Elettra Sincrotrone Trieste

Scientist for the Elettra Laser Laboratory

Deadline: 22 February 2026
Ref: GA/26/3

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) user facility 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 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

The FERMI FEL is based on the high-gain harmonic generation (HGHG) seeding scheme and strongly relies on the use of ultrafast laser systems for the generation of the electron bunches (photoinjector laser, or PIL), suppression of microbunching instabilities (laser heater, or LH), seeding by tunable UV light (seed laser, or SL) and pump-probe experiments at the user stations (pulses derived from the seed laser, or SLU). The Elettra Laser Laboratory team provides full operational support and implements continuous refinement and upgrades of these systems to support the FEL source improvements. Recent examples are the implementation of the echo-enabled harmonic generation (EEHG) seeding scheme, as well as FEL2 operation reaching the oxygen K-edge by 200 nm seeding. Further emphasis on enhancing the performance of the seed pulses in this spectral region, i.e., 200 nm and below, is planned for the near future. The Elettra Laser Laboratory team is also actively involved in the development and support of the set-ups for user experiments using combined FEL/external laser pulses for pump-probe experiments. A task of growing importance for the Elettra Laser Laboratory is also the support of laser systems related to the ongoing Elettra 2.0 facility upgrade. An important first step in this respect is operational support and further development of the two tunable deep-UV narrowband lasers installed in the new Elettra Inelastic Ultraviolet Scattering (IUVS) laboratory.

Job description

The successful candidate will join the Elettra Laser Laboratory team participating in all of the above mentioned activities. In particular he/she will have to provide an expert contribution to the development and deployment of online seed pulses generation and diagnostics in the deep-UV. The successful candidate will also play a major role in the R&D and facility installation work of advanced nonlinear optics set-ups, further improving advanced FERMI seeding modalities (e.g., towards sub-200 nm tunable seed pulses and shorter seed pulse duration). In addition, he/she will join the work on extension of the capabilities of the set-ups for pump-probe type optical laser-FEL measurements at the FERMI end-stations. Another major duty of the new laser scientist would be operational support of user operation of the above mentioned laser systems of the IUVS laboratory and their further development to extend the photon energy above the current 6.4 eV limit.

Qualifications

A Ph.D. in Physics or Engineering is required together with the following technical skills:

- expertise in the daily use and maintenance of laser systems, including oscillators and amplifiers (in particular Ti:Sapphire based) and complex optical set-ups;

- proven experience in the application of techniques for the complete characterization of ultrashort UV laser pulses, e.g., by frequency-resolved optical gating

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Experience in the development and use of set-ups for the generation and characterization of deep-UV light pulses is highly desirable.

The following qualifications would be considered as additional assets (please indicate relevant publications or thesis in the specific field):

- A research background in the fields of lasers, ultrafast and nonlinear optics and spectroscopy
- Set-ups involving use of deep ultraviolet (DUV) and vacuum ultraviolet (VUV) light , and related vacuum equipment
- Familiarity with nonlinear/ultrafast optics software (open or commercial software)
- Programming skills in Python or Matlab, including interfacing of instruments
- Experience with TANGO control system

The successful candidate should possess strong interpersonal 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 withtheability to interact with staff and facility 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 permanent staff position, with a three-month trial period. The salary will be commensurate with previous experience and qualifications.

Applications should include the candidate's full curriculum vitae, the names and contact information (including electronic mail) of up to professional references.

The interviews may be held via video conferencing.

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

Permanent employees of Elettra Sincrotrone Trieste S.C.p.A. 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 February 22, 2026.

We thank all applicants in advance.
For more information, please contact Miltcho Boyanov Danailov (email: miltcho.danailov@elettra.eu).

To apply for this position please visit the following link:
https://www.elettra.trieste.it/it/about/careers/working-withus.html?id=4280