# DTRA 2014 Basic Research Technical Review

## Monday July 21, 2014 w1b

| Start - End | dT | Title | Institution | Presenter | TA |
|---|---|---|---|---|---|
| 8:00 - 8:30 | 30 | Daily Instructions and Computer Intro | DTRA / JHU | | |
| 8:30 - 8:40 | 10 | Intro to Technical Nuclear Forensics | DTRA | Dave Petersen | |
| 8:40 - 9:10 | 30 | New Materials and Geometries for Magnetic Microcalorimetry | University of New Mexico | Stephen Boyd | 1 |
| 9:10 - 9:20 | 10 | Q/A and Computer Feedback | | | |
| 9:20 - 9:50 | 30 | Molecular Recognition and Selective Sequestration for Detection of Uranium, Neptunium, or Plutonium | Auburn University | Branson Maynard (Anne E. V. Gorden) | 1 |
| 9:50 - 10:00 | 10 | Q/A and Computer Feedback | | | |
| 10:00 - 10:20 | 20 | ~ Break ~ | | | |
| 10:20 - 10:50 | 30 | Rapid, Ligand-Assisted Capillary Electrophoresis Methods for Actinide Determinations by Mass Spectrometry | Washington State University | Sue Clark | 1 |
| 10:50 - 11:00 | 10 | Q/A and Computer Feedback | | | |
| 11:00 - 11:30 | 30 | A Holistic Approach to Post-Detonation Radiological Debris Analysis | Charles Stark Draper Laboratory | Theresa Evans-Nguyen | 1 |
| 11:30 - 11:40 | 10 | Q/A and Computer Feedback | | | |
| 11:40 - 12:10 | 30 | Post-Detonation Behavior of Radiological Debris | Oak Ridge National Laboratory | Costas Tsouris | 1 |
| 12:10 - 12:20 | 10 | Q/A and Computer Feedback | | | |
| 12:20 - 1:20 | 60 | ~ Lunch ~ | | | |
| 1:20 - 1:35 | 15 | Program Execution and Funding Expenditures Brief | DTRA | LT Col Rupanovic | |
| 1:35 - 2:05 | 30 | UV/IR Filaments for High Resolution Novel Spectroscopic Interrogation of Plumes on Nuclear Materials | University of New Mexico | Jean-Claude Diels | 1 |
| 2:05 - 2:15 | 10 | Q/A and Computer Feedback | | | |
| 2:15 - 2:35 | 20 | Post-Detonation Radiological and Nuclear Forensics Using Laser-Assisted Mass Spectrometry in Open Air | University of Nebraska | Yongfeng Lu | 1 |
| 2:35 - 2:45 | 10 | Q/A and Computer Feedback | | | |
| 2:45 - 3:15 | 30 | Resonance Ionization Mass Spectrometry for Post-Detonation Nuclear Forensics | Naval Postgraduate School | Craig F. Smith | 1 |
| 3:15 - 3:25 | 10 | Q/A and Computer Feedback | | | |
| 3:25 - 3:45 | 20 | ~ Break ~ | | | |
| 3:45 - 3:55 | 10 | Intro to Monitoring & Verification | DTRA | Calvin Shipbaugh | |
| 3:55 - 4:25 | 30 | The Potential for Decoupling Explosions in Fractured Hard Rock: Examples from Kazakhstan Historical Data and a New Field Study | Weston Geophysical Corporation | Anastasia Stroujkova | 5 |
| 4:25 - 4:35 | 10 | Q/A and Computer Feedback | | | |
| 4:35 - 5:05 | 30 | Mathematical Representation of Isotopic Gas Migration from an Underground Nuclear Weapon Test through Rocks | Los Alamos National Laboratory | Amy Jordan (Dale Anderson) | 5 |
| 5:05 - 5:15 | 10 | Q/A and Computer Feedback | | | |

# DTRA 2014 Basic Research Technical Review

## Tuesday July 22, 2014 — w1b

| Start - End | dT | Title | Institution | Presenter | TA |
|---|---|---|---|---|---|
| 8:00 - 8:25 | 25 | Daily Instructions and Computer Intro | DTRA / JHU | | |
| 8:25 - 8:25 | 0 | Continuation of Monitoring & Verification | DTRA | Calvin Shipbaugh | |
| 8:25 - 8:45 | 20 | Radioxenon Signatures | University of Texas | Steven R. Biegalski | 5 |
| 8:45 - 8:50 | 5 | Q/A and Computer Feedback | | | |
| 8:50 - 9:20 | 30 | OSI Science | University of Texas | Steven R. Biegalski | 5 |
| 9:20 - 9:30 | 10 | Q/A and Computer Feedback | | | |
| 9:30 - 10:00 | 30 | Ultra-Trace-Level Quantification of Alpha- and Beta- Emitting Radionuclides with Extractive Scintillating Resin | Clemson University | Timothy A. DeVol | 5 |
| 10:00 - 10:10 | 10 | Q/A and Computer Feedback | | | |
| 10:10 - 10:30 | 20 | ~ Break ~ | | | |
| 10:30 - 11:00 | 30 | Fast Ultra-Trace Detection of Fission Product Relative Isotopic Abundances | Washington State University | Nathalie A. Wall | 5 |
| 11:00 - 11:10 | 10 | Q/A and Computer Feedback | | | |
| 11:10 - 11:40 | 30 | Ultrafast Fiber Laser Sampling and Plasma-Enhanced Laser Induced Breakdown Spectroscopy to Combat WMD | University of Pittsburgh | Peng Chen | 5 |
| 11:40 - 11:50 | 10 | Q/A and Computer Feedback | | | |
| 11:50 - 12:50 | 60 | ~ Lunch ~ | | | |
| 12:50 - 1:05 | 15 | Program Execution and Funding Expenditures Brief | DTRA | LT Col Rupanovic | |
| 1:05 - 1:25 | 20 | Nuclear Isotopic Detection via Enhanced LIBS | Alakai Defense Systems, Inc. | Alan Ford | 5 |
| 1:25 - 1:35 | 10 | Q/A and Computer Feedback | | | |
| 1:35 - 2:05 | 30 | Vibration Spectrometer for Detecting Single Atoms Using Carbon Nanotube Resonator Arrays | U.S. Air Force Academy | Yalin Lu | 5 |
| 2:05 - 2:15 | 10 | Q/A and Computer Feedback | | | |
| 2:15 - 2:25 | 10 | Intro to Securing Weapons, Facilities, & Weapon-Usable Materials | DTRA | Calvin Shipbaugh | |
| 2:25 - 2:55 | 30 | Novel Materials for Unattended Sensing to Support Future Treaties | Clemson University | Igor Luzinov | 5 |
| 2:55 - 3:05 | 10 | Q/A and Computer Feedback | | | |
| 3:05 - 3:25 | 20 | ~ Break ~ | | | |
| 3:25 - 3:45 | 20 | Structure Collapse in Metal Organic Frameworks A Sensitive Probe of Mechanical Tampering | University of Illinois | Gregory S. Girolami | 5 |
| 3:45 - 3:55 | 10 | Q/A and Computer Feedback | | | |
| 3:55 - 4:25 | 30 | Basic Research of Intrinsic, Tamper-indication Markings Tamper-Indication Markings and Patterns Defined by Pulsed Laser Irradiation | Sandia National Laboratories | David P. Adams | 5 |
| 4:25 - 4:35 | 10 | Q/A and Computer Feedback | | | |
| 4:35 - 5:05 | 30 | Tamper-Indicating Quantum Optical Sensing | Oak Ridge National Laboratory | Travis S. Humble | 5 |
| 5:05 - 5:15 | 10 | Q/A and Computer Feedback | | | |

