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Opportunity Title: Quantum Communication Researcher
Opportunity Reference Code: 0022-NPP-MAR25-GRC-TechDev

Organization National Aeronautics and Space Administration (NASA)

Reference Code 0022-NPP-MAR25-GRC-TechDev

How to Apply All applications must be submitted in Zintellect

Please visit the NASA Postdoctoral Program website for application instructions and requirements: How to Apply | NASA Postdoctoral Program (orau.org)

A complete application to the NASA Postdoctoral Program includes:

1. Research proposal
2. Three letters of recommendation
3. Official doctoral transcript documents

Application Deadline 3/1/2025 6:00:59 PM Eastern Time Zone

Description **About the NASA Postdoctoral Program**

The NASA Postdoctoral Program (NPP) offers unique research opportunities to highly-talented scientists to engage in ongoing NASA research projects at a NASA Center, NASA Headquarters, or at a NASA-affiliated research institute. These one- to three-year fellowships are competitive and are designed to advance NASA's missions in space science, Earth science, aeronautics, space operations, exploration systems, and astrobiology.

Description:

Opportunity Restricted to US Citizens Only

The Quantum Communications team at Glenn Research Center (GRC) is furthering start-of-the-art research for quantum communication (QC) technologies through the development of space-flight compatible entangled photon-pair sources. To meet space-flight requirements, such as compact size and high photon generation rates, novel spontaneous parametric down-conversion waveguide sources that generate time energy or polarization entangled photon pairs have been developed. The work performed by the postdoctoral researcher in conjunction with GRC researchers will be key in determining whether the current iteration of sources and hardware are viable for space-based QC applications, or if further improvements are needed.

The NASA Postdoctoral opportunity consists of assisting GRC researchers with tasks focused on the research and development of space based quantum networks based on sources such as these. The tasks include: (1) research into quantum network concepts for applications in sensing, secure communications and distributed quantum computing (2) characterization of time-entanglement and polarization-entanglement sources using Bell's Inequality Tests; (3) verification of the anti-bunching nature of true single photon sources by means of Hanbury Brown and Twiss experiments; (4) estimation of photon-pair generation rates determined by true and

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accidental coincidence measurements. The entanglement source experiment tasks will be conducted in light of overarching quantum network concepts developed with the GRC quantum communications research team. Each method will require free space or fiber optic systems to be designed, built, and aligned for optimized performance with the integration of entangled sources, photon detectors, and other laboratory hardware. Results from these experiments will be assessed by comparison to application requirements in order to guide future steps in quantum communication network development.

Location:
Glenn Research Center
Cleveland, Ohio

Field of Science: Technology Development

Advisors:
John D. Lekki
john.d.lekki@nasa.gov
216-433-5650

This opportunity may require the following: 1- Mandatory drug testing; 2-Random drug testing; 3- Testing prior to initiation of fellowship appointment.

Questions about this opportunity? Please email npp@orau.org

Eligibility Requirements

- **Citizenship:** U.S. Citizen Only
- **Degree:** Doctoral Degree.