



Thrust Area 6: Education and Outreach

Mission

The CVT will train the next generation of professionals in nuclear nonproliferation, safeguards, and arms control verification by introducing new topic-relevant courses, updating existing ones, organizing workshops and conferences, and engaging students in multi-institution research and development projects. These activities will enable the establishment of the following fellowships:



CVT Research Fellowships

1. CVT Undergraduate Fellowships

- Involvement of students at early stages is critical to recruiting and retaining the best talent in support of the NNSA mission

2. CVT Graduate Fellowships

- The experience of the graduate fellows will be enhanced by student internships at the national laboratories, where they will take part in research under the mentorship of laboratory scientists

3. CVT Postdoctoral Fellowships

- Post-doctoral fellows will be integral part of the research activities and will act as mentors to the CVT students



CVT Research Fellowships

4. CVT Faculty Sabbatical Fellowships

- The CVT will support a portion of faculty time for sabbaticals to be spent at the collaborating national laboratories. These sabbaticals will strengthen the existing relationships between universities and laboratories

5. CVT National Laboratory Expert Fellowships

- The CVT universities will invite national laboratory experts to spend time on campus and participate in activities such as: (i) serving on graduate student theses committees, (ii) teaching a short course on a topic of interest to verification technology and policy, and (iii) presenting invited seminars and lectures.



Career Development

1. CVT Fellows Career Development

- All CVT-supported students and post-doctoral scholars will attend the University and Industry Technical Interchange (UITI) meeting and other field-specific research conferences
- They will be mentored and advised on how to prepare and give poster and oral presentations describing their research activities
- They will be encouraged and supervised in writing peer-reviewed research papers as lead authors

2. CVT Fellows Transition to National Laboratory

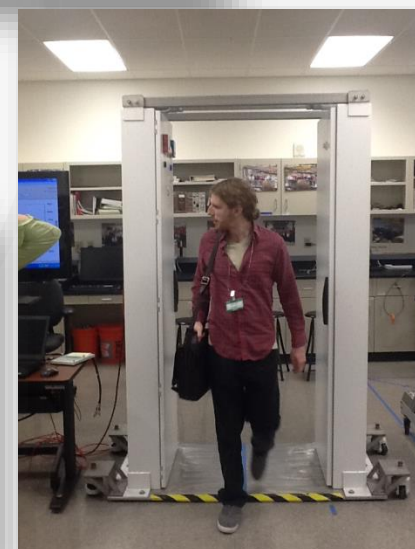
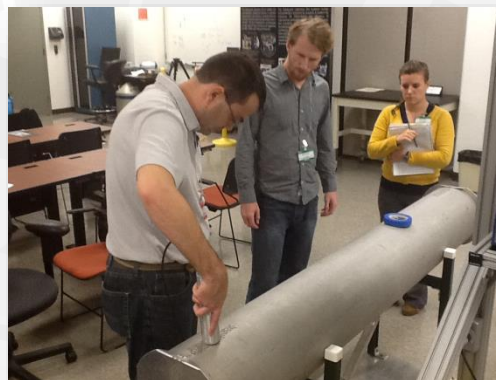
- The CVT's strong connection to the national laboratories will ensure a seamless transition for many of the graduating Fellows to a career in the national laboratory system
- The national laboratories participating in our collaboration already have programs, such as Directors' Post-Doctoral Fellowships, that will ensure that the best talent is retained and transitioned to the national laboratories



Enhanced Academic Courses

Safeguards Laboratory Course

- Students will take part in a week-long hands-on training course offered at the Safeguards Laboratory (SL) at ORNL
- This training includes integrated safeguards methods, procedures, and instrumentation, including experiments with small quantities of fissile material
- UM has been offering this course since 2009

