

Opportunity Title: Development of infrared detectors and focal plane arrays for space instruments

Opportunity Reference Code: 0287-NPP-MAR25-JPL-TechDev

Organization National Aeronautics and Space Administration (NASA)

Reference Code 0287-NPP-MAR25-JPL-TechDev

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 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:

Infrared Photonics group is working on development of new generation of mid- and long-wavelength infrared imagers and spectrometers for future Earth and planetary science missions. These imagers, based on semiconductor detectors, will provide enhanced sensitivity, better spatial and spectral resolutions, and higher operating temperatures than currently existing technologies. These devices utilize novel unipolar barrier detector architectures as well as new materials such as GaSb-based alloys and superlattices. [1, 2, 3] The postdoctoral researcher will have a unique opportunity to work on different aspects of the infrared technology including: (1) Design and bandgap engineering of semiconductor superlattices; (2) Material characterization; (3) Device microfabrication; (4) Single pixel detector and focal plane array characterization; (5) Integration and testing of infrared cameras and spectrometers. The specific research project will be selected based on the researcher interests and experience.

1. Ting, DZ; Khoshakhlagh, A; Soibel, A; Keo, SA; Fisher, AM; Pepper, BJ; Hoglund, L; Rafol, SB; Hill, CJ; Gunapala, SD, "Long and Very Long Wavelength InAs/InAsSb Superlattice Complementary Barrier Infrared Detectors", JOURNAL OF ELECTRONIC MATERIALS, 3, 2022.

2. Wenger, T, Muller, R., Hill, CJ., Fisher, A., Ting, DZ., Wilson, D., Gunapala, SD., and Soibel, A., "Infrared nBn detectors monolithically integrated with metasurface₁ based optical concentrators", Appl. Phys.Lett.



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3. Rafol, SB, Gunapala, SD, Ting, DZ, Soibel, A., Khoshakhlagh, Keo, SA, A., et. al, "Long wavelength type-II superlattice barrier infrared detector for CubeSat hyperspectral thermal imager", Opto-Electronics Review, e144569. 31(SI) 2023

Field of Science:

- Technology Development

Advisors:

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Applications from 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/oii/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

- Qualifications**
- Ph. D in Physics, Applied physics, Electrical Engineering or related area with detailed knowledge of semiconductors
 - On hand experience with semiconductor device fabrication including photolithography, wet and dry etching, metallization
 - Experience with electrical and optical characterization of infrared optical elements and detectors
 - Excellent communication and writing skills

Eligibility Requirements

- **Degree:** Doctoral Degree.