

# Physics and Applications of High Brightness Beams



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## **EuPRAXIA Advanced Photon Sources (EuAPS): a plasma-based betatron source**

*Friday, June 23, 2023 9:30 AM (25 minutes)*

The EuPRAXIA Advanced Photon Sources (EuAPS) project, led by INFN in collaboration with the CNR and the University of Tor Vergata, involves the construction of a laser-driven “betatron” X-ray user facility at the SPARC\_LAB laboratory of the LNF. EuAPS also includes the development of high power (up to 1 PW at LNS) and high repetition frequency (up to 100 Hz at CNR Pisa) laser drives for EuPRAXIA.

In this talk we first examine the physics behind the dynamics of accelerated electron betatrons in plasma accelerator cavities: the betatron oscillations of relativistic electrons at very short scale lengths are responsible for the emission of ultrashort X-ray bursts.

Next, we present the current status of the experimental activity at the LNF, finally discussing the relevant results for the EuAPS project, highlighting the expected performance of the source for user applications.

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**Session Classification:** Advanced concepts and Conclusions