Opportunity Title: USDA-ARS Postdoctoral Associate Fellowship on Genomic Selection for Disease Resistance in Watermelon
Opportunity Reference Code: USDA-ARS-2022-0421

Organization	U.S. Department of Agriculture (USDA)
Reference Code	USDA-ARS-2022-0421
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	3/31/2023 3:00:00 PM Eastern Time Zone
Description	***Applications may be reviewed on a rolling-basis.***

ARS Office/Lab and Location: A postdoctoral research opportunity is currently available with the U.S. Department of Agriculture (USDA), Agricultural Research Service (ARS), within the U.S. Vegetable Laboratory in Charleston, South Carolina.

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: This appointment is part of the "Cucurbit Coordinated Agricultural Project (CucCAP) Harnessing Genomic Resources for Disease Resistance and Management in Cucurbit Crops – Bringing the Tools to the Field". The project objective is to implement "genomic selection (GS)" to improve watermelon germplasm and elite cultivars with resistance to the soil-borne disease Fusarium wilt. This project offers a unique challenge in implementing novel approaches to investigate the power of GS in enhancing disease resistance in watermelon cultivars using germplasm collected in the wild. The candidate will conduct extensive phenotyping and genotyping and collect and analyze data useful for genomic prediction and genotype imputation. The candidate will investigate 1) statistical models, and machine learning algorithms to maximize prediction accuracy and to

identify a working model most suitable for analyzing data structure of admixture populations, 2) establish machine learning approach, 3) improve existing datasets using high resolution phenotyping. The appointment will involve close collaboration with plant pathologists and bioinformatics team at ARS and the Boyce Thompson Institute (Cornell University). The successful candidate is expected to produce quality research to be published in open-access, peer-reviewed journals relevant to the field, as well communicate within the network of the cucurbit community. Research activities will include independent research in development and evaluation of prediction models and analysis of empirical data.

Learning Objectives: As a result of this training the participant will gain knowledge and experience in 1) Plant breeding methodologies, 2) Utilizing of Genomic tools in Plant Breeding, 3) plant pathology and experimental design in screening for disease resistance in vegetable crops, 4) maintaining, evaluating and utilizing crop plant germplasm, 5) on hand growing and experimenting with cucurbit crops.

Mentor(s): The mentor for this opportunity is Dr. Amnon Levi (amnon.levi@usda.gov). If you have questions about the nature of the research please contact the mentor(s).

Anticipated Appointment Start Date: March 1, 2023. 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 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 ORISE.ARS.Southeast@orau.org and include the reference code for this opportunity.

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Qualifications   The qualified candidate should have be currently pursuing or received a doctoral degree in one of the relevant fields.

Preferred skills:

- Knowledge and experience in plant breeding and genetics.
- Knowledge in plant pathology.
- Knowledge in agricultural experiment design and analysis, statistics, statistical models, machine learning, computer software programing skills R, Python.
- Expertise and good knowledge in plant breeding, and breeding practices, and in statistical genomics.
- Knowledge on multi-variate genomic prediction for crop breeding, skills to apply phenotypic and genetic/genomic data simulation methodology to evaluate prediction accuracies of models and complement empirical statistical analysis methodology.
- A strong quantitative genetics background, and experience with integration of high-dimensional phenotypic and genomic datasets to discover gene loci/genomic regions associated with complex traits in crop plants.
- Programming skills and working knowledge of mixed models are desirable, as are good communication skills, including preparation of manuscripts and ability to simplify and explain complex traits to non-experts.
- Abilities to effectively interact with team members and industry and academia people.

Eligibility Requirements
- **Degree:** Doctoral Degree.
- **Overall GPA:** 3.20
- **Discipline(s):**
  - **Communications and Graphics Design** (1 👁)
  - **Computer, Information, and Data Sciences** (2 👁)
  - **Life Health and Medical Sciences** (48 👁)
  - **Mathematics and Statistics** (3 👁)