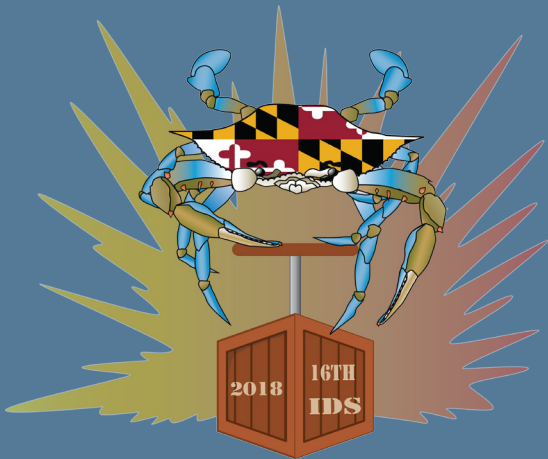


Last Updated  
7/10/2018

# Preliminary Program



# 16th International Detonation Symposium

**July 15-20, 2018**

Hyatt  
Regency  
Chesapeake  
Bay

Cambridge,  
Maryland

## SCHEDULE – Sunday, July 15

5:00pm - 8:00pm	Registration Desk Open	Conference Center Foyer
5:00pm - 8:00pm	I.T. Office / Presenter Ready Room	Skipjack
6:00pm - 8:00pm	Welcome Reception	Regatta Pavilion

## SCHEDULE – Monday, July 16

7:00am - 5:00pm	Registration Desk Open	Conference Center Foyer
7:00am - 5:00pm	I.T. Office / Presenter Ready Room	Skipjack
7:00am - 8:00am	Attendee Continental Breakfast	Conference Center Foyer
8:00am - 8:20am	Opening Remarks	Choptank
8:20am - 9:40am	General Session I	Choptank
9:40am - 10:00am	BREAK	Conference Center Foyer
10:00am - 12:00pm	General Session II	Choptank
12:00pm - 1:00pm	Attendee Buffet Lunch <i>(attendees must wear their badge)</i>	Chesapeake ABCD
1:00pm - 3:00pm	Session A1 - ANET	Choptank
1:00pm - 3:00pm	Session A2 - DSDP	Chesapeake EFG
3:00pm - 3:20pm	BREAK	Conference Center Foyer
3:20pm - 5:20pm	Session A3 - ANET	Choptank
3:20pm - 5:20pm	Session A4 - DSDP	Chesapeake EFG
5:45pm - 9:00pm	Choptank Riverboat Dinner Cruise <i>(advance purchase ticket required)</i>	Breakwater Pavilion Floating Dock
6:00pm - 8:30pm	Bus to Downtown Cambridge <i>(advance registration required; wait list cannot be accommodated unless notified that you have a confirmed seat on the bus)</i>	See Registration Packet for pick-up and drop-off location

### Topic Key

ANET	Advanced and Novel Experimental Techniques
DSDP	Detonation and Sub-Detonative Phenomena
MOD	Modeling
MME	Molecular / Mesoscale Effects
NNTM	New / Non-Traditional Materials
TMP	Thermal / Mechanical Properties

## SCHEDULE - Tuesday, July 17

7:00pm - 5:00pm	Registration Desk Open	Conference Center Foyer
7:00am - 5:00pm	I.T. Office / Presenter Ready Room	Skipjack
7:00am - 8:00am	Attendee Continental Breakfast, Exhibits	Choptank
8:00am - 9:40am	Session B1 - MOD	Chesapeake BCD
8:00am - 9:40am	Session B2 - TMP	Chesapeake EFG
9:40am - 10:00am	BREAK, Posters, Exhibits	Choptank
10:00am - 12:00pm	Session B3 - MOD	Chesapeake BCD
10:00am - 12:00pm	Session B4 - TMP	Chesapeake EFG
12:00pm - 1:20pm	LUNCH on your own	
1:20pm - 2:40pm	Session B5 - MOD	Chesapeake BCD
1:20pm - 2:40pm	Session B6 - MME	Chesapeake EFG
2:40pm - 3:00pm	BREAK, Posters, Exhibits	Choptank
3:00pm - 5:00pm	Session B7 - DSDP / MME	Chesapeake BCD
3:00pm - 5:00pm	Session B8 - MME / MOD	Chesapeake EFG
5:00pm - 9:00pm	Poster Session and Reception <i>(attendees must wear their badge)</i>	Choptank

## SCHEDULE - Wednesday, July 18

7:00am - 1:00pm	Registration Desk Open	Conference Center Foyer
7:00am - 1:00pm	I.T. Office / Presenter Ready Room	Skipjack
7:00am - 8:00am	Attendee Continental Breakfast, Exhibits	Choptank
8:00am - 10:00am	Session C1 - NNTM	Chesapeake BCD
8:00am - 10:00am	Session C2 - DSDP	Chesapeake EFG
10:00am - 10:20am	BREAK, Posters, Exhibits	Choptank
10:20am - 12:20pm	Session C3 - NNTM	Chesapeake BCD
10:20am - 12:20pm	Session C4 - DSDP	Chesapeake EFG
12:20pm	Free Afternoon	

### Topic Key

ANET	Advanced and Novel Experimental Techniques
DSDP	Detonation and Sub-Detonative Phenomena
MOD	Modeling
MME	Molecular / Mesoscale Effects
NNTM	New / Non-Traditional Materials
TMP	Thermal / Mechanical Properties

## SCHEDULE - Thursday, July 19

7:00pm - 5:00pm	Registration Desk Open	Conference Center Foyer
7:00am - 5:00pm	I.T. Office / Presenter Ready Room	Skipjack
7:00am - 8:00am	Attendee Continental Breakfast, Exhibits	Choptank
8:00am - 9:40am	Session D1 - ANET	Chesapeake BCD
8:00am - 9:40am	Session D2 - TMP	Chesapeake EFG
9:40am - 10:00am	BREAK, Posters, Exhibits	Choptank
10:00am - 12:00pm	Session D3 - ANET	Chesapeake BCD
10:00am - 12:00pm	Session D4 - DSDP	Chesapeake EFG
12:00pm - 1:20pm	LUNCH on your own	
1:20pm - 3:00pm	Session D5 - MOD	Chesapeake BCD
1:20pm - 3:00pm	Session D6 - MME	Chesapeake EFG
3:00pm - 3:20pm	BREAK, Posters, Exhibits	Choptank
3:20pm - 4:40pm	Session D7 - MOD	Chesapeake BCD
3:20pm - 4:40pm	Session D8 - MME	Chesapeake EFG
6:15pm - 9:30pm	Cocktail Reception, Dinner, and Keynote <i>(Attendees must wear their badge. Attendees and guests must have ticket showing entree selection.)</i>	Chesapeake ABCD

## SCHEDULE - Friday, July 20

7:00am - 1:00pm	Registration Desk Open	Conference Center Foyer
7:00am - 1:00pm	I.T. Office / Presenter Ready Room	Skipjack
7:00am - 8:00am	Attendee Continental Breakfast, Exhibits	Choptank
8:00am - 9:40am	Session E1 - MOD	Chesapeake BCD
8:00am - 9:40am	Session E2 - DSDP	Chesapeake EFG
9:40am - 10:00am	BREAK, Posters, Exhibits	Choptank
10:00am - 12:00pm	Session E3 - MOD	Chesapeake BCD
10:00am - 12:00pm	Session E4 - DSDP	Chesapeake EFG
12:00pm	16th International Detonation Symposium Concludes	

