Controls developer for CERIC Membership Fees project at the HF-SAXS and µXRF beamlines (WP1)

Deadline: 5 December 2026
Ref: IA/26/36

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 next months. 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. See http://www.elettra.eu for more information.

Beamline/Activity/Project description

In the framework of the aforementioned upgrade, new Elettra 2.0 beamlines will be built, extending our life science programs. Elettra is the Italian Partner Facility of CERIC-ERIC (https://www.ceric-eric.eu/), which was recently upgraded though the "Pathogen Readiness Platform for CERIC-ERIC Upgrade" (PRP@CERIC) project. New and updated beamlines, such as µXRF and high- flux SAXS (HF-SAXS, Austrian PF) and the installation, at the Elettra premises, in collaboration with IOM-CNR and IC CNR, of a Cryo-EM facility for single-particle analysis will give added value to the Life Science (LS) domain, complementing and strengthening the CERIC-ERIC LS program. In this framework, the project aims to support the upgrade of control systems of these new beamlines and to support the operation of the Cryo-EM facility

Job description

The successful candidate will design, develop and validate a domain-specific AI-assisted software development environment ("vibe coding") for the Elettra 2.0 beamlines, working closely with beamline scientists, controls engineers, data specialists and software developers. The first implementation and validation will be carried out at the HF-SAXS beamline.

- Collect and formalize beamline use cases, software requirements and acceptance criteria, and define an architecture.

- Develop the system so that generated code and development workflows account for the Elettra 2.0 control environment, including GEKO, BACS and all applicable interfaces, operational constraints and engineering standards.

- Build the technical context used by the AI tools from relevant source-code repositories, APIs, device specifications, documentation and procedures, and connect it with the laboratory's FAIR data-management infrastructure, preserving metadata, provenance, access control and traceability.

- Integrate AI-assisted code generation with version control, peer review, automated testing, simulation and continuous integration, ensuring that generated software is reproducible, maintainable and secure, and is subject to human review and approval before deployment.

- Implement and evaluate the HF-SAXS pilot on representative control, data-acquisition and scientific data workflows; document the results, support users, and prepare a roadmap for the possible adoption by other beamlines and instruments.

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Qualifications

Essential requirements:

- PhD or equivalent qualification in Computer Science, Software Engineering, Control Engineering, Electronic Engineering, Physics, or a closely related discipline;

- strong software development skills, preferably in Python and in languages used for scientific or control applications, together with experience in modular architecture, APIs and Linux-based environments;

- practical experience with version control, code review, automated testing, continuous integration and the development of maintainable, documented software;

- hands-on experience with LLM-based coding assistants, code-generation tools or agentic development workflows, including context design, knowledge retrieval and evaluation of generated code;

- experience in distributed control, data acquisition, scientific instrumentation software, or the integration of heterogeneous hardware and software systems;

- ability to translate scientific and operational needs into verifiable software requirements, with a sound understanding of secure development, access control, reproducibility, provenance and technical documentation.

Any of the following will be considered as an additional asset:

- experience with GEKO, BACS, or comparable beamline control and automation environments;

- experience at synchrotron facilities or other large-scale research infrastructures, particularly with SAXS instrumentation, detectors, motion control, data acquisition or online data processing;

- knowledge of FAIR data principles and scientific data-management infrastructures, including metadata, provenance, persistent identifiers and data lifecycle management;

- experience deploying LLM-based tools in private or on-premises environments, including retrieval-augmented generation, model and tool evaluation, containers or GPU-based infrastructure;

- experience with cybersecurity, data governance, authentication and authorization in scientific or industrial control environments.

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.

General information

The appointment envisioned is a fixed-term contract with a total duration of 36 months governed by the National Metalworker Collective Labour Agreement (C.C.N.L.) and by the Company Labour Agreements (agreements available on www.elettra.eu section "amministrazione trasparente"). A trial period of 3 (three) months is foreseen.

The employment grade is Level B1 of the National Metalworker Collective Labour Agreement (C.C.N.L.), with a gross annual salary ranging from € 30.814,29 to € 32.500,00 depending on previous experience and qualifications of the candidate.

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

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

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The interviews may be held via video conferencing.

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 (subsection 16ter) of Italian legislative decree no. 165/2001.

The publication of this call does not commit Elettra Sincrotrone Trieste S.C.p.A. to implement the procedure announced. Elettra Sincrotrone Trieste S.C.p.A. reserves the right to suspend/postpone/cancel this selection procedure or to launch a new call at its sole discretion, without the candidate being entitled to rise any claim.
In accordance with current applicable legislation, the selection procedure and any subsequent recruitment will be conducted in line with the principles of equal opportunities and non-discrimination.
Candidates will not be required to disclose information regarding their current or previous remuneration, in compliance with the provisions of Legislative Decree 96/2026.
The deadline for the submission of the application is December 5, 2026.

We thank all applicants in advance.
For more information, please contact Roberto Pugliese (email: roberto.pugliese@elettra.eu).

To apply for this position please visit the following link:
https://www.elettra.trieste.it/it/about/careers/working-withus.html?id=4314