Contractor	Contract Name	Description
Adelphi	Pulsed Neutron Generator	A pulsed neutron generator is proposed for the detection of special nuclear material. Using the T-T nuclear reaction, a novel emission geometry and an ideal acceleration voltage, the expected neutron energy will be less than 8.5 MeV to prevent the emission of interfering gamma-ray lines from other materials.
Advanced Fuel Research	Radiological Source Surveillance With V-RADS Video-Centric Radiation Detection	Develop software for the evaluation of images from security cameras to search for the characteristic small “spots” that appear in images when a radiological source is nearby. Vidiation Radiation Analytics Detection System (V-RADS™) software detects these image artifacts.
Alameda	Alameda Applied Sciences Corp.	Develop a fast pulse, portable, fast neutron source to detect SNM in the field. Our source offers a 20ns neutron pulse with a repetition rate up to 1kHz. The goal is to develop a source with 1000hrs of continuous operation at 1E8 n/s.
Applied Nanotech Inc.	Applied Nanotech Inc.	Develop a novel field ionization technology to produce the deuterium ion (D+) current for a neutron source, enabling fast switching, high repetition rate and high yields. Carbon nanotubes (CNT) possess two unique characteristics suited to this application.
ATK	Semiconductor Large Area Neutron Counting Array (SLANCA)	Develop an innovative solid-state, neutron sensor array that is extremely sensitive to low energy neutrons; immune to high-levels of gamma-ray radiation; inexpensive to fabricate and assemble; and adaptable to all sizes and shapes.
Boston U	Development of a Direction Sensitive Neutron Detector	Build a detector that will measure the direction and energy of recoiling nuclei produced in collisions with neutrons emitted by spontaneous fission from plutonium warheads.
CalTech	Room Temperature Compton Imager	Develop a compact, low power, modular, room temperature radiation imager.
Canberra	SDD Alternative to PMTs for LaBr Scintillator	Prove that arrays of Silicon Drift Detectors can be developed as replacements for photomultiplier tubes for scintillating detector materials.
Creative Electron, Inc.	Standalone Multiple Anomaly Recognition Technique (SMART)	Develop SMART to determine the presence of contraband in non intrusive inspection (NII) images of trucks and cargo containers
Creare	Miniature, Efficient, Low-Vibration Cryocooler For Gamma Ray Detectors	Project to develop an innovative, miniature cryogenic cooling system that will be ideal for handheld detectors.

Contractor	Contract Name	Description
CUNY NYC	Infrared Studies of CdMgTe as the Material of Choice for Room Temperature Gamma-Ray Detectors	Conduct infrared spectroscopic characterization, material growth, and device manufacturing/testing to improve CdMgTe as the material of choice for room temperature gamma-ray detectors
Decision Sciences	Integrated Muon Tomography, Gamma and Neutron Detector	GMT is a unique and transformational combination of three integrated technologies, deeply penetrating cosmic ray muon tomography (MT), passive gamma and passive neutron detection. MT rapidly generates three dimensional tomographic images of high atomic number materials in shipping containers and vehicles, allowing detection of shielded and unshielded SNM and other radiological materials.
Duke, UNC, NC A&T	Nuclear Data Measurements on Actinides Using the High Intensity Gamma-ray Source.	Apply high intensity γ-ray beams as the basis for systems that make isotope-specific images of high-Z materials in cargo containers.
EIC	Layered Semiconductors for Radiation Detectors	Gallium selenide (GaSe) and gallium telluride (GaTe) binary, wide-bandgap, layered semiconductor growth development for gamma ray detection.
FIT	Detection of Heavily Shielded Nuclear Contraband Through Muon Radiography with Advanced Micro-Pattern Detectors	Develop a muon tomography proof of concept prototype that utilizes a Gas Electron Multiplier (GEM) detector. The GEM detector is a novel type of gas avalanche micro-pattern particle detector.