### Topic Key

ANET	Advanced and Novel Experimental Techniques
DSDP	Detonation and Sub-Detonative Phenomena
MOD	Modeling
MME	Molecular / Mesoscale Effects
NNTM	New / Non-Traditional Materials
TMP	Thermal / Mechanical Properties

Choptank Ballroom

(GS-I) Monday, July 16 8:00 AM - 9:40 AM

**GENERAL SESSION I**

Co-Chairs:

Brian D. Roos

Army Research Laboratory

Bryce C. Tappan

Los Alamos National Laboratory

**8:00 Introductory Comments**

Joel Carney, Naval Surface Warfare Center  
IHEODTD, Chair, 16th International  
Detonation Symposium Organizing  
Committee

1. **8:20 Predicting the Effects of Density and Microstructure on Shock Initiation of Explosives**  
W. Lee Perry, Los Alamos National  
Laboratory  
*Topic: Molecular and Meso-Scale Effects*
2. **8:40 Ability of Metalized Gelled Nitromethane to Accelerate a Flyer Plate**  
Jason Loiseau, Royal Military College of  
Canada  
*Topic: New / Non-Traditional Materials*
3. **9:00 Ignition and Growth Modeling of the Shock Initiation of the TATB-based Explosives LX-17 and PBX 9502 at Eight Initial Temperatures Spanning a 446K Range**  
Craig M. Tarver, Lawrence Livermore  
National Laboratory  
*Topic: Modeling*
4. **9:20 The Shell Acceleration Experiment (SAX) – A Modern Corner-Turning Experiment**  
Eric V. Bukovsky, Lawrence Livermore  
National Laboratory  
*Topic: Advanced and Novel Experimental  
Techniques*

**9:40 BREAK**

Choptank Ballroom

(GS-II) Monday, July 16 10:00 AM - 12:00 PM

**GENERAL SESSION II**

Co-Chairs:

Larry G. Hill

Los Alamos National Laboratory

Erik T. Wrobel

Army Armament Research, Development  
and Engineering Center

1. **10:00 Sensitivity and Performance Characterization of Insensitive Explosives**  
Richard J. Lee, Naval Surface Warfare Center,  
Indian Head EOD Technology Division  
*Topic: Advanced and Novel Experimental  
Techniques*
2. **10:20 HMX as Villain and Hero**  
Cary B. Skidmore, Los Alamos National  
Laboratory  
*Topic: Detonation and Sub-Detonative  
Phenomena*
3. **10:40 Microstructural Effects on Initiation Threshold Behavior of HMX Based Materials**  
Christopher D. Molek, Air Force Research  
Laboratory/Munitions Directorate/RWME  
*Topic: Molecular and Meso-Scale Effects*
4. **11:00 Gap Test and Critical Diameter Calculations and Correlations**  
Ernest L. Baker, NATO Munitions Safety  
Information Analysis Center  
*Topic: Modeling*
5. **11:20 Mesoscale Modeling of Explosives at Sandia National Laboratories: Past and Future Directions**  
Cole D. Yarrington, Sandia National  
Laboratory  
*Topic: Molecular and Meso-Scale Effects*
6. **11:40 Can the Large-Scale-Gap-Test Mislead Us**  
Douglas E. Kooker, Bennett Aerospace,  
Incorporated  
*Topic: Detonation and Sub-Detonative  
Phenomena*

**12:00 LUNCH**

Choptank Ballroom

Chesapeake Ballrooms EFG

(A1) Monday, July 16 1:00 PM - 3:00 PM

(A2) Monday, July 16 1:00 PM - 3:00 PM

## ADVANCED AND NOVEL EXPERIMENTAL TECHNIQUES

Co-Chairs:

Kevin L. McNesby  
Army Research Laboratory

Karmen Lappo  
Sandia National Laboratories

## DETONATION AND SUB-DETONATIVE PHENOMENA

Co-Chairs:

Leah Tuttle  
Sandia National Laboratories

Suhithi M. Peiris  
Air Force Research Laboratory

1. **1:00 Proton Radiography as a High Explosive Diagnostic Tool**  
Matthew S. Freeman, Los Alamos National Laboratory
2. **1:20 Steel as a Copper Alternative in Large Scale Cylinder Expansion Tests**  
Forrest R. Svingala, Los Alamos National Laboratory
3. **1:40 Time Resolved Small Angle X-ray Scattering Measurements of Carbon Coagulation for Normal and Reflected Wave Detonations**  
Rachel C. Huber, Los Alamos National Laboratory
4. **2:00 Fast and Slow Cook-off Experiments of LX-17 Using Induction and Resistance Heating**  
Evan M. Kahl, Lawrence Livermore National Laboratory
5. **2:20 Compositional One-Dimensional Time to Explosion**  
Greg L. Klunder, Lawrence Livermore National Laboratory
6. **2:40 Extracting Accurate Shock Kinematics from SWIFT Experiments**  
Michael John Murphy, Los Alamos National Laboratory

3:00 BREAK

1. **1:00 Thermal Explosions of LX-17**  
Evan M. Kahl, Lawrence Livermore National Laboratory
2. **1:20 Thermal Safety Characterization of Energetic Materials in the ODTX/P-ODTX System**  
Peter C. Hsu, Lawrence Livermore National Laboratory
3. **1:40 Isothermal and Shock Hugoniot EOSs of TATB: A Combined Experimental and Theoretical Study**  
Joseph M. Zaugg, Lawrence Livermore National Laboratory
4. **2:00 Features of Superdetonation in Liquid Explosives**  
Dana M. Dattelbaum, Los Alamos National Laboratory
5. **2:20 Evolution of HMX Crystallinity During Thermal Decomposition**  
Pamela R. Bowlan, Los Alamos National Laboratory
6. **2:40 Optical Initiation of Energetic Materials**  
Maija M. Kukla, University of Maryland

3:00 BREAK

Choptank Ballroom

(A3) Monday, July 16 3:20 PM - 5:20 PM

## ADVANCED AND NOVEL EXPERIMENTAL TECHNIQUES

Co-Chairs:

Alexandra A. Reinert  
Naval Surface Warfare Center

William Lee Perry  
Los Alamos National Laboratory

1. 3:20 **Ignition and Growth Response via Cutback Testing**  
Erik T. Wrobel, US Army Armament Research, Development, and Engineering Center
2. 3:40 **Characterization of Hypervelocity Fragments and Subsequent HE Initiation**  
Joseph Olles, Sandia National Laboratories
3. 4:00 **Medium-format Shadowgraph and Schlieren Imaging of Explosions Using Pulsed Lasers**  
Kevin L. McNesby, US Army Research Laboratory
4. 4:20 **Optical Temperature Sensors for use in Explosions**  
Hergen Eilers, Washington State University
5. 4:40 **Diverging Spherical Run-Distance to Detonation Characterization**  
Thomas Elia, CEA, DAM
6. 5:00 **Low Impedance Window Characterization for Unreacted Equation of State Measurements in Explosives**  
Paul E. Specht, Sandia National Laboratories

Chesapeake Ballroom EFG

(A4) Monday, July 16 3:20 PM - 5:20 PM

## DETONATION AND SUB-DETONATIVE PHENOMENA

Co-Chairs:

