



Position available for Project Associate –I/ Project Associate-II

Applications are invited from highly motivated and eligible candidates for the project entitled “Indigenous Development of compact, hands-free, stable, bright entangled photon source at 810 nm” under the Department of Science and Technology (DST) TDP programme, Government of India at Physical Research Laboratory, Ahmedabad.

Name of the Post	No. of Vacancy	Age as on last date of application	Qualifications/ Experience	Fellowship per month (Consolidated)
Project Associate –I/ Project Associate-II DST-TDP programme	2 (TWO)	Maximum 35 Years	(i) Master’s Degree in Physics, Electronics, Applied Physics, Computer Science Sciences, Photonics for both Project Associate-I and II, and (ii) Minimum 2 years’ experience in Research and Development in Industrial and Academic Institutions or Science and Technology Organizations and Scientific activities and services for Project Associate-II. 2. Preferred CSIR-UGC NET including lectureship or GATE or a selection process through national level examinations conducted by central government departments and their agencies and institutions. Desirable: Good knowledge of Physics/Optics/ Electronics/Computer Science, programming languages and some experience on experiments.	Rs. 31,000/- for the first two years and Rs 35,000 for third year + HRA as per prevailing rates for Project Associate –I. Rs 35,000 for third year + HRA as per prevailing rates for Project Associate-II. Candidates not having NET/GATE will receive lower salary as per DST rules (OM no. SR/S9/Z-05/2019 dated 10.07.2020).

Interested candidate may send a letter of motivation and latest Curriculum Vitae (should include educational qualifications from 10th onwards, date of birth, details on NET/GATE exams, research experience if any, internship details, programming skills etc.) along with scanned copies of all the

relevant documents through e-mail (with subject “Project Associate-I/II application for DST TDP Project”) to the project investigator:

Prof. Goutam K Samanta
Atomic, Molecular and Optical Physics Division
Physical Research Laboratory
Navrangpura, Ahmedabad- 380 009.
E-mail:gsamanta@prl.res.in/gsamanta@gmail.com

Last date of receipt of applications: **30th April 2023**

Service conditions:

- i. DA & CCA: Project Associate-II (Scientific/Technical Manpower in projects) will not be entitled to DA & CCA.
- ii. House Rent Allowance (HRA): All Project Associate-II may be provided accommodation based on availability and those residing in accommodation provided by the institute will not be eligible for drawing HRA. Wherever provision of hostel accommodation is not possible, HRA may be allowed to Project Associate-II as per Government norms applicable in the city/location where they are working. The fellowship amount may be taken as basic for calculating the HRA.
- iii. Medical Benefits: The Project Associate-II will be entitled for medical allowance as per institute policy.
- iv. The travel entitlement for Project Associate-II for participation in scientific events/workshops in India will continue to be as per institute norms.
- v. Bonus, Gratuity & Travel Concession: The Project Associate-II will not be entitled to these allowances.

Terms & Conditions:

1. The above position is purely contractual and coterminous with the project.
2. Initial appointment is for one year, which is extendable up to three years upon successful annual evaluation of the candidate.
3. Only shortlisted candidates will be intimated for an online interview.
4. Participation in selection process is subject to possessing relevant original documents substantiating online application submitted by the candidates.

Project Summary:

In Physical Research Laboratory, we are involved in quantum optics experiments, including the development of high brightness entangled photon source, generation of hybrid entangled states, imaging inspired detection of orbital angular momentum states of light, and free-space quantum communication. In fact, we are one of the first experimental research groups in India to work in quantum optics experiments. In 2017 we reported a proof-of-concept experiment based on a novel experimental architecture producing high brightness entangled photons. The concept has opened up the possibility of developing an efficient entangled photon source at all possible wavelength ranges admissible by the available single-photon detection technologies. Previous to this report, the entangled photon sources were demonstrated using different birefringent and quasi-phase-matched nonlinear crystals in different phase-matching geometries producing lower entangled photons per second. At the same time, various applications in the field of quantum science and technology, including quantum communication, demand higher photon rates from the source to produce meaningful results such as quantum bit rate. Therefore, in addition to the various applications of the entangled photon sources, the search was on to develop new entangled photon sources with new system architecture. Our demonstration in 2017 has enabled the highest possible generation rate of the entangled photon source to date by exploring the advantages of quasi-phase-matched crystals operating at degenerate

wavelengths. In the current proposal, we would like to push the pair photon rates further beyond 2 MHz in a compact, standalone system architecture, making the source useful for on-field applications. Recently we have developed a lab model of the bright entangled photon source using a bulky pump laser system and used it in an uncontrolled environment in Space Applications Centre, Ahmedabad, for three months and successfully established the free-space quantum communication link over 300 m. The novelty of the current project lies with the possibility of the generation of the high brightness of the entangled photons from a compact, portable system architecture for on-field quantum experiments also to support various experiments and technologies of India's National Mission on Quantum Technologies & Applications (NMQTA).