

Opportunity Title: USDA-ARS Postdoctoral Fellowship in Improving Land Models Using Remote Sensing Data

Opportunity Reference Code: USDA-ARS-NE-2024-0227

Organization U.S. Department of Agriculture (USDA)

Reference Code USDA-ARS-NE-2024-0227

How to Apply To submit your application, scroll to the bottom of this opportunity and click APPLY.

A complete application consists of:

- · An application
- Transcript(s) For this opportunity, an unofficial transcript or copy of the student academic records printed by the applicant or by academic advisors from internal institution systems may be submitted.
 Click here for detailed information about acceptable transcripts.
- A current resume/CV, including academic history, employment history, relevant experiences, and publication list
- · Two educational or professional recommendations

All documents must be in English or include an official English translation.

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Application Deadline 8/30/2024 11:59:00 PM Eastern Time Zone

Description *Applications are reviewed on a rolling-basis.

ARS Office/Lab and Location: A research opportunity is currently available with the U.S. Department of Agriculture (USDA), Agricultural Research Service (ARS), located in Beltsville, Maryland.

The Agricultural Research Service (ARS) is the U.S. Department of Agriculture's chief scientific in-house research agency with a mission to find solutions to agricultural problems that affect Americans every day from field to table. ARS will deliver cutting-edge, scientific tools and innovative solutions for American farmers, producers, industry, and communities to support the nourishment and well-being of all people; sustain our nation's agroecosystems and natural resources; and ensure the economic competitiveness and excellence of our agriculture. The vision of the agency is to provide global leadership in agricultural discoveries through scientific excellence.

Research Project: For several decades, terrestrial remote sensing has been promoted as a tool for improving our understanding of processes governing the exchange of water, energy, and carbon between the land surface and lower atmosphere. However, to date, it is relatively difficult to come up with concrete examples where water-cycle remote sensing has been physically interpreted to address a specific shortcoming present in land surface models (LSM). This, in turn, has led to credible skepticism regarding the future of physically based LSMs in the face of rapid advances in data-driven modelling. From this perspective, the data-rich environment of the mid-2020s represents the best – and, perhaps, last - chance for the

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> hydrologic analysis of geophysical water products to positively impact physically based LSMs. The participant assigned to this project will utilize a range of existing satellite-based water cycle products (including soil moisture, rainfall, terrestrial water storage, and evapotranspiration) to provide an improved description of the coupling between soil moisture and land surface water fluxes (i.e., ET and streamflow/runoff) that lie at the conceptual heart of modern LSMs. Once developed, these observationbased constraints will be applied to help improve the accuracy of flux estimates (i.e., evapotranspiration and surface) provided by physically based LSMs. Such improvement will be benchmarked against existing machine learning (ML) models to help determine whether improved physical insight obtained from multi-source satellite report sensing can close the reported accuracy gap between physically based and ML-based LSMs.

Learning Objectives: As a result of this fellowship, the participant will receive training in:

- Terrestrial remote sensing,
- Land data assimilation techniques and;
- The application of machine learning approaches to environmental models.

Mentor(s): The mentor for this opportunity is Wade Crow (<u>wade.crow@usda.gov</u>). If you have questions about the nature of the research, please contact the mentor(s).

Anticipated Appointment Start Date: 2024. Start date is flexible and will depend on a variety of factors.

Appointment Length: The appointment will initially be for one year, but may be renewed upon recommendation of ARS and is contingent on the availability of funds.

Level of Participation: The appointment is full time.

Participant Stipend: The participant will receive a monthly stipend commensurate with educational level and experience.

Citizenship Requirements: This opportunity is available to U.S. citizens, Lawful Permanent Residents (LPR), and foreign nationals. Non-U.S. citizen applicants should refer to the <u>Guidelines for Non-U.S. Citizens</u> <u>Details page</u> of the program website for information about the valid immigration statuses that are acceptable for program participation.

ORISE Information: This program, administered by ORAU through its contract with the U.S. Department of Energy (DOE) to manage the Oak Ridge Institute for Science and Education (ORISE), was established through an interagency agreement between DOE and ARS. Participants do not become employees of USDA, ARS, DOE or the program administrator, and there are no employment-related benefits. Proof of health insurance is required for participation in this program. Health insurance can be obtained through ORISE.



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Questions: Please visit our <u>Program Website</u>. After reading, if you have additional questions about the application process, please email <u>ORISE.ARS.Northeast@orau.org</u> and include the reference code for this opportunity.

Qualifications The qualified candidate should be currently pursuing or have received a doctoral degree in the one of the relevant fields. Degree must have been received within the past year, or anticipated to be received by 6/30/2025.

Eligibility Requirements

- y Degree: Doctoral Degree received within the last 12 months or
 - anticipated to be received by 6/30/2025 12:00:00 AM.
 - Discipline(s):
 - $\circ~$ Earth and Geosciences (21 (*)
 - Engineering (27_)