Monday, July 29, 2019

5 - 6:30 PM  Early Bird Registration
   Hyatt Regency Monterey Hotel and Spa in Monterey

Tuesday, July 30, 2019

7:30 AM  Registration and Security Check-in
   Naval Postgraduate School, Glasgow Hall Courtyard

8:00 AM  Introductory Remarks:
   Meeting Co-Chairs:
   James Miller, Dynetics, Huntsville, AL
   Robert D. Ciccarelli, DE Technologies, Inc., King of Prussia, PA

8:15 AM  Invited Presentation
   DoD (TBD)

<table>
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<tr>
<th>Session I: Penetration Mechanics</th>
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<td>Session Chair: TBD</td>
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9:00 AM  Session Introduction

9:05 AM  Penetration-Efficient Composite Kinetic Energy Penetrators
   • Brett Sorensen (U.S. Army Research Laboratory APG, MD)
   • Lee Magness and
   • Timothy Cler

9:25 AM  Terminal Effects of a Non-Traditional Hypervelocity Naval Strike Weapon
   • David West (Naval Post Graduate School, Monterey, CA)
   • Joseph Hooper

9:45 AM  Measuring the Effect of Nose Shape on Penetrator Performance - New Test Data and Scalable Penetration Trends
   • Nicolas Jarrett (Applied Research Associates, Albuquerque, NM)
   • Alma Oliphant,
   • Craig Doolittle, and
   • Bryan Norris

10:05 AM  Use of Finite Element Analysis in the Simulation of Small-Caliber Ammunition Impact Resulting in Fragmentation of Copper Jackets
   • Mark Minisi (US Army RDECOM-ARDEC, Picatinny, NJ)
   • Raymond Chaplain,
   • Ken Hohnecker and
   • Michael Cataldi

10:25 AM  Coffee Break
Session II: Warhead Technology – Shaped Charge and EFP
Session Chairs: TBD

10:45 AM  Session Introduction

10:50 AM  Warhead Performance of Army Missile Systems against Armored Targets
- Scott Hill (Practical Energetics Research, Inc., Huntsville, AL)
- Darin Kielsmeier,
- Rebecca Turner and
- Kim Williams

11:10 AM  Further Development of Tandem Warheads for a Multipurpose Shoulder Launched Missile System
- Daniel Suarez (US Army RDECOM-ARDEC, Picatinny, NJ)
- David Pfau,
- Jack Pincay,,
- Greg Stunzenas, et al.

11:30 AM  Javelin Form Factor Compact Shaped Charge
- Erik Goetzke (Northrop Grumman IS, Plymouth, MN)
- Nick Peterson,
- Justin Sweitzer and
- Nausheen Alshehab

11:50 AM  Developing a Symmetric Radially Firing Warhead with Multimode Effects
- Brian Pavlovic (US Army RDECOM-ARDEC, Picatinny, NJ)
- Yinhua Wu, and
- Peter Rottinger

12:10 PM  Lunch
Hermann Hall Ballroom

1:10 PM  Session II (continued)

1:15 PM  Long Standoff Jet Performance for Shaped Charges of Interest
- Richard Mudd (U.S. Army Research Laboratory APG, MD)
- Steven Boyer

1:35 PM  Planar Shaped Charge Jets
- Geremy Kleiser (US Air Force Research Laboratory, Eglin AFB, FL)
- David Lambert