Eric V. Bukovsky  
Lawrence Livermore National Laboratory

Paul E. Anderson  
Army Armament Research, Development  
and Engineering Center

1. 3:20 **Understanding Sub-detonative Burning and Variability in DDT Characteristics for Granular HMX in Polycarbonate Tubes**  
Gary R. Parker, Los Alamos National Laboratory
2. 3:40 **Low Velocity Detonation in Very Non-Ideal Explosives**  
Harold W. Sandusky, Naval Surface Warfare Center Indian Head EODTD
3. 4:00 **Manipulation of Corner-turning Behavior in High Explosives via Additive Manufacturing**  
Alexander H. Mueller, Los Alamos National Laboratory / Explosive Science and Shock Physics/ High Explosive Science and Technology
4. 4:20 **High Pressure Deflagration of Heated LX-17, an Insensitive High Explosive**  
Jon L. Maienschein, MH Chew and Associates
5. 4:40 **A Volumetric Approach to Shock Initiation of PBX9404**  
Mike DW Bowden, Los Alamos National Laboratory
6. 5:00 **Observations of the Mechanism of EBW Detonator Function**  
Laura B. Smilowitz, Los Alamos National Laboratory

Chesapeake Ballroom BCD

(B1) Tuesday, July 17 8:00 AM - 9:40 AM

**MODELING**

Co-Chairs:

Robert J. Dorgan  
Air Force Research LaboratoryCole D. Yarrington  
Sandia National Laboratories

1. **8:00 Corner Turning Modeling of PBX 9502 Snowball Experiments**  
I-Feng W. Kuo, Lawrence Livermore National Laboratory
2. **8:20 Temperature- and Pressure-Dependent Reaction Rates in Nitromethane and PETN from Density Functional Tight Binding Molecular Dynamics**  
Romain Perriot, Los Alamos National Laboratory
3. **8:40 Development of 3D Mesh-free Detonation Front Tracking Capabilities**  
Jin Yao, Lawrence Livermore National Laboratory
4. **9:00 A Numerical Methodology for Simulating Plasma Arc-initiated Detonations**  
Louisa Michael, University of Cambridge
5. **9:20 Validation of the AWSO Reactive Flow Model with PBX 9502 Experiments**  
Matthew A. Price, Los Alamos National Laboratory

9:40 BREAK

Chesapeake Ballroom EFG

(B2) Tuesday, July 17 8:00 AM - 9:40 AM

**THERMAL AND MECHANICAL PROPERTIES**

Co-Chairs:

Marcia A. Cooper  
Sandia National LaboratoriesJacob Dodson  
Air Force Research Laboratory

1. **8:00 Thermal Characteristics of LLM-105 and its Plastic Bonded Formulations**  
Alexander E. Gash, Lawrence Livermore National Laboratory
2. **8:20 Fracture Toughness Measurement of PBX 9502 High Explosive**  
Cheng Liu, Los Alamos National Laboratory
3. **8:40 Mesoscale Mechanics of Energetic Materials: A Coordinated Experiment-theory Effort Using New In Situ Probes**  
David J. Walters, Los Alamos National Laboratory
4. **9:00 Energy Lost to Fragmentation for Various Inert Warhead Casing Materials**  
Nicholas A. Poirier, University of Illinois Urbana-Champaign
5. **9:20 Development of a New Density and Mechanical Mock for HMX**  
John D. Yeager, Los Alamos National Laboratory

9:40 BREAK



Chesapeake Ballroom BCD

(B3) Tuesday, July 17 10:00 AM - 12:00 PM

**MODELING**

Co-Chairs:

Sunil Dwivedi

Naval Surface Warfare Center

Michael L. Hobbs

Sandia National Laboratories

1. **10:00 Thermal Safety Modeling of TATB-based Explosive**  
Jason S. Moore, Lawrence Livermore National Laboratory
2. **10:20 Heated Cyclotol Transport and Ignition Modeling**  
David K. Zerkle, Los Alamos National Laboratory
3. **10:40 Computational Modeling of Detonations in Branching HE Structures for Plane Wave Generator Applications**  
Bradley W. White, Lawrence Livermore National Laboratory
4. **11:00 Numerical Optimization Procedure to Design Specific Effects Explosive Formulations**  
Nicolas Arnaud, ArianeGroup
5. **11:20 Modelling the Threshold Characteristics of Exploding Bridgewire Detonators**  
Rod C. Drake, Atomic Weapons Establishment
6. **11:40 Modeling of Detonation and Desensitization in Condensed Phase Explosives of Complex Geometry**  
Eleftherios Ioannou, University of Cambridge

12:00 LUNCH

Chesapeake Ballroom EFG

(B4) Tuesday, July 17 10:00 AM - 12:00 PM

**THERMAL AND MECHANICAL PROPERTIES**

Co-Chairs:

John D. Corley

Air Force Research Laboratory

Joseph Tringe

Lawrence Livermore National Laboratory

1. **10:00 Safety Assessments of Thermally Damaged Energetic Materials**  
John G. Reynolds, Lawrence Livermore National Laboratory
2. **10:20 The Effect of Density on the Detonation Response of a TATB-Based Explosive**  
Philip Rae, Los Alamos National Laboratory
3. **10:40 Evolved Gas Analysis of the Thermal Decomposition of TATB and TATB Based Plastic Bonded Explosives from the Small to Large Scales**  
Benjamin J. Yancey, Lawrence Livermore National Laboratory
4. **11:00 Mechanical and Thermomechanical Properties of PBX 9502**  
Paul B. Mirkarimi, Lawrence Livermore National Laboratory
5. **11:20 Raman Thermometry of Shocked Explosives**  
Shawn D. McGrane, Los Alamos National Laboratory
6. **11:40 Development of a Small Scale Thermal Violence Test**  
Malcolm David Cook, AWE plc

12:00 LUNCH

Chesapeake Ballroom BCD

(B5) Tuesday, July 17 1:20 PM - 2:40 PM

**MODELING**

Co-Chairs:

John B. Bdzil

Los Alamos National Laboratory

Anne F. Kyner

Naval Surface Warfare Center

1. **1:20 A Mesoscale Study on Explosively Dispersed Granular Materials**  
Huangrui Mo, University of Waterloo
2. **1:40 ALE3D Simulation of Thermal Decomposition and Violence in Slow Cookoff Experiments with LX-17, a TATB-Based Explosive**  
Matthew A. McClelland, Lawrence Livermore National Laboratory
3. **2:00 Mesoscale Simulations of HMX and PETN**  
Thomas L. Jackson, University of Florida
4. **2:20 Implementation of a CREST Multistate Reactive Burn Model in CTH for Two Solid High Explosives**  
David E. Kittell, Sandia National Laboratories

2:40 BREAK

Chesapeake Ballroom EFG

(B6) Tuesday, July 17 1:20 PM - 2:40 PM

**MOLECULAR AND MESCO-SCALE EFFECTS**

Co-Chairs:

Zachary D. Doorenbos

Naval Air Warfare Center Weapons Division

Kyle T. Sullivan

Lawrence Livermore National Laboratory

1. **1:20 Carbon Chemistry and Formation of Hierarchical Nanocarbons Under Extreme Conditions Produced by High Explosive Detonations**  
Millicent A. Firestone, Los Alamos National Laboratory
2. **1:40 Sub Critical Diameter Structural Effects Exploited by Additive Manufacturing of High Explosive Components**  
Alexander H. Mueller, Los Alamos National Laboratory / Explosive Science and Shock Physics/ High Explosive Science and Technology
3. **2:00 Time-resolved X-ray Imaging of Void Collapse in Silicone and TNT**  
Michael R. Armstrong, Lawrence Livermore National Laboratory
4. **2:20 The Influence of Realistic Pore Geometries in Pressed HMX**  
Jesus O. Mares, National Research Council - Air Force Research Laboratory

