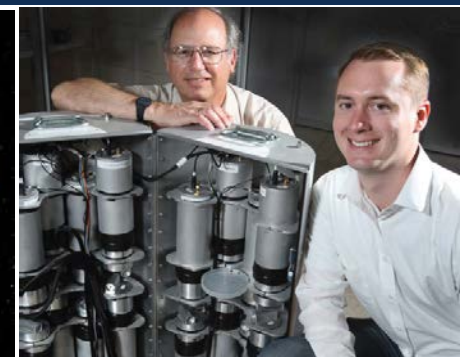


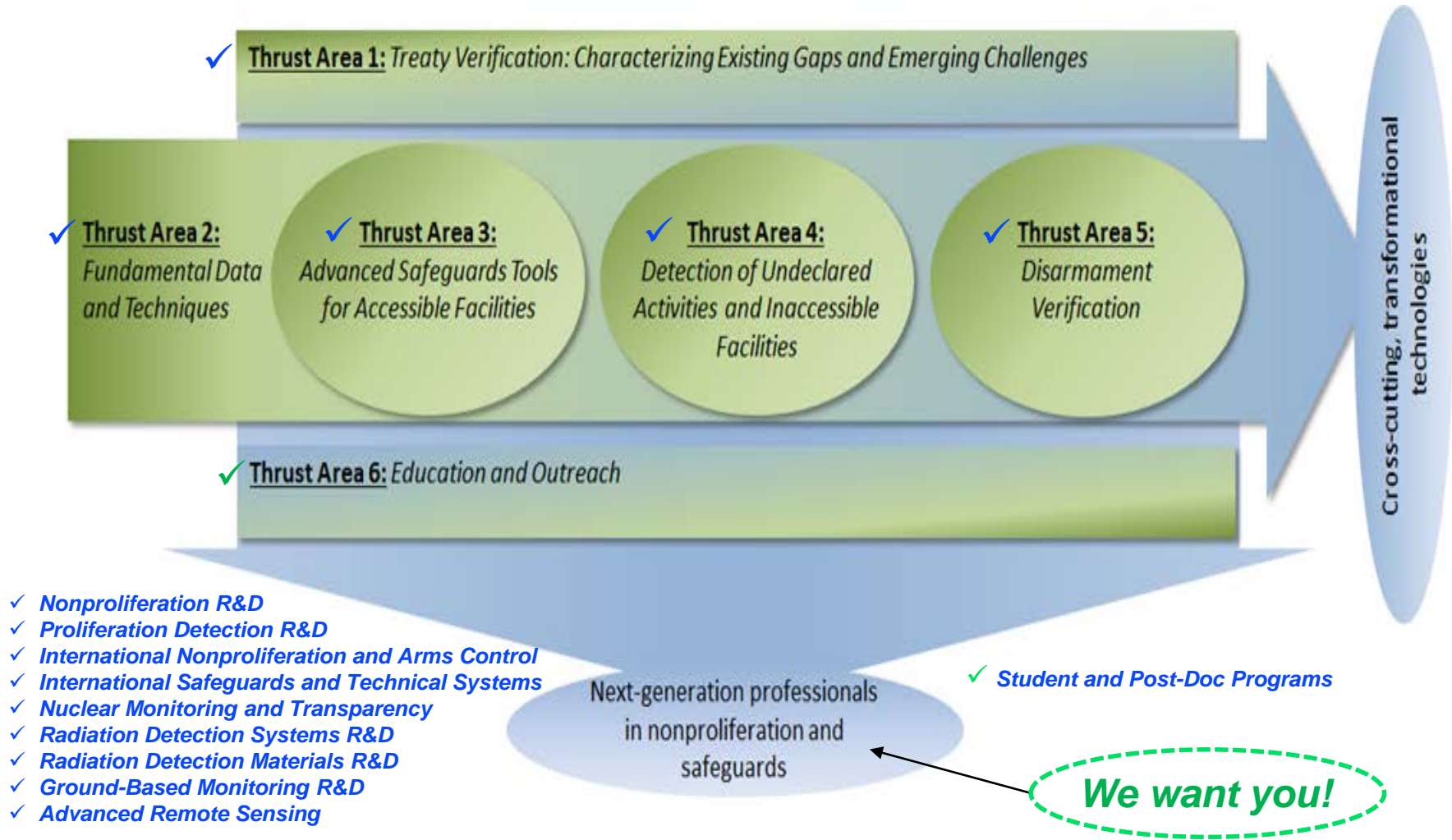
Exceptional service in the national interest



Proliferation Detection Technologies at Sandia National Laboratories

www.sandia.gov

*“The CVT’s overarching theme is the advancement of the state-of-the-art in technologies and policies related to the verification of these [nonproliferation and arms control] treaties.”



