MISSIONE 4
ISTRUZIONE
RICERCA

EUPRAXIA ADVANCED PHOTON SOURCES

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Italiadomani
PIANO NAZIONALE DI RIPRESA E RESILIENZA

Panel di riferimento: ***PSE***

Titolo della Proposta: **EuPRAXIA Advanced Photon Sources**

Codice della proposta: ***IR0000030***

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

Proponente:***INFN***

Infrastruttura di Ricerca: **EuPRAXIA - EUROPEAN PLASMA RESEARCH ACCELERATOR WITH EXCELLENCE IN APPLICATIONS**

Importo totale: ***22.350.588,00€***

Di cui al Sud: **9.062.900,00€ (40,55%)**

Abstract:

Advanced Photon Sources are key components for the successful operation of the EuPRAXIA ESFRI facility. They act, for example, as drivers for plasma waves in ultra-high-gradient accelerators or as plasma-based sources of ultra-short pulses of high intensity x-rays. The proposed EuPRAXIA Advanced Photon Sources (EuAPS) project bundles several frontier science aspects in this domain, to be pursued in Italian research centers and universities. This project will enable the creation of new advanced photon test facilities in Italy that operate at internationally competitive levels and will support users from medical applications or other domains. The proposal includes a Laser-driven “betatron” X-Ray facility to be tested and put in operation at the SPARC_LAB test facility. This proven concept, part of the EuPRAXIA science goals, has inherent advantages in resolution due to the small (point like) emission volume in plasma. Advanced photon diagnostics will be developed at CNR-ISM Potenza and Rome to fully characterize x-ray betatron radiation, while University of Tor Vergata will provide the compact user end station. EuAPS includes the development of the required drive Lasers, targeting a 50% increase in energy efficiency and complying with the green deal goals. The work towards

High Power (up to 1 PW) and High Repetition Rate (up to 100 Hz) is spear-headed by the INFN-LNS-Catania and CNRPisa laboratories, offering a platform for advanced laser-based industrial developments. At CNR-Pisa the consortium will establish user access to the next generation of kW scale high repetition rate laser operation. At INFN-LNS-Catania the focus will be placed on high charge secondary particle production with high power lasers and ion-plasma interaction for astrophysical investigations. The work in EuAPS will play a crucial role in complementing the EuPRAXIA construction project at Frascati.

Elenco partecipanti alla Proposta:

• Consiglio Nazionale delle Ricerche
• Istituto nazionale di fisica nucleare
• Università degli Studi Tor Vergata - Roma