

Opportunity Title: Quantum Machine Learning and Quantum Graph Neural Networks for Enhanced Wildfire and Air Quality Management

Opportunity Reference Code: 0316-NPP-MAR25-JPL-EarthSci

Organization National Aeronautics and Space Administration (NASA)

Reference Code 0316-NPP-MAR25-JPL-EarthSci

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 U.S. and non-U.S. 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:

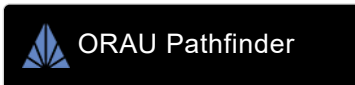
This project aims to address the growing challenges of wildfire monitoring and air quality management by leveraging NASA's satellite observations and cutting-edge quantum computing techniques. By integrating Quantum Graph Neural Networks (QGNNs) and quantum-assisted neural networks with classical methods like Knowledge Graphs and Geometric Deep Learning (GDL), the study seeks to enhance the detection of wildfire smoke plumes, evaluate quantum computing's accuracy and speed advantages, and compare results with classical approaches. Utilizing advanced quantum hardware, the research explores the scalability and precision of quantum methods to process complex, high-dimensional datasets. Expected outcomes include improved detection accuracy, predictive modeling, and computational efficiency. Deliverables include open-source code, comparative analyses, and peer-reviewed publications, contributing to NASA's Earth science objectives and establishing the potential of quantum computing for actionable insights in wildfire and air quality management.

Field of Science: Earth Science

Advisors:

Olga Kalashnikova

Olga.Kalashnikova@jpl.nasa.gov



Whether you are just starting your career or already at a senior level, ORAU offers internships, fellowships, research opportunities, and contract positions that can provide you with invaluable experience. Download the ORAU Pathfinder mobile app and find the right opportunity to propel you along your career path!

Visit ORAU Pathfinder [↗](#)



Opportunity Title: Quantum Machine Learning and Quantum Graph Neural Networks for Enhanced Wildfire and Air Quality Management
Opportunity Reference Code: 0316-NPP-MAR25-JPL-EarthSci

(818) 393-0469

Hugo Lee
huikyo.lee@jpl.nasa.gov
(626) 864-0557

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

Qualifications We are seeking a highly motivated and talented postdoctoral researcher to join our project focused on leveraging quantum computing and machine learning for wildfire monitoring and air quality management using NASA's satellite observations. The ideal candidate will possess a strong background in quantum computing, machine learning, and environmental data analysis, with a demonstrated ability to tackle complex problems in interdisciplinary research.

Qualifications

Education: Ph.D. in Computer Science, Physics, Environmental Science, Atmospheric Science, or a related field, with a focus on quantum computing, machine learning, or spatiotemporal data analysis.

Technical Expertise:

Proficiency in quantum computing frameworks such as IBM Qiskit or similar platforms.

Strong knowledge of machine learning techniques, including Graph Neural Networks (GNNs) and Geometric Deep Learning (GDL).

Experience with handling large-scale spatiotemporal datasets and satellite data.

Familiarity with Knowledge Graphs and multi-variable optimization methods.

Programming Skills: Expertise in Python and other relevant programming languages. Experience in cloud-based or high-performance computing environments is a plus.

Point of Contact [Mikeala](#)

- | | |
|---------------------|---|
| Eligibility | • Citizenship: LPR or U.S. Citizen |
| Requirements | • Degree: Doctoral Degree. |