

1. Position identification

Title of post : Postdoctoral position on construction of a next generation quantum computing platform based on neutral atoms

Type of contract : Post-doctoral contract

Category (A,B or C) : A

Contract/project period : 01.07.2024 - 30.09.2025

Expected date of employment : 01.07.2024

Proportion of work : Full time

Workplace : Institut de Science et d'Ingénierie Supramoléculaires (ISIS) – Centre Européen de Sciences Quantiques (CESQ)

Desired level of education : PhD or equivalent

Experience required : PhD and/or postdoc experience in experimental atomic, molecular and optical physics

Contact(s) for information on the position (identity, position, e-mail address, telephone) : WHITLOCK Shannon, Professor, whitlock@unistra.fr;

SEMAK Svitlana, Project manager, ssemak@unistra.fr

Date of publication : April 29th 2024

Closing date for the receipt of applications : 31 May 2024

2. Research project or operation

The “European infrastructure for Rydberg Quantum Computing (EuRyQa)” project is aimed at establishing Rydberg quantum processors as a leading platform for scalable quantum computing in Europe. Assembling eleven partners from seven countries, EuRyQa is funded under the highly competitive Horizon Europe programme. Within an international consortium, the University of Strasbourg is realizing a large-scale research infrastructure and sustainable quantum computing platform, leading to the establishment of a quantum computing center and ecosystem in the east of France.

3. Activities

➤ Description of the research activities :

This project will focus on the realization of a new dual species platform for atomic quantum computing comprising >400 high quality atomic qubits and a universal gate set.

➤ **Related activities :**

The post-doctoral researcher will work within a team to help manage day-to-day activities in the lab, design, construct and install parts of the aQCess platform. It is expected that the researcher will publish open hardware designs, scientific and technical papers and present research results at national and international conferences.

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4. Skills

➤ **Qualifications/knowledge :** We require experimental experience in atomic, molecular and optical physics, including optics, lasers, mechanical design, ultrahigh vacuum systems and experimental automation. Computer programming experience and control of complex instruments will be considered favorably.

➤ **Operational skills/expertise :**

Proven record of research in atomic physics, publications and presentations, external research grants, or other relevant indicators.

- Demonstrated ability to conduct research collaboratively and independently.
- High-level communication skills.
- Technical knowhow in electronics, mechanical design, modelling will be considered favourably

➤ **Personal qualities :** curiosity, strong motivation for research, ability to learn new subjects. Ability to work in group. Skills for reporting on research results.

5. Environment and context of work

➤ **Presentation of the laboratory/unity :**

We offer the possibility to do exciting experiments embedded in a culturally and scientifically rich research environment, situated in the heart of Europe. The new European Centre for Quantum Sciences (CESQ), attached to ISIS (Institut de Science et d'Ingénierie Supramoléculaires), develops new lines of research and technology exploiting quantum principles, at the frontiers to chemistry, physics, materials science, and computing. CESQ hosts an operational prototype Rydberg quantum processor based on optically trapped Rydberg atom qubits and leads the development of the next generation dual species Rydberg quantum computer with >400 fully addressable qubits for scalable digital QC (aQCess - Atomic Quantum Computing as a Service) currently under construction. For more information and recent publications, visit: eqm.unistra.fr / aqcess.cesq.fr

➤ **Hierarchical relationship** : The aQCess project is coordinated by Shannon Whitlock with Stanimir Kondov as technical lead and Ana Helman as Managing Director. The postdoctoral will be a member of the CESQ, currently directed by Guido Pupillo.

➤ **Special conditions of practice (notice attached): None**

To apply, please send your CV, cover letter and diploma to :

WHITLOCK Shannon whitlock@unistra.fr;

SEMAK Svitlana ssemak@unistra.fr