# DTRA 2014 Basic Research Technical Review

## Wednesday July 23, 2014 w1b

| Start - End | dT | Title | Institution | Presenter | TA |
|---|---|---|---|---|---|
| 8:00 - 8:25 | 25 | Daily Instructions and Computer Intro | DTRA / JHU | | |
| 8:25 - 8:25 | 0 | Continuation of Securing Weapons, Facilities, & Weapon-Usable Materials | DTRA | Calvin Shipbaugh | |
| 8:25 - 8:50 | 25 | Investigation of Graphene-Oxide and Graphine-Oxide Nanocomposites as Nanoscale Radiation Sensitive Materials | Pennsylvania State University | Joshua Robinson | 5 |
| 8:50 - 8:55 | 5 | Q/A and Computer Feedback | | | |
| 8:55 - 9:25 | 30 | Solar Blind UV and IR Nanoparticle Scintillators for Alpha, Beta and Gamma Detection | Oak Ridge National Laboratory | Brenda Smith (Linda A. Lewis) | 5 |
| 9:25 - 9:30 | 5 | Q/A and Computer Feedback | | | |
| 9:30 - 9:55 | 25 | Polymer Multilayer Photonic Films: A New Platform for Low-Cost, Robust Sensors | University of Massachusetts | Ryan Hayward | 5 |
| 9:55 - 10:00 | 5 | Q/A and Computer Feedback | | | |
| 10:00 - 10:20 | 20 | ~ Break ~ | | | |
| 10:20 - 10:45 | 25 | Micro-Photonic Resonator Array on an Inelastic Substrate for Unattended Sensing of Tampering | Purdue University | Minghao Qi | 5 |
| 10:45 - 10:50 | 5 | Q/A and Computer Feedback | | | |
| 10:50 - 11:15 | 25 | Engineered Polypeptide-Based Nanomatrices for Unattended Sensing | Arizona State University | Kaushal Rege | 5 |
| 11:15 - 11:20 | 5 | Q/A and Computer Feedback | | | |
| 11:20 - 11:40 | 20 | Spatial-Light-Modulator-based Signatures of Nanocomposites for Unique Surface Markers | Washington State University | Hergen Eilers | 5 |
| 11:40 - 11:45 | 5 | Q/A and Computer Feedback | | | |
| 11:45 - 12:10 | 25 | Luminescent Core-Shell Nanostructures as Radiation Indicators | University of Texas, Pan American | Yuanbing Mao | 5 |
| 12:10 - 12:15 | 5 | Q/A and Computer Feedback | | | |
| 12:15 - 1:10 | 55 | ~ Lunch ~ | | | |
| 1:10 - 1:25 | 15 | Program Execution and Funding Expenditures Brief | DTRA | LT Col Rupanovic | |
| 1:25 - 1:45 | 20 | Inversion of the Electrical and Optical Properties of Hexagonal Boron Nitride by Acoustic Waves | University of Texas | Deji Akinwande | 5 |
| 1:45 - 1:50 | 5 | Q/A and Computer Feedback | | | |
| 1:50 - 2:10 | 20 | Tamper-Induced Phase Transitions in Protective Materials for WMD-Related Sensing and Monitoring | Air Force Institute of Technology | Alex G. Li | 5 |
| 2:10 - 2:15 | 5 | Q/A and Computer Feedback | | | |
| 2:15 - 4:15 | 2h | Poster Session | | | |

# DTRA 2014 Basic Research Technical Review

## Thursday July 24, 2014 — w1b

| Start - End | dT | Title | Institution | Presenter | TA |
|---|---|---|---|---|---|
| 9:00 - 9:25 | 25 | Daily Instructions and Computer Intro | DTRA / JHU | | |
| 9:25 - 9:30 | 5 | Intro to Radiological - Nuclear Stand Off Detection & Wide Area Search | DTRA | Dave Petersen | |
| 9:30 - 10:00 | 30 | Direct Laser-Acceleration in Plasma Slow-Wave Structures and Application to Gamma-ray Sources for Nuclear Materials Detection | University of Maryland | Howard M. Milchberg | 1 |
| 10:00 - 10:10 | 10 | Q/A and Computer Feedback | | | |
| 10:10 - 10:40 | 30 | Thin Multi-layer Superconductor/ Insulator/ Superconductor (SIS) Systems Capable of Sustaining Large Field Gradients | College of William and Mary | Rosa A. Lukaszew | 1 |
| 10:40 - 10:50 | 10 | Q/A and Computer Feedback | | | |
| 10:50 - 11:00 | 10 | ~ Break ~ | | | |
| 11:00 - 11:30 | 30 | Monochromatic Gamma and X-ray Source Employing Inverse Free-Electron Laser Acceleration | University of California | Pietro Musumeci (James Rosenzweig) | 1 |
| 11:30 - 11:40 | 10 | Q/A and Computer Feedback | | | |
| 11:40 - 12:00 | 20 | All-Optical Quasi-Phase Matching for Laser Electron Acceleration | Pennsylvania State University | Igor Jovanovic | 1 |
| 12:00 - 12:10 | 10 | Q/A and Computer Feedback | | | |
| 12:10 - 12:40 | 30 | Experimental and Numerical Investigation of Compact Dielectric Wakefield Accelerators | Northern Illinois University | Philippe Piot | 1 |
| 12:40 - 12:50 | 10 | Q/A and Computer Feedback | | | |
| 12:50 - 1:50 | 60 | ~ Lunch ~ | | | |
| 1:50 - 2:05 | 15 | Program Execution and Funding Expenditures Brief | DTRA | | |
| 2:05 - 2:35 | 30 | Micro-Scale Laser-Powered Dielectric Particle-Accelerators with Potential Application in the Long Range Sensing of Fissile Materials | University of California | Rodney Yoder (Gil Travish) | 1 |
| 2:35 - 2:45 | 10 | Q/A and Computer Feedback | | | |
| 2:45 - 3:05 | 20 | Filament-Based Raman Detection of Radioactive Materials | Temple University | Robert Levis | 1 |
| 3:05 - 3:15 | 10 | Q/A and Computer Feedback | | | |
| 3:15 - 3:35 | 20 | ~ Break ~ | | | |
| 3:35 - 3:55 | 20 | Remote Detection of Weapons of Mass Destruction Using Hyperspectral Data | University of Nevada | Shahram Latifi | 1 |
| 3:55 - 4:05 | 10 | Q/A and Computer Feedback | | | |
| 4:05 - 4:35 | 30 | Active Detection of Fissile Materials via Laser-Induced Ionization-Seeded Plasmas | University of Michigan | Mark David Hammig | 1 |
| 4:35 - 4:45 | 10 | Q/A and Computer Feedback | | | |
| 4:45 - 5:05 | 20 | Laser Standoff Detection of Shielded Fissile Material | Alakai Defense Systems, Inc. | Adam Hopkins | 1 |
| 5:05 - 5:15 | 10 | Q/A and Computer Feedback | | | |