1:55 PM  Evaluation of a 2.75" Diameter High-Explosive Anti-Tank (HEAT) Tandem Shaped Charge Warhead Design Concept with Anti-Personnel Anti-Armor (APAM) Capabilities
- Edward Lustig (NSWC Indian Head Explosive Ordnance Disposal Technology Division, Indian Head, MD)
- Jonathan Millan
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<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>2:15 PM</td>
<td>Session Introduction</td>
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| 2:20 PM| Sensitivity of Shaped-Charge Warhead Performance to Variation in Explosive Characteristics  
- Brian Doyal (General Dynamics Ordnance and Tactical Systems, Niceville, FL)  
- Michael Steinberg and  
- Jamie Neidert |
| 2:40 PM| Future MIL-STD-1316 Compliant CL-20 Based Initiation Formulations using Coupled Microstructure, Initiation and Spall Characteristics  
- Eric Welle (US Air Force Research Laboratory, Eglin AFB, FL)  
- Jonathan Essel  
- Knepper  
- Dodson |
| 3:00 PM| The Additive Manufacturing of 20 mm Electric Actuated Gun Primers through the DAPR DAN Project with Reactive Nanocomposite Inks  
- Jonathan Essel (Naval Air Warfare Center, China Lake, CA)  
- Zachary Doorenbos,  
- Matthew Kubik and  
- Alicia Hughes |
| 3:20 PM| Coffee Break  
Glasgow Hall Courtyard |
| 3:40 PM| Review of Agent Defeat Weapons Testing, Targets and Phenomenology  
- James Black (DTRA RD-CXW, Eglin AFB, FL) |
| 4:00 PM| Parameter Design Study of an Explosively Driven Gun Using CTH and DAKOTA  
- Nathan Reichenbach (U.S. Army Research Laboratory APG, MD)  
- Paul Conroy,  
- Richard Summers and  
- Joseph Koby |
| 4:20 PM| Coupled Modeling, Simulation and Experimentation Based Design of an Explosive Train  
- Eric Welle (US Air Force Research Laboratory, Eglin AFB, FL)  
- J. Davis  
- R. Kelleher  
- M. Meadows  
- A. Diggs |
| 4:40 PM| Adjourn |
| 5:00 PM – 7 PM| Reception  
Hyatt Regency Monterey Hotel and Spa in Monterey |
Wednesday, July 31, 2019

7:00 AM Registration and Security Check-in  
Naval Postgraduate School, Glasgow Hall Courtyard

8:00 AM Invited Presentation  
US Army (Colonel John Rafferty, Long Range Precision Fires CFT)

| Time  | Session IV: Ballistics  
| Session Chairs: TBD |
|-------|--------------------------|
| 8:30 AM | Session Introduction |
| 8:35 AM | Ordnance Technologies for Hypersonic Weapons  
  • John Corley (US Air Force Research Laboratory, Eglin AFB, FL)  
  • Bradley Martin  
  • Don Littrell  
  • Charles M. Jenkins, et al. |
| 8:55 AM | Use of a Control Map to Maximize Maneuver Footprint of Ballistics-corrected Guided Projectiles  
  • Paul Zemany (BAE Systems Information & Electronic Systems Integration, Inc., Hudson, NH)  
  • Matt Chrobak and  
  • Egor Degtiarev |
| 9:15 AM | Enhanced M940 MPT-SD Cartridge Lethality and Ballistic Performance  
  • David Rophael (Combat Capabilities Development Command - Armaments Center, Picatinny Arsenal, NJ)  
  • Nicole Sapp |
| 9:35 AM | Development of a Test Stand for High Spin Rate Testing of Artillery Rocket Motors  
  • Logan McLeod (National Technical Systems)  
  • Seth Siddle-Mitchell  
  • Daniel Vo and  
  • Ductri Nguyen |
| 9:55 AM | Fluid-Structure Interaction Computational Modeling and Experimentation on Low-Mach External Ballistics  
  • William Schwartz (Northrop Grumman Innovation Systems, Plymouth, MN) |
| 10:15 AM | Coffee Break  
Glasgow Hall Courtyard |
| 10:35 AM | Motion Measurement Package  
  • Anthony Opperman (Orbital Research)  
  • Edward Rapp |
| 10:55 AM | A Summary of the REAPR (Recorder for Embedded Acceleration and Pressure Response) Instrumentation Testing and Capabilities  
  • David Truncellito (Applied Research Associates, Albuquerque, NM) |
11:15 AM  Auto-Catalytic Heat Generation of Foamed Celluloid Combustible Cases in 120mm Tank Ammunition
- Samantha Scutti (Combat Capabilities Development Command - Armaments Center, Picatinny Arsenal, NJ)
- Brian Hunter,
- Jeff Krug and
- Viral Panchal

