



Elettra Sincrotrone Trieste

Postdoctoral Research Associate for the development of novel methodologies and sources for the LEAPS-Innov Project and the EuPRAXIA-PP Project

Deadline: 15 June 2023

Ref: DB/23/12

Background

Elettra Sincrotrone Trieste is an international multidisciplinary research center operated as a user facility, featuring a 2.0/2.4 GeV, third-generation synchrotron light source (Elettra), a new free-electron laser light source (FERMI) and a variety of support laboratories. The extremely high quality of the machines and beamlines has set new performance records and has been producing results of great scientific and technological interest. In order to allow the laboratory to remain competitive in the next 20 years, an entirely new source - Elettra 2.0 - belonging to the new generation of storage rings (DLSR or Diffraction Limited Storage Ring) is being developed. The new source will exhibit a major increase in the brilliance and coherence fraction of the photon beams. The Elettra 2.0 optics is based on our enhanced symmetric six bend achromat structure (S6BA-E) with a 12-fold symmetry and an emittance of 200 pm-rad at 2.4 GeV. The new structure creates also straight sections in the arcs permitting the installation of additional insertion devices, thus increasing the number of beamlines. Existing beamlines will have to be upgraded and new beamlines developed to take full advantage of the characteristics of Elettra 2.0. The new machine is scheduled for commissioning in the second half of 2026. See <http://www.elettra.eu> for more information.

Beamline/Activity/Project description

The selected candidate will develop advanced EUV/soft x-ray based, sub-ps time-resolved experiments involving innovative methodologies in the framework of the European projects EuPRAXIA-PP and LEAPS-Innov.

The LEAPS-INNOV project (<https://www.leaps-innov.eu/>) focusses on the implementation of new strategies and activities for long-term partnerships between industry and European synchrotron and free-electron laser light sources.

The EuPRAXIA-PP project (<https://www.eupraxia-pp.org>) is aimed at organizing the forthcoming construction of the first European plasma acceleration source that is likely to start in 2027, following the preparatory phase. Training of the future scientific staff and user community, as well design of novel experiments based on plasma acceleration and FEL techniques are two of the main objectives of EuPRAXIA-PP.

Job description

The design and assessment of novel experimental methods and technologies to be employed in future EuPRAXIA experiments will be a main activity of the postdoctoral fellow. He/she will collaborate with the scientific staff of the TIMEX and TIMER beamlines at FERMI in conducting cutting-edge FEL experiments using pump-probe and four-wave mixing techniques, such as time-resolved XAS and EUV transient grating. The postdoctoral fellow will take part in a strategic upgrade program aimed at extending the available experimental FEL techniques to liquid/diluted samples and will direct specific R&D activities. In particular, he/she will explore the possibility of using optical tweezers to handle liquids in a vacuum environment. Moreover, the postdoctoral fellow will help commission the liquid-jet set-up based on a gas focusing nozzle currently under construction at FERMI and participate in FERMI user experiments as local contact.

The postdoctoral fellow will also contribute to the work package 5 (WP5, User Strategy and Services) of the EuPRAXIA-PP project that aims at defining the needs of the future user community of EuPRAXIA and a comprehensive list of services to be offered. Participation in both EuPRAXIA and LEAPS-INNOV dissemination/coordination events will be required. Scientific dissemination (manuscripts preparation, conference presentations) of the achieved results is considered an essential activity. The successful candidate will have the opportunity to interact with the user community and exploit the experimental set-ups of the forthcoming EuPRAXIA infrastructure.

Qualifications

A Ph.D. in Physics or a related discipline is required. The candidate should not have more than 6-years of total

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postdoctoral experience, in academic institutions or private companies. Applications will be considered also from candidates who have completed a doctoral course of studies and for whom the

defense has been scheduled. In any case, the Ph.D. must be awarded by the end of June 2023.

The following qualifications will be considered as positive assets:

- Previous participation in experimental campaigns at FELs, synchrotrons or HHG facilities
- Laser laboratory expertise
- Experience in data processing or simulations.

The successful candidate should possess strong personal skills favoring collaborative research programs in a team-oriented environment.

Good time management skills and ability to prioritize are expected, together with the ability to interact with the facility staff and international users at all levels and to work as part of a multi-disciplinary team.

Good oral and written communication skills in English are essential.

The appointment will be a fixed-term contract of 36 month duration starting no later than November 1, 2023. The salary will be commensurate with previous experience and qualifications of the candidate.

Applications should include a full curriculum vitae, the names and contact information (including electronic mail) of up to three persons who have agreed to provide references.

The deadline for the submission of the application is June 15, 2023.

In accordance with the provisions of article 21 of the Italian legislative decree no. 39/2013 and in conjunction with article 53 (subsection 16ter) of Italian legislative decree no. 165/2001, employees or former employees of any Italian Public Entity who have exercised authority over Elettra Sincrotrone Trieste S.C.p.A. or have negotiated with Elettra - Sincrotrone Trieste S.C.p.A. within the last three years will be excluded from the present selection procedure. We thank all applicants in advance.

For more information, please contact Emiliano Principi (email: emiliano.principi@elettra.eu).

To apply for this position please visit the following link:

<https://www.elettra.trieste.it/it/about/careers/working-withus.html?id=3121>

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