2:40 BREAK

Chesapeake Ballroom BCD

(B7) Tuesday, July 17 3:00 PM - 5:00 PM

## DETONATION AND SUB-DETONATIVE PHENOMENA / MOLECULAR AND MESO-SCALE EFFECTS

Co-Chairs:

Joel B. Stewart

Army Research Laboratory

Edward D. Cooke

Army Armament Research, Development and Engineering Center

1. **3:00 Determination of Shock-to-Detonation Transitions and Equations of State of Additively Manufactured High Explosive Feedstocks**  
Patrick R. Bowden, Los Alamos National Laboratory
2. **3:20 Ring-up Induced Shock Initiation of a TATB Based Polymer Bonded Explosive with Reactive Burn Modeling**  
Malcolm J. Burns, AWE Plc (seconded to LANL)
3. **3:40 Viscous Heating via Low-Velocity Crushing Impact of High Explosives**  
Matthew D. Holmes, Los Alamos National Laboratory
4. **4:00 A Global Chemical Mechanism of PETN, HMX and TATB: Applications to Detonation**  
Bryan F. Henson, Los Alamos National Laboratory
5. **4:20 Scaling Law for Criticality Conditions in Heterogeneous Energetic Materials under Shock Loading**  
Anas Nassar, The University of Iowa
6. **4:40 HP-HT Structural and Chemical Stability of TKX-50: Molecular Mechanisms**  
Zbigniew A. Dreger, Naval Surface Warfare Center IHEODTD

Chesapeake Ballroom EFG

(B8) Tuesday, July 17 3:00 PM - 5:00 PM

## MOLECULAR AND MESO-SCALE EFFECTS / MODELING

Co-Chairs:

Harry Keo Springer

Lawrence Livermore National Laboratory

Andrew C. Ihnen

Naval Air Warfare Center Weapons Division

1. **3:00 Microscale Electromagnetic (RF) Heating in Polymer Bonded Explosives Based on X-ray Computed Tomography**  
David S. Moore, Los Alamos National Laboratory
2. **3:20 Examining the Effects of Crystal Structure and Bonding on Explosive Impact Sensitivity**  
Virginia W. Manner, Los Alamos National Laboratory
3. **3:40 Connecting Novel Microstructure Characterization Techniques for Pentaerythritol Tetranitrate (PETN) Pellet Aging to Performance**  
Peter A. Schulze, Los Alamos National Laboratory
4. **4:00 Initiation Phenomenology from Hypervelocity to Low Velocity Impacts**  
Werner A. Arnold, MBDA-TDW
5. **4:20 Aluminum Powder Heat and Combustion Modeling Inside The Detonation Products of High Explosives**  
Gérard Baudin, CEA, DAM
6. **4:40 Uncertainty in the Sensitivity Prediction of Porous HMX: Effects of Constitutive and Reactive Models**  
Nirmal Rai, University of Iowa

The Poster Session and Reception will be held Tuesday, July 17 from  
5:00 PM - 9:00 PM in the Choptank Ballroom.

## IN MEMORIAM

### KA-POW!! Highlights from the Scientific Career of William C. "Bill" Davis

Larry G. Hill, Los Alamos National Laboratory

Since the time of our previous (15th) meeting, we, the International Detonation Symposium (IDS) community, lost one of our most colorful, creative, influential, and longest standing contributors: William C. "Bill" Davis. We highlight key aspects of Bill's career—including many of his formative experiences and his most enduring and endearing scientific accomplishments—placing particular emphasis upon his many IDS contributions.

## INVITED POSTER

### Prepare to Board: The Power of Eighteenth Century Naval Grenades

Stephen Lacey, East Carolina University

## ADVANCED AND NOVEL EXPERIMENTAL TECHNIQUES

Co-Chairs

Gerrit T. Sutherland  
Army Research Laboratory

Timothy J. Foley  
Los Alamos National Laboratory

### P-ANET-001

#### Fiber Light Relay System (FLRS) in Non-Ideal Granular Explosives for Shock Front Monitoring

Karmen N. Lappo, Sandia National Laboratories

### P-ANET-005

#### Measuring Detonation Propagation and Run to Detonation Using Embedded Optical Diagnostics

James W. Ferguson, AWE

### P-ANET-002

#### Embedded Fiber Pressure Measurement Diagnostic for Thermal Ignition Experiments in High Explosives

George Rodriguez, Los Alamos National Laboratory

### P-ANET-006

#### Explosive Particle Image Velocimetry

Christopher F. Tilger, Los Alamos National Laboratory

### P-ANET-003

#### Isothermal Equations of State of Polymer Bonded Explosives via Optical-Microscopy-Interferometry (OMI) Measurements

Elissaios Stavrou, Lawrence Livermore National Laboratory

### P-ANET-007

#### Time-resolved Small Angle X-ray Scattering during the Formation of Detonation Nanodiamond

Michael Bagge-Hansen, Lawrence Livermore National Laboratory

### P-ANET-004

#### Relating Quantified Damage due to Periodic Loading with Shock Sensitivity in Energetic Materials

Nick R. Cummock, Purdue University

### P-ANET-008

#### Experimental Study of an Explosively Driven Flat Plate Launcher

Erik H. Haroz, Los Alamos National Laboratory

The Poster Session and Reception will be held Tuesday, July 17 from  
5:00 PM - 9:00 PM in the Choptank Ballroom.

## DETONATION AND SUB-DETONATIVE PHENOMENA

Co-Chairs:

Samuel Park  
Eric Forrest  
Sandia National Laboratories

Chad G. Rumchik  
Air Force Research Laboratory

Kevin S. Vandersall  
Laurence E. Fried  
Benjamin J. Yancey  
Lawrence Livermore National Laboratory

Gary R. Parker  
Los Alamos National Laboratory

**P-DSDP-001**

**Air Gaps in the Cylinder Test**

Lisa M. Lauderbach, Lawrence Livermore  
National Laboratory

**P-DSDP-002**

**Effect of Mechanoactivation on Detonation  
Ability of Mixtures of Ammonium  
Perchlorate with Aluminum**

Aleksandr Yu Dolgoborodov, Joint Institute  
for High Temperatures of Russian Academy  
of Sciences (JIHT)

**P-DSDP-003**

**Modeling Shock Sensitivity of Explosive  
PBXN-109**

Douglas E. Kooker, Bennett Aerospace,  
Incorporated

**P-DSDP-004**

**Cyclotol Detonation Performance as a  
Function of Scale and Geometry**

Eric K. Anderson, Los Alamos National  
Laboratory

**P-DSDP-005**

**Detonation of Highly Porous Explosives**

Ivan A. Rubtsov, Lavrentyev Institute of  
Hydrodynamics SB RAS

**P-DSDP-006**

**Carbon Condensation during Detonation  
of High Explosives of Various Diameters**

Ivan A. Rubtsov, Lavrentyev Institute of  
Hydrodynamics SB RAS

**P-DSDP-007**

**Multi-Shock Experiments on the TATB  
Based Explosive PBX 9502 and the HMX  
Based Explosive PBX 9501**

Richard L. Gustavsen, Los Alamos National  
Laboratory

**P-DSDP-009**

**Convective Burning in Confined Explosive  
Cracks of HMX-based PBX under Non-  
shock Initiation**

Haibo Hu, Laboratory for Shock Wave and  
Detonation Physics, Institute of Fluid Physics,  
CAEP

**P-DSDP-010**

**The Required Margin for the Reliable  
Functioning of Exploding Foil Initiator  
Detonators**

Elizabeth A. Lee, AWE Plc

**P-DSDP-011**

**Condensation of Carbon During the  
Detonation of Condensed Explosives Using  
Two Methods of Analysis - The Method  
of Labeled Atoms and the Method of  
Electrical Conductivity - is Considered**

Alexey O. Kashkarov, Lavrentyev Institute of  
Hydrodynamics of SB RAS

**P-DSDP-012**

**Chemical Reaction Zone of TATB based PBX**  
Yong Han, Institute of Chemical Materials,  
CAEP

The Poster Session and Reception will be held Tuesday, July 17 from  
5:00 PM - 9:00 PM in the Choptank Ballroom.

