Elettra Sincrotrone Trieste

Mechanical Engineer

Deadline: 2 March 2026
Ref: RA/26/5

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 laser (FEL) 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 also creates 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. An upgrade of the FERMI FEL to produce harder X-rays (FERMI 2.0) will begin after the completion of the Elettra 2.0 project.

Job description

The successful candidate will join the Mechanical Design Team within the Mechanical, Vacuum and Optical engineering (MVO) group. Among the other tasks, he/she will collaborate in the development, design and implementation of new opto-mechanical systems (e.g., focusing systems, spectrometers, intensity monitors, etc.) to characterize, transport and manipulate the photon beam from the machine to the end-stations for both FERMI, where the Photon Analysis, Delivery and Reduction System (PADReS) is used, and the Elettra 2.0 facilities. The successful candidate will be involved in R&D activities, with specific tasks related to the mechanical design of new diagnostics and optical instruments, including structural, thermal and vibration analyses. Moreover, he/she will contribute to the Technical Design Report of the FERMI 2.0 upgrade project, supervising the mechanical aspects of the necessary upgrades of the photon diagnostics and transport systems.

Main duties and responsibilities will be:

- designing new diagnostics and optical systems including components, frames, vacuum parts, optical elements and their related motion/bending sub-systems;
- carrying out finite element analysis (using ANSYS software) on active optics systems in order to assess their feasibility and performance, and converting results and requirements into design recommendations;
- evaluating prototypes from the point of view of compliance with design specifications, as well as technical and economic feasibility of industrialization.
- producing technical documentation (design requirements, technical reports, purchasing documents);
- co-supervising procurement, manufacturing and construction of the components;
- carrying out acceptance tests;
- participating in installation activities.

The successful candidate will work in close collaboration with staff physicists, engineers and technicians experienced in opto-mechanics applied to particle accelerators, photon diagnostics and transport systems, and ultra-high-vacuum. The workplace is Elettra - Sincrotrone Trieste, but occasional travel to other research laboratories might be required.

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Qualifications

A Master's Degree in Mechanical Engineering or equivalent is required, together with experience in designing, simulating and analyzing opto-mechanical systems and prototypes.

The following technical skills will be positively evaluated:

- hands-on experience in the use of CAD software (knowledge of CATIA will be considered a strong asset);
- hands-on experience in the use of finite element analysis codes (knowledge of ANSYS software will be considered a strong asset);
- experience with systems and components of large-scale research facilities (free-electron lasers and/or synchrotrons), in particular, in modeling, simulating and assessing the performance of optical systems for X-rays (mirrors, monochromators, etc.);
- knowledge of Ultra-High Vacuum (UHV) and UHV-compatible mechanical design;
- knowledge of scientific instrumentation and high precision motorized systems;
- knowledge of the basics of X-ray optics;
- knowledge of MATLAB software and programming languages such as Python;
- knowledge in vibration measurement and analysis.

Good oral and written communication skills in English are required; a working knowledge of Italian is an asset.

Good time management skills and ability to prioritize are expected, together with the ability to interact with the group members as well as colleagues from other groups, and to work as part of a multi-disciplinary team.

General information

The appointment envisioned is a fixed term contract with an initial duration of 24 months, renewable upon agreement of the parties. The salary will be commensurate with previous experience and qualifications of the candidate. A trial period of 3 (three) months is foreseen.

The interviews could be performed through video conferencing.

Applications should include a full curriculum vitae, description as well as any evidence of the qualifications declared, and, if possible, the names and contact information (including electronic mail) of two references.

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.

The deadline for the submission of the application is March 2, 2026.

We thank all applicants in advance.
For more information, please contact Maurizio Polentarutti (email: maurizio.polentarutti@elettra.eu) or Giovanni Simonetti (email: giovanni.simonetti@elettra.eu).

To apply for this position please visit the following link:

Elettra Sincrotrone Trieste

https://www.elettra.trieste.it/it/about/careers/working-withus.html?id=4282