Quantum Computing Postdoctoral researcher for QUASAR FVG project (FSC - 44620/25 GRFVG, CUP: D93C25001400001)

Deadline: 31 March 2026
Ref: IA/26/8

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 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. Seehttp://www.elettra.eufor more information.

Beamline/Activity/Project description

The QUASAR FVG project, funded by the Friuli Venezia Giulia Region following the FSC - 44620/25 GRFVG call for proposals (September 30, 2025), CUP: D93C25001400001, aims to develop innovative solutions to address the problem of scalability of quantum computing and simulation platforms based on neutral atoms, helping to consolidate the role of Friuli Venezia Giulia as a national and international reference point in quantum technology research. The integrated approach-which combines experimental development, numerical simulations, and advanced algorithm design-will create a coherent framework between hardware, theoretical models, and application protocols, facilitating the validation and benchmarking of quantum protocols. Thanks to the collaboration between universities, research centers, and centers of excellence already present in the area, the project will strengthen the attractiveness of the Friuli-Venezia Giulia region as a competitive scientific and technological ecosystem open to future industrial synergies. With the involvement of six institutions with cross-cutting expertise (University of Trieste, SISSA, University of Udine, CNR-INO, CNR-IOM, Elettra Sincrotrone Trieste), QUASAR-FVG aims to strengthen the region's national and international positioning in the field of quantum computing, contributing to scientific and technological growth in the area at a key moment for the development of quantum technologies.

The Scientific and Quantum Computing (SciQC - quantum.elettra.eu) team at Elettra Sincrotrone Trieste is a multidisciplinary R&D unit within the IT Group focused on advancing computational methods for synchrotron, free-electron laser (FEL), and related scientific challenges. SciQC combines expertise in mathematics, numerical algorithms, high-performance computing, data analysis and visualization, computational imaging and spectroscopy, AI and compressive sensing, and quantum computing to develop robust solutions that bridge theoretical frameworks with real experimental data and workflows. The team drives innovation in algorithm design, GPU-accelerated computing, and quantum-ready methodologies applicable to complex scientific problems across the experimental portfolio of Elettra Sincrotrone Trieste.

Job description

The successful candidate will contribute to the design of algorithms, their performance evaluation, and cross-validation on experimental hardware and high-performance classical simulations, working at the interface between quantum theory, numerical methods, and large-scale scientific data analysis. The position is not limited to quantum computing and includes a substantial component of traditional scientific computing, as required by the everyday operation of the facility.

Qualifications

A Ph.D. in Physics, Computing, Engineering or related field is required together with the following technical skills and

knowledge:

- Computational methods for data analysis
- Quantum Computing theory (e.g., QC algorithms)
- Practical Quantum Computing (e.g., Qiskit)
- Software development in Linux

The following skills would be considered an asset:

- Proven experience with QC SDKs like Qiskit, PennyLane, or Cirq
- Experience with scientific computing in research institutions
- Experience with QC algorithms (ie. QAOA, VQE, Grover's)
- Published peer-reviewed research

Good time management skills and ability to prioritize are expected, together with the ability 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 deadline for the submission of the application is March 31, 2026.

The appointment envisioned is a fixed-term employment contract with a duration of 18 months. A trial period of 3 (three) months is foreseen.The salary will be commensurate with previous experience and qualifications.

Applications must include completed, dated, and signed curriculum vitae, a motivation letter, and the contact details of at least one person who has agreed to provide references.

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

Selection interviews may also be conducted via videoconference.

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.

We thank all applicants in advance.
For more information, please contact Georgios Kourousias (email: george.kourousias@elettra.eu) or Roberto Pugliese (email: roberto.pugliese@elettra.eu).

To apply for this position please visit the following link:
https://www.elettra.trieste.it/it/about/careers/working-withus.html?id=4285

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

S.S. 14 Km 163,5 in Area Science Park
34149 Basovizza, Trieste, Italy
T. +39 040 37581
F. +39 040 938 0903

P.IVA e C.F. IT00697920320
Cap. Soc. € 49.969.980,45 i.v.
PEC: sincrotrone.trieste.elettra@legalmail.it
www.elettra.eu

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