## Friday July 25, 2014 — w1b

| Start - End | dT | Title | Institution | Presenter | TA |
|---|---|---|---|---|---|
| 9:00 - 9:20 | 20 | Daily Instructions and Computer Intro | DTRA / JHU | | |
| 9:20 - 9:20 | 0 | Continuation of Radiological - Nuclear Stand Off Detection & Wide Area Search | DTRA | Dave Petersen | |
| 9:20 - 9:50 | 30 | Rapid Location of Radiation Sources in Complex Environments Using Optical and Radiation Sensors | Air Force Institute of Technology | Christoph Borel-Donohue | 1 |
| 9:50 - 10:00 | 10 | Q/A and Computer Feedback | | | |
| 10:00 - 10:20 | 20 | Dynamic Placement of Sensors for Rapid Characterization of Radiation Threat | Carnegie Mellon University | Artur Dubrawski | 1 |
| 10:20 - 10:40 | 20 | ~ Break ~ | | | |
| 10:40 - 10:50 | 10 | Q/A and Computer Feedback | | | |
| 10:50 - 11:20 | 30 | Polarimetric HSI for Improved Radioactive Source Detection Sensitivity and Localization Accuracy | Air Force Institute of Technology | Kevin C. Gross | 1 |
| 11:20 - 11:30 | 10 | Q/A and Computer Feedback | | | |
| 11:30 - 12:00 | 30 | Harmonic Analysis Methodologies for Autonomous Radiological Search: A Data Driven Approach | University of Maryland | Wojciech Czaja | 1 |
| 12:00 - 12:10 | 10 | Q/A and Computer Feedback | | | |

# DTRA 2014 Basic Research Technical Review

## Monday July 21, 2014 w1c

| Start - End | dT | Title | Institution | Presenter | TA |
|---|---|---|---|---|---|
| 9:00 - 9:30 | 30 | Daily Instructions and Computer Intro | DTRA / JHU | | |
| 9:30 - 9:40 | 10 | Intro to Life Science | DTRA | Heather Meeks | |
| 9:40 - 10:00 | 20 | Ab-Initio & Semiempirical Investigation of Deinococcus Radiodurans Resistance to Ionizing & UV Radiation | Purdue University | Jorge Rodriguez | 3 |
| 10:00 - 10:10 | 10 | Q/A and Computer Feedback | | | |
| 10:10 - 10:30 | 20 | Investigating RNA-Mediated Regulatory Mechanisms in Radioresistant Bacteria | University of Texas | Lydia Contreras-Martin | 5 |
| 10:30 - 10:40 | 10 | Q/A and Computer Feedback | | | |
| 10:40 - 11:00 | 20 | ~ Break ~ | | | |
| 11:00 - 11:30 | 30 | Acute Radiation Response of Mammalian Stem Cells | University of California | Charles L. Limoli | 3 |
| 11:30 - 11:40 | 10 | Q/A and Computer Feedback | | | |
| 11:40 - 12:10 | 30 | Deinococcus radiodurans Mn2+ Complexes: A Revolutionary Approach to Radioprotection and Vaccine Production | Uniformed Services University | Radha K. Maheshwari | 3 |
| 12:10 - 12:20 | 10 | Q/A and Computer Feedback | | | |
| 12:20 - 12:50 | 30 | Cross-Species Virus-Host Protein-Protein Interactions Inhibiting Innate Immunity | Hauptman Woodward Medical Research Institute, Inc. | L. Wayne Schultz | 3 |
| 12:50 - 1:00 | 10 | Q/A and Computer Feedback | | | |
| 1:00 - 2:00 | 60 | ~ Lunch ~ | | | |
| 2:00 - 2:15 | 15 | Program Execution and Funding Expenditures Brief | DTRA | LT Col Rupanovic | |
| 2:15 - 2:45 | 30 | Codon Usage in Morbilliviruses: Evidence for Evolutionary Conservation and Importance for Adaptation to New Hosts | University of Georgia Research Foundation | Elizabeth W. Uhl | 3 |
| 2:45 - 2:55 | 10 | Q/A and Computer Feedback | | | |
| 2:55 - 3:15 | 20 | Flow-Through Capture Filters for Investigating and Enhancing Antibody-Antigen Binding Kinetics | Illinois State University | Jeremy Driskell | 3 |
| 3:15 - 3:25 | 10 | Q/A and Computer Feedback | | | |
| 3:25 - 3:40 | 15 | ~ Break ~ | | | |
| 3:40 - 4:10 | 30 | Correlations of Enzyme Surface Engineering/Immobilization Methods, Enzyme Orientation, and Enzyme Activity | University of Michigan | Zhan Chen | 3 |
| 4:10 - 4:20 | 10 | Q/A and Computer Feedback | | | |
| 4:20 - 4:50 | 30 | Role of Confinement and Material Surface on Protein Dynamics and Function | Pacific Northwest National Laboratory | Thomas C. Squier | 3 |
| 4:50 - 5:00 | 10 | Q/A and Computer Feedback | | | |

# DTRA 2014 Basic Research Technical Review

## Tuesday July 22, 2014 — w1c

| Start - End | dT | Title | Institution | Presenter | TA |
|---|---|---|---|---|---|
| 8:00 - 8:25 | 25 | Daily Instructions and Computer Intro | DTRA / JHU | | |
| 8:25 - 8:30 | 5 | Intro Nuclear Point Detection | DTRA | Dave Petersen | |
| 8:30 - 8:50 | 20 | Suppression of Interface-induced Noise by the Control of Electron-Phonon Interactions | University of Michigan | Mark Hammig | 1 |
| 8:50 - 9:00 | 10 | Q/A and Computer Feedback | | | |
| 9:00 - 9:20 | 20 | A Novel Strategy for Efficient Photodetectors using Excitonic Polymeric Materials | University of Chicago | Gregory S. Engel | 1 |
| 9:20 - 9:30 | 10 | Q/A and Computer Feedback | | | |
| 9:30 - 10:00 | 30 | Glasses for Detection of Penetrating Radiation via the Cherenkov Effect | University of Tennessee | Jason Hayward | 1 |
| 10:00 - 10:10 | 10 | Q/A and Computer Feedback | | | |
| 10:10 - 10:30 | 20 | ~ Break ~ | | | |
| 10:30 - 11:00 | 30 | Doped Boron Carbide Polymers: Fundamental Studies of a Novel Class of Materials for Enhanced Radiation Detection | University of North Texas | Jeffry A. Kelber | 1 |
| 11:00 - 11:10 | 10 | Q/A and Computer Feedback | | | |
| 11:10 - 11:40 | 30 | Electronic Structure of Semiconductor Detector Surfaces and Contact Interfaces: Optimization of Signal to Noise Ratio | The University Corporation | Nicholas Kioussis | 1 |
| 11:40 - 11:50 | 10 | Q/A and Computer Feedback | | | |
| 11:50 - 12:20 | 30 | Bandgap Engineering of CZT Contacts for Radiation Detectors | Lawrence Livermore National Laboratory | Lars Voss (Steven Payne) | 1 |
| 12:20 - 12:25 | 5 | Q/A and Computer Feedback | | | |
| 12:25 - 1:25 | 60 | ~ Lunch ~ | | | |
| 1:25 - 1:40 | 15 | Program Execution and Funding Expenditures Brief | DTRA | LT Col Rupanovic | |
| 1:40 - 2:10 | 30 | Understanding the Electronic Structure of the Amorphous Semiconducting Boron Carbide to Metal Interface | University of Missouri | Anthony N. Caruso | 1 |
| 2:10 - 2:15 | 5 | Q/A and Computer Feedback | | | |
| 2:15 - 2:35 | 20 | A Novel High Quantum Efficiency Mechanism in Organic Photodetector for Sensing the Radiation from Weapons of Mass Destruction | University of Nebraska | Jinsong Huang | 1 |
| 2:35 - 2:40 | 5 | Q/A and Computer Feedback | | | |
| 2:40 - 3:00 | 20 | Nanoengineered, Nitride-Based Core-Shell PIN Diodes for High-Efficiency, Reduced-SWAP Photodetectors | University of Maryland | Abhishek Motayed | 1 |
| 3:00 - 3:05 | 5 | Q/A and Computer Feedback | | | |
| 3:05 - 3:25 | 20 | ~ Break ~ | | | |
| 3:25 - 3:55 | 30 | Low Cost Fast Neutron Detector Material - Basic Research for 3He Alternatives | Colorado School of Mines | Uwe Greife | 1 |
| 3:55 - 4:00 | 5 | Q/A and Computer Feedback | | | |
| 4:00 - 4:05 | 5 | Intro to Protection of Sensitive Systems | DTRA | Jacob Calkins | |
| 4:05 - 4:35 | 30 | Mechanisms of Radiation-Induced Effects in Carbon Nanotubes | Rochester Institute of Technology | Brian Landi | 3 |
| 4:35 - 4:40 | 5 | Q/A and Computer Feedback | | | |
| 4:40 - 5:10 | 30 | Basic Radiation Studies in GaN Materials and Devices | University of California | James S. Speck | 3 |
| 5:10 - 5:15 | 5 | Q/A and Computer Feedback | | | |

