



USDA-ARS SCINet Newsletter: July 2021

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Announcements

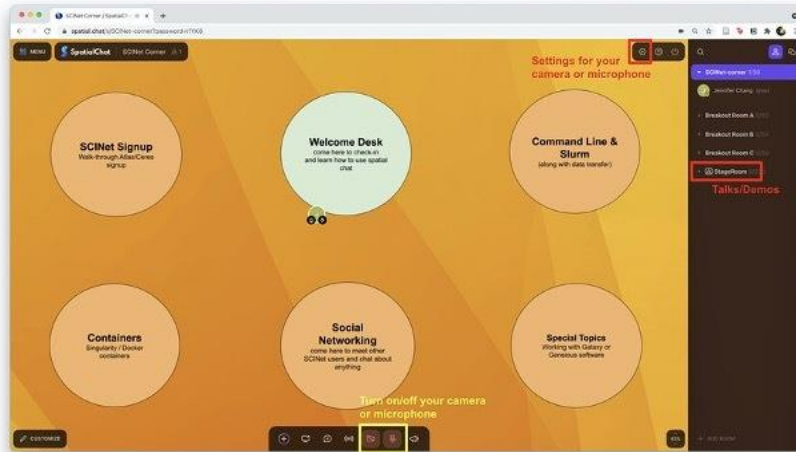
AI Innovation Awardees

Out of over 60 applications, 4 proposals were awarded AI Innovation funds led by ARS scientists **David Augustine**, **Lance Cadle-Davidson**, **Renfu Lu**, and **Kristen Veum**.

- **David Augustine** is a Research Ecologist in the Rangeland Resources & Systems Research unit in Fort Collins, CO. His project is titled “Automated-detection of prairie dog colonies from airborne imagery using deep learning” with co-PIs Justin Derner and Lauren Porensky.
- **Lance Cadle-Davidson** is a Research Plant Pathologist in the Grape Genetics Research Unit in Geneva, NY. His project is titled “Explainable deep learning-based image analysis with Blackbird RGB imaging robot for laboratory high throughput phenotyping” with co-PI Yu Jiang at Cornell University.
- **Renfu Lu** is an Agricultural Engineer in the Sugarbeet and Bean Research Unit in East Lansing, MI. His project is titled “Deep learning-based 3D fruit tree perception through efficient multi-sensor fusion for robotic harvesting of apples” with PI Zhaojian Li at Michigan State University.
- **Kristen Veum** is a Research Soil Scientist in the Cropping Systems and Water Quality Research unit in Columbia, MO. Her project is titled “Adapting deep learning for 3-D mapping of soil carbon” with co-PIs Newell Kitchen, Curtis Ransom, and Ken Sudduth.

Congratulations! We’re looking forward to sharing the exciting results from these proposals with the SCINet community.

SCINet Corner: Third Thursdays of the Month



SCINet Corner is a VRSC-moderated virtual space for people to share knowledge, discuss projects, and identify resources needed to progress on their projects. The next event is on **July 15th** (10am PDT, 11am MDT, 12pm CDT, 1pm EDT). Participants are encouraged to share information on tutorials, conferences, and other upcoming SCINet training opportunities. It is recommended to join the event via [Google Chrome or Firefox](#). Together, we discuss ideas, problems, and form collaborations to address your questions.

- Where: [spatial chat link](#) sent out the Monday before and the night before
- Register: <https://forms.gle/7DcBoBvbGcjQDBP38>

SCINet Forum

Register your SCINet Forum account at <https://forum.scinet.usda.gov> today! SCINet's new discussion forum provides better discussion, search, and control of what emails you receive. Need help installing or [troubleshooting software](#)? Need help with [login or account info](#)? The first time you visit, select "Sign Up" and you will be asked to log in with your existing SCINet account login and two-factor authentication credentials (what you use to log in to Ceres or Atlas). For instance: if your SCINet Password is "Password" and your Verification Code is "123456", then enter "Password123456". Once you log in, visit [here](#) for basic Forum usage.

Applications to become a SCINet fellow posted

There are 13 opportunities posted through ORISE to become a SCINet fellow--please share with your networks! Three positions require a Master's degree and 10 require a Ph.D. For more information on the positions including deadlines and potential start dates, visit: <https://www.zintelllect.com/Catalog> and enter the keyword: *SCINet*

Research Highlights



SCINet HPC resources, [PacBio software](#), and a new assembly program has allowed ARS researchers in [Ag100Pest](#) to assemble the large genomes of the American and [Desert locusts](#). Locusts are dangerous and widespread pests that threaten global food security. Assembling locust genomes allows us to better understand their behavior and physiology. Locust genomes are large--3 times larger than human or [bovine](#) genomes--requiring SCINet computing resources. Initial assembly took just over a day, much faster than the several weeks to months required when Ag100Pest began.

