

**Opportunity Title:** Space Radiation Biophysical and Risk Modeling

**Opportunity Reference Code:** 0027-NPP-NOV23-LRC-Interdisc

**Organization** National Aeronautics and Space Administration (NASA)

**Reference Code** 0027-NPP-NOV23-LRC-Interdisc

**Application Deadline** 11/1/2023 6:00:59 PM Eastern Time Zone

**Description** NASA models the risk of space radiation-induced health decrements including cancer, cardiovascular disease, and central nervous system damage to inform human exploration missions including International Space Station missions, future lunar missions (Artemis), and future missions to mars. Space radiation, in the context of human exploration, consists of the high energy particles loosely grouped into galactic cosmic rays and solar energetic particle events. An accurate understanding of the health risks associated with space radiation exposure are required to inform mission planning and post-mission health care. Risk models rely on understanding radiation-induced disease through epidemiological studies which quantify the risk in human cohorts. The epidemiological evidence is supplemented with knowledge gained through ground-based radiobiology experiments and limited spaceflight experiments. Due to the small number of astronauts with appreciable space radiation exposures, risks are scaled from terrestrial radiation exposure using models to account for the fundamental differences between terrestrial and space radiation exposures.

The primary focus of this work is the development of these scaling models along with the associated computational framework used to determine the risk and associated uncertainties. Currently, NASA has an existing space radiation-induced cancer risk model with active research in all components of that model. Work is currently ongoing to develop a space radiation-induced cardiovascular risk model and to understand the basic risks of space radiation to the central nervous system. There is also interest in ensemble modeling of risk for use in the space radiation problem.

Opportunities exist to participate in all aspects of this computational modeling effort. Successful applicants should have a PhD in an appropriate field of study and have experience developing computational models.

A successful proposal will contain work that shows clear translatability to human risk from space radiation and **must be computational in nature**.

The primary point of contact for this opportunity is Dr. Ryan Norman, whose contact information is included in the list of advisors. Please contact Dr. Norman for details about this opportunity.

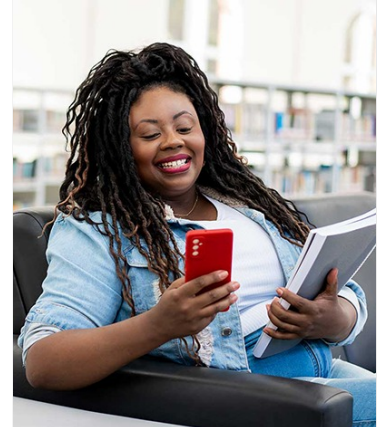
**Location:**

Langley Research Center  
Hampton, Virginia

**Field of Science:** Interdisciplinary/Other

**Advisors:**

Ryan Norman



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:** Space Radiation Biophysical and Risk Modeling

**Opportunity Reference Code:** 0027-NPP-NOV23-LRC-Interdisc

ryan.b.norman@nasa.gov

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