GE	Intelligent Personal Radiation Locator	Pocket-sized detectors with capability for identifying materials, determining location of sources, scalable to larger systems of detectors, with a goal of 1mC at 10 m
Forell Enterprises, Inc.	Cargo X-Ray Image Anomaly Detection using Intelligent Agents	FORELL's unique intelligent agent technology to learn rules for detection of anomalies in images created by high energy x-rays, thereby reducing operator load, reducing false positives, and reducing inspection time.
GE	High-Quality Low-Cost CZT Crystals and Detectors	Develop a high quality, low cost, high fabrication throughput CZT-growth development using high pressure hydrothermal processes for gamma-ray detection.
GE	Large Area X-ray Detector for Cargo Inspection	Develop a large area x-ray detector (LAXD) for xray radiography systems. Through its large area and small pixel size, a LAXD provides a greatly improved signal-to-noise ratio (SNR) while maintaining high resolution; it enables volumetric imaging of containers; and it enables object imaging without motion.

Contractor	Contract Name	Description
GE	Stand-Off Radiation Imaging System	Mobile passive detection systems with a goal of detection at a distance, 1mC at 100m
GE	Direct-Conversion Semiconductors for Neutron Spectroscopy	GE Global Research is proposing 6Li-based semiconductor materials for high-performance neutron spectroscopy.
GE	CZT Boule-to-Device Breakthrough	Use breakthrough approach to Cadmium-Zinc-Telluride (CZT) boule-to-device processing to enable the economic production of detectors with 10-15 mm thickness and energy resolution below 1.5% FWHM at 662 keV. A one order of magnitude or greater improvement is targeted for thick detectors that are only rarely produced today.
GE	High-Energy Computed Tomography for Air Cargo Inspection	Demonstrating the feasibility of detecting nuclear and shielding materials (SNM) with a very low false alarm rate, by leveraging an existing TSA funded GE-designed megavolt CT system as well as flat panel detectors developed under DNDO's LAXD project
GE	Target-Linked Radiation Imaging for Standoff Detection	Demonstrate the benefit of fusing target tracking data directly into radiation imaging algorithms by building a Target-Linked Radiation Imaging (TLRI) system that integrates GE's state-of-the-art video tracking system with advanced cadmium zinc telluride (CZT) detector technology.
Georgia Tech	Gamma-Ray Spectroscopy by Large Nanophotonic Scintillator Arrays	Design and test a gamma-ray spectrometer system that combines: a large-volume scintillator of nano-phosphors or light-emitting quantum-dots in solid suspension, an array of collection optics of and/or fiber-optic bundles, and photodiodes for converting the focused light to electron pulses.
Hope College	Cathodoluminescent Signatures of Neutron Irradiation	Make proof-of-concept measurements of the effects of neutron irradiation on common cathodoluminescent minerals.
HSSSI	Stimulated Electron Emission in Forensic Analysis (SEEFA)	Hamilton Sundstrand and Bubble Technology Industries propose to combine their instrument development and radiation detection expertise to investigate and apply the Stimulated Electron Emission (SEE) phenomenon for nuclear forensic application. This proven but unexploited technique has the potential to enable sensitive detection and tracking of illicit radioactive material by detecting the energy stored in common materials following exposure to radiation. The program objective is a proof-of concept prototype of a rugged, easy to use handheld instrument suitable for widespread field use.

Contractor	Contract Name	Description
Hy-Tech Research	A process to enable large-scale manufacturing of solid-state neutron detectors	Production of high-sensitivity, solid-state, thermal neutron detectors using a novel, high-density, energetic ion deposition technique for depositing the active material, boron-10, onto the patterned silicon, which forms the substrate for these devices.
INL	Actively-Induced Prompt Radiation Emission Characterization	Investigate the detection and inspection-related utilization of prompt radiation emissions (i.e., gamma-rays and neutrons) that are actively induced by electron accelerators (both pulsed and CW-operations). For this effort, prompt is defined as during an accelerator pulse/(photo)fission event and/or immediately after (< 1 μs).
