

Opportunity Title: Venus Atmospheric Research

Opportunity Reference Code: 0019-NPP-NOV23-GRC-PlanetSci

Organization National Aeronautics and Space Administration (NASA)

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

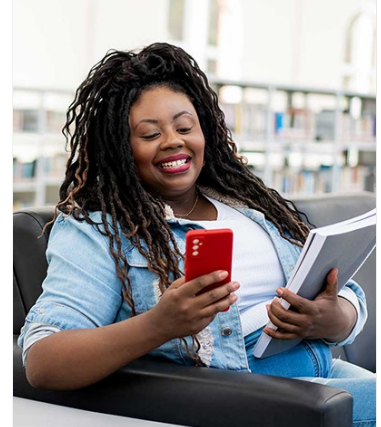
Description Venus exploration has gained considerable interest and relevance in recent years. It has been called a virtual ""twin"" of Earth and has significant similarities in terms of size, initial composition, and solar-radiative influences. However, its planetary conditions contrast drastically from that of Earth. Venus has a dense atmosphere composed predominantly of carbon dioxide with a significant greenhouse effect, and an average surface temperature of ~460 °C. Only limited in situ data of the atmosphere has been obtained, and what has been obtained was with atmospheric balloons that have drifted in an uncontrolled trajectory in the cloud layer. Many questions remain about the Venus atmosphere including the driving mechanisms of superrotation, the nature of cloud structure that differs dramatically from Earth, and the nature of an unknown UV absorber. Other unanswered questions include the degree of mixing (especially below the cloud decks), the possibility of current or prior biological presence in the more temperate cloud layers, and so on.

Recent instrument and technology developments, and new mission concepts that incorporate aerial elements, have been explored. Potential future mission opportunities exist spawning interest for in situ and perhaps long duration presence in the Venus atmosphere. NASA Glenn has been developing a test capability to simulate and explore the Venus atmosphere including the cloud layers. This capability allows for pursuing science investigations, developing necessary technologies and instruments for aerial systems, and generating aerial mission concepts.

This postdoctoral fellowship concentrates on in situ Venus chemical and physics investigations focusing on the Venus atmosphere / clouds. Opportunities for research can include but not limited to research in the chemistry, physics and dynamics of atmospheres as well as exploring the capabilities of potential instrumentation suites to provide relevant science data, including composition, dynamic chemistry, particle detection and tracking, and life detection. The core of this work is aimed at preparing NASA to have the relevant core scientific understanding and capabilities to conduct scientific investigations in the Venus atmosphere, although other target bodies may also be of interest.

The candidate will have access to unique experimental capabilities and instrumentation technology to carry out the studies. In particular, the candidate will have access to the utilization of the Glenn Extreme Environment Rig (GEER). Coupled with this characterization capability, a range of human talent and facility capability for instrumentation, sensors, and electronics is present.

The candidate may use these capabilities coupled with ongoing studies of potential Venus mission scenarios to conduct scientific investigations anywhere in the Venus atmosphere, including the cloud layers. Research



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can also entail development and verification of various forms of instrumentation required to implement future missions in the respective environments. Similar science for other planetary bodies may also be considered based on relevance to these research topics and applicant interest.

Requirements are a recent Ph.D. in atmospheric chemistry or physics. Experience in experiment design or instrument/space craft system development is desirable.

The position is for two years with a possible extension to three years.

The primary point of contact for this opportunity is Dr. Tibor Kremic, whose contact information is included on the list of advisors. Please contact Dr. Kremic for details about this opportunity.

Location:

Glenn Research Center
Cleveland, Ohio

Field of Science: Planetary Science

Advisors:

Tibor Kremic
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216-433-5003

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- Eligibility Requirements**
- **Citizenship:** U.S. Citizen Only
 - **Degree:** Doctoral Degree.