Opportunity Title: USDA-ARS SCINet Postdoctoral Fellowship in Determining the Pervasiveness of Hybridization and Introgression in Agriculture and the Driving Mechanisms
Opportunity Reference Code: USDA-ARS-2022-0147

Organization U.S. Department of Agriculture (USDA)

Reference Code USDA-ARS-2022-0147

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. All transcripts must be in English or include an official English translation. 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 2/28/2023 3:00:00 PM Eastern Time Zone

Description ***Applications will be reviewed on a rolling-basis and this posting could close before the deadline.**

ARS Office/Lab and Location: A postdoctoral research opportunity is available with Christopher L. Owen and Gary L. Miller at the U.S. Department of Agriculture (USDA), Agricultural Research Service (ARS), located in Washington, DC.

Research Project: The U.S. Department of Agriculture - Agricultural Research Service (USDA ARS) mission involves problem-solving research in the widely diverse food and agricultural areas encompassing plant production and protection; animal production and protection; natural resources and sustainable agricultural systems; and nutrition; food safety; and quality. The programs are conducted in 46 of the 50 States, Puerto Rico, and the U.S. Virgin Islands. For ARS to maintain its standing as a premier scientific organization, major investments in computing, networking, and storage infrastructure are required. Training in data and information management are integral to the integrity, security, and accessibility of research findings, results, and outcomes within the ARS research enterprise. Nearly 2000 scientists and support staff conduct research within the ARS research enterprise.

The SCINet/Big Data Research Participation Program of the USDA ARS offers research opportunities to motivated postdoctoral fellows interested in collaborating on agricultural-related problems at a range of spatial and temporal scales, from the genome to the continent, and sub-daily to evolutionary time scales. One of the goals of the SCINet Initiative is to develop and apply new technologies, including AI and machine learning, to help solve complex agricultural problems that also depend on collaboration across scientific disciplines and geographic locations. In addition, many of these technologies rely on the synthesis, integration, and analysis of large,

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diverse datasets that benefit from high performance computing clusters (HPC). The objective of this fellowship is to facilitate cross-disciplinary, cross-location research through collaborative research on problems of interest to each applicant and amenable to or required by the HPC environment. Training will be provided in specific AI, machine learning, deep learning, and statistical software needed for a fellow to use the HPC to analyze large datasets.

Under the guidance of the mentors, the participant will have the opportunity to gain experience in and learn about the challenges of arthropod pest hybridization and introgression in agroecosystems, including issues related to the abiotic and biotic factors driving these evolutionary processes leading to invasion success. A range of computational skills will be provided that are needed to conduct comparative genomic studies, including genome assembly, phylogenomic analyses, and incorporating ecological and spatial data with phylogenomic inference.

Learning Objectives: The participant will learn HPC computing technologies and will help develop and co-lead ARS-wide workshops, resulting in a community of scientific practice on biological invasions. The participant will have the opportunity to collaborate with multiple USDA ARS scientists on genomics projects focusing on hybridization and introgression in agroecosystems, and write collaborative peer-reviewed manuscripts on using genomic data to identify hybridization and introgression over geographic space and time in agriculturally important arthropods (especially aphids).

Mentor(s): If you have questions about the nature of the research, please contact Christopher L. Owen (christopher.owen@usda.gov).

Anticipated Appointment Start Date: 2022. 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 the mentor and ARS, and is contingent on the availability of funds.

Level of Participation: The appointment is full-time.

Participant Stipend: The participant(s) 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.

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This is an equal opportunity program open to all qualified individuals without regard to race, color, age, sex, religion, national origin, mental or physical disability, genetic information, sexual orientation, or covered veteran's status.

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

Qualifications

The qualified candidate should have received a doctoral degree in one of the relevant fields listed below, or be currently pursuing the degree with completion by December 31, 2022.

Preferred Skills:

- Experience with genome assembly (Illumina, PacBio, and Oxford nanopore)
- Experience with phylogenomic analyses (maximum likelihood and Bayesian inference)
- Experience incorporating climate and spatial environmental data with phylogenetic analyses
- Proficiency in HPC, linux, and Python or R
- Strong oral and written communication skills

Eligibility Requirements

- **Degree:** Doctoral Degree received within the last 60 months or anticipated to be received by 9/30/2022 11:59:00 PM.
- **Discipline(s):**
  - **Computer, Information, and Data Sciences** (2)
  - **Environmental and Marine Sciences** (3)
  - **Life Health and Medical Sciences** (10)
  - **Mathematics and Statistics** (1)
- **Veteran Status:** Veterans Preference, degree received within the last 120 month(s).