# DTRA 2014 Basic Research Technical Review

## Wednesday July 23, 2014 w1c

| Start - End | dT | Title | Institution | Presenter | TA |
|---|---|---|---|---|---|
| 8:00 - 8:25 | 25 | Daily Instructions and Computer Intro | DTRA / JHU | | |
| 8:25 - 8:30 | 5 | Intro to Protection of Sensitive Systems | DTRA | Jacob Calkins | |
| 8:30 - 9:00 | 30 | Radiation Effects in High-k Gate Dielectrics on III-V Semiconductors | Yale University | Tso-Ping Ma | 3 |
| 9:00 - 9:10 | 10 | Q/A and Computer Feedback | | | |
| 9:10 - 9:40 | 30 | Basic Radiation Effects Mechanisms in Chalcogenide-Based Nanoionic Structures | Arizona State University | Hugh Barnaby | 3 |
| 9:40 - 9:50 | 10 | Q/A and Computer Feedback | | | |
| 9:50 - 10:10 | 20 | ~ Break ~ | | | |
| 10:10 - 10:40 | 30 | Science for Novel Radiation-Hardened Electronics Materials | AFRL/RYD | Gregg Jessen | 3 |
| 10:40 - 10:50 | 10 | Q/A and Computer Feedback | | | |
| 10:50 - 11:20 | 30 | Fundamental Studies and Modeling of Radiation Effects in GaN-Based Heterostructures | University of Florida, Engineering | Stephen Pearton | 3 |
| 11:20 - 11:30 | 10 | Q/A and Computer Feedback | | | |
| 11:30 - 12:30 | 60 | ~ Lunch ~ | | | |
| 12:30 - 12:45 | 15 | Program Execution and Funding Expenditures Brief | DTRA | LT Col Rupanovic | |
| 12:45 - 1:15 | 30 | Ion Irradiation Effects in Graphene-Silicon Hybrid Devices for Combating WMD | University of Manchester | Sarah Jane Haigh | 3 |
| 1:15 - 1:25 | 10 | Q/A and Computer Feedback | | | |
| 1:25 - 1:55 | 30 | Investigation of Physical Mechanisms for Radiation-Induced Effects in Non-Silicon Channel CMOS Devices | Vanderbilt University | Robert Andrew Reed | 3 |
| 1:55 - 2:05 | 10 | Q/A and Computer Feedback | | | |
| 2:05 - 4:15 | 2h | Poster Session | | | |

# DTRA 2014 Basic Research Technical Review

## Thursday July 24, 2014 — w1c

| Start - End | dT | Title | Institution | Presenter | TA |
|---|---|---|---|---|---|
| 8:00 - 8:20 | 20 | Daily Instructions and Computer Intro | DTRA / JHU | | |
| 8:20 - 8:20 | 0 | Continuation of Protection of Sensitive Systems | DTRA | Jacob Calkins | |
| 8:20 - 8:50 | 30 | Basic Single-Event and Total-Ionizing Dose Mechanisms in Antimony (Sb)-Based CMOS Transistors with High-K Dielectric | Pennsylvania State University | Suman Datta | 3 |
| 8:50 - 9:00 | 10 | Q/A and Computer Feedback | | | |
| 9:00 - 9:30 | 30 | Radiation Tolerance of New Self-Healing Crystalline Memristors for Neuromorphic Computing | Georgia Tech | William Alan Doolittle | 3 |
| 9:30 - 9:40 | 10 | Q/A and Computer Feedback | | | |
| 9:40 - 10:00 | 20 | ~ Break ~ | | | |
| 10:00 - 10:30 | 30 | Radiation-Induced Photonic Defects in Si, Ge, Chalcogenides and Polymers | MIT | Anu Agarwal | 3 |
| 10:30 - 10:40 | 10 | Q/A and Computer Feedback | | | |
| 10:40 - 11:10 | 30 | Spin-Polarized Silicon Photonic and Electronic Interconnects | University of Michigan | Vanessa Sih | 3 |
| 11:10 - 11:20 | 10 | Q/A and Computer Feedback | | | |
| 11:20 - 11:50 | 30 | Study of Radiation Influenced Defects in (Al, Ga) N/Si | Naval Postgraduate School | T.R. Weatherford | 3 |
| 11:50 - 12:00 | 10 | Q/A and Computer Feedback | | | |
| 12:00 - 1:00 | 60 | ~ Lunch ~ | | | |
| 1:00 - 1:15 | 15 | Program Execution and Funding Expenditures Brief | DTRA | LT Col Rupanovic | |
| 1:15 - 1:45 | 30 | Heavy-Ion Energy Deposition in Dielectrics and Semiconductors | University of Tennessee | Yanwen Zhang | 3 |
| 1:45 - 1:55 | 10 | Q/A and Computer Feedback | | | |
| 1:55 - 2:15 | 20 | On the Radiation Sensitivity and Failure Mechanism of Critical Radiation-Hardened Robotic Components | Ohio State University | Lei Cao | 3 |
| 2:15 - 2:25 | 10 | Q/A and Computer Feedback | | | |
| 2:25 - 2:55 | 30 | Radiation-Induced Changes in Robotic Materials, Components, and Subsystems | Vanderbilt University | Arthur Witulski | 3 |
| 2:55 - 3:05 | 10 | Q/A and Computer Feedback | | | |
| 3:05 - 3:25 | 20 | ~ Break ~ | | | |
| 3:25 - 3:30 | 5 | Intro to Metamaterials | DTRA | James Reed | |
| 3:30 - 4:00 | 30 | Blast Wave Manipulation Using Hierarchical Metamaterial Stuctures | MIT | Xuanlai Fang | 3 |
| 4:00 - 4:10 | 10 | Q/A and Computer Feedback | | | |
| 4:10 - 4:30 | 20 | Development of Acoustic Metamaterials with Anisotropic Mass Densities for Blast Wave Mitigation | Purdue University | Jeff Youngblood | 3 |
| 4:30 - 4:40 | 10 | Q/A and Computer Feedback | | | |
| 4:40 - 5:00 | 20 | Metamaterials and Metasurface to Realize Cloaks, Anti-Cloaks, Isolators and Energy Concentrators | University of Texas | Andrea Alu | 3 |
| 5:00 - 5:10 | 10 | Q/A and Computer Feedback | | | |