Session V: Energetics – Reactive Materials
Session Chairs: TBD

11:35 AM  Session Introduction

11:40 AM  Analytic Models for the Energy Release of Reactive Materials
- Joseph Hooper (Naval Post Graduate School, Monterey, CA)
- Jacob Kline and
- Christopher Milby

12:00 PM  Lunch
Hermann Hall Ballroom

1:00 PM  Session V (continued)

1:05 PM  Novel Techniques for Investigating Energy Release and the Combustion Of Reactive Material Fragments
- Alexandra A. Reinert (NSWC Indian Head Explosive Ordnance Disposal Technology Division, Indian Head, MD)
- Anne Kyner

1:25 PM  Characterization of Barrier Thickness for Reactive Fragment Energy Release
- Anne Kyner (NSWC Indian Head Explosive Ordnance Disposal Technology Division, Indian Head, MD)

1:45 PM  Computational Modeling of High-Density Reactive Materials
- Thomas McGrath (NSWC Indian Head Explosive Ordnance Disposal Technology Division, Indian Head, MD)
- James Warner
- Cameron Stewart and
- Jason Hackl

2:05 PM  Lethality Assessment of the High-Density Reactive Material (Hdrm) Enhanced Warhead for the 57mmk332 Mod 0 Guided Round
- Thoai Nguyen (Naval Surface Warfare Center, Dahlgren Division, Dahlgren, VA)
- Dan Piwowar
- James Sambrook and
- Erika Wood

2:25 PM  Characterization of Fragmentation and Energy Release Behavior of Reactive Metal Composites
- Michael J. Hargather (New Mexico Tech / EMRTC, Socorro, NM)
- Jamie Kimberley,
- Steven Thoma and
- Phil Martellaro
<table>
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<tr>
<th>Time</th>
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<tr>
<td>2:45 PM</td>
<td>Comparison of Reactive and Inert Explosively Launched Fragment Penetration Performance</td>
<td>- Geremy Kleiser (US Air Force Research Laboratory, Eglin AFB, FL)&lt;br&gt;- David Lacina and&lt;br&gt;- Robert Bush</td>
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<td>3:05 PM</td>
<td>Coffee Break</td>
<td>Glasgow Hall Courtyard</td>
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<td>3:25 PM</td>
<td>Session Introduction</td>
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<td>3:30 PM</td>
<td>SPEAR Warhead Development</td>
<td>- Sean Treadway (Corvid Technologies, Mooresville, NC)&lt;br&gt;- Mike Worsham and&lt;br&gt;- Todd Hadley</td>
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<td>3:50 PM</td>
<td>Flex Liner Warhead Technology for Scalable Effects Missile System</td>
<td>- Tomasz Blyskal (Combat Capabilities Development Command - Armaments Center, Picatinny Arsenal, NJ)&lt;br&gt;- Peter Rottinger</td>
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<td>4:10 PM</td>
<td>Blast Overpressure Modeling of Complex Targets for Personnel Lethality Analysis Improvement</td>
<td>- John M. Steen (US Army CCDC Aviation and Missile Center, Redstone Arsenal, AL)&lt;br&gt;- Jon M. Kilpatrick,&lt;br&gt;- Allen W. Pike and&lt;br&gt;- Gustavo Emmanuelli</td>
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<td>4:30 PM</td>
<td>Optical Diagnostics Applied to Detonation and Fragmentation of the MK 84 Munition</td>
<td>- Phillip Reu (Sandia National Laboratories, Albuquerque, NM)&lt;br&gt;- Russell Teeter&lt;br&gt;- Mark Anderson&lt;br&gt;- Daniel Guildenbeche, et al</td>
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<td>4:50 PM</td>
<td>Numerical Modeling of the Detonation and Fragmentation of the MK 84 Munition</td>
<td>- Russell Teeter (Sandia National Laboratories, Albuquerque, NM)&lt;br&gt;- Phillip Reu&lt;br&gt;- Daniel Rogers&lt;br&gt;- Steven Attaway</td>
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<td>5:10 PM</td>
<td>Adjourn</td>
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Thursday, August 1, 2019

