

**Opportunity Title:** Physical and AI Based Satellite Remote Sensing Algorithm-development and Applications

**Opportunity Reference Code:** 0048-NPP-MAR26-LRC-EarthSci

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

**Reference Code** 0048-NPP-MAR26-LRC-EarthSci

**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** 4/2/2026 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.

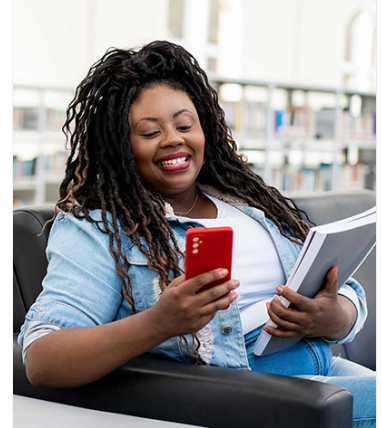
**Description:**

The Principal Component-based Radiative Transfer Model (PCRTM) group at NASA Langley Research Center has developed innovative radiative transfer models and associated retrieval algorithms for satellite remote sensing applications. PCRTM has been successfully implemented for thermal instruments including NAST-I, S-HIS, AIRS, CrIS, IASI, and CLARREO, as well as solar instruments such as CPF, SCIAMACHY, EMIT, OMPS, and OMI/TEMPO O3. The PCRTM rapidly and accurately calculates radiance/reflectance spectra across multiple spectral regions, ranging from ultraviolet, visible, near-IR, mid-IR, far-IR, to microwave (MW). Advanced retrieval algorithms based on PCRTM are currently used to generate weather and climate data products operationally from CrIS and ATMS aboard Suomi NPP, NOAA-20, and NOAA-21.

**We are seeking exceptional candidates to contribute to the following research areas:**

**1. AI-Enhanced Radiative Transfer Modeling**

Further improve the computational speed of the PCRTM using advanced artificial intelligence techniques. While PCRTM currently operates on the order of milliseconds per thousand spectral channels in thermal IR and MW spectral regions, speed improvements are still needed for near-IR and solar spectral regions. AI offers significant potential for achieving these



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performance gains. The primary challenge is developing an advanced AI-based radiative transfer model that maintains accurate Jacobians (derivatives of spectra with respect to model inputs).

## **2. AI-Based Retrieval Algorithm Development**

Develop next-generation AI-based retrieval algorithms leveraging PCRTM's proven track record. PCRTM-based satellite remote sensing algorithms have been extensively used for analyzing satellite data and validated against multiple data sources. These retrieval systems can provide realistic training databases for advanced AI algorithms. The new AI-based approach will incorporate spatial and temporal information along with real satellite data.

## **3. Novel Applications of PCRTM Retrieval Products**

Leverage existing PCRTM retrieval products and real satellite data to develop additional products for diverse applications. Examples include:

- Deriving 3D atmospheric wind motion vectors from PCRTM-based Single Field-of-view Sounding Atmospheric Products (SIFSAP)
- Wildland fire prediction and plume tracking
- Surface change characterization
- AI-based algorithms for weather prediction improvement
- Planetary boundary layer characterization

**Field of Science:** Earth Science

### **Advisors:**

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**Questions about this opportunity?** Please email [npp@orau.org](mailto:npp@orau.org)

**Qualifications** Ph D. in physical science such as atmospheric science, physics, and computer science.

Experience in analyzing satellite data and geospatial data are desired.

Skills in AI, machine learning, deep learning, keras, Pytorch are preferred.

A proven track record of scientific publications and a demonstrated ability to collaborative with others are highly desired.

**Point of Contact** [Mikeala](#)

**Eligibility** • **Citizenship:** LPR or U.S. Citizen

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