

**Opportunity Title:** Surface Biology and Energy Processes

**Opportunity Reference Code:** 0012-NPP-NOV23-MSFC-EarthSci

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

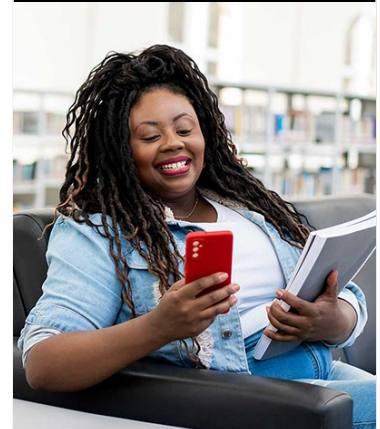
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**Application Deadline:** 11/1/2023 6:00:59 PM Eastern Time Zone

**Description:** There is increasing evidence that land surface significantly influences weather and climate at local, regional, and global scales by exchanging energy and momentum with the atmosphere. The land surface acts as a link between the solid earth and atmosphere; thus, characterizing land surface features and related biogeochemical processes gain significance to address land-atmospheric interactions and climate variations. With recent advances in remote sensing technologies, various satellites with spectral and temporal characteristics are readily available for research and operational decisions. In particular, NASA has a fleet of Earth observation satellite missions currently operating (Landsat-7,8,9, ECOSTRESS, TERRA, CALIPSO, GEDI, GPM, GRACE-FO, Suomi NPP, etc.) as well as future planned missions (Landsat-9, NISAR, GeoCarb, Sentinel-6/Jason-CS, SWOT, etc.) useful to map and monitor land surface characteristics and processes. In addition, the commercial Very High Resolution Data such as Planetscope and MAXAR data available free of charge to NASA researchers may be integrated into the analysis. This NASA Postdoctoral Program opportunity supports scientific investigations that aim to document the use of the latest remote sensing datasets for land surface characterization and process-related studies. We welcome proposals on the following topics:??

- Mapping and monitoring land cover changes in diverse regions of the world, integrating novel remote sensing methods such as machine learning, deep learning, data fusion, and dense time-series analysis.??
- Quantifying the impacts of land use/cover changes such as urban expansion, agricultural land loss, land abandonment, deforestation, logging, and reforestation on the environment using multi-satellite datasets (hyperspectral, multispectral, synthetic aperture radar (SAR) including light detection and ranging (LiDAR)).??
- Use of thermal remote sensing data to characterize urban environments, heat island effects, and impacts.??
- Use of remote sensing data to address public health problems such as disease vector habitat characterization and epidemiology, distributions, life cycles, and host interactions.
- Land surface and hydrological modeling to develop offline modeling systems to accelerate the use of NASA datasets in operational research.??
- Integrating observations from current (e.g., S-NPP, GOES-16, SMAP, GPM, GRACE, Landsat-7) and near-future (SWOT, Landsat-9, NISAR) NASA satellites to demonstrate forecast improvements to land surface models (e.g., Noah-MP, ALEXI) and hydrologic models (e.g., CREST, WRF-Hydro) in support of the transition to operations activities at the Short-term Prediction Research and Transition (SPoRT) Center at Marshall Space Flight Center.
- Ecological thermodynamic analysis of terrestrial ecosystems using airborne hyperspectral thermal data from HyTES (Hyperspectral Thermal Emission Spectrometer) and sampled ground based terrestrial vegetation traits for the SHIFT (SBG High Frequency Time series) field campaign.

The prospective applicant should contact Dr. Krishna Vadrevu ([krishna.p.vadrevu@nasa.gov](mailto:krishna.p.vadrevu@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



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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

**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

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