Kansas State	Boron-rich semiconductors for neutron detectors	High quality bulk crystals of the icosahedra borides B12P2 and B12As2 will be grown from molten metal solutions, so their material properties and device applications can be thoroughly investigated.
L-3	R-SNAR	Propose to build a re-locatable Shielded Nuclear Alarm Resolution (SNAR) system using 6-7 MeV neutrons to induce fission in shielded or un-shielded fissionable materials by measuring delayed radiation from fission products with simultaneous imaging to make a positive identification.
LANL	Nanocomposite Gamma-ray Detectors	Incorporate optical properties of nanophosphors and quantum dots with extant processing technology makes possible fabrication of nanocomposite scintillators with expected energy resolution <1% FWHM (662-keV γ)
LANL	Directed-Radiation for Active-Interrogation Near Coastal Cities	Conduct end-to-end system analyses of both Compton back-scattering (CBS) directed-beams of gammas and directed-muon techniques to enable selection of appropriate components and concepts.
LANL	Physics and Algorithm Enhancements for a Validated MCNP/X Monte Carlo Simulation Tool	Develop and implement several key physics and algorithm enhancements, improvements in evaluated data and benchmark measurements for the MCNP/MCNPX Monte Carlo codes for active and passive detection systems
LANL	Advanced High Gradient Laser-Driven Proton Accelerator for SNM Detection	Demonstrate the technical basis for a compact, highgradient, high-current laser-driven ion-beam accelerator, capable of delivering a large dose of either protons or deuterium ions (~1010 ions) in a single shot with energies of order 1 GeV, suitable for special nuclear materials (SNM) detection.

Contractor	Contract Name	Description
LANL	Microcalorimeter Alpha Spectrometry for Rapid Nuclear Forensics	Microcalorimeter alpha spectrometry to reduce the time for nuclear forensic analysis from weeks to days. By exploiting the unsurpassed energy resolution of cryogenic microcalorimeters, we will eliminate the need for time-consuming labor-intensive separation of the actinides (U, Pu, Am, Np, etc.) from each other.
LANL	Chemical Forensic Science	Application of Chemical Forensic Science (CFS) will revolutionize our ability to detect pathway-related nuclear forensic signatures associated with radiological materials. LANL will explore the chemical properties of particles containing actinide target elements uranium (U) and plutonium (Pu), such that interrogation of materials containing these elements will suggest or rule out geographical locations or microclimes as associated with the transport pathway taken by these materials.
LBNL	High-Throughput Discovery of Scintillation Materials	Search for new scintillation materials through: Automation of synthesis and characterization procedures for high-throughput screening, use of available information and first-principles calculations of electronic structure properties to select families of candidate compounds, explore experimentally the scintillation properties of those families, and acquire samples of the most promising candidates and test them as scintillator radiation detectors.
LBNL	High Efficiency Multimode Imager (HEMI)	Develop the High Efficiency Multimode Imager (HEMI). HEMI is based on commercially-available, CdZnTe-based coplanar-grid (CPG) detectors assembled as a gamma-ray imaging device that simultaneously enables both coded aperture and Compton imaging techniques.
LLNL	New Materials: High Resolution Scintillator Materials and Detectors	Identify and test prospective scintillator materials for high light yield and proportional energy response. Consider both oxide transparent ceramics and halide single crystals.
LLNL	Scalable Compton Imaging for Search and Surveillance	Build and demonstrate a scalable, high-resolution Compton imaging system that provides unsurpassed energy and spatial resolution
LLNL	Passive Detection of Shielded SNM	Develop a system of algorithms, intermediate scale neutron and gamma-ray counters, and performance metrics to passively identify the presence of SNM by neutron-induced nuclear fission reactions that create bursts of many neutrons and gamma rays.

