Opportunity Title: Computational modeling of biological systems for spaceflight applications
Opportunity Reference Code: 0134-NPP-MAR26-ARC-BioSci

Organization National Aeronautics and Space Administration (NASA)

Reference Code 0134-NPP-MAR26-ARC-BioSci

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 4/2/2026 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:

On Earth, humans depend on other organisms to provide us with clean air, water, food, drugs, fuels, and building materials. To live sustainably for long durations in space, we will likewise need to bring plant and microbial systems to serve those functions. Designing biological systems to be efficient and robust, however, still faces challenges. Opportunities for conducting spaceflight experiments are limited; results from the lab are difficult to translate into predictions about behavior in space; and biological systems are inherently much more complex and therefore difficult to predict than the physical and chemical life support systems currently in use.

Computational modeling can help overcome some of these challenges to advance the development of biological systems for space applications in a multitude of ways. Tools such as metabolic modeling and molecular dynamics can be used to probe fundamental biological processes or develop tools, assays, or products. Simulations of microbial systems can provide a platform for prediction and experimentation.

This postdoctoral project focuses on developing advanced computational tools to facilitate the development of biological systems for spaceflight applications, and conducting experimental validation in the lab. It will be co-mentored by researchers from the Space Biosciences Research Branch

and the Intelligent Systems Division. Proposals should describe an independent project with both modeling and experimental components; a wide range of potential projects will be considered. Examples of biological systems for study include microbial bioproduction, bioregenerative life support systems, or crop plants. Methods proposed should be appropriate to the scientific question and to the expertise of the candidate and the mentors. For context, please see the work that is currently conducted in the Space Biosciences Research Branch (https://www.nasa.gov/ames/space-biosciences/research-branch/) and the Computational Materials Group (https://www.nasa.gov/intelligent-systems-division/discovery-and-systems-health/computational-materials-group/); proposals building on the mentors' current projects are particularly encouraged. Use of the Ames High End Computing Capability may be proposed.

Interested applicants should contact Dr. Jessica Lee (jessica.a.lee@nasa.gov) as early as possible and provide a brief summary of their suggested proposal concept(s) prior to preparing a full proposal for submission to the NPP opportunity.

Field of Science: Biological Sciences

Advisors:

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Applications with citizens from Designated Countries will not be accepted at this time, unless they are Legal Permanent Residents of the United States. A complete list of Designated Countries can be found at: https://www.nasa.gov/oiir/export-control.

Eligibility is currently open to:

- U.S. Citizens;
- U.S. Lawful Permanent Residents (LPR);
- Foreign Nationals eligible for an Exchange Visitor J-1 visa status; and,

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- Applicants for LPR, asylees, or refugees in the U.S. at the time of application with 1) a valid EAD card and 2) I-485 or I-589 forms in pending status

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

Qualifications Candidates should have proficiency both in the relevant modeling tools and experience in the appropriate laboratory experimental methods to carry out the proposed work. An interest in learning new methods (in either modeling or experimentation) is welcomed as long as the candidate has appropriate foundational knowledge. Candidates who have completed their PhD recently (within the last 5 years) are strongly preferred.

Point of Contact Mikeala

Eligibility Requirements

- **Degree:** Doctoral Degree.