# RAMAN RESEARCH INSTITUTE

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

**Advt. No. NQM/QC/US-01 dt.10 July 2025**

**Raman Research Institute in collaboration with the IITM CDoT Samgnya Technology foundation** invites applications from motivated individuals **for two Quantum Scientist/Quantum Engineer positions** to contribute towards exciting research in the domain of secure quantum communications. The candidates must possess excellent and consistent academic record and core competence and research aptitude in Physics and 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 is leading 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.**

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 has a Canada Excellence Research Chair 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. Quantum Repeater technology is globally at a nascent stage of development with a global record of 2-3 repeater node- based networks so far. **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.**

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| Position | **<u>Quantum Scientist/Quantum Engineer --- 2 in number</u>** |
| Essential Qualification | • PhD in optics in the experimental domain with hands on experience in optical alignment (both fibre and free space) as a part of the PhD project. Candidates who have submitted their thesis but have not yet obtained the PhD degree are also encouraged to apply. |
| Consolidated salary range | 1,00,000 – 1,50,000 INR per month with yearly 3% increase in salary, Consumables grant up to 2,00,000 per annum. |
| Tenure of Assignment | Initially 1 year, extendable up to 2031 subject to satisfactory performance and annual review by expert committee. |
| Desired Experience & skill sets | • PhD in any of the Experimental Quantum Optics Domains: Photonic Quantum Communication/Photonic quantum computing/Photonic Quantum Information Processing.<br>• >=2 years of Post Ph.D. research experience in optics based labs.<br>• Experience with building confocal microscopes.<br>• Experience with research involving vacancies in diamond.<br>• Experience with research involving building single and entangled photon sources using SPDC or any other means.<br>• Experience in quantum communications experiments before/during and/or after PhD.<br>• Experience with cryogenics based experiments.<br>• Experience with fabrication as well as characterisation of integrated photonic chips.<br>• Prior experience in taking solutions from lab to market. |

**Selection procedure:**

Interested candidates may apply by submitting a detailed resume with copies of all experiences and project details, a cover letter summarizing the experience in relevant technologies and software, and it's compulsory to fill out the form in the online link below:

At the time of the interview, you must bring copies of the degree certificate and grade sheets for all degrees, School final, and Higher Secondary exams. Submission accepted only as submission through this online link:

http://rhino.rri.res.in/forms/quantum_scientist.php

No other form will be acceptable. Please note that if a detailed cover letter, copies of grade sheets, certificates are missing, the application will be immediately rejected. Please clearly indicate the Project Number and position being applied in the cover. Also note that the applications/resumes sent to any mail id SHALL NOT be considered for any scrutiny.

Candidates who qualify in the required criteria will be called for an interview.

**Closing date for receiving the applications: 9th August 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/women categories (as per NPDF norms).
- 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.