## Friday July 25, 2014 — w1c

| Start - End | dT | Title | Institution | Presenter | TA |
|---|---|---|---|---|---|
| 8:00 - 8:20 | 20 | Daily Instructions and Computer Intro | DTRA / JHU | | |
| 8:20 - 8:30 | 10 | Intro to Novel X-ray Sources | DTRA | Calvin Shipbaugh | |
| 8:30 - 9:00 | 30 | Investigation and Control of Electron Transport in Laser X-Ray Sources | University of Michigan | Paul Keiter | 3 |
| 9:00 - 9:05 | 5 | Q/A and Computer Feedback | | | |
| 9:05 - 9:35 | 30 | Efficient Generation of Extremely Bright X-Ray Sources by Femtosecond Laser Irradiation of Vertically Aligned Nanostructures | Colorado State University | Jorge Rocca | 3 |
| 9:35 - 9:40 | 5 | Q/A and Computer Feedback | | | |
| 9:40 - 10:10 | 30 | Laser-Generated X-rays in an Under-Dense Plasma Produced in a High-Density Linear Gas Jet | University of Nevada | Victor Kantsyrev | 3 |
| 10:10 - 10:15 | 5 | Q/A and Computer Feedback | | | |
| 10:15 - 10:35 | 20 | ~ Break ~ | | | |
| 10:35 - 11:05 | 30 | High-Z Non-Equilibrium Physics & Bright X-ray Sources with New Laser Targets | LLNL | Jeffrey Colvin | 3 |
| 11:05 - 11:10 | 5 | Q/A and Computer Feedback | | | |
| 11:10 - 11:40 | 30 | Generation of Miniature Hohlraum Xray Sources Using Intense Lasers | University of Michigan | Karl Krushelnick | 3 |
| 11:40 - 11:45 | 5 | Q/A and Computer Feedback | | | |

# DTRA 2014 Basic Research Technical Review

## Monday July 28, 2014 w2b

| Start - End | dT | Title | Institution | Presenter | TA |
|---|---|---|---|---|---|
| 8:00 - 8:25 | 25 | Daily Instructions and Computer Intro | DTRA / JHU | | |
| 8:25 - 8:30 | 5 | Intro to Physical Networks: Mathematical Network Analysis | DTRA | Paul Tandy | |
| 8:30 - 8:50 | 20 | Combating Weapons of Mass Destruction: Models, Complexity, and Algorithms in Complex Dynamic and Evolving Networks | University of Florida, Engineering | My T. Thai | 2 |
| 8:50 - 9:00 | 10 | Q/A and Computer Feedback | | | |
| 9:00 - 9:30 | 30 | Mathematical Approaches to WMD Defense and Vulnerability Assessments on Dynamic Networks | University of Florida, Engineering | J. Cole Smith | 2 |
| 9:30 - 9:40 | 10 | Q/A and Computer Feedback | | | |
| 9:40 - 10:00 | 20 | Balanced Coordinated Algorithms for Damage Mitigation and Resource Allocation in Network Systems | Texas Tech University | Qing Hui | 2 |
| 10:00 - 10:10 | 10 | Q/A and Computer Feedback | | | |
| 10:10 - 10:40 | 30 | ~ Break ~ | | | |
| 10:40 - 11:00 | 20 | Multiagent Swarm Based Application Software Development for Optimal Defense Strategy Synthesis of Geospatial Physical Networks in Networked Environments | Texas Tech University | Qing Hui | 2 |
| 11:00 - 11:10 | 10 | Q/A and Computer Feedback | | | |
| 11:10 - 11:30 | 20 | Robustness, Resilience and Emergent Properties of Interdependent Networks | University of California | Raissa D'Souza | 2 |
| 11:30 - 11:40 | 10 | Q/A and Computer Feedback | | | |
| 11:40 - 11:45 | 5 | Intro to Physical Networks: Power Grids | DTRA | Paul Tandy | |
| 11:45 - 12:15 | 30 | Rigorous Approaches for Validation and Verification of Networked Systems | Virginia Polytechnic Institute | Madhav Marathe | 2 |
| 12:15 - 12:25 | 10 | Q/A and Computer Feedback | | | |
| 12:25 - 1:25 | 60 | ~ Lunch ~ | | | |
| 1:25 - 1:40 | 15 | Program Execution and Funding Expenditures Brief | DTRA | LT Col Rupanovic | |
| 1:40 - 2:10 | 30 | Robust Network Architecture Against Mobile Threats in WMD Environments: Theoretical Limits and Recovery Strategies | North Carolina State University | Wenye Wang | 2 |
| 2:10 - 2:20 | 10 | Q/A and Computer Feedback | | | |
| 2:20 - 2:50 | 30 | Optimizing Robustness of Large-Scale Information and Infrastructure Networks | Rensselaer Polytechnic Institute | Gyorgy Korniss (Boleslaw Szymanski) | 2 |
| 2:50 - 3:00 | 10 | Q/A and Computer Feedback | | | |
| 3:00 - 3:20 | 20 | ~ Break ~ | | | |
| 3:20 - 3:50 | 30 | Network Adaptability from WMD Disruption and Cascading Failures | Los Alamos National Laboratory | Michael Chertkov | 2 |
| 3:50 - 4:00 | 10 | Q/A and Computer Feedback | | | |
| 4:00 - 4:20 | 20 | Theory-Based Approaches for Complex Probabilistic Software Verification and Validation | Naval Postgraduate School | Doron Drusinsky | 2 |
| 4:20 - 4:25 | 5 | Q/A and Computer Feedback | | | |

# DTRA 2014 Basic Research Technical Review

## Tuesday July 29, 2014 — w2b

| Start - End | dT | Title | Institution | Presenter | TA |
|---|---|---|---|---|---|
| 8:00 - 8:25 | 25 | Daily Instructions and Computer Intro | DTRA / JHU | | |
| 8:25 - 8:25 | 0 | Continuation of Physical Networks: Power Grids | DTRA | Paul Tandy | |
| 8:25 - 8:55 | 30 | Defending Interdependent Infrastructure Systems | Naval Postgraduate School<br>University of Texas | David Anderson<br>(Ross Baldick) | 2 |
| 8:55 - 9:05 | 10 | Q/A and Computer Feedback | | | |
| 9:05 - 9:35 | 30 | Advancing Knowledge of Network Theory for Understanding Robustness | Los Alamos National Laboratory | Feng Pan | 2 |
| 9:35 - 9:45 | 10 | Q/A and Computer Feedback | | | |
| 9:45 - 10:15 | 30 | Power Grid Vulnerability and Resilience to Geographically Correlated Failures | Columbia University | Gil Zussman | 2 |
| 10:15 - 10:25 | 10 | Q/A and Computer Feedback | | | |
| 10:25 - 10:45 | 20 | ~ Break ~ | | | |
| 10:45 - 10:50 | 5 | Intro to Physical Networks: Telecom & Data | DTRA | Paul Tandy | |
| 10:50 - 11:20 | 30 | Probabilistic Characterization of Precursors to WMD-induced Cascading Failures in the Electric-cyber Infrastructure | University of New Mexico | Majeed M. Hayat | 2 |
| 11:20 - 11:30 | 10 | Q/A and Computer Feedback | | | |
| 11:30 - 12:00 | 30 | State Estimation and Optimal Recovery in Networks with Massive Cascading Failures | Pennsylvania State University | Thomas LaPorta | 2 |
| 12:00 - 12:10 | 10 | Q/A and Computer Feedback | | | |
| 12:10 - 12:30 | 20 | Network Adaptability from WMD Disruption and Cascading Failures | University of California | Biswanath Mukherjee | 2 |
| 12:30 - 12:40 | 10 | Q/A and Computer Feedback | | | |
| 12:40 - 1:40 | 60 | ~ Lunch ~ | | | |
| 1:40 - 1:55 | 15 | Program Execution and Funding Expenditures Brief | DTRA | LT Col Rupanovic | |
| 1:55 - 2:25 | 30 | Foundations for Network Resilience Against Cascading Failures: Modeling, Fundamental Limits and Robust Network Architecture | Arizona State University | Junshan Zhang | 2 |
| 2:25 - 2:35 | 10 | Q/A and Computer Feedback | | | |
| 2:35 - 3:05 | 30 | Towards a Theory of Self-Organizing Networks for Countering WMD Attacks | Texas Engineering Experiment Station | Srinivas Shakkottai | 2 |
| 3:05 - 3:15 | 10 | Q/A and Computer Feedback | | | |
| 3:15 - 3:35 | 20 | ~ Break ~ | | | |
| 3:35 - 3:55 | 20 | Cascading Failures in Networks: Inference, Intervention & Robustness to WMDs | University of Texas | Sujay Sanghavi | 2 |
| 3:55 - 4:05 | 10 | Q/A and Computer Feedback | | | |
| 4:05 - 4:35 | 30 | Towards a Theory for Network Robustness and Inter-Dependence under Attacks | University of Minnesota | Zhi-Li Zhang | 2 |
| 4:35 - 4:45 | 10 | Q/A and Computer Feedback | | | |
| 4:45 - 5:05 | 20 | A Network Planning and Management Tool for Design of Robust and Resilient Networks to Withstand WMD Attack | Arizona State University | Arun Sen | 2 |
| 5:05 - 5:15 | 10 | Q/A and Computer Feedback | | | |