Contractor	Contract Name	Description
LLNL	Mapping isotopic distributions in cargo (FINDER) to detect SNM and its configuration	Demonstrate isotope-specific imaging using nuclear resonance fluorescence (NRF) via tunable quasi-monochromatic (Thomson) photon sources, while at the same time providing a conventional radiograph of the bulk matter distribution.
LLNL	Contextually-Aware Expert-System for Automated Threat Assessment	Combine gamma and neutron measurements with non-radiation and contextual information to vastly improve threat/non-threat discrimination and radiation alarm resolution. Develop Decision Analysis Expert System (DAES), supported by an Information Architecture (IA), developed specifically for this application.
LLNL	Physics-Based Simulation Tools for Development and Evaluation of Detection Systems	Add several physics processes to an open source core software library with interfaces to commonly used detector simulation tools.
LLNL	Scalable Solid-State Thermal Neutron Detectors	Demonstrate a high efficiency solid state thermal neutron detector that has operational characteristics that exceed current 3He tube technology. In addition, LLNL will establish the manufacturability of these detectors such that they could be readily transitioned to industry for mass production.
LLNL	Data Fusion for High Sensitivity Tracking Using Distributed Mobile Radiation Detector Arrays	Propose to develop a Proof-of-Concept (PoC) prototype distributed detector data fusion system which we will use to provide performance assessments as a function of network architecture, detector array and data fusion algorithm specifications.
Northrop Grumman	Development of a Novel Class of γ-Ray Detector Crystals	Develop novel large, defect free crystals for room temperature gamma ray detectors with greater quality, higher yield, and larger size than currently available Cadmium Zinc Telluride (CZT).
NOVA Scientific	Combined Solid-State Neutron Gamma High Efficiency Detector	Development of a novel combined solid-state neutron and gamma detector achieved by integrating 10B/Gd loaded neutron-sensitive micro-channel plates with high performance scintillators and readout to provide both neutron and gamma detection within a single unit.
NRL	SoftWare for Optimization of Radiation Detectors (SWORD)	Employ a set of existing tools to assess and compare the operational performance of new radiation detection systems using Monte Carlo simulation of radiation interactions in complex detector geometries.
NRL	Mobile Imaging and Spectroscopic Threat Identification	Mobile passive detection systems with a goal of detection at a distance, 1mC at 100m

Contractor	Contract Name	Description
Ohio State	Photonics-Based Nuclear Radiation Sensor Imaging Array for Defensive Measures Against Unconventional Radiological Weapons	Investigate a novel room temperature photonics-based nuclear radiation sensor imaging array for defensive measures against "dirty bomb" domestic nuclear threats employing Cesium-137.
ORNL	Transparent Polycrystalline Ceramic Scintillators	Develop synthesis techniques for producing inorganic scintillators at a substantially reduced cost and an increased rate of production as compared to current single crystal growth techniques.
ORNL	Integrating Portal Monitors with Individual Source Identification, Tracking	Integrated video and radiation imaging system
Passport	Active Detection and Imaging of SNM and All Nuclear Isotopes via Nuclear Resonance Fluorescence Imaging	Design an isotopic 3-D imaging system using nuclear resonance fluorescence, absorption and an effective-Z measurement approach - may be used for all contraband of interest (explosives, drugs, chemicals, etc.)
Passport	Portable Electron Accelerator Development for Advanced SNM Interrogation and Verification Systems	Electron accelerators that produce continuous (DC) or continuous wave (CW) electron beams at very high repetition rates are essential for use in rapid Nuclear Resonance Fluorescence and EZ-3DTM imaging technologies.
Passport	Portable Multimodal Monochromatic High-Energy Gamma-Ray Source	Confirm and accurately catalog the properties of known (n,γ) reactions that would have the greatest impact on radiography and Nuclear Resonance Fluorescence (NRF) technology.
