

Opportunity Title: Microwave Remote Sensing and Precipitation Science

Opportunity Reference Code: 0011-NPP-NOV23-MSFC-EarthSci

Organization National Aeronautics and Space Administration (NASA)

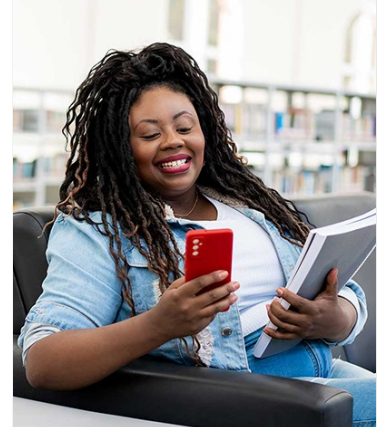
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Application Deadline 11/1/2023 6:00:59 PM Eastern Time Zone

Description Satellite observations provide a unique perspective on the sources and sinks of water through the Earth system. These observations support investigation of critical processes and their interactions including surface evaporation, convection, and moisture transport. Precipitation measurement from space has been a key interest for NASA with the Global Precipitation Measurement (GPM) Core Observatory (2014-present), GPM mission constellation partner spacecraft, and the Tropical Rainfall Measuring Mission (TRMM, 1997-2015). This interest continues into the future with a notional Aerosol, Clouds, Convection, and Precipitation (ACCP) mission expected in the next decade. The connections between ocean evaporation driven by surface winds, boundary layer variability, and convection have been and are expected to continue to be at the focus of NASA missions using active and passive microwave remote sensing. The MSFC Earth Science Branch has multiple, ongoing research activities that align with those NASA missions relevant to understanding the causes and effects of precipitation and distribution of water within the Earth system This NASA Postdoctoral Program opportunity supports scientific investigations that address:

- Investigation of retrieval capabilities or process studies enabled by ACCP mission concepts.
- The use of satellite, ground, and/or airborne measurements for physical process studies to gain a better understanding of precipitation, the global water cycle, climate, weather, and concomitant improvements in numerical models from cloud resolving to climate scales.
- The development and/or application of active or passive microwave ocean surface wind retrievals or atmospheric soundings for the study of ocean-atmosphere exchanges and their relationship to the atmospheric boundary layer
- Validation of satellite-based precipitation retrieval algorithms through the use of innovative physically-based or machine learning approaches.
- The use of remote sensing and modeling to investigate tropical cyclone structure, intensity and evolution.
- Applications of microwave satellite-based measurements, in particular to hydrologic modeling
- Improving NASA satellite sounding retrieval algorithms or their assimilation with a particular emphasis related to upcoming (e.g., TROPICS) and potential decadal missions (e.g., Planetary Boundary Layer).
- Use of microwave remote sensing SmallSat or CubeSat based observing platforms to improve measurements of precipitation, ocean surface winds, or atmospheric sounding

Observations from satellite, aircraft, and ground instrumentation may be used for the proposed research with a special emphasis on microwave



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remote sensing. Use of modelling is also supported but the leading emphasis should be placed on the application of observational data.

The prospective applicant should contact Dr. Brent Roberts (jason.b.roberts@nasa.gov) well in advance of developing the proposal to ensure alignment of the idea with opportunity objectives. Please include a Curriculum Vitae (CV) and a brief statement of interest that identifies the primary topic of interest from those listed above. Other related topics will also be considered. The candidate will then be put in touch with the appropriate research mentor who will coordinate with the candidate on the proposal concept.

Location:

Marshall Space Flight Center
Huntsville, Alabama

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/oiiir/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

Eligibility Requirements

- **Degree:** Doctoral Degree.