# RAMAN RESEARCH INSTITUTE

**Announcement of opportunity for engineering research in**
**Quantum Communications under India's National Quantum Mission**

**Advt. no.10/2025 dt.11 April 2025**

**Raman Research Institute** invites applications from individuals for two Senior Project Associate positions to contribute towards engineering challenges in the domain of secure quantum communications. The candidates must possess excellent and consistent academic record and core competence and research aptitude in Engineering.

The Quantum Information and Computing (QuIC) lab of RRI has been working on several approaches in secure quantum communications and has achieved notable global success in this sphere. The QuIC lab has now been awarded a mega project under India's National Quantum Mission (NQM) titled " A multi node quantum repeater network for entanglement distribution based quantum communication." Professor Urbasi Sinha of RRI who heads the QuIC lab at RRI Bangalore is the lead Principal Investigator for the project with RRI Bangalore as the lead institution. The other institutions involved in the consortium include HRI Prayagraj, IIT Tirupati, IIT Patna and IISER Mohali. The current advertisement is for positions in the QuIC lab under NQM.

**Academic and technology focus of the project that the successful applicants will be contributing**
The QuIC lab at RRI will establish a multi node quantum repeater network by developing high end quantum memories based on vacancies in diamond, commensurate single and entangled photon sources as well as all relevant experimental science and technology goals relevant to this grand mission. They will also collaborate with theory Co-PIs at HRI Prayagraj, IISER Mohali as well as international partners towards robust repeater frameworks. Quantum Repeater technology is globally at a nascent stage of development with a global record of 2-3 repeater node- based networks so far. Successful candidates will have the opportunity to contribute to a vibrant globally competitive research program that will also involve international exposure. Prof. Urbasi Sinha also holds the Canada Excellence Research professorship at the University of Calgary, Canada. Our team members benefit from:

- Access to advanced facilities and equipment across two international locations
- Regular travel opportunities between India and Canada
- Collaboration with leading scientists in both countries
- Exposure to diverse research methodologies and cultural perspectives
- The chance to work on breakthrough experiments that bridge theoretical concepts with practical applications
- Strong industry connections in both regions
- Mentorship from established researchers in both locations

Integrating vacancy-based memories into multi-node quantum repeater networks presents the overarching challenge, requiring efficient entanglement distribution and swapping protocols across heterogeneous nodes. **Success would enable a flexible quantum network infrastructure that leverages the unique strengths of diamond vacancy centres, revolutionizing secure communication, distributed quantum computing, and quantum sensing toward a global quantum internet.**

We are currently looking for two **Senior Project Associate appointments** within the QuIC lab, Light and Matter Physics group of the Institute. Candidates with Bachelors' degree in Engineering or Technology as well as candidates with Masters' degree in Engineering or Technology from a recognized university or equivalent are encouraged to apply. Those with Bachelors' degree need four years or more of experience in research and development in industrial and academic institutions or science and technology organizations while those with Masters' degree need two or more years of such experience.

**Remuneration:** 54, 600 INR per month (consolidated)

**Eligibility:**

**Age:** Not more than 35 Years on the closing date for receiving the completed application forms online. Age relaxation may be considered for candidates with relevant research experience.

We are looking for two candidates in different engineering domains.

**Position one:**

**Essential:**

Bachelors' degree in Engineering or Technology in Electronics; Electronics and Communications or Instrumentation from a recognized university or equivalent. 70% or more marks in aggregate or equivalent grade and four years or more of experience in research and development in industrial and academic institutions or science and technology organizations.

The candidate should have experience in one or more of the following :

1. Prior hands on experience in handling Test and measurement instruments (Oscilloscopes, Spectrum analyzer, Signal Generator etc.)

2. Hands on coding experience of Hardware description languages (Verilog, VHDL or HLS) as well as proven capability of design and development of FPGA based systems.

3. Hands on experience with PCB/CAD design tools.

**Position two:**

**Essential:**

Bachelors' degree in Engineering or Technology in Electronics; Electronics and Communications or Instrumentation from a recognized university or equivalent. 70% or more marks in aggregate or equivalent grade and four years or more of experience in research and development in industrial and academic institutions or science and technology organizations.

The candidate should have experience in one or more of the following :

1. Prior hands on experience in handling Test and measurement instruments (Oscilloscopes, Spectrum analyzer, Signal Generator etc.)

2. Hands on experience in control systems design and hardware.

3. Hands on experience with PCB/CAD design tools.

**Desirable (for both roles):**

1. Working experience with programming languages like C, C++, MATLAB and Python.

2. Knowledge in controlling of equipment using Labview.

3. Proficiency in working with ZEMAX/ Optics Studio/ Ray Optics simulator.

4. Experience with photonics systems and engineering.

**Tenure:**

Initially 1 year, extendable up to three more years of project subject to satisfactory performance and annual review by expert committee.

**Selection procedure:**

Candidates who qualify in the required criteria will be called for an interview. The interviews will be held online.
Applications may be uploaded at: http://rhino.rri.res.in/forms/spa_quic.php

**Closing date for receiving the applications: 15ᵗʰ May 2025.**
**Applications received after the last date will not be considered.**

**General Information:**

- Those who are already working in Government/Semi Government/PSU/Autonomous Bodies shall submit their applications through proper channel.

- The Institute reserves the right to restrict the number of candidates for interview to a reasonable limit, on the basis of qualification and experience higher than the minimum prescribed in the advertisement. Mere fulfilling the essential and desired qualifications will not entitle an applicant to be called for interview.

- Age relaxation will be applicable as per Govt., of India rules for the candidates belonging to SC/ST/OBC/Persons with disabilities categories.

- Second Class AC train fare for attending interview shall be reimbursed to the candidate on provision of original tickets.

- This is a project-based position. Remuneration shall depend on availability of project funding.

- The institute reserves the right to relax any of the above requirements in exceptional cases.

- The Institute reserves the right not to fill the posts herein advertised. Canvassing in any form shall disqualify the candidate.