INDO-KOREA SCIENCE & TECHNOLOGY CENTRE, BANGALORE

POSTDOCTORAL RESEARCH FELLOW

Quantum Computation and Quantum Machine Learning

ABOUT IKST

The Indo-Korea Science and Technology Centre (IKST), Bangalore, is the Indian branch of the Korea Institute of Science and Technology (KIST), Seoul, and is funded by the Government of Korea. Established in 2010, IKST promotes collaborative research between Indian and Korean scientists and institutions on problems of mutual interest and the development of advanced technologies.

IKST's current research programme spans computational materials science, data analytics, AI/ML, and emerging quantum-computing approaches. The Centre collaborates with leading Indian institutions and with KIST research groups in Korea. Its internal R&D division is expanding activities in quantum computation and quantum machine learning, including photonic implementations and quantum algorithms relevant to materials and molecular systems.

THE POSITION

IKST invites applications for a postdoctoral opening in quantum computation and quantum machine learning (QML), with particular emphasis on photonic quantum systems. The selected candidate will develop and benchmark quantum and hybrid quantum–classical algorithms for bosonic and fermionic problems, translate materials or molecular descriptors into suitable quantum encodings, prepare research software and publications, and work closely with collaborators in India and Korea, including teams developing photon-based quantum platforms.

ESSENTIAL QUALIFICATIONS

- PhD in Physics, Quantum Information/Quantum Engineering, Materials Science, Chemistry, Computer Science, Electrical Engineering, or a closely related discipline.
- Strong foundation in quantum mechanics, linear algebra, and quantum information/computation, with demonstrated research experience in quantum algorithms or QML.
- Strong programming and scientific-computing skills, preferably in Python and one or more quantum-software frameworks such as Qiskit, PennyLane or equivalent tools.
- Ability to formulate, simulate, validate, and critically benchmark quantum models against appropriate classical or numerical baselines.
- Evidence of research productivity through peer-reviewed publications and/or reproducible software, code repositories, documented packages, or project portfolios.
- Excellent oral and written communication skills and the ability to work effectively in interdisciplinary and international collaborations.

PREFERRED EXPERTISE

Expertise in photonic quantum information or quantum optics will be highly valued, including linear-optical circuits, bosonic encodings, qudits/ququarts, continuous-variable or discrete-variable photonic models, and measurement-based feature extraction. Experience with quantum kernels, variational quantum circuits/QNNs, quantum data encoding, hybrid optimization, shot/noise effects, or trainability analysis is desirable. Familiarity with fermionic Hamiltonians and quantum algorithms for chemistry or materials—such as variational eigensolvers, quantum phase estimation, or sampling/subspace-based diagonalization—would be an additional advantage. Candidates are not expected to have prior experience in every area.

HOW TO APPLY

Applicants should email the following materials to **careers@ikst.res.in**:

- Curriculum vitae, including a publication list;
- Two letters of recommendation;
- A brief statement of research experience, interests, and proposed fit to the quantum-computation/QML programme; and
- Links to relevant code repositories, software releases, or project portfolios.

Only shortlisted candidates will be contacted by the HR team by email or telephone regarding the next steps.

Learn more about IKST and its activities: www.ikst.res.in