



Elettra Sincrotrone Trieste

# Postdoc for the SYRMEP beamline at Elettra

Deadline: 21 January 2023

Ref: DA/22/37

## 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 SYRMEP beamline at Elettra has been operating since more than 20 years applying advanced hard X-ray imaging techniques in the field of biomedicine, preclinical studies and materials science. In Materials Science, the main research activities include the study of biomaterials and advanced materials, applications to volcanology, geology, as well as cultural heritage and paleo-anthropology.

The beamline operates in the 10-40 keV X-ray energy range, either in monochromatic and white/pink beam modality. Micro-tomography (microCT) studies can be performed in absorption or phase contrast mode in a wide range of spatial resolutions, from the micron scale to several tens of microns, according to sample size and experimental requirements. Propagation-based phase contrast imaging is the most frequently used approach. A set-up for analyzer-based imaging is also available for applications with a monochromatic beam. Dynamic microCT scans can be used for *in-situ* and real-time studies, with specific environmental conditions, e.g., high temperature, controlled atmosphere, mechanical stress, etc.

Current research activities are exploiting the capabilities presently offered by the SYRMEP beamline; further developments are foreseen thanks to new funded projects, aiming to improve the beamline potential and performance. In particular, in the framework of the Elettra 2.0 project, a new SYRMEP beamline served by a superbend 6T photon source is under development.

See <http://www.elettra.eu/elettra-beamlines/syrmep.html> for more information.

## Job description

The successful candidate will be involved in the operation, maintenance and upgrade of the SYRMEP experimental station in order to meet the needs of the Materials Science user community. He/she will collaborate in the management of dynamic CT (4DCT) experiments and support the beamline staff in optimizing imaging protocols and acquisition/reconstruction pipelines to improve beamline offerings and competitiveness.

The successful candidate will be involved in the experimental activity with focus on the characterization of new materials and geomaterials by means of hard X-ray imaging, both in absorption and phase contrast modality. He/she will work with the staff of the SYRMEP beamline in order to achieve a reliable and efficient user operation of the beamline, in particular in the management of *in-situ* experiments involving instrumentation capable of modifying the physical and mechanical parameters of the sample such as the recently implemented high-temperature furnace.

He/she will also be encouraged to establish new collaborations and open new opportunities of research in geology and, more generally, in that of innovative materials.

### Elettra - Sincrotrone Trieste S.C.p.A.

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## Qualifications

A Ph.D. in Physics, Chemistry, Geology or a related discipline is required. 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 March 2023.

Proven experience in the development and maintenance of instrumentation/sample environments related to synchrotron-based X-ray imaging and familiarity with X-rays Computed Tomography is required.

Basic knowledge of image processing techniques and data analysis and visualization software (ImageJ, VGStudio, Avizo, etc.) will be considered as a valuable asset.

The candidate should possess strong personal skills to pursue collaborative research programs in a team-oriented environment and to become part of existing research collaborations.

Good time management skills and ability to prioritize are expected, together with the ability to interact with project partners and to work as part of a multi-disciplinary team. Good oral and written communication skills in English are essential.

The appointment envisioned is a fixed term contract with an initial duration of 12 months.

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 individuals who have agreed to provide references.

Due to the situation related to the COVID-19 virus, the interviews may be performed through video conferencing.

The deadline for the submission of the application is January 21, 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 Giuliana Tromba (email: [giuliana.tromba@elettra.eu](mailto:giuliana.tromba@elettra.eu)).

To apply for this position please visit the following link:

<https://www.elettra.trieste.it/it/about/careers/working-withus.html?id=2861>

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