# DTRA 2014 Basic Research Technical Review

## Wednesday July 30, 2014 w2b

| Start - End | dT | Title | Institution | Presenter | TA |
|---|---|---|---|---|---|
| 8:00 - 8:25 | 25 | Daily Instructions and Computer Intro | DTRA / JHU | | |
| 8:25 - 8:30 | 5 | Intro to Social Networks | DTRA | Paul Tandy | |
| 8:30 - 9:00 | 30 | Robustness Analysis and Anomaly Detection of Interdependent Physical and Social Networks | University of Illinois | Tarek Abdelzaher | 2 |
| 9:00 - 9:05 | 5 | Q/A and Computer Feedback | | | |
| 9:05 - 9:35 | 30 | New Analytic Methods for the Exploitation of Open-Source Structured Databases on the Pursuit of WMD Terrorism | University of Arizona | Ronald Breiger | 2 |
| 9:35 - 9:40 | 5 | Q/A and Computer Feedback | | | |
| 9:40 - 10:10 | 30 | Understanding Societal Response to Emergencies | Northeastern University | David Lazer (A.-L. Barabasi) | 2 |
| 10:10 - 10:15 | 5 | Q/A and Computer Feedback | | | |
| 10:15 - 10:45 | 30 | ~ Break ~ | | | |
| 10:45 - 11:15 | 30 | Remote Capabilities Assessment | Carnegie Mellon University | Kathleen M. Carley | 2 |
| 11:15 - 11:20 | 5 | Q/A and Computer Feedback | | | |
| 11:20 - 11:50 | 30 | Uncovering and Penetrating CBRN Networks: A General Methodology for Mapping Covert Social Networks | Cornell University | Matthew Brashears | 2 |
| 11:50 - 11:55 | 5 | Q/A and Computer Feedback | | | |
| 11:55 - 12:25 | 30 | Theoretical and Experimental Investigation of Opinion Dynamics in Small Social Networks | University of Washington | Michael Gabbay | 2 |
| 12:25 - 12:30 | 5 | Q/A and Computer Feedback | | | |
| 12:30 - 1:30 | 60 | ~ Lunch ~ | | | |
| 1:30 - 1:45 | 15 | Program Execution and Funding Expenditures Brief | DTRA | LT Col Rupanovic | |
| 1:45 - 2:15 | 30 | Getting it Right the First Time: Predicted Performance Guarantees from the Analysis of Emergent Behavior in Autonomous and Semi-autonomous Systems | Georgia Tech | Ronald C. Arkin | 2 |
| 2:15 - 2:20 | 5 | Q/A and Computer Feedback | | | |
| 2:20 - 2:50 | 30 | Robustness of Interdependent Networks Subject to Cascading Failures Under WMD Attack | Boston University | Harry E. Stanley | 2 |
| 2:50 - 3:00 | 10 | Q/A and Computer Feedback | | | |
| 3:00 - 5:00 | 2h | Poster Session | | | |

## Thursday July 31, 2014

| Start - End | dT | Title | Institution | Presenter | TA |
|---|---|---|---|---|---|
| 9:00 - 1:00 | 4h | Network Sciences Workshop - Open | DTRA | Paul Tandy | 2 |
| 1:00 - 2:00 | 60 | ~ Lunch ~ | | | |
| 2:00 - 5:00 | 3h | Network Sciences Workshop - Open | DTRA | Paul Tandy | 2 |

## Friday August 1, 2014

| Start - End | dT | Title | Institution | Presenter | TA |
|---|---|---|---|---|---|
| 8:00 - 12:00 | 4h | Network Sciences Workshop - Government ONLY | DTRA | Paul Tandy | 2 |

# DTRA 2014 Basic Research Technical Review

## Monday July 28, 2014 w2c

| Start - End | dT | Title | Institution | Presenter | TA |
|---|---|---|---|---|---|
| 8:30 - 8:55 | 25 | Daily Instructions and Computer Intro | DTRA / JHU | | |
| 8:55 - 9:00 | 5 | Intro to Amorphous Metals | DTRA | Su Peiris | |
| 9:00 - 9:20 | 20 | Development of Compositionally Graded Metallic Glass Alloys with Desirable Properties | Ohio State University | Wolfgang Windl | 4 |
| 9:20 - 9:25 | 5 | Q/A and Computer Feedback | | | |
| 9:25 - 9:55 | 30 | Discovery and Fundamentals of New Amorphous Metals/Composites with High-Performance Ballistic Properties | University of Virginia | Joseph Poon | 4 |
| 9:55 - 10:00 | 5 | Q/A and Computer Feedback | | | |
| 10:00 - 10:30 | 30 | Amorphous Metals for High-Performance Penetration | Massachusetts Institute of Technology | Christopher Schuh | 4 |
| 10:30 - 10:35 | 5 | Q/A and Computer Feedback | | | |
| 10:35 - 10:55 | 20 | ~ Break ~ | | | |
| 10:55 - 11:15 | 20 | Understanding and Enhancement of Amorphous Metals Performance Under Dynamic Loading | Washington State University | Atakan Peker | 4 |
| 11:15 - 11:20 | 5 | Q/A and Computer Feedback | | | |
| 11:20 - 11:50 | 30 | Synthesis and Mechanical Properties of Next Generation Structural Amorphous Metals and their Performance under Ballistic Impact | University of Southern California | Andrea Hodge | 4 |
| 11:50 - 11:55 | 5 | Q/A and Computer Feedback | | | |
| 11:55 - 12:55 | 60 | ~ Lunch ~ | | | |
| 12:55 - 1:10 | 15 | Program Execution and Funding Expenditures Brief | DTRA | LT Col Rupanovic | |
| 1:10 - 1:15 | 5 | Intro to Nano-sized Thermometers | DTRA | Su Peiris | |
| 1:15 - 1:45 | 30 | Irreversible Phase Changes in Nanophase RE-doped M2O3 and Their Optical Signatures | Washington State University | Hergen Eilers | 4 |
| 1:45 - 1:50 | 5 | Q/A and Computer Feedback | | | |
| 1:50 - 2:20 | 30 | Luminescence Materials as Nanoparticle Thermal Sensors | Oklahoma State University | Eduardo Yukihara | 4 |
| 2:20 - 2:25 | 5 | Q/A and Computer Feedback | | | |
| 2:25 - 2:45 | 20 | Phonon Confinement Effect in TiO2 Nanoparticles as Thermosensor Materials | Rensselaer Polytechnic Institute | Liping Huang | 4 |
| 2:45 - 2:50 | 5 | Q/A and Computer Feedback | | | |
| 2:50 - 3:10 | 20 | ~ Break ~ | | | |
| 3:10 - 3:15 | 5 | Intro to Meso Diagnostics | DTRA | Su Peiris | |
| 3:15 - 3:45 | 30 | Inter-Particle Force Inference Under Dynamic Loading: Advanced Experimental Visualization Aided by Multiscale Computations | California Institute of Technology | G. Ravichandran (Jose E. Andrade) | 4 |
| 3:45 - 3:50 | 5 | Q/A and Computer Feedback | | | |
| 3:50 - 4:20 | 30 | Multi-Scale Penetration Mechanics of Projectiles through Granular Media using Neutron and X-Rays | University of Tennessee | Dayakar Penumadu | 4 |
| 4:20 - 4:25 | 5 | Q/A and Computer Feedback | | | |
| 4:25 - 4:55 | 30 | In-Situ Molecular Diagnostics for Heterogeneous Polymer Composites | Naval Postgraduate School | Joseph Hooper | 4 |
| 4:55 - 5:00 | 5 | Q/A and Computer Feedback | | | |