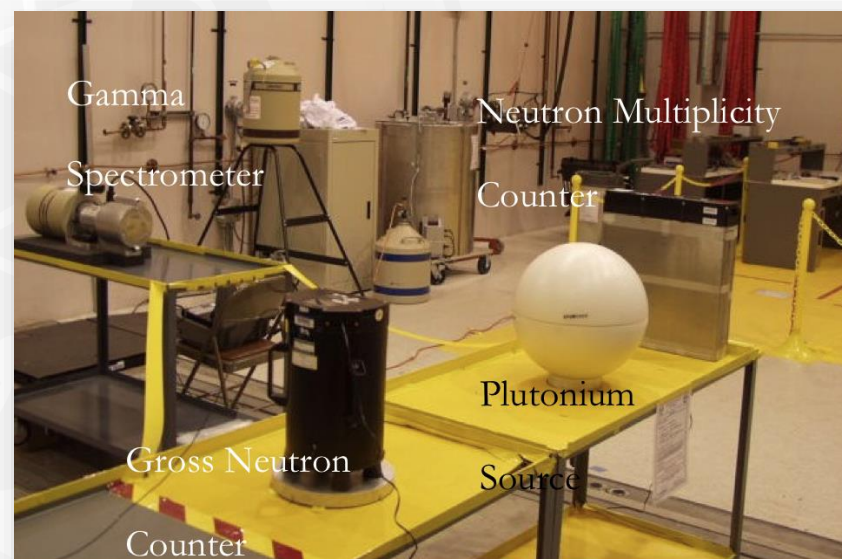


Enhanced Academic Courses

Subcritical Measurements of Category-I SNM at the Nevada National Security Site

Students will measure objects such as:

1. BeRP ball: a 4.5 kg sphere of alpha-phase weapons-grade plutonium metal
2. Rocky Flats Shells: a collection of 80 nesting hemispherical shells of HEU with individual masses ranging from 176 grams to 8.4 kilograms



New Academic Course Development

Tutorials on Seismic Detection

- Columbia University and the University of Hawaii will develop a series of tutorials on seismic and infrasound detection, location, identification, and yield estimation for underground explosions

Coursera Open-Access Course on Nuclear Science

- Princeton University will develop a *Coursera* open-access course on Science and Technology of Nuclear Power, with special emphasis on proliferation issues

Nuclear Security and Policy Courses

- UM offers a cross-cutting course entitled “Nuclear Weapons,”
- MIT, PSU, and TAMU have jointly developed multiple Nuclear Security and Policy courses funded by Global Threat Reduction Initiative



Certificates of Public Policy

- In order to broaden Fellows' educational experiences, several CVT universities have existing certificates of public policy that incorporate public policy and technology
- UM offers the Science Technology and Public Policy Graduate Certificate Program in which students explore the politics and policy related to science and technology.
- PSU offers bachelor's, master's, and doctoral degrees in public policy
- UH offers graduate certificates in Public Policy and a program in Futures Studies.
- Princeton University's Woodrow Wilson School of Public and International Affairs offers the Science Technology and Environmental Policy graduate fellowship
- UW offers the Energy Analysis and Policy Graduate Certificate Program in which students combine studies in technology, policy, economics and environmental science
- MIT has a Technology and Public Policy Program which studies technology policy and also a Security Studies Program that integrates technical and political analysis
- UIUC offers an undergraduate certificate in Global Security through the Program in Arms Control, Disarmament, and International Security



Outreach

- The consortium faculty and laboratory researchers represent a remarkable pool of interdisciplinary talent
- We will showcase this expertise through the following outreach activities
 1. Workshops, Summer Schools and Conferences
 2. Underrepresented Minority Summer Undergraduate Research Opportunities Program
 3. Institute of Nuclear Materials Management (INMM) Student Chapters



Outreach

*Existing and **proposed** summer schools, workshops, and conferences of CVT institutions*

Institution	Annual Summer Schools	Annual Workshops/Conferences
University of Michigan		CVT Annual Workshop MCNPX-PoliMi Training Workshop Symposium on Radiation Measurements and Applications (SORMA)
Massachusetts Institute of Technology	Nuclear Plant Safety, Nuclear Operational Risk Management	Multiple conferences across a broad spectrum from fundamental science to the Annual MIT Energy Conference
Princeton University		International Panel on Fissile Materials. Topical workshops for the International Panel on Fissile Materials International workshops on political and technical verification challenges
Columbia University	Lamont-Doherty Earth Observatory Summer School	Science and Technology conference sponsored by the CTBTO
North Carolina State University	Young Investigators Summer Program in Nuclear Engineering.	
University of Hawaii		Annual CTBTO Infrasound Technology Workshop Biennial CTBTO Science and Technology Conference
Pennsylvania State University	Toshiba-Westinghouse Fellows program	2014 American Nuclear Society Student Conference
Duke University		Workshops on analysis of high-dimensional sensing data
University of Florida	PNNL Radiation Detection for Nuclear Security Summer School	Regular host for the annual FL-HPS and FL-AAPM joint meeting
Oregon State University	Advanced Radiation Detection and Radioanalytical Methods offered to distance students (ECampus program)	IAEA International Collaborative Standard Problem (ICSP) on Prediction of Hydro-Mechanical Behavior in Reactor Core with a Plate-type Fuel Assembly Nuclear Future: New Nuclear Power Plants from Design to Generation, International Workshop
Yale University	Summer School on Solid State Dosimetry	International Conference on Solid State Dosimetry
University of Illinois		Summer Workshop in International Security

