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Opportunity Title: Materials and Process Development for Ultraviolet Detector Technologies
Opportunity Reference Code: 0250-NPP-NOV24-JPL-TechDev

Organization National Aeronautics and Space Administration (NASA)

Reference Code 0250-NPP-NOV24-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 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:

This project involves the development of new technologies for ultraviolet (UV) instrumentation and systems. Successful candidates will utilize thin-film processing and nanoscale interface engineering methods to fabricate advanced detector technologies and optical components. Research within the UV detector technology team has largely focused on the use of molecular beam epitaxy (MBE) for band structure engineering and passivation of silicon-based photodetectors [1, 2]. Developments in recent years has been geared toward wafer-scale processing as well as improving the space worthiness of MBE-passivated detectors. We also use atomic layer deposition (ALD) processes in order to engineer new coatings for advanced optics or detectors, including the customization of detector response over a broad wavelength range. The performance objectives for our technologies are defined to meet the objectives of a variety of NASA research programs with the ultimate goal of flight instrument and mission infusion. Participation in this research could include work on the development and evaluation of new MBE and ALD processes as well as other methods to improve detector performance and capabilities. During their NPP tenure the Fellow will be expected to report research/technology developments through publication of first-author manuscripts, conference presentations and proceedings, and in internal team meetings and seminars

[1] A. D. Jewell et al., "Low-temperature homoepitaxial growth of two-

dimensional antimony superlattices in silicon," Journal of Vacuum Science & Technology A **36**(6), 061513 (2018).

[2] A. D. Jewell et al., "Toward ultrafast, ultra-stable imaging arrays: Superlattice doping to enhance the performance of backside-illuminated 3D-hybridized silicon photodetectors," Journal of Vacuum Science & Technology A **38**(2), 023203 (2020).

Field of Science: Technology Development

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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

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

Eligibility Requirements

- **Degree:** Doctoral Degree.