

MISSIONE 4
ISTRUZIONE
RICERCA

CHERENKOV TELESCOPE ARRAY PLUS



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e della Ricerca



Italiadomani
PIANO NAZIONALE
DI RIPRESA E RESILIENZA

Panel di riferimento: *PSE*

Titolo della Proposta: **Cherenkov Telescope Array Plus**

Codice della proposta: **IR0000012**

Tipologia: **(i) - Empowering**

Proponente: **INAF**

Infrastruttura di Ricerca: **CTA - Cherenkov Telescope Array**

Importo totale: **71.477.540,83€**

Di cui al Sud: **43.898.782,79€ (61,42%)**

Abstract:

The Cherenkov Telescope Array Observatory ERIC, with Headquarters in Italy, will soon revolutionize the field of gamma-ray astrophysics thanks to its unprecedented sensitivity extending over 4 decades in energy (0.02-300 TeV).

Outstanding science and unexpected discoveries are secured! However, due to budget constraints, the approved CTAO “Alpha configuration” of the Southern Array in Chile does not yet include the Large-Sized Telescopes (LSTs) and has a reduced number of Small-Sized Telescopes (SSTs).

This is unfortunate because LSTs are needed to provide sensitivity below 100 GeV which is key to probe cosmological and transient sources such as GRBs and multi-messenger targets from the most powerful explosions in the Universe.

More SSTs will strongly enhance the sensitivity at the highest (>10 TeV) energies and strengthen the case for PeV domain gamma-ray astronomy in the Milky Way. CTA+ represents a unique opportunity to fill this gap by providing the much needed additional telescopes, specifically 3 LSTs and 9 SSTs to be deployed in Chile. To maximize the scientific return, we will pursue the enhancements of INAF facilities (the VST and TNG telescopes, and the 3 Italian VLBI radio antennae) for e.m. multi-wavelength (IR/Opt/radio) follow-up observations, which would establish CTA+ as a cornerstone of the national multi-messenger strategy, in synergy with other PNRR multi-messengers proposals (gravitational waves with ET, neutrinos with KM3).

Additional R&D activities will be done as “CTA spin-offs” including two E2E prototypes: the Stellar Intensity Interferometry and a new Muon Tomography system to probe Volcanoes underground activity. Young scientists will be deeply involved, and a specific scientific education, outreach & communication will be carried out, in particular at the HQ in Bologna.

CTA+ will provide a unique opportunity to the Italian & international communities to greatly enhance the scientific & technological returns associated to CTA.

Elenco partecipanti alla Proposta:

- Istituto nazionale di astrofisica
- Istituto nazionale di fisica nucleare
- Politecnico di Bari
- Università degli Studi Aldo Moro - Bari
- Università degli Studi Alma Mater - Bologna
- Università degli Studi di Palermo
- Università degli Studi di Siena