SCINet Training Program

SCINet-funded Training

[Introduction to Atlas](#) **July 15 (10-11:30 AM CDT)**: During the month of July, Mississippi State University is offering a new training course for USDA-ARS scientists. [Introduction to Atlas](#) is a 90-minute information session for anyone interested in learning more about USDA's new state-of-the-art supercomputer Atlas. Atlas is a high-performance computer with 101 terabytes of total RAM designed to help power research advances in biocomputing, epidemiology, geospatial technology and more. This introduction will cover a range of topics that include everything from a general overview of high-performance computing and why you might want to take advantage of its capabilities in your research to basic protocols associated with using Atlas (how to gain access to Atlas, how to log-in to your account, how to transfer data, etc.). This introduction session will be led by Dr. Adam Thrash, MSU Research Associate and Computer Specialist with MSU's Institute of Genomics, Biocomputing, and Biotechnology. Along with Introduction to Atlas, a [Blockchain Networks](#) workshop occurred on July 6 and 7. **Those interested in attending *Introduction to Atlas* must [register](#) in advance.** For questions regarding training courses, please contact [Dixie Cartwright](#).

The Carpentries R and Python Workshops: Multi-day online software and data Carpentry workshops co-sponsored by SCINet and [The Carpentries](#) will be posted on the [Upcoming SCINet Events webpage](#). Workshop topics included Unix, Git, and Intro to R or Python, data

organization and cleaning. To join the priority list for the next round of Carpentries workshops, contact [Kathy Yeater](#).

- **The Carpentries instructor training** is available to qualified applicants who desire to become certified Carpentries workshop instructors. [This training](#) teaches participants The Carpentries pedagogy and provides the resources to instruct Carpentries workshops in Unix, git, SQL, OpenRefine, R, Python, and more. Contact Kathy Yeater for more information about Instructor Training.

Coursera.org Certified Courses: The SCINet Initiative and the AI Center of Excellence are excited to provide training opportunities through [Coursera](#). A limited number of Coursera licenses are available to ARS scientists and support staff to complete training focused on scientific computing and artificial intelligence. Successful completion of courses and specializations will result in widely recognized certificates and credentials. **The application deadline for the next round of licenses is July 15th.** Please visit the [Coursera Training](#) page of the SCINet website for more details about the program and application process.

Free Online Computational Training (Self-paced)

Make use of your work-from-home time with computational training! A large list of free tutorials and courses has been compiled on the [Free Online Training page](#). Training topic areas include Python, R, SAS, and MATLAB programming; statistics; data science concepts; AI and machine learning; GIS; Google Earth Engine; Git and GitHub; reproducibility, productivity, and integration management tools; and bioinformatics and ecology domain learning. Know of additional free training opportunities? Send them to SCINet-Newsletter@usda.gov.

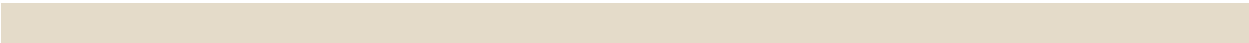
SCINet Online Science Tutorials

Browse our growing set of SCINet science tutorials created by ARS scientists and the SCINet Virtual Research Support Core. Our [ARS Science Tutorials page](#) includes Ceres Onboarding and Intro to Unix for new HPC users, two geospatial computing tutorials, a QTL Analysis tutorial for sequencing in R, and machine learning training material. These tutorials are being further developed and organized in the [Bioinformatics Workbook](#) and the [Geospatial Workbook](#)--new content is welcome.

Meet the VRSC

The SCINet Virtual Research Support Core (VRSC) manages the day-to-day operations and maintenance of the SCINet HPC systems and is also involved with the networking aspects of SCINet. The VRSC is staffed by talented IT administrators and engineers with expertise in high-performance computing system and network engineering, operations, maintenance, and administration. Additionally, the VRSC provides research IT support, computational expertise in various research domains, and support for SCINet-funded workshops/training for SCINet users. In the previous issue, we [introduced the VRSC for Ceres: Jim Coyle, Marina Kraeva, David Orman, and Andrew Severin](#).

In this issue, we're introducing some of the VRSC personnel who facilitate the Atlas HPC system at Mississippi State University (MSU) in Starkville, Mississippi: **Robert Moorhead, Bindu Nanduri, Trey Breckenridge, Joey Jones, Adam Thrash, and Dixie Cartwright**.



Robert Moorhead

Dr. Robert Moorhead is the Director of the Geosystems Research Institute (GRI), a university-level institute that focuses on understanding Earth's natural and managed systems. GRI addresses spatial technology, visualization of complex datasets, and computational modeling in agriculture, forestry, water resources, climate, weather, and oceanography. He is the PI of the AAR-HPC award. He has worked for MSU for 32 years, initially as an assistant professor in Electrical and Computer Engineering and now as the Director of two university-level Institutes. His research has migrated from image processing to visualization of large-scale computer simulations to most recently using unmanned aerial systems for advancing agriculture performance and understanding the environment.



