Postdoctoral Research Associate for µXRD beamline at Elettra 2.0

Deadline: 20 December 2025
Ref: DA/25/37

Background

Elettra Sincrotrone Trieste is an international multidisciplinary research center offering international users access to synchrotron and free-electron laser radiation for the characterization and processing of matter. The extremely high quality of the light sources 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 synchrotron radiation source - Elettra 2.0 - belonging to the new generation of storage rings (DLSR or Diffraction Limited Storage Ring) is being installed and will join the already operating free-electron source FERMI in the second half of 2026. 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 are being upgraded and new beamlines constructed to take full advantage of the characteristics of Elettra 2.0. Seehttp://www.elettra.eufor more information.

Beamline/Activity/Project description

As part of the Elettra 2.0 upgrade program, the µXRD beamline will become the main X-Ray diffraction beamline, for high-throughput macromolecular crystallography (MX). The µXRD beamline is developed and managed in collaboration by Elettra-Sincrotrone Trieste and the Indian Institute of Science (IISc) of Bangalore.

The beamline represents the natural evolution of the XRD2 beamline with tunable energy range (5 to 17 KeV) for SAD/MAD experiment capabilities, automated sample mounting in cryogenic environment, high speed large area detector, high-throughput (HT) sample screening protocols, fast and automated data collection, processing and support for experiments from remote locations. The new beamline will start commissioning in late 2027 and is foreseen to be operational for general users in 2028.

The beamline will be a fundamental asset of the structural biology ecosystem at Elettra-Sincrotrone Trieste, that will include a recently installed CryoEM, a renewed high-flux SAXS beamline, a new high-brilliance SAXS beamline and the existing Structural Biology Laboratory. The latter is supporting sample preparation with state-of-art equipment and it is specialized in protein production, sample characterization and HT-crystallization. The HT-crystallization facility has been recently upgraded with MosquitoX3 robotics and Formulatrix RI360 imagers and will be soon opened to users.

Job description

The successful candidate will join the staff of the µXRD beamline and work as part of a multidisciplinary team, maintaining relations with the other facilities of the structural biology ecosystem of Elettra-Sincrotrone Trieste. In particular, the successful candidate will maintain relations between the µXRD beamline and the Structural Biology Laboratory, contributing to the operation of the crystallization facility and leading the development of the hardware and software required to better integrate the two entities and facilitate user experience at the µXRD beamline.

The successful candidate is expected to actively contribute (i.e., protocol development, coding and testing) to the implementation of:

- methods for in-situ and multi crystal-sample delivery compatible with beamline MiniDIff diffractometer;

- new sample delivery systems like novel sample holders (e.g., meshes, plates, chips) or sample and ligand delivery systems (e.g. jet streams, extruders, soaking system like acoustic ejection of droplets);

- software pipeline for multi crystal-multi sweep live processing and merging of datasets;

- user-friendly crystallization workflows to facilitate user access, including support in definition of crystallization protocols, crystallization set up, crystal handling and monitoring of results;

- a user-friendly, flexible and comprehensive Crystallographic Information Management System (CRIMS) to keep track of events from crystallization experiments down to sample characterization, including rawdata data acquisition, rawdata automated and manual processing and post processing pipelines output.

The successful candidate will be able to conduct independent research and to attract new users, publish peer-reviewed articles, give presentations at scientific conferences, meetings or workshops, and apply for financial support to national or international funding Agencies. He/She may be involved in supervision and coordination of PhD and ungraduated students. He/She is also expected to be involved in the design, execution and reporting of possible confidential research activities performed in collaboration with industrial customers.

Qualifications

A PhD in Physics, Chemistry, Structural Biology or related disciplines is required together with the following technical skills:

- proven experience in single crystal XRD data collection at synchrotron facilities;

- consolidated expertise in single crystal X-Ray diffraction sample preparation, data handling and analysis, from raw data processing to structure refinement and deposition, as applied to structural biology research;

- proven experience in protein biotechnology, from protein sample preparation to crystallization, and structural biology of targets for drug development;

The following qualifications will be considered as additional assets:

- experience with web application development and proven programming skills in modern software coding languages (Python, JavaScript, PHP, Full Stack development approaches), database, AI usage and AI model development.

- experience on the installation, commissioning and managing of crystallization lab equipment;

Good time management skills, the ability to prioritize effectively, and the capacity to engage with facility users and colleagues, including tutoring students and to work within a multidisciplinary team, are necessary qualifications.

Proficiency in both oral and written communication in English is essential.

General information

The envisioned appointment is a fixed term contract of an initial duration of 12 months, renewable upon agreement by the parties. The salary will be commensurate with previous experience and qualifications of the candidate. A trial period of 3 (three) months is foreseen.

Applications must include a full curriculum vitae, the names and contact information (including electronic mail) of up to three individuals who have agreed to provide references. A motivation letter is desirable.

The interviews could be performed through video conferencing.

The ranking of suitable candidates resulting from this selection process may be used within the following 24 months.

Employees or former employees of Elettra Sincrotrone Trieste S.C.p.A., as well as current or former personnel provided by temporary work agencies will be excluded from the present selection procedure. 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 also be excluded from the present selection procedure, in accordance with the provisions of article 21 of the Italian legislative decree no. 39/2013 and in conjunction with article 53 (subsection16ter) of Italian legislative decree no. 165/2001.

Elettra Sincrotrone Trieste

The deadline for the submission of the application is December 20, 2025.

We thank all applicants in advance.
For more information, please contact Lisa Vaccari (email: lisa.vaccari@elettra.eu) or Nicola Demitri (email: nicola.demitri@elettra.eu).

To apply for this position please visit the following link:
https://www.elettra.trieste.it/it/about/careers/working-withus.html?id=4275