

Opportunity Title: Satellite, Aircraft, and Ground Observed Cloud and Radiative Flux Analyses

Opportunity Reference Code: 0006-NPP-NOV23-LRC-EarthSci

Organization National Aeronautics and Space Administration (NASA)

Reference Code 0006-NPP-NOV23-LRC-EarthSci

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

Description Basic and applied research is being conducted in remote sensing of the Earth's cloudiness and radiative fluxes (top of atmosphere, surface, within atmosphere). Clouds are the primary modulators of the radiative energy balance of the Earth's surface and atmosphere on both local and global scales. Data sets from several satellite instruments, including CERES, ERBE, MODIS, VIIRS, CALIPSO, CloudSat, MISR, Geostationary Operational Environmental Satellite, Landsat, AVHRR, HIRS, SSM/I, will be analyzed and compared. Studies in the long-term variability of the surface, clouds, and aerosols in relationship to their effects on the radiative budget of the atmosphere and surface are performed. These studies also involve the usage of surface measurement data sets. In addition, simultaneous aircraft (e.g., SEAC4RS) and/or ground-based laser-radar measurements (e.g. ARM) will be used to examine cloud cover, cloud base and top height, optical depth, reflectance, cloud particle size, liquid and ice water path, and emissivity. Comparisons will be made with theoretical predictions of cloud generation/dissipation and with models of cloud radiative properties such as cloud albedo, bidirectional reflectance, and emissivity. Simulation studies will examine the sampling requirements and cloud measurement capabilities of current and future satellite measurement systems. Use of passive and active microwave observations are of special interest in addressing the problems associated with multilayered cloud systems. Studies are also encouraged that analyze cloud data as large ensembles of cloud systems or "cloud objects": a Lagrangian analog to the more traditional Eulerian monthly averaged gridded climate data. Cloud studies of this sort include attempts to unscramble changes in cloud dynamics from aerosol effects on clouds, i.e. the aerosol indirect effect. Opportunities also exist for the advancement of radiative transfer model algorithms to improve both the physical representation and speed of computations. These algorithms are being used to investigate the radiative impacts of observed changes to trace gas abundances, as well as to changes in the cloud and aerosol properties (e.g., amount and distribution).

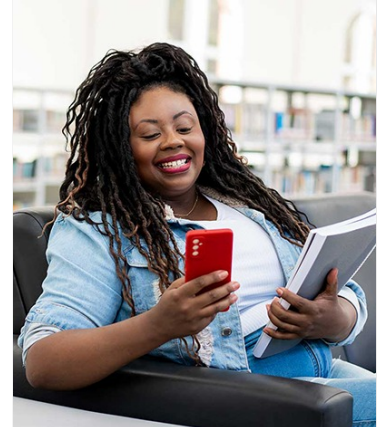
Location:

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.