

## The EuAPS betatron photon beam: ultra-bright light pulses for imaging and spectroscopy

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The EuPRAXIA Advanced Photon Sources (EuAPS) project, led by INFN in collaboration with CNR and the University of Rome Tor Vergata, foresees the construction of a laser-driven “betatron” X-ray user facility at the LNF SPARC\_LAB laboratory [1]. EuAPS has received financial support from the Italian PNRR plan for the creation of a new research infrastructure.

While the EuPRAXIA@SPARC\_LAB facility [2] will provide the Laboratori Nazionali di Frascati (LNF) with a unique combination of a high-brightness GeV-range electron beam accelerated by a state-of-the-art X-band RF linac, a 0.5 PW class laser system and an ultimate soft X-ray FEL light source [3] driven by a plasma accelerator, the EuAPS project, still using the plasma acceleration, will move in the direction of a pulsed X-ray beam having a continuous energy spectral range from soft to hard X-rays [4,5].

The foreseen applications of the betatron photon source [6], which include ultrafast, time-resolved imaging and spectroscopy measurements on a variety of samples, both biological and inorganic, providing information about their structure and dynamics will be described.

[1] <https://euaps.infn.it/>

[2] M. Ferrario et al. Nucl. Instrum. Methods Phys. Res. Sect. A 909, 134-138 (2018).

[3] A. Balerna et al. Condensed Matter 4: 30 (2019).

[4] A. Curcio et al. Phys. Rev. Accel. Beams 20 012801 (2017).

[5] A. Curcio, et al., Nucl. Instrum. Methods Phys. Res. Sect. B 388 (2017).

[6] F. Stellato et al. Condensed Matter, 7, 23 (2022).

### Summary

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