



Elettra Sincrotrone Trieste

Junior Scientist for the SYRMEP beamline at Elettra

Deadline: 17 June 2022

Ref: DA/22/19

Company description

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, main research activities include the study of biomaterials and advanced materials, volcanology, geology, as well as cultural heritage and paleoanthropology.

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 modes, in a wide spatial resolution range, from the micron scale to several tens of microns, according to sample sizes and needed spatial resolution. Propagation-based phase contrast imaging is the most frequently used approach. A setup for Analyzer Based Imaging is also available for applications with the monochromatic beam. Dynamic microCT scans can be performed for *in-situ* and real-time studies with specific environmental conditions (high temperature, controlled atmosphere, mechanical stress, etc.).

The present research activities exploit the capabilities currently offered by the SYRMEP beamline; further developments are foreseen in the framework of the Elettra 2.0 new source. A major upgrade plan will further develop the hard X-ray imaging capabilities through the construction of a new imaging beamline exploiting hard-X-ray radiation from a superconducting magnet, greatly improving the beamline potential and performance.

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 requirements of the user community.

She/he will be required to bring a significant contribution in the development of materials science research at the beamline, supporting user research activity, promoting the implementation of new *in-situ* and *operando* set-ups for specific applications and the optimization of imaging protocols for dynamic CT studies (4DCT).

The successful candidate will be involved in optimizing the pipeline for data analysis with the aim of defining fast, reliable and easy-to-use tools for obtaining quantitative results from large data sets.

She/he will work closely with the beamline coordinator and the staff of the SYRMEP beamline, as well as with the staff of the IT group at Elettra, in order to achieve an efficient user operation of the beamline

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In the framework of the Elettra 2.0 upgrade project, he/she will participate in the design and implementation of the technical developments of the new beamline, as well as in all scientific activities involving hard X-ray imaging techniques. She/he is also expected to establish new research collaborations and to be involved in submitting proposals to suitable funding agencies.

Qualifications

The candidate must hold a PhD in physics, geology, chemistry, engineering or related disciplines and postdoctoral experience and a significant publication record in the field of X-ray microCT applications in material sciences. The successful candidate must have proven experience in managing synchrotron radiation imaging experiments using absorption and phase-contrast approaches relevant to the advertised position. Knowledge of image processing techniques and data visualization software (e.g., VGStudio, Avizo, etc.) is also mandatory.

Experience in the use and development of instrumentation related to synchrotron-based X-ray imaging for *in situ* and *operando* experiments will be considered a plus.

The candidate should possess strong interpersonal skills to pursue collaborative research programs in a team-oriented environment and 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 work as part of a multidisciplinary team. Good oral and written communication skills in English are essential.

The appointment envisioned is a fixed term contract of an initial duration of 24 months. The salary will be commensurate with the previous experience and qualifications of the candidate.

Applications should include a full curriculum vitae signed by the applicant, with the names and contact information (including electronic mail) of at least two professional references.

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

The deadline for the submission of the application is June 17, 2022.

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).

To apply for this position please visit the following link:

<https://www.elettra.trieste.it/it/about/careers/working-withus.html?id=2582>

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