Research Associate Level III (RA-III) Opportunity: One post

Inter-University Centre for Astronomy and Astrophysics (IUCAA) is inviting applications for ONE Research Associate at level III (RA-III) position to work on the "Optical clock based accurate time stamping in quantum communication" project at its Precision & Quantum Measurement lab (PQM-lab: https://pqmlab.iucaa.in/). This project is funded by the Department of Science and Technology (DST), Govt. of India for three years under their flagship Quantum Enabled Science and Technology (QuEST) program.

Brief description of the project:
The PQM-lab is developing an optical atomic clock using ytterbium-ion, which will be confined in an electrodynamic trap and cooled to nearly zero Kelvin temperature using ion trapping and laser cooling techniques. Such an atomic clock will have unprecedented accuracy, which is an indispensable requisite for most of the quantum-phenomena based technologies. India is keen on developing such atomic clocks to support its quantum mission, which has various applications starting from strategic sector, advanced communication & navigation, meteorology, finance, e-governance and many more. Apart from supporting various emerging quantum technologies, at IUCAA we are interested to conduct sophisticated experiments to investigate yet unanswered questions in foundation of science. Some of these experiments shall aim to measure the constancy of the fundamental constants; violation of the fundamental symmetries and Geodic measurements.

The experimental facility at the PQM-lab shall comprise of a trapped ytterbium-ion (Yb^+) optical clock for the absolute optical referencing, ultra-stable Fabry-Perot (FP) cavity that acts as a steady optical oscillator and used to generate narrow line-width ultra-stable laser to probe the clock transition, stabilized optical frequency-comb to synthesize frequency of the clock transition frequency and phase stabilized link-fibre for dissemination of the reference photons without losing their characteristics. Collaborative support on different aspects of the experimental and instrumentational works, such as, lasers & optics, electronics, mechanical, designing, simulation will be required to develop this state-of-the-art experiment.

The selected candidate will get opportunity to work on interdisciplinary areas that are required for setting up of the experiment. Some of these are, simulation; designing, fabrication, testing of indigenous instruments in the field of lasers & optics, developing low-noise analog & digital electronics, developing FPGA based systems, ultra-high vacuum, mechanical & software development and so on. Apart from the instrumentation, they will have to work on physics problems which is necessary to meet the experimental goals. A full fledged experiment involves multiple work-packages; developing those require expertise in interdisciplinary fields. Within a lab, this can be achieved by working in a collaborative manner.

Applications are encouraged from those who have prior expertise in some of the mentioned areas together with good knowledge of Physics, Optics and Electronics. Highly motivated candidates who are willing to take up new challenges and are interested

to learn new topics are encouraged to apply. The candidates have to fully engage themselves to deliver fruitful work in a collaborative manner. The selected candidate will have ample opportunity to work with other national and international collaborators.

For any further query or discussion about the project, interested candidates may feel free to contact Prof. Subhadeep De (subhadeep@iucaa.in), principal investigator of this project.

Desired qualification and experience:
Ph. D. in Physics / Electronics / Instrumentation / Optical engineering/ nano Fabrication / other related areas. Candidates who have submitted/ defended their PhD thesis and are waiting for final degree can also apply.

Or, ME/ M. Tech in Physics / Electronics / Instrumentation / Optical engineering/ other related areas with minimum three years' experience and having at-least one original research paper in SCI journals.

Desirable experience in C, C++, Python, Matlab/ Mathematica / VHDL/ LabVIEW/ Solidworks / COMSOL/ ANSYS/ digital & analog electronics/ optics/ fabrication will be useful.

The offer:
The selected candidates will receive a monthly fellowship of Rs. 54,000 + HRA (HRA will be provided only if he/she does not avail IUCAA's accommodation).

The finally offered candidate can start to work immediately after the selection or later depending on the pandemic situation / mutually agreeable date. The total tenure of the position is for three years or till the end of the project, whichever comes first, and is renewable annually based on performance.

Application process: The deadline for applications and letters of recommendation is **July 23, 2021** 12:00:00 midnight of IST**.**
At least two letters of recommendation are needed, which the reviewers can send directly to application@iucaa.in

Applications in a "**single PDF**" must include

(i) a detailed curriculum vitae mentioning theoretical, experimental, instrumentation and other working experience,
(ii) list of publications
(iii) a statement of purpose

Please mention in the subject line '**RA application at the PQM-lab**' and send the PDF file to application@iucaa.in. Incomplete applications will be rejected.