## DETONATION AND SUB-DETONATIVE PHENOMENA - CONTINUED

### P-DSDP-013

**Reaction Build-up of TATB-based Explosive JB-9014 under Different Initiation Pressures**

Xu Zhang, Institute of Fluid Physics, China Academy of Engineering Physics

### P-DSDP-022

**Computer Simulations to Study the Post-ignition Violence of HMX Explosives in the Steven Test**

Bradley W. White, Lawrence Livermore National Laboratory

### P-DSDP-016

**Ultrafast Mid-Infrared Spectroscopy on Shocked Thin Film Explosive Crystals**

Michael S. Powell, Purdue University/Los Alamos National Laboratory

### P-DSDP-023

**Arrhenius Reactive Burn Model Calibration for Hexanitrostilbene (HNS)**

Graham D. Kosiba, Lawrence Livermore National Laboratory

### P-DSDP-018

**Conversion of Size-Effect Curves to Detonation Velocity Versus Curvature Relationships using Particle Swarm Optimisation**

Alexander N. Hodgson, AWE Plc

### P-DSDP-024

**Design Considerations and Test Results for PBX 9502 in Large Scale, Overly Confined DDT Tubes**

Ian D. Lopez-Pulliam, Los Alamos National Laboratory

### P-DSDP-019

**Experimental Determination of Chapman-Jouguet Pressure Using Disc Acceleration eXperiment (DAX) Data**

Marcos Chaos, Lawrence Livermore National Laboratory

### P-DSDP-025

**Pressure Amplification Off High Impedance Barriers in DDT**

Eric M. Heatwole, Los Alamos National Laboratory

### P-DSDP-020

**Explosively Generated Plasma Interaction with Confined Explosives**

Daniel E. McCarthy, Naval Surface Warfare Center, Indian Head EOD Technology Division

### P-DSDP-026

**Investigation of Simple and New Experimental Method on Shock to Detonation Transition Process**

Shiro Kubota, National Institute of Advanced Industrial Science and Technology

### P-DSDP-021

**Dynamic Measurements of Solid Carbon Cluster Growth and Morphology in High Explosive Detonation Products**

Erik B. Watkins, Los Alamos National Laboratory

### P-DSDP-027

**Failure Cone Test in TATB-base High-explosive**

Remy Sorin, CEA

The Poster Session and Reception will be held Tuesday, July 17 from  
5:00 PM - 9:00 PM in the Choptank Ballroom.

## DETONATION AND SUB-DETONATIVE PHENOMENA - CONTINUED

## MOLECULAR AND MESO-SCALE EFFECTS

P-DSDP-028

**Parameterization of a Cookoff Model for  
LX-07**

Cuauhtemoc Aviles-Ramos, Los Alamos  
National Laboratory

Co-Chairs:

John K. Brennan  
U.S. Army Research Laboratory

Dana M. Dattelbaum  
Los Alamos National Laboratory

P-DSDP-029

**Multiscale Modeling of Shock-to-  
Detonation Transition of Pressed Energetic  
Materials**

Oishik Sen, University of Iowa

P-MME-002

**Aging of RDX Crystal Qualities  
Investigated by Means of X-ray Diffraction  
Rocking Curves**

Michael J. Herrmann, Fraunhofer ICT

P-DSDP-030

**Ceria as a Catalyst for Explosive Energy  
Release**

David K. Amondson, University of Illinois  
Urbana Champaign

P-MME-003

**Developing Accurate Semi-Empirical  
Quantum Models for CNHO Chemistry at  
Detonation Conditions**

Matthew P. Kroonblawd, Lawrence Livermore  
National Laboratory

P-MME-004

**Adhesion Controlled by Crystal Surface  
Roughness and the Creep Properties of  
LX07 Explosive**

Amir Weitz, RAFAEL

P-MME-005

**A Chemometric Approach in Correlating  
Critical Physical Property Metrics to  
Explosives Performance**

Josh M. Ottaway, Lawrence Livermore  
National Laboratory

P-MME-006

**Microstructural Response of HE Crystals  
Subjected to Nonhydrostatic Loading in  
DAC Experiments**

Zbigniew A. Dreger, Naval Surface Warfare  
Center IHEODTD

The Poster Session and Reception will be held Tuesday, July 17 from  
5:00 PM - 9:00 PM in the Choptank Ballroom.

## MODELING

Co-Chairs:  
Joseph P. Hooper  
Naval Postgraduate School

Sorin Bastea  
Lawrence Livermore National Laboratory

### P-MOD-001

**Mesoscale Numerical Analysis of Thermal–mechanical–chemical Responses of Polymer-bonded Explosives under Impact Loading**  
Xinjie Wang, Beijing Institute of Technology

### P-MOD-003

**Cluster Evolution during the Early Stages of Heated and Shocked Explosives**  
Yushi Wen, China Institute of Chemical Materials, CAEP

### P-MOD-004

**Modeling the Response of a Plastic Bonded Explosive to Complex Shock Stimuli using the Extended History Variable Reactive Burn Model**  
John Starckenberg, Survice Engineering Company

### P-MOD-005

**Effects of Crystal Morphology on Impact Sensitivity of LLM-105 Based Explosives**  
Xinjie Wang, Beijing Institute of Technology

### P-MOD-011

**PX-80 Shock Initiation Characteristics Based on Large Scale Gap Test (LSGT) Experimental Setup**  
Valentin Ognev, Rafael

## NEW / NON-TRADITIONAL MATERIALS

Co-Chairs:  
Jonathan T. Essel  
Naval Air Warfare Center Weapons Division

Bryce C. Tappan  
Los Alamos National Laboratory

### P-NNTM-001

**Structural Analyses of Detonation Nanodiamonds and their Correlations with Impurities**  
Chi-Chin Wu, US Army Research Laboratory

### P-NNTM-003

**Glassy Organic Energetics**  
Rajen B. Patel, US Army Armament Research, Development, and Engineering Center

### P-NNTM-006

**Detonation Performance Characterization of Energetic Cocrystals**  
Vasant S. Vuppuluri, Purdue University

### P-NNTM-007

**Parameters of Detonation of Nano-dispersed Low-density High Explosives Based on PETN, RDX, and HMX**  
Konstantin A. Ten, Lavrentyev Institute of Hydrodynamic



The Poster Session and Reception will be held Tuesday, July 17 from  
5:00 PM - 9:00 PM in the Choptank Ballroom.