Passport	ATD, SNAR Integrated NII system	Develop Prompt Neutrons from Photo-Fission (PNPF) and Nuclear Resonance Fluorescence (NRF) modules for the detection of fissile materials and isotopic identification of SNM
PNNL	Nuclear Resonance Fluorescence Signatures (NuRFS) – Pu Source	Support the development of a sealed plutonium sources for shielded SNM and NRF testing.
PNNL	Information-Driven Semiconducting Materials Discovery	Identify new radiation detection materials and accelerate their development using an information-driven material discovery process.
POC	Dirty-Bomb Gamma-Ray Identification System	Develop an all-optical gamma-ray detector based on change in refractive index.
PTSE	Intensity-Modulated Advanced X-ray Source (IMAXS)	Build an Intensity-Modulated Advanced X-ray Source (IMAXS) for cargo inspection systems that allows such systems to achieve 1 to 2 inches greater penetration for dense cargo (steel or equivalent) while, on average, producing the same amount, or less, and radiation.

Contractor	Contract Name	Description
Purdue	Intelligent Model-Assisted Sensing System (iMASS) for Fast and Accurate Nuclear Material Interrogation	Investigate a new nuclear detection approach using a combination of Computer Simulated-Nuclear Resonance Fluorescence (CS-NRF) and real time Monte Carlo to iteratively and adaptively integrate gamma measurements and decision making.
Purdue	Graphene Based Sensors for Detecting Special Nuclear Materials	Develop radiation sensors and detector architectures based on graphene, a novel electronic material with many exceptional properties of potential use for special nuclear material (SNM) detection
Radiabeam Technologies	An ultra-low cost miniature X-band linac to replace radionuclide gamma sources	The development of an inexpensive, handportable accelerator to replace radionuclide radiography devices. The accelerator, which we term the MicroLinac, is based on X-band RF linac technology developed at SLAC, and is powered by a commercially available inexpensive RF source.
Rapiscan	Automated Detection of High-Z Materials in Cargo	Development of a Portal System for X-ray Inspection and Automated Detection of High-Z Materials in Vehicles and Cargo
Rapiscan	Data Fusion for Nuclear Threat Detection	Evaluate the feasibility of using “data fusion” to enhance the performance of existing nuclear threat detection techniques and integrated systems. Physics-based decision algorithms will be evaluated that could be applied to a wide range of nuclear threat detection systems.
Rapiscan	DDAA SNAR	a system based on a proven special nuclear material (SNM) detection technique, Differential Die Away Analysis (DDAA), and enhanced with several complementary technologies to improve performance, in relocatable configuration.
Rapiscan	PBAR SNAR	The system proposed here fully integrates into an existing NIIXS, improves its performance by reducing the false positive rate of high Z material detection and then positively determines the presence or absence of a nuclear material.
Raytheon	Tri-Modal Imager	Mobile passive detection systems with a goal of detection at a distance, 1mC at 100m
Raytheon	Stand-Off Warning Against Radiological Materials (SWARM)	An alternate radiation detection and localization approach utilizing multiple mobile, highly distributed sensors. The integrated system promotes cooperative behavior and data fusion (i.e. swarming) to reduce search time and cost, as well as maximize the probability of radiological threat detection.

Contractor	Contract Name	Description
RMD	Improved Spectroscopic Gamma Ray Detectors	Investigate promising new scintillators for homeland security applications.
RMD	High Quantum Efficiency, Fast Detectors for the Readout of Scintillators for Gamma-Ray Detection	Explore and advance the silicon avalanche photodiode (APD) technology for reading out LaBr3:Ce and related scintillators in the proposed effort.
RMD	High Sensitivity, High Resolution Radioisotopic Detection	Thallium bromide (TlBr) semiconductor growth development for high resolution gamma detectors.
