

Opportunity Title: High Contrast Astronomical Imaging and Interferometry

Opportunity Reference Code: 0027-NPP-NOV26-JPL-Astrophys

Organization National Aeronautics and Space Administration (NASA)

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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 11/1/2026 6:00:59 PM Eastern Time Zone

Description About the [NASA Postdoctoral Program](#)

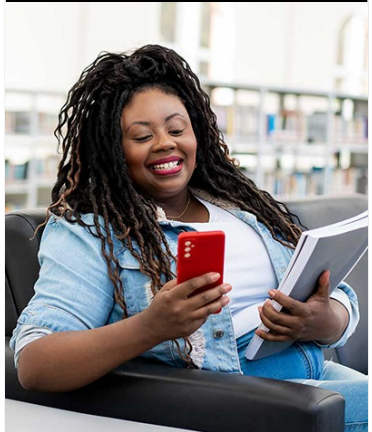
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Description:

The number of known planets around nearby stars continues to increase, and NASA's Habitable Worlds Observatory (HWO) is aiming at the spectroscopy of terrestrial planets in the future. The primary goal of this research is to develop the technology for the direct detection of the faint emission from such exoplanets and exozodiacal debris disks. New high-contrast near-neighbor detection techniques are emerging regularly, and work is planned to develop and test the optical masks needed, mainly in the lab, but also at large telescopes. Specifically, a variety of optical phase masks that can be applied to either stellar coronagraphy or cross-aperture nulling are being developed, employing a number of fabrication techniques. Optical vortex masks are a prime candidate for stellar coronagraphy, and such masks are being developed using liquid crystal layers, dielectric structures, and metasurfaces. Likewise, phase-knife masks are being developed with these techniques for cross-aperture nulling. These masks will be tested on our laboratory coronagraphic and nulling testbeds, and could also be deployed to large ground-based telescopes. Technical work in any of these areas is envisioned, and the work can also include the observational search for faint companions such as brown dwarfs and hot young planets around nearby stars.

References:

1. "Vector vortex coronagraphy for exoplanet detection with spatially variant diffractive waveplates," E. Serabyn, C. Mejia Prada, P. Chen & D. Mawet 2019, Jour. Opt. Soc. Am. B 36, D13
2. "A geometric-phase-based phase-knife mask for stellar nulling and coronagraphy," E.



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Serabyn, K. Liewer & G. Ruane, Opt. Exp., 32, 19924, 2024

Location:

Jet Propulsion Laboratory
Pasadena, California

Field of Science: Astrophysics

Advisors:

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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

Point of Contact [Mikeala](#)

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