



Elettra Sincrotrone Trieste

# Staff Accelerator Physicist

Deadline: 6 November 2020

Ref: CA/20/36

## 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. See <http://www.elettra.eu> for more information.

## Beamline/Activity/Project description

Unique among the FEL sources currently operating in the ultraviolet and soft x-ray range worldwide, FERMI has been developed as an externally seeded FEL to provide fully coherent and highly reproducible ultrashort (20-100 femtosecond) pulses with a peak brightness ten billion times higher than that made available by third-generation light sources. FERMI is opening unique opportunities for exploring the structure and transient states of condensed matter, soft matter and low-density matter using a variety of diffraction, scattering and spectroscopy techniques.

The research activities in FEL and Accelerator Physics are performed, both theoretically and experimentally, to exploit the present capabilities offered by the machine and to develop new upgrades to the machine complex and new schemes for FEL generation. The main upgrade foreseen consists in an extension of the FELs spectral range to the oxygen K-edge on the fundamental harmonic and beyond at higher harmonics. This upgrade will involve the two FELs at FERMI, FEL-1 and FEL-2. The upgrade design for FEL-1 is in progress. An Echo Enabled Harmonic Generation scheme will be implemented on FEL-1 to extend the operating range of FEL-1 to include the 60-120 eV photon energy range.

This upgrade will also allow in depth studies of the possibilities offered by the EEHG scheme and will pave the way for the upgrade of FEL-2 aimed at reaching for the first time the oxygen K-edge energy target (530-550 eV) on an externally seeded Free Electron Laser.

See <http://www.elettra.eu/FERMI/> for more information.

## Job description

The primary responsibility of the selected candidate will be in the area of the design and simulation activities devoted to the photon energy upgrade of FEL-1 and FEL-2 at FERMI. His/her tasks will include proposing and carrying out new measurements on the existing linac and FELs, aimed at better defining the best strategy for the upgrade of FEL-2 to reach the 500 eV photon energy range. He/she will be coordinating the experimental activity on the studies of beam dynamics, FEL dynamics and microbunching instability made possible by the upgraded layout of FEL-1.

The selected candidate will be involved in the experimental activities of FERMI becoming a member of the FERMI Machine Physics team. He/she will collaborate with the other members of the physics staff in the development of new concepts to enhance the capability and performance of the FERMI FELs and will contribute to the research and development of experiments with the x-ray FEL to advance the frontiers of physics. He/she will provide his/her competence in tuning and running the FERMI FEL-s to set-up the machine for user beamtimes and will be involved in the cutting edge research carried out during the external user beamtimes. He/she will be participate in the operation of the facility and is expected to contribute to its further developments. He/she will also be involved in R&D studies on high harmonic generation and advance laser science and applications.

The selected candidate will be encouraged to develop and strengthen links with accelerator physics specialists from other international facilities.

## Qualifications

A Ph.D. in Physics or a related discipline is required as well as a proven track record in the following areas:

### Elettra - Sincrotrone Trieste S.C.p.A.

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[www.elettra.eu](http://www.elettra.eu)

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- free-electron lasers (FELs) and high harmonic generation schemes;
- simulation of FEL devices;
- accelerator design and beam dynamics codes.

Experience in the following areas will be considered an advantage:

- laser optics;
- beam instrumentation;
- ultra-high vacuum techniques;
- programming skills (such as Python, IDL, C++, Labview or Matlab).

Good time management skills and ability to prioritize are expected, together with the ability to interact with staff and facility users and to work as part of a multi-disciplinary team.

Good oral and written communication skills in English are essential. A working knowledge of the Italian language is desirable, but is not required.

*The appointment envisioned is a permanent position. The salary will be commensurate with previous experience and qualifications.*

*Applications should include full curriculum vitae, the names and contact information (including electronic mail) of possibly two references.*

The deadline for the submission of the application is November 6, 2020.

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 Elena Cantori (email: [elena.cantori@elettra.eu](mailto:elena.cantori@elettra.eu)).

To apply for this position please visit the following link:

<https://www.elettra.trieste.it/it/about/careers/working-withus.html?ref=CA%2F20%2F36>

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