RMD	Improved Solid-State Neutron Detector	Develop a neutron detector that has the potential of replacing pressurized 3He-tubes and current solid-state detectors with an ultra-compact detector based on CMOS-SSPM (Solid State Photomultipliers) technology.
RMD	New Neutron Detectors with Pulse Shape Discrimination	Investigate two promising scintillators for neutron detection. The first material (Cs2LiLaBr6 doped with Ce3+) will address the detection of thermal neutrons while the second composition (HOC6H4CO2Li) will focus on thermal and epithermal (fast) neutron radiation.
RMD	High Performance Gamma Ray Detectors	Develop high sensitivity semiconductor radiation detectors for identification of radioisotopic sources with the goal of achieving energy resolution of 0.5% (FWHM) or better at 662 keV.
RMD	Ultra-High Efficiency Semiconductor Detectors	Exploration of two new semiconductors (mercuric sulfide (HgS) and mercuric oxide (HgO)) as the detector materials.
RMD	CVD Diamond Neutron Detectors with Pulse Shape Discrimination	Develop improved solid state neutron detectors from CVD diamond for homeland security applications. Phase I work will focus on optimizing electronic properties of CVD diamond films for neutron detection and fabricating and characterizing detectors.
RMD	Optimization of TlBr Processing via Materials Analysis	Exploration of an advanced semiconductor, thallium bromide, as the detector material. TlBr possesses excellent gamma-ray stopping power due to high density (7.5 g/cm3) and high-Z constituents (such as Tl). This makes possible a semiconductor detector with modest volume having an effective efficiency that is comparable with much larger scintillators.
RPI	A Novel Portable Battery Operated Neutron Source	Develop a portable, battery operated DT neutron source using pyroelectric materials.
RPI	A Novel Solid-State Self Powered Neutron Detector	Develop a new type of thermal neutron detector based on coupling a high neutron cross-section material with specially fabricated solar cell type devices that are multi-layered.

Contractor	Contract Name	Description
Rutgers	Sensor Management Problems of Nuclear Detection	Address sensor management for nuclear threat detection by formulating the related problems using precise mathematical language and then developing tools of the mathematical sciences to solve them.
Rutgers	Deceptive Detection Strategies: Optimizing the Value of Sensor Information	Addresses the issues of interpretation of data, responsive action, and managing the information in sensing systems.
SAIC	Highly Penetrating Source of Monochromatic Gamma Rays	Develop monochromatic gamma-ray source consisting of a compact electron-cooled storage ring (CESR) combined with an innovative gas target to exploit relevant nuclear resonances and generate mono-energetic gamma rays.
SAIC	Stand-Off Radiation Detection System	Mobile passive detection systems with a goal of detection at a distance, 1mC at 100m
SAIC	A New Approach for CAT/CdTe PIN Detectors Using Electro-Chemically Grown Contracts	Developed and demonstrated a novel contact technique that forms junctions on a compound semiconductor using electro-chemistry in such a way as to insure that the contact is made on an atomic level using the atoms within the crystal itself.
Smith's Detection	Hand Held Radiation Locator with High-Resolution Pixilated CZT Spectral Imaging	Pocket-sized detectors with capability for identifying materials, determining location of sources, scalable to larger systems of detectors, with a goal of 1mC at 10 m
SNL	Fission Neutron Detection Using Heteroepitaxial Chemical Vapor Deposition (CVD) Diamond	Utilize new techniques to grow single crystalline diamond and evaluate its detection capabilities as a spectroscopic-grade neutron detector.
SNL	Advanced SNM Interrogation and Verification Mobile Dual Neutron/Gamma Source Interrogation System	Car portable proton-based neutron and gamma-ray interrogation system.
Space Micro	Portable/Transportable Directional Gamma Ray and/or Neutron Detectors	Developed a Radiation Source Identification and Targeting (RADSITE.) innovation that not only remotely detects and identifies Gamma Sources; but by use of a unique processing technique will provide the operator with simultaneous threat Azimuth Directions.
