



# Los Alamos National Laboratory University Collaborations as Part of NSSC-3

Margaret Root, Los Alamos National  
Laboratory POC for NSSC-3

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# Successes

- Student Research at LANL
  - 13 NSSC students at worked at LANL in 2021
  - 5 NSSC students converted to LANL staff within the past two years (3 were previous Keepin Program students!)
- LANL-NSSC Keepin Nonproliferation Summer Program
  - Annual LANL summer safeguards school that includes internship, hands-on laboratory course, trip to DAF, and lectures from nuclear safeguards and security experts
  - 44 participants in the past 3 years, 15 from NSSC specifically
- Experiments at the Device Assembly Facility in Nevada
  - Experimental campaigns yearly at the DAF
  - Unique resources not available to most university students!
- LANL-NSSC Summer Nonproliferation Seminar Series
  - 6 talks (2 in 2020 and 4 in 2021)
  - Speakers from LANL and SNL presenting on safeguards and nonproliferation work



## Universities Partner with Los Alamos for a Unique Hands-On Experience

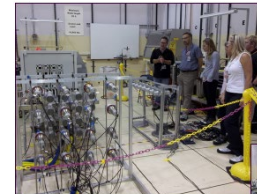
Faculty, students, and post-docs from five universities had the chance to measure radiation signatures from Category I Special Nuclear Material (SNM) at the Device Assembly Facility (DAF) at the Nevada National Security Site (NNSS) as part of a two-week measurement campaign organized by Los Alamos National Laboratory (LANL) and North Carolina State University. This unique activity was organized on behalf of the Consortium for Nonproliferation Enabling Capabilities (CNEC) and Consortium for Verification Technology (CVT) with support from DNN's Office of Research and Development (R&D).

The DAF is home to the National Criticality Experiments Research Center (NCERC), which is operated by Los Alamos. The facility maintains a substantial SNM inventory and expertise to support a variety of nuclear security missions requiring hands-on access to weapons-grade

plutonium and highly enriched uranium (HEU) in numerous configurations.

In July 2016, consortium participants from the University of Michigan, North Carolina State University, North Carolina A&T, Princeton, and the University of Illinois used different radiation detection systems (gamma spectroscopy, fast-neutron time-correlation, gamma scatter and pinhole aperture imaging, dual neutron-gamma scatter imaging, and neutron coded aperture imaging) to measure kilogram quantities of uranium, plutonium, and other fissile materials in bare, shielded and/or reflected (surrounded) with materials that may reflect neutrons back into the SNM configurations.

This is the second year that LANL has partnered with CNEC and CVT to provide the unique research and training opportunity on SNM detection and analysis. Results from the measurement campaign held in summer 2015 were presented at the 2016 Institute for Nuclear Materials Management Annual Meeting in Atlanta. The consortia plan to publish results from 2016's measurements as well.

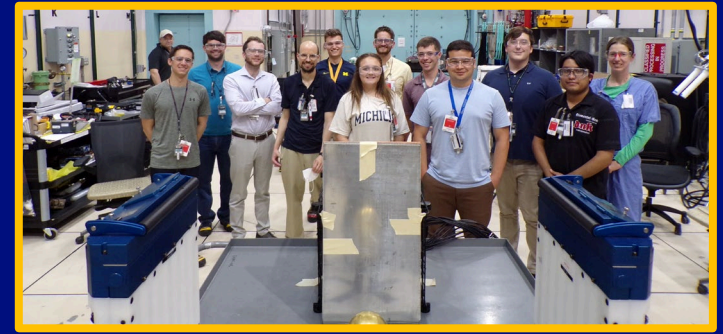


Above: The delegation from the NSSC tour in one of the critical experiments buildings at NCERC located at the DAF.

Right: Team of CNEC/CVT faculty, students and post-docs performing active measurements of correlated particle emissions from HEU pellets surrounded by americium-beryllium sources.



# Initiatives/Plans/Opportunities



- Laboratory Investigators Rotation
  - We are in talks with professors now about summer 2022 opportunities.
  - We can also fund LANL researchers to go to universities to conduct research
  - Please reach out to me if you are interested in participating now or in the future!
- Keepin Program continuing
  - 14 students will be participating in the Keepin Program this year, 7 NSSC students
- DAF Measurements continuing
  - 2 experimental campaigns are planned for FY22, one in the spring and one in the fall
- Please reach out to me if you have interest in a presentation at your university from a LANL staff member whose research has caught your eye, or if you are interested in sharing your work or that of your students with LANL. I can help to organize these talks!
- **Contact: [margaret@lanl.gov](mailto:margaret@lanl.gov)**