7:00 AM  Registration and Security Check-in  
**Naval Postgraduate School, Glasgow Hall Courtyard**

8:00 AM  Invited Presentation  
**JEMTP (TBD)**

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<th>Session VI: Warheads – Blast and Frags (CONTINUED)</th>
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8:30 AM  Session Introduction

8:35 AM  Low Collateral Warhead Design and Experiment
- Chandler Clough (U.S. Army Research Laboratory APG, MD)
- Jason Davis,
- Drew Marable,
- Darin Kielsmeier and
- Adolphus McDonald

8:55 AM  Development & Demonstration of a Dialable Effects Munition (DEM)
- John Bailey (US Air Force Research Laboratory, Eglin AFB, FL)
- Daniel B. Vu
- Russell Gunter
- Thomas Lagoski
- Pamela Pitchford and
- Antwon Gallagher

9:15 AM  Advanced Data Collection for Non-Traditional Munitions
- James Mathis (Southwest Research Institute, San Antonio, TX)
- David Stevens
- David Hogg and
- Robert Tynan

9:35 AM  Conformal Panel Warhead for Aero-Heated Air-to-Ground Missiles
- Michael Denigan (US Air Force Research Laboratory, Eglin AFB, FL)
- Michael Murphy
- Darin L. Kielsmeier and
- John Granier

9:55 AM  Enhanced Terminal Effects: A Technology Demonstration
- Andrew C. Ihnen (NSWC Indian Head Explosive Ordnance Disposal Technology Division, Indian Head, MD)
- Samuel B. Emery,
- Kevin W. Genson and
- Clark R. Newbold

10:15 AM  Coffee Break  
**Glasgow Hall Courtyard**

10:35 AM  Second Generation Aerostable Penetrator Technology Detonation Testing
- David Bittle (US Army RDECOM-ARDEC, Picatinny, NJ)
- David Kafrouni
10:55 AM Kinetic Energy Warhead (KEWH) Development
   • Matt Rontti (Northrop Grumman Innovation Systems (NGIS), Plymouth, MN)

11:15 AM Invited Presentation
   (NGIC) (TBD)

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Session VII: Protection Systems
Session Chairs: TBD

11:45 AM Session Introduction

11:50 AM Low-Collateral Anti-Rocket-Propelled Grenade (RPG) Warheads
   • Vincent Schuetz (Naval Air Warfare Center, China Lake, CA)

12:10 PM Lunch
   Hermann Hall Ballroom

1:10 PM Session VII (continued)

1:15 PM Analytic Shaped-Charge Code Development with Formation, Propagation, Breakup, and Penetration Calculations
   • Justin Sweitzer (Practical Energetics Research, Inc., Huntsville, AL)
   • Paul Reitmeier

1:35 PM Computational Design to Tailor the Velocity of Explosively Driven Plates for an Adaptive Armor Concept
   • Joel Stewart (U.S. Army Research Laboratory APG, MD)

1:55 PM Lateral-Confinement Effects on the Ballistic Response to Relevant Small-Arms Threats of Ceramics Having Small Thickness and Lateral Dimension
   • Jason McDonald (U.S. Army Research Laboratory APG, MD)
   • Andrew Tonge and
   • Sikhanda Satapathy

2:15 PM Computational Simulation of Shatter Gap in Hard Armor
   • Christopher Freitas (Southwest Research Institute, San Antonio, TX)

2:35 PM An Analysis of Ballistic Helmet Protection and Skull Fracture Patterns
   • Erika A. Matheis (Bennett Aerospace, Cary, NC)
   • Samantha L. Wozniak
   • Ashley E. Eidsmore and
   • Karin A. Rafaels

2:55 PM Fracture/Failure Behavior, and Ballistic Performance of Various Silicon Carbide Ceramic Materials in Lightweight Ceramic/Composite Laminate Armors
   • Mark D. Andrews (U.S. Army Research Laboratory APG, MD)
   • Lee S. Magness and
   • James Campbell

3:15 PM Adjourn
Alternate Presentations

Session I: Penetration Mechanics

- Mark Minisi (US Army RDECOM-ARDEC, Picatinny, NJ)
- Raymond Chaplain,
- Ken Hohnecker and
- Michael Cataldi

