Opportunity Title: Forested Aboveground Biomass from Mechanistic and Statistical Analyses of Structural Remote-Sensing Data
Opportunity Reference Code: 0292-NPP-MAR26-JPL-TechDev

Organization	National Aeronautics and Space Administration (NASA)
Reference Code	0292-NPP-MAR26-JPL-TechDev
How to Apply	All applications must be submitted in [Zintellect](#)

Please visit the NASA Postdoctoral Program website for application instructions and requirements: [How to Apply | NASA Postdoctoral Program (orau.org)](#)

A complete application to the NASA Postdoctoral Program includes:

1. Research proposal
2. Three letters of recommendation
3. Official doctoral transcript documents

Application Deadline	3/1/2026 6:00:59 PM Eastern Time Zone
Description	**About the [NASA Postdoctoral Program](#)**

The [NASA Postdoctoral Program (NPP)](#) offers unique research opportunities to highly-talented scientists to engage in ongoing NASA research projects at a NASA Center, NASA Headquarters, or at a NASA-affiliated research institute. These one- to three-year fellowships are competitive and are designed to advance NASA's missions in space science, Earth science, aeronautics, space operations, exploration systems, and astrobiology.

Description:

Remotely sensed estimates of aboveground biomass (AGB) are important inputs to ecological and climate modeling. They have evolved over the last 30 years. AGB measurements used to center around the correlation between remote-sensing signal strength (radar or optical) and AGB. With the advent of interferometric SAR (InSAR) and lidar, remote measurements of tree height have been combined with average-power measurements to improve accuracy and resolution of AGB estimates. In this project, radar profiles from multi-baseline InSAR, called "tomoSAR", and/or lidar profiles from waveforms will be used to estimate AGB. Properties of the vertical profiles of radar (tomograms) and lidar (waveforms) bearing on AGB include InSAR phase and amplitude, averages of InSAR phase or waveform height, and/or Fourier transforms of both tomograms and waveforms. These properties are principal observables for NASA's Surface Topography and Vegetation (STV) observation program.

The postdoc on this project will first learn or review characteristics of measurements with InSAR and tomoSAR, as well as lidar waveforms. She/he will use data in hand from airborne-UAVSAR tomoSAR and airborne lidar and develop algorithms for estimating AGB from their profiles. The data from UAVSAR were taken in boreal Saskatchewan, Canada in 2017 and 2022, while the lidar data were taken over the same area in 2017. Lidar data were also taken in 2020 over tropical forests near the Atlantic coast of

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Brazil. Fieldwork was done at the boreal and tropical sites.

The postdoc will study diverse approaches to analysis and combining of data types to arrive at AGB. "Mechanistic" analyses involve postulating relationships between remote sensing observations and characteristics of forest structure, derived from biophysical descriptions of forest vegetation. "Statistical analyses" involve realizing remote sensing estimates by choosing them so as to produce optimal agreement with field "truth"estimates, as in "parameter estimation" and "supervised learning". The postdoc will also investigate "unsupervised learning", a form of statistical analysis that is based on derived, internal properties of measurements. It will be applied to tomoSAR and lidar data.

It is envisioned that the postdoc will get exposure to the above methods of AGB estimation from remotely sensed forest structure, and focus on one or two approaches for a publication concerning the technology and/or the science of the remotely-sensed region(s).

Field of Science:

- Technology Development

Advisors:

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Applications from 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

Questions about this opportunity? Please email npp@orau.org

Qualifications Preferred qualifications include a PhD in applied math, physics, electrical engineering or computer science. Experimental experience preferred, with hands-on data acquisition and analysis. Applicant must be interested in a

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hybrid of mechanistic, science based models and statistical approaches to model forest structure and its relationship to biomass estimation. Familiarity with machine language would be helpful. Good communication skills are of paramount importance so that colleagues and mentors of the Postdoc can learn from her/his ongoing discoveries. The ability to work independently, as most PhD's do, would be appreciated.

Experience in coding physical, and statistical models in Python or other computer language would be helpful.

Point of Contact	Mikeala
Eligibility Requirements	• **Degree:** Doctoral Degree.