

**Opportunity Title:** Far-Infrared Detectors for Space-Based Low-Background Astronomy

**Opportunity Reference Code:** 0245-NPP-NOV24-GSFC-Astrophys

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

**Reference Code** 0245-NPP-NOV24-GSFC-Astrophys

**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** 11/1/2024 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:**

The next generation of space-based far-IR astronomical telescopes require ultra-low noise detectors for background-limited observations with cooled optics. Detectors arrays with tens of thousands of pixels spanning the 20 - 600  $\mu\text{m}$  waveband and having high optical coupling efficiency will be needed to support this vision. A detector technology has yet to be identified that can meet these requirements, which would enable revolutionary science from a future space mission such as a far-IR Probe as recommended by the 2020 Decadal Survey. We address this technology gap with focused development programs in absorber-coupled transition-edge sensor (TES) bolometers. The successful candidate will contribute to a multi-disciplinary research effort that encompasses the development of astronomical focal plane instrumentation, frequency selective electromagnetic coupling structures (photonics), superconducting detectors, as well as coherent (phononic) and non-coherent (thermal) phonon transport at low temperatures. These and other related methods are used to reduce dark noise, and increase detector coupling efficiency, detection bandwidth, and array multiplexing factor.

We also have a focused effort to increase the energy-resolution of Near-IR Kinetic Inductance Detectors (KIDs) for ultra-low-background observations of exoplanet atmospheres. The KID is a promising technology that is effectively immune to the effects of particle radiation and thermal drift in a spacecraft.



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Astronomy

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**Location:**

Goddard Space Flight Center  
Greenbelt, Maryland

**Field of Science:** Astrophysics

**Advisors:**

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(301) 286-0308

**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

**Questions about this opportunity?** Please email [npp@orau.org](mailto:npp@orau.org)

**Eligibility Requirements** • **Degree:** Doctoral Degree.