Opportunity Title: ICAR - OxyMoRon: Understanding dioxygen production and consumption in apparently anoxic environments
Opportunity Reference Code: 0042-NPP-MAR26-ABProg-Astrobio

Organization National Aeronautics and Space Administration (NASA)

Reference Code 0042-NPP-MAR26-ABProg-Astrobio

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 3/1/2026 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:

Molecular oxygen (O2) has been central to Earth's biogeosphere and the evolution of complex life. While O2 is traditionally attributed to photosynthesis, growing evidence shows that it is also produced in the absence of light through "dark oxygen production" (DOP), occurring abiotically and microbially in environments long considered anoxic, including marine and terrestrial subsurface systems. Despite many independent observations, DOP lacks a systematic assessment, and its mechanisms and biogeochemical and ecological impacts remain poorly understood.

This project asks whether any environments in Earth's biosphere are truly devoid of O2. The OxyMoRon consortium brings together complementary expertise in microbial ecology, physiology, bioinformatics, and geochemistry to study DOP across four key environments: marine and terrestrial subsurface habitats and O2-deficient marine and lacustrine waters. We will investigate DOP across scales, from genes and metabolisms to ecosystems, combining meta-omics, phylogenetics, isotope and microelectrode analyses, and laboratory and field studies.

Our aims are to identify the microbes and metabolisms responsible for DOP, quantify O2 sources and production rates, and test whether DOP

creates aerobic niches in apparently anoxic environments. Using novel isotope and mass spectrometry approaches, we will link DOP to aerobic metabolisms in situ and in culture. Overall, this work seeks to redefine global O2 dynamics and the role of dark O2 production in shaping Earth's biosphere.

Field of Science: Astrobiology

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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,
- 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

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

Point of Contact Mikeala

Eligibility Requirements

- **Degree:** Doctoral Degree.