Opportunity Title: Satellite remote sensing of clouds and atmospheric thermodynamics for weather and climate applications
Opportunity Reference Code: 0030-NPP-NOV23-LRC-EarthSci

Organization National Aeronautics and Space Administration (NASA)

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

Description The CERES Cloud Working Group and LaRC Satellite ClOud and Radiative Property retrieval System(SatCORPS) team at NASA Langley work synergistically to produce global datasets of cloud properties and radiation parameters derived from passive visible and infrared sensors on sun-synchronous (e.g. Aqua, Terra, Suomi-NPP, and NOAA-series) and geostationary (e.g. GOES, Meteosat and Himawari) satellites. These retrievals are key datasets for monitoring cloud systems at different spatiotemporal scales and are essential for quantifying and monitoring the Earth‘s energy budget, and for determining cloud radiative effects and weather impacts. Unique algorithms have been developed for application to operational satellites to determine aviation weather parameters and hazards, including the flight icing threat to aircraft. In addition, empirical methods and machine learning techniques have been applied for improving cloud retrievals in the more difficult conditions and for refining nighttime cloud products. Tasks of the cloud remote sensing group include 1) development and refinement of cloud retrieval algorithms, 2) validation of cloud properties by combining numerous datasets and theoretical observations, 3) satellite support for field campaigns (e.g. ORACLES, NAAMES, ACTIVATE), 4) applied research on the role of clouds in climate, and 5) studies to demonstrate the utility of satellite retrievals in weather forecasting tools.

1. Opportunities exist for studies that make use of radiative transfer simulations for interpreting viewing and solar geometry effects on cloud retrievals. Algorithm development and validation studies that combine satellite retrievals from numerous platforms (e.g. CloudSat, CALIPSO, and microwave sensors) as well as from aircraft data are also of interest.
2. Studies that relate aerosol variability to cloud microphysical and radiative changes (aerosol indirect effect and contrail forcing) are solicited.
3. Research that combines satellite retrievals with observations from recent field campaigns supported by the group (https://satcorps.larc.nasa.gov) fit well within the scope of this NPP opportunity.
4. Projects that propose novel use of machine learning techniques for algorithm development and data analysis of the climate data record are also encouraged.
5. Potential also exists for developing new products and applications that utilize hyperspectral infrared remote sensing measurements from current and future operational satellite systems.

Candidates with a solid background in remote sensing, radiative transfer, and physical climatology, with interests aligned with those of the CERES Cloud Working Group and SatCORPS team are welcome to apply.

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Location:
Langley Research Center
Hampton, Virginia

Field of Science: Earth Science

Advisors:
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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

Eligibility Requirements

- **Degree:** Doctoral Degree.