Opportunity Title: UV Emission and Electron-Impact Excitation Processes Relevant to Planetary Atmospheres
Opportunity Reference Code: 0029-NPP-NOV23-JPL-PlanetSci

Organization National Aeronautics and Space Administration (NASA)

Reference Code 0029-NPP-NOV23-JPL-PlanetSci

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

Description In planetary atmospheres, stellar atmospheres and diffuse molecular clouds, a dominant energy mechanism for energy transfer is electron collision processes with neutral species leading to UV radiation. To answer the need for electron-impact excitation cross sections for species of importance in planetary atmospheres with better accuracy for use in modeling ground and spacecraft observations of the planetary atmospheres and/or astrophysical environment, we have established a research program at the Jet Propulsion Laboratory. The research program focuses on electron collisions with species important to planetary atmospheres and astrophysical environments. Laboratory experiments are performed using two main experimental techniques (1) electron energy loss spectroscopy and (2) electron impact induced emission spectroscopy. In our laboratory, we have developed unique capabilities (instrumentation and methods) for measuring electron collision cross sections for species such as O, S, O2, N2, H2, SO2 and their ions.
References:

1) Kanik, I., Noren, C., Makarov, O., and Ajello, J. M.,“Electron Impact Dissociative Excitation of O2.II: Emission Cross Sections of OI (130.4 nm) and OI (135.6 nm)” J. Geophys. Res., 108, 11,040 (2003). 2) Johnson P. V., Malone C. P., Kanik I, Tran K., Khakoo M. A. Integral cross sections for the direct excitation of the A (3)Sigma(+)(u), B (3)Pi(g), W (3)Delta(u), B ' (3)Sigma(-)(u), a ' 1 Sigma(-)(u), a (1)Pi(g), w (1)Delta(u), and C (3)Pi(u) electronic states in N-2 by electron impact, J. Geophys. Res.– Space Phys. 110 (A11) No. A11311, (2005).

Location:
Jet Propulsion Laboratory
Pasadena, California

Field of Science: Planetary Science

Advisors:
Isik Kanik
Isik.Kanik@jpl.nasa.gov
818-354-7233

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:

Opportunity Title: UV Emission and Electron-Impact Excitation Processes Relevant to Planetary Atmospheres
Opportunity Reference Code: 0029-NPP-NOV23-JPL-PlanetSci

- 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

Eligibility Requirements

- **Degree:** Doctoral Degree.