

**Opportunity Title:** Integrated radiometric receivers

**Opportunity Reference Code:** 0145-NPP-NOV23-JPL-EarthSci

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

**Reference Code** 0145-NPP-NOV23-JPL-EarthSci

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

**Description** Sounding of atmospheric humidity is key component of atmospheric science as water vapor transports large quantities of energy thru evaporation and condensation. This sounding can be achieved at the flanks of 183 GHz water vapor molecule resonance frequency. Microwave humidity sounders have been shown to have the largest impact on weather forecasts of all the space based instruments. Integration of radiometer functions on compound and silicon semiconductors will reduce the mass, power and size of the humidity sounders to enable arraying of large numbers of receivers for interferometric and focal plane arrays. These can be used in many types of radiometer instruments from large GeoStationary systems to LEO CubeSat scale systems. Integration of receiver functions will be achieved by designing low noise amplifiers, mixers, LO's and IF and digitization circuitry on a single or multiple technologies. At 183 GHz water vapor sounding frequencies InP technology would provide the lowest noise temperature, however, integrated receivers were demonstrated at these frequencies in CMOS technology. Optimizing these receiver functions for integration into one hybrid multichip module (MCM) would provide the lowest noise, mass and power system.

**Location:**

Jet Propulsion Laboratory  
Pasadena, California

**Field of Science:**Earth Science

**Advisors:**

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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.