SPAWAR	A Microwave-Based Gamma-Ray Spectrometer	An optical, semiconductor-based gamma radiation spectrometer using a detector employing AC resonance rather than DC electric fields to detect gamma-ray interactions within a semiconductor and does not require charge transport and collection.

Contractor	Contract Name	Description
Stanford	Improved Transparent Ceramic Fabrication Techniques for Radiological and Nuclear Detectors	Identify the relationship between the non-proportionality in energy response of a scintillator material and its crystal structure and chemistry. 2) Develop improved tools for predicting response linearity and light output of scintillator materials.
Starfire Industries	Non-Radioactive Alternative to Replace Radioactive Sources in Commercial Applications	Developing an innovative fusion neutron generator solution to improve output efficiency, extend lifetime, and reduce total cost-of-ownership, while enabling survivability in the harsh wellbore environment
Stellarray Inc.	Cold Cathode Radiation Sources	Flat panel X-ray Sources (FPXS) use cold cathode arrays lithographically formed on the exit window to emit hundred of thousands of e-beams towards a broad X-ray target
SUNY	Semiconductor High Energy Radiation Detector with Excellent Isotope Identification and Directional Capability	Develop a new scintillator that will offer better energy resolution for isotopic and location identification in a more compact and inexpensive detector. Their scintillator converts high-energy radiation to pulses of light that can convey both the location and the energy of the intercepted ray.
SUNY	Three-Dimensionally Pixellated Semiconductor Scintillator	Develop a three-dimensionally pixellated semiconductor scintillator
Texas A&M	A Framework for Developing Novel Detection Systems Focused on Interdicting Shielded HEU	Demonstrate the ability to develop and deploy new detector concepts with fully integrated signal and information analysis to attain breakthrough improvements in the nation's ability to detect domestic nuclear threats
Texas A&M & Purdue	Tensioned Fluid Metastable State Special Nuclear Material Detector	Develop a detector system that promises the following features: • improved reliability (minimizing false negatives and false positives) of active inspection systems for detecting special nuclear material • high (to 90%+) intrinsic efficiency for (eV to MeV) neutron and alpha detection • duty cycles from 50% to 100% • reduced radiation dose which must be accommodated during inspection
U of Michigan	Silicon based 3D position sensitive scatter detector with integrated amplification	Develop novel techniques to combine real-time Compton gamma-ray imaging, isotope detection and identification algorithms for all detector systems employing 3-D position-sensitive semiconductor gamma-ray spectrometers.

Contractor	Contract Name	Description
U of Michigan	Development of Integrated Real-Time Imaging and Isotope Detection Algorithms for 3-D Position-Sensitive Semiconductor Gamma-Ray Imaging Spectrometers and Sensor Networks	Enhance the directional resolution of semiconductor detectors by imaging the electron-hole cloud that is created from the passage of radiation through the semiconductor.
U of Michigan	Active Interrogation Using Radiation Generated from Intense Laser Produced Electron Beams	Experimental investigation into active interrogation techniques for nuclear materials using radiation sources generated by high power laser produced particle beams
U of New Mexico	Nuclear Radiation Detectors Based on Colloidal Nanocrystals	Project is proposed, aiming at development of novel rare-earth halide scintillating nanocrystals (NCs). Colloidal synthesis approach will be used to prepare the NCs in reverse-micelle nanoreactors.
U of Tennessee	Transformational Scintillation Materials for Neutron and Gamma Detectors and Educational Interrogation	Develop transformational radiation detectors for nuclear threat detection using novel scintillation materials for neutron and gamma radiation.
U of Texas @ Arlington	Local Field Enhanced Nanostructured Scintillation Phosphors for Radiation Detection	Apply local field enhancement from the surface plasmon of metallic nanoparticles to enhance the light output and to shorten the decay lifetime of scintillation phosphors and will develop these new type of nanostructured scintillation phosphor for radiation detection with a focus on uranium detection.