## THERMAL AND MECHANICAL PROPERTIES

Co-Chairs:

Laura B. Smilowitz  
Los Alamos National Laboratory

Alexander E. Gash  
Lawrence Livermore National Laboratory

### P-TMP-001

**Wider Strain-rate Dependent Damage Constitutive Model for PBX Explosive and its Application in Penetrating Concrete Target Simulations**  
Yanqing Wu, Beijing Institute of Technology

### P-TMP-006

**Magnitude of Response to Frictional Ignition by Oblique Impact of High Explosives Formulations**  
Robert M. Broilo, Los Alamos National Laboratory

### P-TMP-002

**Direct Observation of Thin Layers of Pure Energetic Materials when Heated to Elevated Temperatures Under Confinement**  
Andrew David Wood, Syanco Ltd

### P-TMP-007

**Determination of Spall Strength in Pressed Energetics**  
Jacob C. Dodson, Air Force Research Laboratory, Munitions Directorate, Fuzes Branch

### P-TMP-003

**The Response of Energetic Materials in the First 50 Picoseconds Following Thermal Excitation**  
Nhan C. Dang, U.S. Army Research Laboratory

### P-TMP-008

**PBX 9502 Gas Generation Throughout Long-Duration Thermal Exposure and Cookoff**  
Michael A. Englert-Erickson, Los Alamos National Laboratory

### P-TMP-004

**A Constitutive Model for Polymer Bonded Explosives under Confining Pressures**  
Qiang Wei, Institute of Systems Engineering, China Academy of Engineering

### P-TMP-005

**Viscoelastic-Viscoplastic Material Model for PBX**  
Roman Kositski, Rafael Ltd.

Chesapeake Ballroom BCD

(C1) Wednesday, July 18 8:00 AM - 10:00 AM

**NEW / NON-TRADITIONAL  
MATERIALS**

Co-Chairs:

Jonathan M. Zucker  
Los Alamos National Laboratory

Rajen B. Patel

Army Armament Research, Development  
and Engineering Center

1. **8:00 Comprehensive Approach to Design High Explosives**  
Roman Tsyshevskiy, University of Maryland  
College Park
2. **8:20 Development of Reactive Fragments**  
Jack RH Mellor, MBDA UK Ltd
3. **8:40 Additive Manufacturing of Thermites –  
Reaction Mechanisms, Formulations, and  
On-the-fly Mixing**  
Kyle T. Sullivan, Lawrence Livermore  
National Laboratory
4. **9:00 Nanostructured Composites of Explosives  
and Single-Walled Carbon Nanotubes**  
Alexey O. Kashkarov, Lavrentyev Institute of  
Hydrodynamics of SB RAS
5. **9:20 Impact Fragmentation of Reactive  
Materials**  
Joseph P. Hooper, Naval Postgraduate School
6. **9:40 A Large Scale Study of Blast Effects from  
a Structural Reactive Material Solid under  
Explosive Loading**  
Fan Zhang, Defence Research and  
Development Canada / University of  
Waterloo

**10:00 BREAK**

Chesapeake Ballroom EFG

(C2) Wednesday, July 18 8:00 AM - 10:00 AM

**DETONATION AND  
SUB-DETONATIVE PHENOMENA**

Co-Chairs:

Richard L. Gustavsen  
Los Alamos National Laboratory

Michaela Fasano

Naval Surface Warfare Center

1. **8:00 Detonation Behavior in Vapor-deposited  
3,4-bis(4-nitro-1,2,5-oxadiazol-3-yl)-1,2,5-  
oxadiazole 2-oxide (BNFF)**  
Alexander S. Tappan, Sandia National  
Laboratories
  2. **8:20 The Loss of Detonation Confinement: The  
Evolution from a 1D to a 2D Detonation  
Reaction Zone**  
John B. Bdzil, Los Alamos National  
Laboratory
  3. **8:40 Shock Initiation Sensitivities of Cast TNT-  
based Explosives: Cyclotol and Octol**  
Dana M. Dattelbaum, Los Alamos National  
Laboratory
  4. **9:00 The Los Alamos Enhanced Corner Turning  
(ECOT) Test**  
Larry G. Hill, Los Alamos National  
Laboratory
  5. **9:20 Temperature Measurement of a Shocked  
TATB-based Explosive using Raman  
Spectroscopy**  
Philippe A. Hébert, CEA
  6. **9:40 Shock-induced Ultrafast Reactions in  
Pentaerythritol Tetranitrate (PETN) Thin  
Films**  
Samuel Park, Sandia National Laboratories
- 10:00 BREAK**

Chesapeake Ballroom BCD

(C3) Wednesday, July 18 10:20 AM - 12:20 PM

**NEW / NON-TRADITIONAL  
MATERIALS**

Co-Chairs:

Robert Knepper  
Sandia National LaboratoriesAlfred G. Stern  
Naval Surface Warfare Center

1. **10:20 Properties of Explosives Charges Based on TKX-50**  
Peter Gerber, Fraunhofer ICT
2. **10:40 Detonation and Metal Acceleration of Aluminum-Water Mixtures**  
Jason Loiseau, Royal Military College of Canada
3. **11:00 Blast Testing and Analysis of Cast-cured Explosives**  
Edward D. Cooke, US Army Armament Research, Development, and Engineering Center
4. **11:20 Microwave Ignition of Thermites**  
Amanda L. Duque, Los Alamos National Laboratory
5. **11:40 Synthesis of Novel Energetic Materials**  
Leah A. Wingard, Army Research Laboratory
6. **12:00 Laser Initiation of Photothermally Active Metal-Ligand Charge Transfer (MLCT) Complexes for Detonator Applications**  
Kathryn E. Brown, Los Alamos National Laboratory

Chesapeake Ballroom EFG

(C4) Wednesday, July 18 10:20 AM - 12:20 PM

**DETONATION AND  
SUB-DETONATIVE PHENOMENA**

Co-Chairs:

Douglas E. Kooker  
Bennett Aerospace, IncorporatedJoseph D. Olles  
Sandia National Laboratories

1. **10:20 Diameter Effect Observations in Pressed HMX-Aluminum Explosive Formulations**  
Bryce C. Tappan, Los Alamos National Laboratory / High Explosive Science and Technology
2. **10:40 Double-Shock Initiation of a TATB Based Explosive: Influence of Preshock Pressure and Duration on the Desensitization Effect**  
Arnaud Sollier, CEA
3. **11:00 Detonation Thermochemistry: From Equation of State to Kinetic Modeling**  
Sorin Bastea, Lawrence Livermore National Laboratory
4. **11:20 Laser-Driven Flyers for Shock Initiation in PBX materials: Observation of Hot Spots**  
Will P. Bassett, Lawrence Livermore National Laboratory
5. **11:40 Modeling of Condensed Phase Explosives with a Temperature Dependent Rate Law**  
Simon D. Wilkinson, University of Cambridge
6. **12:00 Characterisation of Stress-Waves Formed by Exploding Bridgewires in Porous and Condensed Media Applied to the Shock-to-Detonation Theory**  
William D. Neal, AWE

Chesapeake Ballroom BCD

(D1) Thursday, July 19 8:00 AM - 9:40 AM

## ADVANCED AND NOVEL EXPERIMENTAL TECHNIQUES

Co-Chairs:

Jacob Dodson

Air Force Research Laboratory

Zbigniew A. Dreger

Naval Surface Warfare Center

1. **8:00 CT Scan Characterization of Thermally Damaged Energetic Materials**  
William W. Erikson, Sandia National Laboratories
2. **8:20 A Vision for Future Energetic Materials Experiments at X-Ray Light Sources: Requirements for the Matter-Radiation Interactions in Extremes (MaRIE) Project**  
Cris W. Barnes, Los Alamos National Laboratory
3. **8:40 High Speed Temperature Measurement in Explosive Fireballs Using Tunable Diode Laser Absorption Spectroscopy**  
Christopher M. Murzyn, University of Illinois at Urbana-Champaign
4. **9:00 The Explosive Skeleton Key: Using Multiple Wave Interactions as an Initiation Tool**  
Elizabeth G. Francois, Los Alamos National Laboratory
5. **9:20 Quantitative Investigation of Fracture Process in Brittle/Quasi-Brittle Solids**  
Cheng Liu, Los Alamos National Laboratory

