

**Opportunity Title:** USDA-ARS Postdoctoral Fellowship in Monitoring Crop

Responses to Abiotic Stress

**Opportunity Reference Code:** USDA-ARS-2022-0206

**Organization** U.S. Department of Agriculture (USDA)

**Reference Code** USDA-ARS-2022-0206

**How to Apply** *Connect with ORISE...on the GO!* Download the new ORISE GO mobile app in the [Apple App Store](#) or [Google Play Store](#) to help you stay engaged, connected, and informed during your ORISE experience and beyond!

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.

**Application Deadline** 7/4/2022 3:00:00 PM Eastern Time Zone

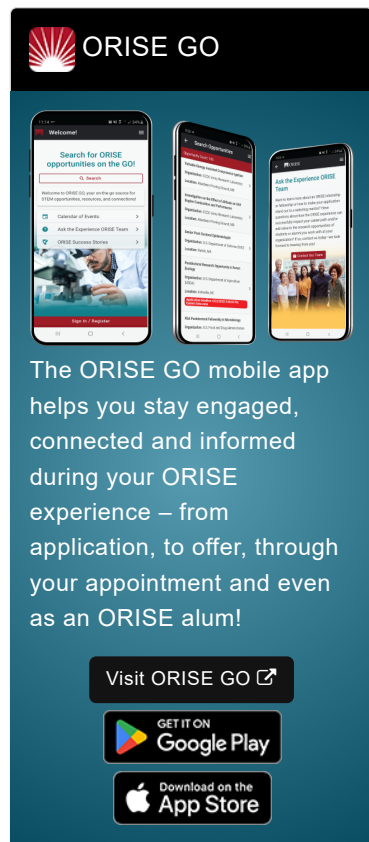
**Description** \*Applications may be reviewed on a rolling-basis.

**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:** The participant will conduct research using an existing hyperspectral field spectroscopy system to develop a high-throughput phenotyping system for monitoring crop responses to abiotic stress.

As part of the appointment, the participant will 1) calibrate and test spectral measurements and adapt the spectroscopy system for indoor deployment, 2) acquire and analyze hyperspectral data, and 3) conduct experiments to assess system robustness and applicability across different crop types and stresses. The participant will evaluate system performance for acquiring hyperspectral reflectance including vegetation indices (NDVI, EVI, PRI, NIRv, NIRvP), solar induced chlorophyll fluorescence (SIF); crop sensitivity to varying resource requirements (fertilizer and water); and suitability of the developed system to stakeholder needs and equipment.



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**Learning Objectives:** The participant will learn to 1) collaborate with team members to develop and test hardware for a greenhouse-based high throughput phenotyping system, 2) design and conduct greenhouse experiments, and 3) collect, process and analyze data from greenhouse experiments to evaluate system performance as well as performance of hyperspectral reflectance and solar-induced chlorophyll fluorescence for detecting photosynthetic capacity and abiotic stress responses for different crops. The participant will conduct literature searches, design spectrometer and fiber optic mounting and controller systems, calibrate and stress test the aforementioned system, perform statistical techniques as needed to account for experimental differences, calibrate and deploy instrumentation, and analyze and prepare data for publications.

**Mentor(s):** The mentor for this opportunity is Christine Chang ([christine.chang@usda.gov](mailto:christine.chang@usda.gov)). If you have questions about the nature of the research please contact the mentor.

**Anticipated Appointment Start Date:** September 2, 2022. Start date subject to change based on a variety of reasons, and start date may be flexible to accommodate the needs of a qualified candidate.

**Appointment Length:** The appointment will initially be for two years, but may be extended 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 [Guidelines for Non-U.S. Citizens Details](#) page 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.

**Questions:** Please visit our [Program Website](#). After reading, if you have additional questions about the application process please email [USDA-ARS@ornl.gov](mailto:USDA-ARS@ornl.gov) and include the reference code for this opportunity.

**Qualifications** The qualified candidate should have received a doctoral degree in one of the relevant disciplines (e.g. Plant Physiology, Remote Sensing, Agricultural Engineering), or be currently pursuing the degree with completion before September 2022.

Preferred Skills:

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- A solid understanding of crop responses to soil, climate, and nutrient constraints
- Working knowledge of spectroscopy techniques and equipment and experience with data organization
- Experience with programming languages such as Python, CRBasic, Matlab, and/or R

**Eligibility**  
**Requirements**

- **Degree:** Doctoral Degree.
- **Discipline(s):**
  - **Computer, Information, and Data Sciences** ([3](#) 👁)
  - **Earth and Geosciences** ([2](#) 👁)
  - **Engineering** ([4](#) 👁)
  - **Environmental and Marine Sciences** ([5](#) 👁)
  - **Life Health and Medical Sciences** ([6](#) 👁)