

Postdoctoral Research Associate at LDM

Deadline: 18 February 2024

Ref: DB/24/2

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

Our laboratory is committed to conducting outstanding research in diverse fields, among which atomic, molecular and optical (AMO) science. The Low Density Matter (LDM) beamline at FERMI leverages the unique capabilities of the FEL source, including high brilliance and coherence, in conjunction with variable-focusing optics and a synchronized optical laser pump. These features enable time-resolved experiments with a resolution of tens of femtoseconds and, by an interferometric approach, the exploration of coherent electronic dynamics below 1 attosecond. The target systems encompass very dilute species, such as weakly-bound complexes, radicals, ions, as well as matter under extreme irradiation conditions (multiple excitation, non-linear optics). Experiments adopt a multi-technique approach that facilitates a thorough investigation of the electronic properties of free atoms, molecules, and clusters. See <http://www.elettra.eu/elettra-beamlines/ldm.html> for more information. Close collaborations are envisioned with AMO activities utilizing beamlines of the Elettra source, including the Gas Phase beamline and its successor MOST (Molecular and Optical Science and Technology) beamline, currently under construction as part of the Elettra 2.0 project.

Job description

The postdoctoral position offers unique opportunities for researchers aiming to make impactful contributions to one of the active AMO research fields, which include coherent control with shaped FEL pulses, molecular dynamics and cluster science. The role requires a proactive approach to support users throughout every phase of their activity, from preparing the experimental setup to conducting complex data analysis and writing scientific manuscripts. The selected candidate will be involved in development activities, such as implementation of new sample sources, expansion of optical laser set-up and optimization of existing spectrometers, while also contributing to the ordinary maintenance and operation of the beamline. The selected candidate is expected to actively take part and shape internal research, closely collaborating with the LDM and MOST research teams.

Qualifications

Applicants must hold a Ph.D. in physics, chemistry or a related field, earned within the last six years. Consideration will also be given to those who have completed their doctoral studies and have a defense scheduled, with the expectation that the Ph.D. will be awarded by April 2024.

A background in the field of Atomic and Molecular Physics or Chemistry is mandatory, supported by a publication record commensurate with career advancement and experience in at least one of the following techniques: charged particle spectroscopy, ion mass spectrometry, ion/electron imaging, short-wavelength laser spectroscopy.

The following qualifications will be considered as additional assets (please indicate relevant publications or thesis):

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Elettra Sincrotrone Trieste

- Participation in experimental campaigns at synchrotron/FEL user facilities.
- Use and basic maintenance of pulsed laser systems; experience in pump-probe experiments.
- Previous use and development of ultrafast optical lasers.
- Previous use and basic maintenance of charged particle optics, detectors and related electronics.
- Previous use and development of liquid jets, molecular beams, cluster or electrospray sources.
- Use and basic maintenance of UHV vacuum systems compatible with the delivery of gaseous samples.
- Programming skills in Python, Matlab, and Labview, including interfacing of instruments.

The successful candidate should possess strong personal skills favoring collaborative research programs in a team-oriented environment.

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 will be a fixed term contract with an initial duration of 12 months. The salary will be commensurate with previous experience and qualifications of the candidate.

Applications should include the full curriculum vitae, the names and contact information (including electronic mail) of up to three persons who have agreed to provide references.

The interviews may be held via video conferencing.

The deadline for the submission of the application is February 18, 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 Carlo Callegari (email: carlo.callegari@elettra.eu).

To apply for this position please visit the following link:

<https://www.elettra.trieste.it/it/about/careers/working-withus.html?id=3722>

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