9:40 BREAK

Chesapeake Ballroom EFG

(D2) Thursday, July 19 8:00 AM - 9:40 AM

## THERMAL AND MECHANICAL PROPERTIES

Co-Chairs:

Bryan F. Henson

Los Alamos National Laboratory

Vasant S. Joshi

Naval Surface Warfare Center

1. **8:00 Evaluating the Ignitibility of PETN and PETN Formulations by Aged Slappers**  
William L. Shaw, Lawrence Livermore National Laboratory
2. **8:20 Mutiphysics Modeling of Density Shift and Decomposition Response to Thermal Insult in Plastic Bonded Explosive Formulation PBX 9502**  
Genevieve L. Watt, Los Alamos National Laboratory
3. **8:40 USANS and SANS Studies of Artificially Aged PETN**  
Joseph T. Mang, Los Alamos National Laboratory
4. **9:00 In-Situ SANS and USANS Measurements of Thermally Elevated TATB and PBX 9502**  
Christopher L. Armstrong, Los Alamos National Laboratory
5. **9:20 Analysis of the Kinetics of Crystallization and Melting of Different Lots of TNT and Tritonal**  
Benjamin J. Yancey, Lawrence Livermore National Laboratory

9:40 BREAK

Chesapeake Ballroom BCD

(D3) Thursday, July 19 10:00 AM - 12:00 PM

## ADVANCED AND NOVEL EXPERIMENTAL TECHNIQUES

Co-Chairs:  
Samuel B. Emery  
Naval Surface Warfare Center

John Korbin  
Sandia National Laboratories

1. **10:00 Dynamic Exploding Foil Initiator Imaging at the Advanced Photon Source**  
Nate J. Sanchez, Los Alamos National Laboratory
2. **10:20 Development of Low Explosive Mass Plane Wave Generators for Explosively Driven Flyer Experiments**  
Robert V. Reeves, Lawrence Livermore National Laboratory
3. **10:40 Simulation and Analysis of Smaller-Scale Explosive Experiments**  
Gerrit T. Sutherland, US Army Research Laboratory
4. **11:00 Shear Ignition Experiments of a Plastic Bonded Explosive under Long Duration Impact Conditions**  
Tao Li, Laboratory for Shock Wave and Detonation Physics, Institute of Fluid Physics, CAEP
5. **11:20 The High Explosive Survivability Test**  
Adam J. Wilkins, Air Force Research Laboratory - Munitions Directorate - Energetic Materials Branch
6. **11:40 Simultaneous Shock and Particle Velocities Measurement using a Single Microwave Interferometer on Pressed TATB Composition T2 submitted to Plate Impact**  
Alexandre S. Lefrançois, CEA, DAM

12:00 LUNCH

Chesapeake Ballroom EFG

(D4) Thursday, July 19 10:00 AM - 12:00 PM

## DETONATION AND SUB-DETONATIVE PHENOMENA

Co-Chairs:  
Peter M. Dickson  
Los Alamos National Laboratory

Gerardo I. Pangilinan  
Naval Surface Warfare Center

1. **10:00 Effects of Confinement on Detonation Behavior of Vapor-deposited Hexanitrostilbene (HNS) Films**  
Robert Knepper, Sandia National Laboratories
2. **10:20 Quantitative Details of Exploding Wires with Application to Single Pore Collapse Validation**  
Joseph Olles, Sandia National Laboratories
3. **10:40 Effect of Microscale Defects on Shock and Detonation Propagation in Pentaerythritol Tetranitrate (PETN) Films**  
Eric C. Forrest, Sandia National Laboratories
4. **11:00 Insensitive High Explosive Shock-to-Detonation Transition Criteria**  
Micha Gresshoff, Lawrence Livermore National Laboratory
5. **11:20 Progress in Understanding Chemical Reaction Rates and Equations of State in the Non-Equilibrium Zeldovich-von Neumann-Doring (NEZND) Model of Detonation**  
Craig M. Tarver, Lawrence Livermore National Laboratory
6. **11:40 Shock-induced Collapse of Multiple Cavities in Liquid Nitromethane**  
Jason Loiseau, Royal Military College of Canada

12:00 LUNCH

Chesapeake Ballroom BCD

(D5) Thursday, July 19 1:20 PM - 3:00 PM

**MODELING**

Co-Chairs:

Philip Rae

Los Alamos National Laboratory

Bradley W. White

Lawrence Livermore National Laboratory

1. **1:20 Reactive Burn Model Parameterizations to Predict Ignition Response to Shaped Charge Jets**  
Robert J. Dorgan, Air Force Research Laboratory/Munitions Directorate
2. **1:40 On the Development of a Phenomenological, Macro-scale Composite Reactive Flow Model for Multicomponent Explosive Formulations**  
Sunhee Yoo, Torch Technologies
3. **2:00 Temperature Dependent Reactive Flow Model for a Porous Explosive**  
Yehuda Partom, Retired from RAFAEL
4. **2:20 A Phonon Boltzmann Study of Microscale Thermal Transport in  $\alpha$ -RDX Cook-Off**  
Peter W. Chung, Department of Mechanical Engineering, University of Maryland
5. **2:40 Shock-induced Chemical Reactivity in CO on Picosecond Time Scales**  
Michael R. Armstrong, Lawrence Livermore National Laboratory

**3:00 BREAK**

Chesapeake Ballroom EFG

(D6) Thursday, July 19 1:20 PM - 3:00 PM

**MOLECULAR AND MESO-SCALE EFFECTS**

Co-Chairs:

Christopher D. Molek

Air Force Research Laboratory

Leanna M. Minier

Sandia National Laboratories

1. **1:20 Influence of Chemistry in HMX-based PBX Initiation**  
Christopher M. Miller, Georgia Institute of Technology
2. **1:40 High-Pressure Characterization of a Melt Castable Bisoxazole Energetic**  
Jonathan C. Bennion, US Army Research Laboratory
3. **2:00 Considerations for Ultrafast Spectroscopy on Shocked Explosives: Preliminary Investigations into using the Explosive as Impactor**  
Kathryn E. Brown, Los Alamos National Laboratory
4. **2:20 Computational and Experimental Study of TATB Shock Initiation at the Grain Scale**  
Joseph M. Zaug, Lawrence Livermore National Laboratory
5. **2:40 Modeling the Effects of Microstructure and Chemical Kinetics on the Short Pulse Shock Initiation Behavior of HMX-Based Explosives**  
H. Keo Springer, Lawrence Livermore National Laboratory

**3:00 BREAK**

Chesapeake Ballroom BCD

(D7) Thursday, July 19 3:20 PM - 4:40 PM

**MODELING**

Co-Chairs:

David Kittell

Sandia National Laboratories

Svjetlana Stekovic

University of Illinois Urbana-Champaign

1. **3:20 Understanding the Role of Microstructure in Energetic Material Composites Using Coarse-Grain Modeling and Simulation**  
John K. Brennan, U.S. Army Research Laboratory
2. **3:40 Ignition and Growth Modelling of RS-RDX Based Explosive ARX-2014**  
Jing-Ping Lu, Defence Science & Technology Group
3. **4:00 Reactive Burn Modelling of Experiments to Study the Transverse Initiation Behaviour of the TATB-Based Explosive PBX 9502**  
Nicholas John Whitworth, AWE
4. **4:20 Reactive Flow Modeling of Small Scale Corner Turning Experiments**  
I-Feng W. Kuo, Lawrence Livermore National Laboratory

