Elettra Sincrotrone Trieste

# Part-time Senior Scientist Position for Coherent Diffraction Imaging at Elettra

Deadline: 31 March 2020
Ref: DA/20/14

## 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

The development of a new generation storage ring, denoted as Elettra 2.0, with a substantial increase in the brilliance and coherence fraction of the source as compared to the present Elettra storage ring has begun. The increased coherence will be utilized for ptychography and coherent diffraction imaging by means of new and upgraded synchrotron radiation beamlines. In particular, a new advanced experimental station for dynamic resonant elastic X-ray imaging and scattering studies of material and biomaterials is currently under construction. The new experimental station will undergo early evaluation on the current Elettra source and final installation on the new Elettra 2.0 source.

To take full advantage of the complementarity and modularity of soft/tender X-ray imaging techniques, a new beamline in the energy range 400-4000 eV with multimodal capabilities will serve a broad spectrum of scientific cases and materials or samples. This instrument will enable soft/tender X-ray scattering and imaging experiments in different modes and geometries; as such, it will represent a unique facility in the arena of coherent soft/tender X-ray science, with a specialization in Bragg ptychography and diffractive imaging, Fourier transform holography, scanning X-ray nanodiffraction and X-ray photon correlation spectroscopy.

The experimental station currently under construction is based on a fully in-UHV diffractometer. Inside the vacuum chamber a stable optical base will host the desired optics in suitable positions relative to the sample. Scanning nanopositioners will position pinholes and a complete focusing optics setup (zone plate and order-sorting aperture) to focus or shape the beam at the sample position in the various configurations needed for the different techniques to be implemented. A sample liquid helium cooled cryo-manipulator will provide the low sample temperatures required for surviving radiation damage and entering the structural and electronic phases of interest. High efficiency fast X-ray detectors (both pixelated and area-integrating) installed on the moveable diffraction arms will provide both time-domain access for the investigation of collective ordering dynamics as well as off-scattering plane angular capabilities.

## Job description

The successful candidate will be the senior scientist primarily responsible for monitoring the construction of the new experimental station by the supplier, conducting factory acceptance tests, coordinating installation of the experimental station on a branch line of an existing soft-X-ray beamline at the Elettra source and evaluating the overall performance of the experimental station, in collaboration with physicists and engineers of the optics, mechanics, vacuum, and detector laboratories and the ICT staff. Starting in the second year of the contract she/he will be supported by a postdoctoral fellow who will have undergone one year of training in coherent diffraction imaging techniques at NSLS-II.

She/he will participate in the design and implementation of the technical developments of the beamline for Elettra 2.0 and will be free to collaborate in any of the scientific activities involving X-ray imaging techniques at Elettra. She/he is also expected to establish new research collaborations and be involved in submitting proposals to suitable funding agencies.

## Qualifications

A PhD in Physics or related disciplines and more than five years of research experience in the application of synchrotron radiation X-ray imaging in the life sciences and/or materials science is required. A distinguished publication record in the

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field is expected. Specific experience in X-ray microscopy and tomography, X-ray phase-contrast and dark-field imaging, X-ray near-field and far-field ptychography, and wavefront sensing and optics characterization would be considered a plus, as would be previous experience in the development of instrumentation related to synchrotron-based X-ray imaging experiments and a high-level knowledge of 3D image processing and analysis tools.

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 with the ability to interact with project partners and to work as part of a multi-disciplinary team. Good oral and written communication skills in English are essential.

The deadline for the submission of the application is March 31, 2020.

The appointment envisioned is a part-time (62.5% time; 5 hrs/day, 25 hrs/week), fixed-term contract of a 36 month duration. The salary will be commensurate with the previous experience and qualifications of the candidate.

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, 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 Luca Gregoratti (email: luca.gregoratti@elettra.eu) or Silvano Lizzit (email: silvano.lizzit@elettra.eu).

To apply for this position please visit the following link:
https://www.elettra.trieste.it/it/about/careers/working-withus.html?ref=DA%2F20%2F14