

**Opportunity Title:** Plasma Applications and Technology Development for Crewed Space and Planetary Habitation

**Opportunity Reference Code:** 0002-NPP-NOV23-KSC-Interdisc

**Organization** National Aeronautics and Space Administration (NASA)

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

**Description Job Description:**

The plasma team at Kennedy Space Center (KSC) is seeking outstanding candidates to investigate plasma assisted applications for logistical waste management, agricultural production applications, lunar regolith reduction, and advanced processing. Such investigations include waste-to-gas, plant disinfection and sterilization, plant growth and germination stimulation, water treatment, and treatment of volatile organic compounds, specifically using plasma assisted technologies of various power sources. Waste-to-gas, treatment of plants for sanitation and consumption, the re-usability of water for potable and non-potable uses, extraction of oxygen from the lunar soil, and advanced processing of chemicals or surfaces are critical to support NASA's sustainable lunar, Gateway, ISS and deep space exploration platforms for mission success and human spaceflight.

The fellow will investigate and utilize the available plasma sources at KSC to determine effective experimental campaign parameters for each of the following focuses:

1. Plasma assisted logistical space waste conversion to gas
2. Direct plasma treatment of seeds using various plasma sources
3. Plasma sterilization of plants and equipment
4. Plasma activated water for sterilization, growth, and for potable or non-potable reuse.
5. Plasma reduction of lunar regolith for oxygen extraction and recovery
6. Assist in design and development of a plasma system for spaceflight

In addition to this project, the postdoctoral position offers opportunities to pursue research related to: safe and efficient closed loop waste and food processes, alternative product consumption, alternative plasma power supplies for advanced operation on spacecraft systems and microgravity considerations, alternative hydroponic systems and new plasma sterilization techniques. It is expected that the successful candidate will present their work at national/international conferences and will publish their results in appropriate refereed journals.

**Minimum Position Requirements:**

A background in plasma physics and engineering is preferred. Demonstrated expertise in the majority of the following:

1. Demonstrated expert level with low-temperature plasma systems including alternative carrier gas systems. Such systems include radiofrequency (RF), direct current (DC), pulsed DC, and alternating current (AC) plasma sources.
2. Experience in theoretical plasma physics calculations to determine plasma properties.



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3. Strong background in plasma experimental testing and associated equipment.
4. Strong background in spectroscopy systems and analysis.
5. Proven ability to work independently with initiative.
6. Possesses proven strong verbal and written communication skills.
7. Experience with data validation, analytical data report generation, and/or publication of analytical results.
8. Demonstrated experience in conducting original scientific research through peer reviewed publication record.

**Desired Skills:**

- Education: A Ph.D. in engineering with a focus in plasma physics.
- Experience working on technology development.
- Ability to adapt to new requirements for projects and be flexible enough to learn new areas of research as needed.
- Ability to work effectively as a part of a team in a multi-disciplinary environment and interact with people with a variety of expertise.

**Location:**

Kennedy Space Center  
Kennedy Space Center, Florida

**Field of Science:** Interdisciplinary/Other

**Advisors:**

Kenneth Engeling  
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(321) 861-3019

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