Chesapeake Ballroom EFG

(D8) Thursday, July 19 3:20 PM - 4:40 PM

**MOLECULAR AND MESO-SCALE EFFECTS**

Co-Chairs:

William W. Erikson

Sandia National Laboratories

Michael Bagge-Hansen

Lawrence Livermore National Laboratory

1. **3:20 Multiscale Modeling of Frictional Hotspot Generation in Energetic Materials**  
Grant D. Smith, Wasatch Molecular
2. **3:40 Reaction Dynamics in RDX at GPa Pressures**  
Igor V. Schweigert, Naval Research Laboratory
3. **4:00 Effect of Void Morphological and Spatial Features on the Sensitivity of HMX**  
Sidhartha Roy, University of Iowa
4. **4:20 The Use of Detailed Kinetic Models in the Shock to Detonation Transition Field: Review and Validation Proposal**  
Vincent Chuzeville, Commissariat à l'Énergie Atomique et aux Énergies Alternatives

## COCKTAIL RECEPTION, DINNER, AND KEYNOTE PRESENTATION

**Cocktail Reception from 6:15 p.m. - 6:45 p.m.**

**Dinner begins at 6:45 p.m.**

**Location: Chesapeake ABCD**

*Attendees must wear their badge and have their ticket showing their entree selection.*

*Guests must have their ticket showing their entree selection.*

### **Keynote Presentation**

***“You’re Either an Expert or You’re Dead:” Col. Thomas J. Kane’s  
75-Year Legacy for U.S. Army Explosive Ordnance Disposal***

Just over seventy-five years ago, Col. Thomas J. Kane and a small group of U.S. ordnance soldiers visited the war-torn United Kingdom. Training under the Royal Engineers, they became qualified bomb disposal technicians and returned to the United States. Kane and his cadre would supervise the U.S. Army’s very first ordnance disposal school at Aberdeen Proving Ground, Maryland. From these obscure roots, the U.S. Army bomb disposal branch has grown into a mainstay of today’s EOD community. But fewer people are aware of their unique contributions to Allied victory and their noble battlefield sacrifices.

Dr. Jeffrey M. Leatherwood is a published author, best known for *Nine From Aberdeen*, the first academic history of the origins of U.S. Army EOD in World War II. In 2009, he received his doctorate in Modern U.S. and World History from West Virginia University. Leatherwood has served as keynote speaker for the National EOD Association and he delivered the 2013 dedication address for Kane Hall at Fort Campbell, Kentucky. He is also a U.S. Army veteran who served one term in the Field Artillery. Leatherwood now serves as Associate Professor of History for American Military University and teaches part-time for the University of South Carolina.



Chesapeake Ballroom BCD

Chesapeake Ballroom EFG

(E1) Friday, July 20 8:00 AM - 9:40 AM

(E2) Friday, July 20 8:00 AM - 9:40 AM

**MODELING**

Co-Chairs:

Eric Brown

Los Alamos National Laboratory

Sean P. Maharrey

Naval Surface Warfare Center

**DETONATION AND  
SUB-DETONATIVE PHENOMENA**

Co-Chairs:

Joshua E. Felts

Naval Surface Warfare Center

William L. Shaw

Lawrence Livermore National Laboratory

**1. 8:00 Validation of the SURF Implementation in FLAG with the LANL Gapstick Experiment**  
Carl E. Johnson, Los Alamos National Laboratory

**2. 8:20 Machine Learning of Energetic Material Properties**  
Brian C. Barnes, US Army Research Laboratory

**3. 8:40 Numerical Modeling Comparing Slab to Cylinder Test Expansion Geometries for PBX 9501**  
Marvin A. Zocher, Los Alamos National Laboratory

**4. 9:00 Validation of a PETN Equation of State using Optically Diagnosed Explosively Driven Flying Plates**  
Matthew P. Maisey, AWE Plc

**5. 9:20 High Explosive Shock Initiation Model Based on Hot Spot Temperature**  
Laurence E. Fried, Lawrence Livermore National Laboratory

**9:40 BREAK**

**1. 8:00 Effect of Pressure Pulse Duration and Lateral Distribution on Fragment Impact Initiation of High Explosives**  
Magnus Bergh, Swedish Defence Research Agency

**2. 8:20 Explosive Desensitization in Multi-Dimensional Scenarios**  
Leah W. Tuttle, Sandia National Laboratories

**3. 8:40 Effects of TATB Texture and Ratchet Growth on PBX 9502 Corner Turning**  
Darla G. Thompson, Los Alamos National Laboratory

**4. 9:00 Detonation Corner Turning, Dead Zones and Detonation Extinction**  
Caroline A. Handley, AWE

**5. 9:20 Microclad Parameter Study for the Initiation of PETN**  
Matthew M. Biss, Los Alamos National Laboratory

**9:40 BREAK**

Chesapeake Ballroom BCD

(E3) Friday, July 20 10:00 AM - 12:00 PM

## MODELING

Co-Chairs:

Craig M. Tarver

Lawrence Livermore National Laboratory

Igor V. Schweigert

Naval Research Laboratory

1. **10:00 A Selection Rule for Flyer Plate and a Generalized Measure of Shock Sensitivity**  
Yasuyuki Horie, University of Dayton  
Research Institute
  2. **10:20 Modeling Multi-Shock Scenarios with XHVRB**  
Leah W. Tuttle, Sandia National Laboratories
  3. **10:40 Toward a Morphology Aware Detonation Model**  
Albert L. Nichols, Lawrence Livermore  
National Laboratory
  4. **11:00 Shock Initiation Response of PBX 9502 Considering Rarefaction Wave Effects**  
Brad E. Clements, Los Alamos National  
Laboratory
  5. **11:20 Hydrodynamics of Pyrotechnic Explosions**  
Allen L. Kuhl, Lawrence Livermore National  
Laboratory
- 11:40 CONFERENCE WRAP UP**  
Joel Carney and Chad Stoltz, Naval Surface  
Warfare Center

Chesapeake Ballroom EFG

(E4) Friday, July 20 10:00 AM - 12:00 PM

## DETONATION AND SUB-DETONATIVE PHENOMENA

Co-Chairs:

Eric J. Welle

Air Force Research Laboratory

Robert V. Reeves

Lawrence Livermore National Laboratory

1. **10:00 JCZS3--An Improved Database for EOS Calculations**  
Michael L. Hobbs, Sandia National  
Laboratories
  2. **10:20 The Transverse Radial Initiation Dynamics of PBX 9502**  
Terry R. Salyer, Los Alamos National  
Laboratory
  3. **10:40 Complete Mie-Grüneisen Equation of State for Several Explosives and Universal Unreacted Hugoniot Relations**  
Vincent Chuzeville, Commissariat à l'Énergie  
Atomique et aux Énergies Alternatives
  4. **11:00 Deflagration To Detonation During Impact Type Accidents**  
Malcolm David Cook, AWE plc
  5. **11:20 Optimum Non-Equilibrium Carbon Phase Relationships for Detonation Calculations**  
Leonard I. Stiel, L.I. STIEL, Chemical  
Engineer
- 11:40 CONFERENCE WRAP UP**  
Joel Carney and Chad Stoltz, Naval Surface  
Warfare Center