



Elettra Sincrotrone Trieste

Scientist for hard X-ray fluorescence and absorption beamlines at Elettra and Elettra 2.0

Deadline: 20 March 2024

Ref: DA/24/9

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

Within the Elettra 2.0 upgrade program two beamlines dedicated to X-ray fluorescence and X-ray absorption in the hard X-ray range will be completely rebuilt.

The present X-Ray Fluorescence (XRF) beamline is mainly dedicated to X-ray fluorescence mapping not only at 45/45 geometry, but also at grazing incidence, and has also spectroscopic capabilities and spatial resolution down to 100 x 100 mm² (<http://www.elettra.trieste.it/lightsources/elettra/elettra-beamlines/microfluorescence/x-ray-fluorescence.html>). It will be replaced by the new mXRF beamline downstream of an in-vacuum undulator and will feature high brightness and micrometric spot size. In continuity with XRF, μ XRF at Elettra 2.0 will be a multidisciplinary instrument for the elemental and chemical characterization of heterogeneous samples.

The present X-ray Absorption Fine Structure (XAFS) beamline at Elettra is dedicated to X-ray absorption spectroscopy in the hard X-ray range. It is installed on a bending magnet source and covers a wide energy range, from 2.4 to 25 keV (<http://www.elettra.eu/elettra-beamlines/xafs.html>). At Elettra 2.0, the beamline will be rebuilt downstream a superconducting bending magnet, from which the new name originates: XAS-SB. It will remain a general-purpose XAFS beamline with an extended energy range above 40 keV and high throughput both in fluorescence and in transmission mode. It will feature a moderately focused beam at the sample, maintaining the possibility to work out-of-focus.

The XRF and XAFS beamlines at Elettra are employed in research areas ranging from materials science to solid state physics, from environmental and earth science to cultural heritage. We envisage that mXRF and XAS-SB beamlines at Elettra 2.0 will work in synergy on the same scientific topics, sharing users and partially staff.

Job description

The successful candidate will join the facility staff in developing the m-XRF and XAS-SB beamlines. The main tasks will be to contribute to the design of the experimental stations of the mXRF and XAS-SB beamlines in order to meet the high expectations of the user community. She/he will also contribute to the operation of the XRF and XAFS beamlines of Elettra providing high-quality support to external users by assuming the role of local contact, thus gaining opportunities for collaborative work at the frontiers of the field before the dark period starting in July 2025, when the removal of Elettra and the installation of Elettra 2.0 will take place.

Qualifications

The following qualifications are expected:

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CERTIFIED
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- . Degree in Engineering, Physics, Materials Science or related disciplines.
- . Proven knowledge of complex instrumentation and experimental methods.
- . Good oral and written communication skills in English.

The following qualifications will be considered as useful assets (when proven by a suitable publication record):

- . PhD in Engineering Physics, Materials Science or related disciplines.
- . Research experience in public organisations or private companies with a job description relevant to the present position.
- . Experience in scientific instrumentation development (i.e., synchrotron instrumentation, beamlines, experimental stations, etc.).
- . Knowledge of radiation-matter interactions.
- . Hands-on experience with optics and detection systems.
- . Hands-on experience with vacuum systems, cryo-sample environment and experiments with gases.
- . Ability to understand technical drawings and to use drawing programs.
- . Basic knowledge of electronics.
- . Coding capabilities (e.g., Python).
- . Proven experience in X-ray spectrometry and X-ray spectroscopy.
- . Working knowledge of Italian.

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.

General information

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

The interviews may be held via video conferencing.

The deadline for the submission of the application is March 20, 2024.

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 Aquilanti (email: giuliana.aquilanti@elettra.eu).

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To apply for this position please visit the following link:

<https://www.elettra.trieste.it/it/about/careers/working-withus.html?id=3862>

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