Opportunity Title: Isotopic and Chemical Studies of Aqueous Environments
Opportunity Reference Code: 0007-NPP-NOV23-JSC-PlanetSci

Organization National Aeronautics and Space Administration (NASA)

Reference Code 0007-NPP-NOV23-JSC-PlanetSci

Application Deadline 11/1/2023 6:00:59 PM Eastern Time Zone

Description Research is centered on understanding and interpreting the geologic conditions of past aqueous environments on Earth, Mars, and meteorite parent bodies. We seek to answer questions regarding the temperatures, time scales, nature of water-rock interaction, and chemical characteristics of these ancient aqueous systems with the final goal of assessing their suitability for sustaining life. The approach to the problem encompasses analysis of data returned from planetary missions (such as MSL, Phoenix, and the MER rovers), geochemical analysis of samples, laboratory experiments, and field work. Sample analysis includes mineralogy and bulk chemistry with an emphasis on light stable isotope measurements. Laboratory experiments are used in conjunction with theoretical calculations to better understand complex systems where kinetic processes may be dominant. Field work has primarily focused on terrestrial analogs to planetary environments.

Our recent focus has been centered on Mars including analysis of data returned from the SAM instrument on the Curiosity rover, analysis of martian meteorites (e.g. ALH84001), laboratory experiments exploring the weathering of minerals in cryogenic environments, laboratory experiments on abiotic methane synthesis and oxidation, and field work at continental hot springs in Nevada and California.

Besides the other available analytical laboratories at JSC, our research primarily utilizes a gas source isotope ratio mass spectrometer (MAT 253) equipped with a gas bench and GC-C/TC-Pyroprobe allowing for stable isotope analysis of water, carbonates, gases, and any combustible material.

Location:
Johnson Space Center
Houston, Texas

Field of Science: Planetary Science

Advisors:
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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

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application with 1) a valid EAD card and 2) I-485 or I-589 forms in pending status

Eligibility Requirements

- **Degree:** Doctoral Degree.