

# NUCLEAR SCIENCE AND SECURITY CONSORTIUM WORKSHOP & EXTERNAL ADVISORY BOARD MEETING

October 1 - 2, 2018

**October 1, 2018**

**Sandia National Laboratories, Building 904 Auditorium (unless otherwise noted)**

|                       |  |                                       |
|-----------------------|--|---------------------------------------|
| <b>8:30-9:00 a.m.</b> | Morning Refreshments<br>Lobby of Building 904 Auditorium   |                                       |
| <b>9:00-9:05</b>      | <b>Safety and Security Reminders</b>   | <i>Alf Morales (SNL)</i>              |
| <b>9:05-9:15</b>      | <b>Welcome and DNN Office Overview</b>   | <i>Victoria Franques (NNSA)</i>       |
| <b>9:15-9:35</b>      | <b>Sandia National Laboratories: Mission and History</b>   | <i>Dori Ellis (SNL)</i>               |
| <b>9:35-10:00</b>     | <b>NSSC Overview: Structure, Accomplishments, and Metrics</b>  | <i>Jasmina Vujic (UCB)</i>            |
| <b>10:00-10:20</b>    | <b>Radiation Detection and Instrumentation: Fast Neutron Time-Encoded Imaging for Treaty Verification</b>  | <i>Rebecca Krentz-Wee (UCB)</i>       |
| <b>10:20-10:40</b>    | <b>Nuclear Data: Experimentally Constrained <math>^{92}\text{Sr}(n,g)</math> Reaction Rates</b>  | <i>Adriana Ureche (UCB)</i>           |
| <b>10:40-11:00</b>    | Break  |                                       |
| <b>11:00-11:20</b>    | <b>Modeling and Simulation: The Forward-Backward Algorithm and the Judge: A Framework for Tracking Reactor Operation with WATCHMAN Data</b>              | <i>Teal Pershing (UCD)</i>            |
| <b>11:20-11:40</b>    | <b>Radiation Detection and Instrumentation: Analog Pulse Shape Discrimination Circuit Development for Neutron Imagers</b>                                | <i>Ben Godfrey (UCD)</i>              |
| <b>11:40 – 12:00p</b> | <b>Nuclear and Particle Physics: Whence Antineutrinos? Fission Fragment Beta Spectroscopy and the Reactor Antineutrino Anomaly</b>                       | <i>Elizabeth Heckmaier (UCI/LLNL)</i> |
| <b>12:00-12:20</b>    | <b>Nuclear Chemistry and Forensics: Speciation and Recovery of Uranium in Ionic Liquids for Nuclear Forensics</b>  | <i>Katherine Luebke (UNLV)</i>        |
| <b>12:20-1:30</b>     | <b>Group Photo/Lunch</b><br><i>Location: Event Pad</i>   |                                       |
| <b>1:30-1:50</b>      | <b>Nuclear and Particle Physics: Characterization of EJ-301 Liquid Scintillators for Neutron and Gamma Detection</b>                                     | <i>Thomas Redpath (MSU)</i>           |
| <b>1:50-2:10</b>      | <b>Radiation Detection and Instrumentation: Sol-Gel Processing for <math>\text{Li}_5\text{La}_3\text{Ta}_2\text{O}_{12}</math> Ceramic Scintillators</b> | <i>Joshua Smith (UTK)</i>             |
| <b>2:10-2:30</b>      | <b>Nuclear Engineering: Measuring Key Isotope Ratios in Two Irradiated Fuel Samples for the Discrimination Forensics of Separate Plutonium</b>           | <i>Kevin Glennon (TAMU)</i>           |
| <b>2:30-2:50</b>      | <b>Radiation Detection and Instrumentation: Fabrication of Cesium Hafnium Chloride Transparent Ceramics</b>  | <i>Cordell Delzer (UTK)</i>           |
| <b>2:50-3:10</b>      | <b>Nuclear and Particle Physics: Constraining Neutron Capture and <math>\beta</math>-Decay Strengths for Basic Research and Applications</b>             | <i>Andrea Richard (MSU)</i>           |
| <b>3:10-5:00</b>      | <b>Student Poster Session and Light Refreshments</b><br><i>Location: Event Pad</i>   |                                       |

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*October 1, 2018 - Poster Session*  
Event Pad, Sandia National Laboratories

