Opportunity Title: Understanding Methane Point Source Emissions
Opportunity Reference Code: 0135-NPP-JUL24-JPL-EarthSci

Organization National Aeronautics and Space Administration (NASA)

Reference Code 0135-NPP-JUL24-JPL-EarthSci

Application Deadline 7/1/2024 6:00:59 PM Eastern Time Zone

Description Methane budgets derived from bottom-up data sets are often in strong disagreement with top-down estimates and the persistent lack of process based knowledge is exemplified by the ongoing scientific discussion on both the hiatus in the atmospheric growth rate in the early 21st century as well as the unexpected rise starting in 2007. Emissions and process attribution remain highly uncertain but are needed to resolve key elements of uncertainty in carbon cycle science, generate accurate greenhouse gas inventories and inform emission mitigation decisions. A key factor is that regional top-down emissions estimates cannot discriminate source categories and thereby attribute fluxes to specific processes or sources. One way of solving this knowledge gap is by isolating methane point sources from regional totals. We are developing a tiered methane observing system that will identify and quantify methane fluxes on local to national scales. This project focuses on the application of breakthrough airborne and satellite methane remote sensing technologies - including the ability to conduct large area surveys and image methane plumes at ~1 to 10 m scales with high detection sensitivity - to the point source challenge, and more generally to understanding and characterizing methane budgets across multiple scales. Recent work includes studies of emissions from the Four Corners, NM area, California's San Joaquin Valley, and the Los Angeles basin, including the recent Aliso Canyon natural gas blowout.

Ongoing components of this activity are the California Airborne Methane Survey, investigations of future space-based remote sensing options from the International Space Station (ISS) and geostationary orbit, GIS-based methane inventories, the Methane Source Finder project, and the Megacities Carbon Project. We are especially interested in scientists seeking to expand their skills to include remote sensing data and/or synthesis of diverse data sets to understand and attribute methane emissions across economic sectors.

Successful candidates will have expertise in atmospheric physics and chemistry, carbon cycle science, airborne instruments, atmospheric remote sensing, regional scale CO2 flux inversions, or the equivalent. They will join the active JPL Carbon Cycle Science group and have opportunities to interact with colleagues at Caltech.

References

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Thorpe, A. K., Frankenberg, C., Roberts, D. A. (2014). Retrieval techniques for airborne imaging of methane concentrations using high spatial and moderate spectral resolution: Application to AVIRIS. Atmospheric Measurement Techniques, 7(1), 491-506. http://dx.doi.org/10.5194/amt-7-491-2014

Location:
Jet Propulsion Laboratory
Pasadena, California

Field of Science: Earth Science

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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:

- 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

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Eligibility Requirements	• **Degree:** Doctoral Degree.