

Opportunity Title: Development of high-resolution, broadband Raman spectrometers for planetary exploration

Opportunity Reference Code: 0285-NPP-MAR26-GSFC-PlanetSci

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 4/2/2026 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:

Raman spectroscopy is a powerful spectroscopic analysis technique, that has been applied into many geo-scientific areas including mineralogy, gemology, planetary exploration, and astrobiology, etc., and can provide accurate and detailed molecular and structural information of planetary materials. Owing to its advantages in no sample preparations, quick and non-destructive analyses, unambiguous phase identifications, as well as low-mass and robust behaviors on the mineralogy and mineral chemistries of rock and soil samples, many Raman spectroscopic studies on returned samples, meteorites and planetary analogues have been reported.

However, almost all of these studies used traditional micro-Raman with a working distance of several centimeters or less. During planetary exploration, tools with long detective distance are desirable. In the early 1960s, remote Raman was developed and employed in the detection of gases. Kobayasi and Inaba successfully observed Raman features of SO₂ and CO₂ from an oil smoke plume using a remote Raman system at a distance of 20 m. In 1992, Angel employed a remote Raman system to identify solid inorganics and organics such as NaNO₃, NaNO₂, and acetaminophen at a distance of ten meters. To date, several Raman systems have been proposed for either in situ or remote detection on planetary surfaces for lander or rover exploration missions to the Moon, Mars, Venus, Europa, asteroids, etc. Remote Raman systems for planetary



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exploration have been established by several groups especially by the Raman spectroscopy laboratory at the University of Hawai'i, which has a greatly improved remote Raman instrument for the application in planetary explorations. At Goddard Space Flight Center, work is currently underway to demonstrate various Raman systems for planetary exploration, our team is looking for an NPP candidate that can participate in the conception, research and development of in-situ and stand-off Raman systems.

Field of Science: Planetary Science

Advisors:

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

Qualifications The ideal candidate will have the following skills:

A Ph.D in Planetary Sciences Experienced in developing

Python programs to process and analyze spectral data

Understand the principles of classic Raman Spectrometers, Spatial heterodyne Raman Spectrometer (SHRS) and UV-Vis Spectroscopy

Understand instruments such as SUPERCAM deployed on Mars Perform different forms of spectroscopy including LIBS, Raman, Time-resolved Fluorescence Spectroscopy, and Visible and InfraRed reflectance spectroscopy at a distance

Experienced using vacuum and high-pressure systems

Experienced in designing UV-VIS instrumentation

Point of Contact [Mikeala](#)

Eligibility • **Citizenship:** U.S. Citizen Only

Requirements • **Degree:** Doctoral Degree.