Opportunity Title: Astrophysics: Infrared Stellar Interferometry: Instrumentation and Observations of Circumstellar Material around Young and Late Type Stars
Opportunity Reference Code: 0039-NPP-MAR26-GSFC-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 3/1/2026 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:

Stellar Interferometry
Stellar interferometry is a technique in high-angular resolution astronomy that utilizes discrete separated telescopes to synthesize a telescope that is effectively the size of an equivalent telescope of diameter equal to the maximum spacing. This technique was initially developed in radio astronomy. In the past 30 years several ground-based interferometers at optical and infrared wavelengths have been successfully developed and are in routine operation in the US and Europe.

Debris Disk Observations with the LBTI
Dr. Danchi is a co-Investigator on an international team of a funded Precursor Science project for the Habitable Worlds Observatory (HWO), the new 6.5 m diameter telescope designed to observe and characterize habitable zone planets around nearby stars at optical and UV wavelengths. The new research program is called "Securing Revolutionary Exozodi Resarch with VLTI/NOTT." VLTI is short for the Very Large Telescope Interferometer and NOTT means "Nulling Observations of ExoplaneTs and dusT." Exozodiacal dust, by analogy with the zodiacal dust in our solar system, is the main astrophysical noise source that affects the search for earth-sized or terrestrial planets in the habitable zone of such stars. There are two main components of concern to direct imaging studies of exoplanets. The first is warm exozodi dust at around 300K, roughly at the

temperature of a habitable zone planet. The second is hot exozodi dust that exists at high temperatures, around 1500K, and is very close to the host star. Much is now known about warm dust due to the successful LBTI (Large Binocular Telescope Interferometer) Hunt for Observable Signs of Terrestrial Systems (HOSTS) project that measured the amount of exozodi emission around nearby solar-type stars. However, little is known about the hot dust in terms of the luminosity function and its effects on exoplanet detection and characterization applicable to HWO. The hot dust is most observable at the 3.5-micron band called L-band. The NOTT instrument is being funded by a European Research Grant and is led out of KU Leuven University in Belgium. Our US team is led from the University of Arizona. We will leverage and assist the European team on the development of the instrument and its initial use at the VLTI. We will develop modeling tools and strategies, simulate instrument performance, calibration, create a target list and science plan, contribute to commissioning, and publish results from an initial mini survey.

Protoplanetary Disk and YSO Observations with MATISSE

Dr. Danchi is also a member of the MATISSE (Multi-Aperture mid-Infrared SpectroScopic Experiment) Science Team. MATISSE is a second-generation instrument iinstalled at the Very Large Telescope Interferometer (VLTI). It combines four of the Unit Telescopes (UTs – 8.4 m diameter) or four of the Auxiliary Telescopes (ATs –1.8 m diameter) to provide six simultaneous visibilities and four closures, and over a night, it is possible to use aperture synthesis techniques to create complex images of the terrestrial planet forming regions of disks of nearby Herbig Ae/Be and T Tauri stars, as just one example. It operates simultaneously at L, M, and N bands (3.5, 4.6, and 10 microns, respectively), with spectral resolutions from approximately 30 to a few thousand. Dr. Danchi as a member of the Science Team is involved in Guaranteed Time Observations (GTO) with this instrument in the areas of star and planet formation, and other science topics such as massive stars and late- type mass-losing stars. MATISSE was installed at the VLTI on Mt. Paranal in late 2019. It was commissioned over the past few years and has been accepted by ESO. GTO observations are on-going and Open Time proposals have been accepted. The research opportunity includes observations, data analysis, modeling (geometric and radiative transfer), and image reconstruction. Many papers have been published and many more on the way due to a large amount of data being collected as part of the GTO survey of about 100 YSOs.

Location:
Goddard Space Flight Center
Greenbelt, Maryland

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.