spain	José Luis Blázquez Salcedo	23	1.00
University of Valencia ET	Spain	Pablo Cerdá Durán	18	2.40
USAL-Fundamental Physics: Astrophysics and Cosmology	Spain	Ivan de Martino	11	1.95

Core Program

- Almost finalized, intense work going on, review of the Core Program to be done soon



A - The basic layout for the ET implementation. This effectively reflects the current understanding of the available technologies and methods to be adopted.

B - Short-term R&D. R&D activities that are expected to deliver concrete results and provide a quantitative impact on the implementation design, within a period of five years. Given the current baseline, what degree of flexibility is there to take advantage of potential developments that might arise from specific R&D activities?

C - Backup solutions. Should B fail, what alternative options are available. These need to be studied in depth from inception.

D - Medium and Long-term R&D motivated by the known intrinsic limitations described in B and C. Concrete results expected over a timeline of more than 5 years.

AI-for-ET

Mandate and coordinators (G. Inguglia and T. Andric) approved, June 2026
Activities have started, kick-off meeting took place on Sept. 4

AI for ET

4 Structural Pillars

Infrastructure and Integration
covering AI/ML aspects related to real-time systems, detector control, and the integration of AI methods into ET infrastructure and computing environments.

Searches and Interpretation
Focusing on AI-enabled approaches to data analysis, including detection, classification, parameter estimation, and other methods supporting ET science.

Networking and Coordination
Connecting activities across the Collaboration, supporting exchanges with external communities (e.g., high-energy physics, astrophysics, industry).

Collaborative Services and Tools
Targeting the development of shared tools and services that support Collaboration activities

First activities organized in 4 task forces

TF1: Ethics, fair usage, and guidelines (with term, 6-12 months)

TF2: self-hosted LLM (with term, ~12 months, and depending on available hardware infrastructure)

TF3: training (continuous effort)

TF4: Network with other communities (continuous effort)

Cross-cutting principles: benchmarking, validation, reproducibility, documentation, and sustainable software practices.

ETC R&D Coordinator

- mandate approved (July), coordinator nominated (Sept), G. Losurdo

  the ETC R&D Coordinator is member of the ETC Executive Board

- the R&D Coordinator is forming a team and starting discussions with various stakesholders

  - ETO Directors
  - ETO Coordinators, for alignment with Agencies R&D coordination
  - discussions with main labs
  - vision document to be presented at Prague Annual Meeting

ETC R&D Coordinator - Key Tasks - 1/2

Task 1: Technology & R&D Mapping

- **Objective:** Develop **prioritized lists** of technologies and R&D activities for ET. Draw the **first implementation of ET** given the first available technologies and **future upgrade stages to reach the ET design sensitivity**
- **Deliverables:** List of technologies and associated R&Ds
  - Technologies for **first implementation** of ET highlighting enabling technologies.
  - Upgrade technologies **with infrastructure impact**.
  - Upgrade technologies without infrastructure impact.
- **Sources:** Pre-TDR reports, ISB divisions, ET Project Program Committee (PPC), R&D teams

Task 2: Facility Catalog

- **Objective:** Create a **standardized catalog** of R&D and integration facilities.
  - Document objectives, characteristics, limitations, accessibility, and ET compliance.
  - Include testing capabilities (e.g., cryogenic conditions) and access procedures.

ETC R&D Coordinator - Key Tasks - 2/2

Task 3: Coordination with Stakeholders

- **Objective:** Align R&D activities with ET's roadmap.
- **Actions:**
  - Coordinate R&D to reach **TRL 6+** on **first implementation** technologies before integration.
  - Track upgrade technologies **with infrastructure impact** to reach **TRL 4+** before Infrastructure Technical
  - Design finalization.

Task 4: Synergies with Advanced Virgo and Cosmic Explorer (CE)

- **Objective:** Optimize resource sharing and collaboration.
- **Actions:**
  - Identify **dual-benefit technologies** with Advanced Virgo (e.g. high laser power, squeezing, suspensions, etc.) and develop a **joint action plan** (validated by ETC and Virgo governance).
  - Identify **common** technologies for ET and CE and develop a **joint action plan** (validated by ETC and CE governance)

ETC and the GCR - 1/4

the triangle-2L comparison has a long history in the Collaboration

- Science comparison - intense work by the Collaboration since about 2021

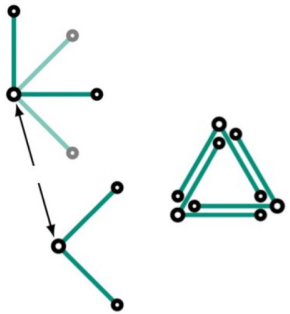
2021-2023: the 'CoBA' paper

coordinated by M. Branchesi, and MM
2 yrs of work, 76 authors, 197 pages, JCAP 2023

emerges a clear global preference for the 2L from the point of view of the science

Journal of Cosmology and Astroparticle Physics
An IOP and SISSA journal

Science with the Einstein Telescope: a comparison of different designs



ETC and the GCR - 2/4

the 'BlueBook':

coordinated by A. Ghosh, M. Branchesi, and MM,
3+ yrs of work, 485 authors, 880 pages, JCAP 2025

Exhaustive study of the science with 3G detectors

ET in both triangle and 2L configurations.

Confirms that 2L is overall better for the science

Journal of Cosmology and Astroparticle Physics
An IOP and SISSA journal

Received: *March 18, 2025*
Revised: *July 19, 2025*
Accepted: *August 28, 2025*
Published: *March 26, 2026*

The Science of the Einstein Telescope

The Einstein Telescope collaboration

Full author list at the end of the paper

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ETC and the GCR - 3/4

- Scientific Risk Analysis – the ETRAC Report, L. Barsotti et al., ET-0132A-24

Report of the Einstein Telescope Risk Assessment Committee (ETRAC)

Lisa Barsotti, Enrico Calloni, Hartmut Grote, Christian Olivetto, Piero Rapagnani, Alessio Rocchi, Bas Swinkels, Matteo Tacca, Edwige Tournefier, Benno Willke

14 Conclusions

We identified more, and more significant, risks for the △ configuration than for the 2L configuration. Delays, complexity, reduced duty-cycle, flexibility to upgrades and missing science opportunities in the global network have been identified as associated with a high risk for the △ configuration, with another six risks estimated as medium and four as low. This compares to only one medium risk and two low risk items for the 2L configuration.

We therefore conclude that the △ configuration poses significantly higher *differential* risk than the 2L configuration.

The GCR report: key insights (from the public ET website)

- **Scientific added value**

Both the triangular design with 10 km arms and the 2L configuration with 15 km arms meet the ET science requirements successfully. To enable better comparisons between the opportunities of the designs, the group that worked on the Scientific Added Value chapter has established a portfolio of 'science golden channels'. The report indicates that the 2L geometry is better suited to address the broadest range of these channels

- **Risk analysis**

The risk analysis does not show one geometry to be preferable over the other. However, the nature of the identified risks differs between the two approaches: while the triangular geometry shows a stronger exposure to risks associated with technical challenges and scientific performance, the 2L geometry is more exposed to risks related to governance and organisational aspects

Full agreement with the previous studies of the Collaboration

Thank you!