| <b>Poster #</b> | <b>Poster Title</b>  | <b>Presenter</b>              |
|-----------------|--|-------------------------------|
| 1               | Iron-Rich Microstructures Preserved in Post-Detection Nuclear Debris   | <i>Tim Genda (UCB)</i>        |
| 2               | Enrichment and Multiplication Estimation of Shielded Uranium Assemblies Under Active Interrogation Using Inverse Methods | <i>Aaron Nowack (UTK)</i>     |
| 3               | Strength Distributions for Neutron-Rich Co Isotopes  | <i>Stephanie Lyons (MSU)</i>  |
| 4               | The Retrospective Analysis of Plutonium in Banded Coral Cores from the Bikini Atoll                                      | <i>Athena Gallardo (UNLV)</i> |
| 5               | Scintillation Enhancement through UV Emission Nanoclusters   | <i>Alan Tam (UCI)</i>         |
| 6               | Low Energy Light Yield of Fast Plastic Scintillators   | <i>Thibault Laplace (UCB)</i> |
| 7               | Studies of Neutron Unbound Excited States  | <i>Dayah Chrisman (MSU)</i>   |
| 8               | Nuclear Spectroscopy with Fusion Reactions Induced by Reaccelerated Rare-Isotope Beams                                   | <i>John Ash (MSU)</i>         |
| 9               | Fusing Visual Imagery and Radiation Data to Improve Radiological Detection and Localization                              | <i>Emily Frame (UCB)</i>      |
| 10              | Linking Synthetic Chemistry to Proliferation Detection: New Routes to Nanostructured Actinide Reference Materials        | <i>Mark Straub (UCB)</i>      |
| 11              | Precision Lifetime Measurements of Rare Isotopes and Diamond Detectors in High Radiation Background                      | <i>Mara Grinder (MSU)</i>     |
| 12              | Constraints on Neutrino Lifetime from the Sudbury Neutrino Observatory   | <i>Ben Land (UCB)</i>         |
| 13              | Optical Light Transport in Scintillator Detector Response Simulations with DRIFT   | <i>Tyler Jordan (UCB)</i>     |
| 14              | Foil Activation Analysis for Neutron Spectrum Unfolding  | <i>Zachary Sweger (UCB)</i>   |
| 15              | Modeling, Prediction, and Monitoring of Chemical Species for Advanced Nuclear Fuel Reprocessing                          | <i>Edward Jenner (UCI)</i>    |
| 16              | Small Scale Mechanical Testing for Irradiated Materials  | <i>Hi Vo (UCB)</i>            |
| 17              | Cross Section Measurement of $^{84}\text{Kr}(p,\gamma)^{85}\text{Rb}$  | <i>Alicia Palmisano (MSU)</i> |
| 18              | Spectroscopic Techniques for the Characterization of Uranyl-PAMAM Dendrimer Complexes                                    | <i>Kara Thomas (UCI)</i>      |
| 19              | Comparative Study using Ion Exchange Resins to Separate and Reduce NORM from Complex Matrices                            | <i>Rose Pier (UCI)</i>        |

Even numbered posters must be manned by students from 3:00– 4:00  
Odd numbered posters must be manned by students from 4:00– 5:00

# NUCLEAR SCIENCE AND SECURITY CONSORTIUM WORKSHOP & EXTERNAL ADVISORY BOARD MEETING

## October 1 - 2, 2018

**October 2, 2018**

**Sandia National Laboratories, Building 904 Auditorium (unless otherwise noted)**

|                       |  |  |
|-----------------------|--|--|
| <b>8:30-9:00a</b>     | Morning Refreshments<br><i>Lobby of Building 904 Auditorium</i>                    |  |
| <b>9:00-9:05</b>      | Welcome Address  | <i>Bethany Goldblum (UCB)</i>  |
| <b>9:05-9:30</b>      | Nuclear Engineering Research Focus Area, Modeling and Simulation Crosscutting Area | <i>Focus Area Lead: Max Fratoni, UCB (presenter)<br/>Focus Area Co-Lead: Philippe Bardet, GWU</i>  |
| <b>9:30-9:55</b>      | Radiochemistry and Forensics Research Focus Area                                   | <i>Focus Area Lead: Ken Czerwinski, UNLV (presenter)<br/>Focus Area Co-Lead: John Arnold, UCB</i>  |
| <b>9:55-10:20</b>     | Nuclear & Particle Physics Research Focus Area                                     | <i>Focus Area Lead: Barbara Jacak, UCB (presenter)<br/>Focus Area Co-Lead: Sean Liddick, MSU (presenter)</i>   |
| <b>10:20-10:45</b>    | Break  |  |
| <b>10:45-11:10</b>    | Radiation Detection and Instrumentation Research Focus Area                        | <i>Focus Area Lead: Kai Vetter, UCB<br/>Focus Area Co-Lead: Jason Hayward, UTK (presenter)</i>   |
| <b>11:10-11:35</b>    | Nuclear Data Crosscutting Area   | <i>Crosscutting Area Lead: Lee Bernstein, UCB (presenter)</i>  |
| <b>11:35 – 12:00p</b> | Nuclear Security Policy Crosscutting Area  | <i>Crosscutting Area Lead: Michael Nacht, UCB (presenter)<br/>Crosscutting Area Co-Lead: Allison Macfarlane, GWU<br/>Chris Cahill, GWU (presenter)</i> |
| <b>12:00-12:25</b>    | NSSC-LANL Keepin Nonproliferation Science Summer Program                           | <i>Rian Bahran, LANL</i>   |
| <b>12:25 – 12:30</b>  | Closing Remarks  | <i>Jason Hayward, UTK</i>  |
| <b>12:30-1:30</b>     | Lunch  |  |

**October 2, 2018**

**Parallel Tracks, Sandia National Laboratories (unless otherwise noted)**

|              |  |  |  |
|--------------|--|--|--|
| <b>1:30p</b> | CLOSED SESSION:<br>Executive Advisory Board<br><i>Building 903, Room 1021/1022</i>   | Lightning Presentations by Lab Scientists<br><i>Building 904 Auditorium<br/>Hosted by Ben Cook (SNL)</i> |  |
| <b>2:30p</b> |  | Student-Scientist Meet-and-Greet<br><i>Event Pad</i>   |  |
| <b>3:00p</b> | Executive Advisory Board Outbrief<br>(NSSC Executive Team, Faculty, Lab POCs, and NNSA Sponsors)<br><i>Building 904 Auditorium</i> |  | Special Session with LLNL Scientists<br>(By Reservation Only)<br><i>Livermore Valley Open Campus<br/>Hosted by Scot Olivier (LLNL)</i> |
| <b>4:00p</b> | <i>Adjourn</i>   | <i>Adjourn</i>   |  |
| <b>5:00p</b> |  |  | <i>Adjourn</i>   |