

Registration for the 2020 Nevada Science Bowl, Jan. 31 to Feb. 1, will open [this summer](#). The winning team will advance to next year's National Science Bowl, April 30 to May 4.



## From intern to post-doctoral scholar, student leads key research for NNSS

Doctoral research by an on-site intern will shape the way data are analyzed for experimental programs at the Nevada National Security Site (NNSS).

Following three summers as an intern, Jesse Adams will join the NNSS as a post-doctoral researcher this May. A soon-to-be graduate from the applied mathematics program at the University of Arizona, Jesse is also the recipient of the school's 2019 AI Scott Prize Lecture. The accolade is presented to a student nearing the completion of his or her capstone research and includes the opportunity to present at the university as well as funding for educational materials.



"Jesse's doctoral research is some of the most impactful I've ever seen over my years in academia and the DOE research enterprise," said Dr. Aaron Luttmann, NNSS data analytics and wireless sensor technologies program manager and Adams' Ph.D. co-advisor. "We're very excited to have Jesse joining us as a post-doctoral scholar this summer. We know he'll make great contributions to the scientific work being done at the NNSS."

On April 12 at the University of Arizona, Adams shared his research regarding the development of the Site's statistical methods for image processing. His work encompassed creating new computer methods for deconvolving very large images from X-ray systems. Through an approach called Markov Chain Monte Carlo, Jesse built schemes that supply information about uncertain quantities measured in data. In turn, this helps the team compare what Jesse's computed to numerical simulations.

"After we do a large experiment at the Site, our group is on the hook for the data analysis," said Dr. Marylesa Howard, NNSS signal processing and applied mathematics supervisor. "Once we process the data, the labs compare the data product versus the simulations. Having uncertainty quantification, essentially error bars, from Jesse's work is something we can regularly implement into that paradigm that will significantly increase the value of our data product."

Adams was first introduced to the NNSS during his master's program at the University of Montana, where he met Dr. Howard.

"They had an opening," said Adams. "I applied, got it and ended up enjoying working for the group so much that I came back. After my second summer, NNSS got a contract with the University of Arizona and had my research funded. I got to present this research at a few different places and conferences in different parts of the U.S. and received external funding to go to a conference in Australia."

"Supporting graduate students' doctoral research is an outstanding approach to training future NNSS scientists and engineers while they're still in school," said Dr. Luttmann, who added that the team is collaborating to write

Adams' thesis research for publication in an academic journal. "Rather than learning on the job when they start as full-time employees, they begin on day one as fully trained staff members, ready with the skills needed for our unique national security applications."

As Adams joins the NNSS full time, more than 60 incoming students are preparing for internships this May. Student Programs includes opportunities for post-doctorate, graduate, post-baccalaureate and undergraduate students at NNSS locations across the country.

"We've had wonderful experiences bringing interns into our group," said Dr. Howard. "The summer program allows us to vet students before hiring full time. It's like a very long interview for both them and us."

The success has been such that Dr. Howard's team will continue its research relationship with the University of Arizona by bringing another student from its graduate program to the NNSS this summer for doctorate research.

"The NNSS program for working with graduate students is the best pipeline we have to develop the next-generation scientific workforce," said Dr. Luttman. "Our university collaborations allow us to establish long-term relationships with professors who help us grow young researchers into the creative and collaborative scientists needed to solve the nuclear security problems of the future."

For more information about NNSS Student Programs, visit <https://www.nnss.gov/pages/NFO/MSTSSStudentPrograms.html>.



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