# DTRA 2014 Basic Research Technical Review

## Tuesday July 29, 2014 w2c

| Start - End | dT | Title | Institution | Presenter | TA |
|---|---|---|---|---|---|
| 8:30 - 8:55 | 25 | Daily Instructions and Computer Intro | DTRA / JHU | | |
| 8:55 - 9:00 | 5 | Intro to Meso Diagnostics | DTRA | Su Peiris | |
| 9:00 - 9:30 | 30 | Meso-Scale Time-Resolved Diagnostics Employing Photonic Crystals for Probing Dynamic Events in Inert and Reactive Particulate Materials | Georgia Tech | Naresh Thadhani | 4 |
| 9:30 - 9:35 | 5 | Q/A and Computer Feedback | | | |
| 9:35 - 9:55 | 20 | Ultrafast Diagnostics for High-Speed Impacts with Particulate Composites | University of Illinois | Dana Dlott | 4 |
| 9:55 - 10:00 | 5 | Q/A and Computer Feedback | | | |
| 10:00 - 10:20 | 20 | ~ Break ~ | | | |
| 10:20 - 10:25 | 5 | Intro to Agent-Defeat Reactions and Modeling | DTRA | Su Peiris | |
| 10:25 - 10:55 | 30 | Thermochemical Kinetics of Halogenated Materials in Turbulent Flows of Detonation Products | University of Illinois | Nick Glumac | 4 |
| 10:55 - 11:00 | 5 | Q/A and Computer Feedback | | | |
| 11:00 - 11:20 | 20 | Combustion of Reactive Materials in Gas Flows with Turbulent Mixing | New Jersey Institute of Technology | Edward L. Dreizin | 4 |
| 11:20 - 11:25 | 5 | Q/A and Computer Feedback | | | |
| 11:25 - 11:45 | 20 | Intense Terahertz Fields for Fast Energy Release | Massachusetts Institute of Technology | Keith Adam Nelson | 4 |
| 11:45 - 11:50 | 5 | Q/A and Computer Feedback | | | |
| 11:50 - 12:50 | 60 | ~ Lunch ~ | | | |
| 12:50 - 1:05 | 15 | Program Execution and Funding Expenditures Brief | DTRA | LT Col Rupanovic | |
| 1:05 - 1:35 | 30 | A Unified Bio-Chemical and Engineering Approach to Research of Heat and Chemical De-Activation of Biological Warfare Agents | Pennsylvania State University | Charles Neely (Deborah A. Levin) | 4 |
| 1:35 - 1:40 | 5 | Q/A and Computer Feedback | | | |
| 1:40 - 2:00 | 20 | Statistics of Particle Temperature-Time Histories in Turbulent Reacting Flows | Sandia National Laboratories | John C. Hewson | 4 |
| 2:00 - 2:05 | 5 | Q/A and Computer Feedback | | | |
| 2:05 - 2:25 | 20 | Multiscale Modeling of Multiphase Turbulent Mixing to Enable Predictive Simulations of Chem/Bio Defeat | University of Florida | Siva Balachandar | 4 |
| 2:25 - 2:30 | 5 | Q/A and Computer Feedback | | | |
| 2:30 - 3:00 | 30 | Simulation of Chem/Bio Agent Neutralization in Turbulent Multi-Scale, Multi-Phase Reactive Post-Det. Environment with Model Uncertainty Quantification | Georgia Tech | Suresh Menon | 4 |
| 3:00 - 3:05 | 5 | Q/A and Computer Feedback | | | |
| 3:05 - 3:25 | 20 | ~ Break ~ | | | |
| 3:25 - 3:30 | 5 | Intro to Meso-scale Modeling and Verification | DTRA | Su Peiris | |
| 3:30 - 4:00 | 30 | Integrated Modeling and Experimental Studies at the Meso-Scale for Advanced Reactive Materials | University of Illinois | D. Scott Stewart | 4 |
| 4:00 - 4:05 | 5 | Q/A and Computer Feedback | | | |
| 4:05 - 4:35 | 30 | Multiscale Theoretical and Numerical of the Post-Shock Response of Aluminum-based Metastable Intermolecular Composites | University of Missouri | Thomas D. Sewell | 4 |
| 4:35 - 4:40 | 5 | Q/A and Computer Feedback | | | |
| 4:40 - 5:10 | 30 | Multi-Resolution Modeling and Experiments of Nanostructured Reactive Materials | Purdue University | Alejandro Strachan | 4 |
| 5:10 - 5:15 | 5 | Q/A and Computer Feedback | | | |
| 5:15 - 5:45 | 30 | Computational Characterization of Impact Induced Multi-Scale Dissipation in Reactive Solid Composites | Louisiana State University | Keith A. Gonthier | 4 |
| 5:45 - 5:50 | 5 | Q/A and Computer Feedback | | | |