U of Texas @ Austin	Interdicting Smuggled Nuclear Material	Proposes a class of stochastic interdiction models on a transportation network consisting of two adversaries: a smuggler and an interdictor. The models are hierarchical, stochastic, and involve strategic gaming.
UC Berkeley	Center for Domestic Nuclear Security Technology	The proposed UC Berkeley (UCB) Center is to advance the state of the art of nuclear threat detection while developing a new generation of scientists who will be tomorrow's leaders in the field of homeland security.
UC Berkeley	Electron tracking for advanced gamma-ray imaging applications in Homeland Security	Develop and demonstrate electron-tracking based Compton imaging. The goal is to demonstrate and quantify the gain in sensitivity of this approach over state-of-the art gamma-ray imaging systems in the detection of weakly emitting nuclear materials by passive means.
UC Berkeley	High Resolution Electron Tracker Compton Imager	Evaluation and demonstration of a novel approach to measuring Compton electron trajectories by utilizing advancements in deep depletion CCD technology developed at Lawrence Berkeley National Laboratory.

UC Berkeley & CSU East Bay Foundation	An Experimental and Computational Study of Actinide Detection and Identification by Engineered Mesoporous Sensor Materials for Actinide Forensics	An experimental and computational project relevant to actinide and fission product forensic chemistry through study of actinide identification, separation and detection by engineered mesoporous materials

Contractor	Contract Name	Description
UC Berkeley & Naval Postgraduate School	High Z Materials for Nuclear Detection: Synergy of Growth, Characterization, and Device Physics for Room Temperature Devices	Perform state-of-the-art characterization of charge collection behaviors that currently limit widespread use of high Z compound semiconductors. This will lead to the identification and removal of charge trapping centers that limit the applications of novel materials.
UC Santa Barbara	Novel Neutron Detectors Made of Conjugated Polymers and Inorganic Nanoparticles: New Science and Technology	Deeper understanding of the fundamental principles for designing high performance novel composites for neutron detection device applications
UNL	Tunable, monoenergetic gamma ray source for identification of embedded SNM	Develop an all-laser driven, high average brightness, quasi mono-energetic, and tunable Compton radiation source. This source uses Wakefield acceleration to generate the high energy electrons needed for the Compton scattering.
Va. Commonwealth U.	Multi-layered system level screening for port security	Explore how a systems approach can be used to design and analyze systems for detecting nuclear material at our nation's ports.
Wake Forest	A Portable Tungsten Coil Atomic Emission Detector for Nuclear Forensics	Develop A Portable Tungsten Coil Atomic Emission Detector for Nuclear Forensics.
WSU	Development of Nuclear Solid-State Dual-Anode Calorimeters	Develop CZT crystals with a dual anode design that gives the 3D location of the radiation interaction. The 3D locations can be used to obtain information about the direction from which the incident radiation comes and correct the anode signals for the location of the interaction and to compensate for material in homogeneities.
WSU	Metal-Enhanced Radiative Decay-Rates in Scintillator Materials	This project seeks to enhance the sensitivity and applicability of scintillator materials for nuclear threat detection.
WSU	From Ce:YAG to Ce:GGG for High Energy Resolution High Efficiency Gamma Detection - A Novel and Powerful Class of Scintillators	Demonstration of methods to identify and remove intrinsic defects in whole classes of materials will advance detector developments far beyond the exhaustion of all possible materials.

WSU	Improved Radiochemical Separations for Actinide Forensic Signatures	Use CZT crystals with thicknesses between 0.5 cm and 1.5 cm with an innovative detection technique based on a dual anode design.
Westinghouse	Advanced Silicon Carbide Semiconductor Detectors for Pulsed Photonuclear Inspection for Shielded SNM in Cargo	Develop a fast prompt silicon carbide neutron detector for use in pulsed neutron and photon interrogation systems