Bindu Nanduri

Dr. Bindu Nanduri is an Associate Professor with the College of Veterinary Medicine at MSU. As a co-investigator on the AAR-HPC project, she helps coordinate efforts to foster collaborative research with USDA ARS and assists in the overall management of the project. She has worked at MSU for 18 years and her research includes genomics, bioinformatics, and infectious diseases. Bindu works with the project team to develop novel methods to integrate data from disparate domains such as genomics, spatial epidemiology, machine learning, and agricultural operations, in a HPC environment. She is excited about building a multidisciplinary research hub at MSU that will have a long-term impact on agricultural research and is looking forward to the training opportunities.



Trey Breckenridge

Trey Breckenridge is the Director of High-Performance Computing at MSU's High-Performance Computing Collaboratory (HPC2), where he is responsible for the oversight of computing, data storage, data communications, and general operations. He has over 25 years of professional experience in high performance computing and computer support.



Joey Jones



Joey Jones is a Senior Computer Specialist with the MSU HPC2 Computing Office. He has been with the HPC2 for 20 years, focusing primarily on High Performance Computing administration, as well as other system administration tasks. One of the greatest perks of his work is seeing the accomplishments and advances created on the machines that he and his team manage.



Vincent Sanders

Vincent Sanders is the Computing Systems Manager at MSU HPC2. He is a MSU graduate where he obtained a Bachelor's in Electrical Engineering (1990) and a Master's in Electrical Engineering (1992). After graduation he joined the MSU Microsystems Prototyping Laboratory (MPL) where he continued his research in hardware modeling and simulation of components and systems. He then joined the HPC2's Computing Office working on various projects focusing on high-performance computing management. He has over 25 years of professional experience in high-performance computing and computer management. He is currently responsible for the oversight of computing, storage, networking, and high-performance computing operations at the HPC2.



Adam Thrash

Dr. Adam Thrash is a computer specialist at the Institute for Genomics, Biocomputing & Biotechnology. Adam has a Ph.D. in computer science, an M.S. in computer science, and a B.S. in software engineering. He provides expertise in working with bioinformatics software to the AAR-HPC project, with a special interest in developing new software designed with HPC and user-friendliness in mind. Adam also enjoys the challenge of explaining complicated concepts in understandable ways, whether through developing visualizations of large datasets or working to create training courses for Atlas.



Dixie Cartwright



Dixie Cartwright is the Training and External Facilitator with the Geosystems Research Institute at MSU. She works with the AAR-HPC project team to help coordinate training courses and outreach efforts. She has worked for MSU for 17 years in a variety of professional roles related to distance and continuing education. She enjoys the opportunity this work gives her to meet and work with so many great people. Dixie is looking forward to working with the project team to develop new virtual and online training courses in the coming months and being able to offer some in-person workshops at MSU by the end of the year.



SCINet Website Update

The screenshot shows the top portion of the SCINet website. At the top left is the USDA Agricultural Research Service logo. The main header reads "SCINet Scientific Computing Initiative" with a "Content" link on the right. A navigation bar includes links for "Sign up for an account", "News", "User Guides", "Education", "Use Cases", "Support", "About", and "Opportunities". The main content area features a large, colorful, abstract image of a city or data grid. On the left side of this image is a dark blue call-to-action box with the text "Get Started with SCINet ARS scientists/ collaborators: Register for an account" and a "Get Started now" button. Below the image, the text reads "High Performance computing. Training. Network improvements." followed by a paragraph: "The SCINet initiative is an effort by ARS to improve our research capacity by providing scientists with access to high performance computer clusters, cloud computing, improved networking for data transfer and training in scientific computing".

New content is constantly being added to the [SCINet website](#). Please send any website feedback to SCINet-Newsletter@usda.gov.

How to Get Started



Simply [request a SCINet account](#) (eAuthentication required) to get started. Upon approval, you will receive instructions for logging into SCINet and accessing Basecamp.

Check out the [SCINet website](#) for more info on how SCINet can enable your research.

Read the [SCINet FAQs](#) covering general info, accounts/login, software, storage, data transfer, support/policy/O&M, parallel computing, and technical issues.

Contribute / Contact

For questions about this newsletter, to contribute content, feedback on the SCINet website, or SCINet policy and development questions please email SCINet-Newsletter@usda.gov.

SCINet Newsletter Editor: Amy Hudson

For technical assistance with your SCINet account, please email scinet_vrsc@usda.gov.

SCINet Leadership Team

Deb Peters, Acting Chief Science Information Officer

Rob Butler, Acting SCINet Project Manager

Adam Rivers, Science Advisory Committee (SAC) Chair

Brian Scheffler and Stan Kosecki, Ex Officio

[SCINet Website | Comments](#)

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