

MISSIONE 4
ISTRUZIONE
RICERCA

EINSTEIN TELESCOPE INFRASTRUCTURE CONSORTIUM



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Italiadomani
PIANO NAZIONALE
DI RIPRESA E RESILIENZA

Panel di riferimento: **PSE**

Titolo della Proposta: **Einstein Telescope Infrastructure Consortium**

Codice della proposta: **IR0000004**

Tipologia: **(ii) - Starting up**

Proponente: **INFN**

Infrastruttura di Ricerca: **ET - Einstein Telescope**

Importo totale: **49.998.931,39€**

Di cui al Sud: **26.160.272,49€ (52,32%)**

Abstract:

Einstein Telescope (ET) is the most ambitious research infrastructure entered in the ESFRI roadmap 2021 update. ET aims to realize a 3rd generation Gravitational Wave (GW) observatory, which will revolutionize the way we look at the Universe through GWs. ET will observe the coalescence of stellar and intermediate mass black hole binary systems (BBH) back to the dark ages of the Universe, before the star formation, shedding light on the first phases of the Universe and contributing solving the dark matter enigma. The unprecedented BBH and binary neutron stars (BNS) detection rate expected in ET promises breakthrough discoveries in fundamental physics, nuclear physics, astrophysics and cosmology. Although ET is based on the well proven detector concept realized in Virgo and LIGO, it will need new technologies to achieve the target sensitivity. Advancement in lasers, optics, electronics and photonics in different wavelengths are necessary to implement the ET detectors. Enhanced precision mechanics is needed to realise the seismic filters and the cryogenic suspensions for achieving the expected low frequency sensitivity. New materials must be developed to reduce the mechanical and optical energy dissipation in the ET mirrors. The realisation of the ET underground infrastructure, cutting edge technologies and advanced models are necessary in order to secure a sustainable engineering design. ETIC proposal has the ambition to form the Italian network of laboratories needed to develop the ET technologies and to define the key elements of the ET technical and engineering design. ETIC will address environmental, architectural, infrastructural and socio-economical aspects to support the feasibility study for the ET infrastructure in the Sardinian site. ETIC aggregates the most advanced expertise and knowledge in GW physics, engineering and architecture to form a wide network of national research institutions and universities.

Elenco partecipanti alla Proposta:

- Agenzia Spaziale Italiana
- Gran Sasso Science Institute
- Istituto nazionale di astrofisica
- Istituto nazionale di fisica nucleare
- Università degli Studi Alma Mater - Bologna
- Università degli Studi di Cagliari
- Università degli Studi di Genova
- Università degli studi di Napoli Federico II
- Università degli Studi di Padova
- Università degli Studi di Perugia
- Università degli Studi di Pisa
- Università degli Studi L. Vanvitelli - Caserta
- Università degli Studi La Sapienza - Roma
- Università degli Studi Tor Vergata - Roma