* Consortium for Verification Technology Proposal - University of Michigan

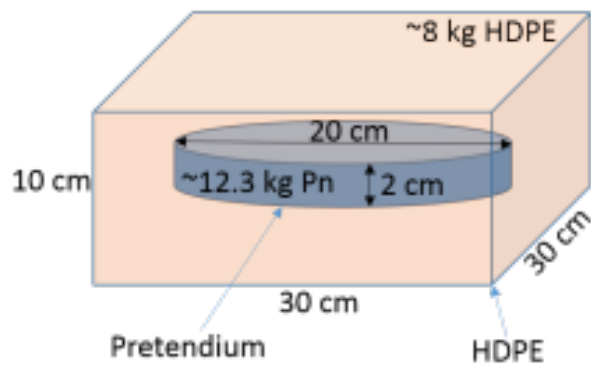
CVT students at SNL (incomplete?)



Student	Institution	Mentor	Duration	Project
Steven Czyz	OSU	Brubaker	Summer 2015	Single Volume Scatter Camera
David Goodman	UM	Brubaker	Jan-Feb 2016	Neutron Imaging with Polaris
Kyle Weinfurther	NCSU	Brubaker	Summer 2016 - present	Compact Scatter Camera Hardware
Mateusz Monterial	UM	Marleau	2015 - present	Correlated g-n timing
Marc Ruch	UM	Marleau	Summer 2015 - present	Si-PM – PSD and timing in Compact Scatter Cameras
Kyle Polack	UM	Marleau	Received PhD Now SNL staff	Dual Particle Imaging Algorithms
Jason Natress	PSU	Cabrera- Palmer	Summer 2015	Muon spallation in MARS
Kelsey Reamer	NCSU	Kiff	Summer 2015	MC-15 characterization
Gabriel Chandler	UF	Kiff	Summer 2016	MC-15 characterization
Michael Hamel	UM	Weber	Long term	Fissile Material Imaging with the Dual Particle Imager

Other Activities

- Workshop on Techniques for Information Protection of Imaging Information
 - Jointly hosted by PNNL and SNL as part of the Intrinsic Information Barriers for Imaging venture. June 1-2, Seattle, WA.
 - Researchers from PNNL, SNL, LLNL, UA, MIT, and Princeton.
 - W.K. Pitts, et al, “Outcomes of a Workshop on Techniques for Information Protection of Imaging Information” and 6 other papers at the Annual INMM meeting, 2016.
 - Not officially a CVT activity, but included many CVT players.
- Potential FY17 follow on CVT Workshop?



Object T = valid type 1 TAI



Collaboration Options

- Summer Internships
- Year-round internships (full or supplemental)
 - Job opening #654384– Student Intern - Radiation Detection R&D Year Round
 - Job opening #653885– Student Intern/Fellow – National Nuclear Security Administration (NNSA) R&D Grad YR
- Visiting Researcher
 - Pros
 - Freedom to work on non-funded R&D
 - Lab CVT funding for mentors.
 - Cons
 - No funding for hardware at the Lab.
 - **Cost of living.**

Potential SNL/CVT Rad/det projects



Mentor	Potential Projects
Erik Brubaker	RadMAP background data analysis
	Single Volume Scatter Camera event reconstruction analysis
	Advanced image reconstruction techniques
	Anisotropic response of crystalline organic scintillators to neutrons
	Uncertainty quantification for radiation imaging data
	Organic scintillator characterization (temperature, pulse shape)
Scott Kiff	Neutron spectroscopy (fission vs. alpha interaction applications)
	Correlated neutron signatures
Peter Marleau	Three dimensional reconstruction using correlated gamma-neutron timing and double scatter imaging
	Electronic collimation for search/detection applications
	Novel calibration methods for large volume detectors using phoswich style PSD
	Monte Carlo optimization of a Gamma-ray time-encoded imager
David Reyna	Antineutrino detection as applied to next generation treaties
Melinda Sweany	Adaptive masks for time-encoded imaging systems
	Material identification using resonant neutron attenuation
	Study of pattern recognition metrics for coded aperture images
Belkis Cabrera-Palmer	Neutron Scatter Camera application to high-energy spectral unfolding
	Time-encoded imaging using a High-purity G2 detector