# DTRA 2014 Basic Research Technical Review

## Wednesday July 30, 2014 w2c

| Start - End | dT | Title | Institution | Presenter | TA |
|---|---|---|---|---|---|
| 8:30 - 8:55 | 25 | Daily Instructions and Computer Intro | DTRA / JHU | | |
| 8:55 - 9:00 | 5 | Intro to Meso-scale Modeling and Verification | DTRA | Su Peiris | |
| 9:00 - 9:30 | 30 | Three-dimensional Multiscale/Multicomponent Modeling of Impact Response of Heterogenous Energetic Materials | Georgia Tech | Min Zhou | 4 |
| 9:30 - 9:35 | 5 | Q/A and Computer Feedback | | | |
| 9:35 - 10:05 | 30 | Multiscale Modeling and Simulations of Energetic Composites for Sensitivity, Performance Evaluation, and Design | Georgia Tech | Sunil K. Dwivedi | 4 |
| 10:05 - 10:10 | 5 | Q/A and Computer Feedback | | | |
| 10:10 - 10:25 | 15 | ~ Break ~ | | | |
| 10:25 - 10:30 | 5 | Intro to Multi-scale Simulation | DTRA | Su Peiris | |
| 10:30 - 10:50 | 20 | Computational Homogenization Approach for Scale Linking and Multiscale Modeling of Energetic Solid State Composites | University of Michigan | Veera Sundararaghavan | 4 |
| 10:50 - 10:55 | 5 | Q/A and Computer Feedback | | | |
| 10:55 - 11:15 | 20 | Initiation and Post-Detonation Kinetics of Aluminized RDX Composites Using a First-principles Guided Multiscale Approach | Washington State University | Santanu Chaudhuri | 4 |
| 11:15 - 11:20 | 5 | Q/A and Computer Feedback | | | |
| 11:20 - 11:40 | 20 | Nonholonomic Coupling of Hamiltonian Models for Reacting Shock Physics at Multiple Scales | University of Texas | Eric P. Fahrenthold | 4 |
| 11:40 - 11:45 | 5 | Q/A and Computer Feedback | | | |
| 11:45 - 12:40 | 55 | ~ Lunch ~ | | | |
| 12:40 - 12:55 | 15 | Program Execution and Funding Expenditures Brief | DTRA | LT Col Rupanovic | |
| 12:55 - 1:15 | 20 | A Novel Multiscale QM-MD-SPH Computational Method for Heterogeneous Multicomponent Reactive Systems | University of Cincinnati | Gui-Rong Liu | 4 |
| 1:15 - 1:20 | 5 | Q/A and Computer Feedback | | | |
| 1:20 - 1:40 | 20 | Multi-scale Coupling Strategies for Multi-physics Simulation Tools | University of South Florida | Thomas L. Jackson | 4 |
| 1:40 - 1:45 | 5 | Q/A and Computer Feedback | | | |
| 1:45 - 1:50 | 5 | Intro to Agent Defeat Materials and Properties | DTRA | Su Peiris | |
| 1:50 - 2:30 | 40 | Development and Characterization of Prompt Agent Defeat Materials and Methods | Naval Surface Warfare Center | James M. Lightstone | 4 |
| 2:30 - 2:35 | 5 | Q/A and Computer Feedback | | | |
| 2:35 - 2:55 | 20 | High-Energy Iodine-Rich Compositions as Bio-Agent Defeat Materials | Naval Air Warfare Center | Curtis E. Johnson | 4 |
| 2:55 - 3:00 | 5 | Q/A and Computer Feedback | | | |
| 3:00 - 5:00 | 2h | Poster Session | | | |

# DTRA 2014 Basic Research Technical Review

## Thursday July 31, 2014 w2c

| Start - End | dT | Title | Institution | Presenter | TA |
|---|---|---|---|---|---|
| 8:30 - 8:55 | 25 | Daily Instructions and Computer Intro | DTRA / JHU | | |
| 8:55 - 9:00 | 5 | Intro to Agent Defeat Materials and Properties | DTRA | Su Peiris | |
| 9:00 - 9:30 | 30 | Experimental and Computational Studies of BioAgent Defeat Using Slow, Intermetallic Oxidation Reactions and Gaseous Biocidals | Johns Hopkins University | Timothy Weihs | 4 |
| 9:30 - 9:35 | 5 | Q/A and Computer Feedback | | | |
| 9:35 - 10:05 | 30 | Probing Spore Neutralization Mechanisms and Tuning Energetic Biocides | University of Maryland | Vincent Lee | 4 |
| 10:05 - 10:10 | 5 | Q/A and Computer Feedback | | | |
| 10:10 - 10:40 | 30 | Neutralization of Aerosolized Bio-Agents by Filled Nanocomposite Materials through Thermal and Chemical Inactivation Mechanisms | University of Cincinnati | Sergey Grinshpun | 4 |
| 10:40 - 10:45 | 5 | Q/A and Computer Feedback | | | |
| 10:45 - 11:05 | 20 | ~ Break ~ | | | |
| 11:05 - 11:35 | 30 | Novel Approaches to Destroying Biothreat Agents | Loyola University | Adam Driks | 4 |
| 11:35 - 11:40 | 5 | Q/A and Computer Feedback | | | |
| 11:40 - 12:10 | 30 | Characterization and Optimization of Prompt Agent Defeat Materials | Southwest Research Institute | Michael MacNaughton | 4 |
| 12:10 - 12:15 | 5 | Q/A and Computer Feedback | | | |
| 12:15 - 1:15 | 60 | ~ Lunch ~ | | | |
| 1:15 - 1:30 | 15 | Program Execution and Funding Expenditures Brief | DTRA | LT Col Rupanovic | |
| 1:30 - 2:00 | 30 | Dust Cloud Combustion for Defeat of Airborne Bio-WMD | McGill University | David Frost | 4 |
| 2:00 - 2:05 | 5 | Q/A and Computer Feedback | | | |
| 2:05 - 2:35 | 30 | Determining Thermochemical Properties of Halogenated Metals: On enabling rapid and Accurate Assessments of Agent Defeat Formulations | Lawrence Livermore National Laboratory | Joseph M. Zaug | 4 |
| 2:35 - 2:40 | 5 | Q/A and Computer Feedback | | | |
| 2:40 - 3:00 | 20 | Energetic Materials for Bio-Agent Destruction | University of Idaho | Jean'ne M. Shreeve | 4 |
| 3:00 - 3:05 | 5 | Q/A and Computer Feedback | | | |
| 3:05 - 3:25 | 20 | ~ Break ~ | | | |
| 3:25 - 3:30 | 5 | Intro to Agent Defeat Binders and Coatings | DTRA | Su Peiris | |
| 3:30 - 4:00 | 30 | High Throughput Electrospray Formation of Reactive-Energetic Biocidal Polymer Composites | University of Maryland | Michael Zachariah | 4 |
| 4:00 - 4:05 | 5 | Q/A and Computer Feedback | | | |
| 4:05 - 4:35 | 30 | Unique Polymer Packaging & Delivery of ADW | University of Rhode Island | Jimmie C. Oxley | 4 |
| 4:35 - 4:40 | 5 | Q/A and Computer Feedback | | | |
| 4:40 - 5:00 | 20 | Printable Polymer Bound Reactives | South Dakota School of Mines and Technology | Lori Groven | 4 |
| 5:00 - 5:05 | 5 | Q/A and Computer Feedback | | | |

# DTRA 2014 Basic Research Technical Review

## Friday August 1, 2014 w2c

| Start - End | dT | Title | Institution | Presenter | TA |
|---|---|---|---|---|---|
| 8:30 - 8:50 | 20 | Daily Instructions and Computer Intro | DTRA / JHU | | 4 |
| 8:50 - 8:55 | 5 | Intro to HEDM | DTRA | Su Peiris | |
| 8:55 - 9:25 | 30 | Next Generation Energetic Materials: New Cluster Hydrides and Metastable Alloys of Aluminum in Very Low Oxidation States | University of Maryland | Bryan Eichhorn | 4 |
| 9:25 - 9:30 | 5 | Q/A and Computer Feedback | | | |
| 9:30 - 9:50 | 20 | New Materials for Fast Energy Release | University of Southern California | Ralf Haiges | 4 |
| 9:50 - 9:55 | 5 | Q/A and Computer Feedback | | | |
| 9:55 - 10:15 | 20 | High-Energy-Density Monolithic Organometallic Solids | Washington State University | Choong-Shik Yoo | 4 |
| 10:15 - 10:20 | 5 | Q/A and Computer Feedback | | | |
| 10:20 - 10:40 | 20 | ~ Break ~ | | | |
| 10:40 - 11:00 | 20 | Synthesis, Characterization and Theory/Modeling of Polynitrogen Energetic Materials | University of South Florida | Ivan Oleynik | 4 |
| 11:00 - 11:05 | 5 | Q/A and Computer Feedback | | | |
| 11:05 - 11:25 | 20 | Pathways to N-Rich High Energy Density Materials | University of Ottawa | Serge Desgreniers | 4 |
| 11:25 - 11:30 | 5 | Q/A and Computer Feedback | | | |