Session II: Warhead Technology – Shaped Charge and EFP

Shaped Charge Liner Affordability Initiative for AGM-114R Multipurpose Warhead
- Brian Doyal (General Dynamics Ordnance and Tactical Systems, Niceville, FL)
- Michael Steinberg and
- Dan Boeka

Multi Role Warhead Characterization
- Becca Loudin (CCDC AvMC, Redstone Arsenal, AL)
- Brent Deerman and
- Darin Kielsmeir

ANALYSIS AND DESIGN OF A COUNTER-UNMANNED AIRCRAFT SYSTEM (C-UAS) WARHEAD
- Brian Pavlovic (US Army RDECOM-ARDEC, Picatinny, NJ)
- Henry Hsieh,
- Peter Rottinger and
- Lamar Thompson

Anti-Armor Warhead Design with Forward Fragmentation
- Drew Marable (Practical Energetics Research, Inc., Huntsville, AL)
- Paul Reitmeier and
- Scott Amos

TESTING AND EVALUATION OF VIPER WARHEADS LOADED WITH FEM LX-14 EXPLOSIVE
- Arthur S. Daniels (Practical Energetics Research, Inc., Huntsville, AL)
- Nicholas R. Peterson and
- Nausheen Al-Shehab

Development and Testing of a Higher Performance Linear Shaped Charge For Demilitarization of UXO
- Stanley DeFisher (US Army RDECOM-ARDEC, Picatinny, NJ)
- Gregory Stunzenas,
- Bill Adams and
- Erik Wrobel

Gator Landmine Warhead Characterization and Replacement Approach
- Gawain Chan (U.S. Army RDECOM-ARDEC, Picatinny, NJ)
- Edward W. Chin,
- Peter Rottinger and
- Brian Pavlovic
Session III: Energetics – Explosives and Propellants

NONE

Session IV: Energetics – Ballistics

Innovative Nitrogen-doped Boron Propellants, Part II-25mm Gun Firings and Characterizations
- Thelma Manning (US Army RDECOM-ARDEC, Picatinny, NJ)
- Michael Fair,
- Viral Panchal,
- Eugene Rozumov,
- James Barnes and
- Paul Matter

Defeating Shot Localization with Small Arms Low Noise Supersonic Projectile
- Greg Kangas (GREAT LAKES SOUND AND VIBRATION INC., Houghton, MI)

Propulsion Development for 120-mm M865A1 Tank Cartridge
- Adriana Eng (US Army RDECOM-ARDEC, Picatinny, NJ)
- Manfredi Luciano,
- Brian Wong,
- Hany Malek and
- Vinod Nagori

105MM IGNITION SYSTEM FLAME FRONT CHARACTERIZATION AND DESIGN ADVANCES
- Paul Henderson (US Army RDECOM-ARDEC, Picatinny, NJ)

Curved Trajectory Grenade Launcher
- Chris Fortunato (ASU Research Enterprise, Scottsdale, AZ)
- Lloyd Brown

Session V: Energetics – Reactive Materials

NEUTRALIZATION OF HOME-MADE EXPLOSIVE MATERIAL BY WAY OF REACTIVE MATERIALS
- Robert Koch, (US Army RDECOM-ARDEC, Picatinny, NJ)
- Paul Redner,
- Richard Fong,
- Deepak Kapoor

Concomitant 3D Printing of Nanostructured Metal and Polymers for Energetic Applications
- Bruno Azeredo (ASU Research Enterprise, Scottsdale, AZ)
Session VI: Warheads – Blast and Frags

Lethality Analysis Techniques for Fragmentation Panel Warheads
- Eric L. Scarborough (US Air Force Research Laboratory, Eglin AFB, FL)
- Michael Denigan and
- Samuel Tipton

Additive Manufacturing of AF9628 Steel for Ordnance Applications
- Erin Hager (CCDC AvMC, Redstone Arsenal, AL)
- Ryan O'Hara,
- Philip Flater and
- Ryan Kemnitz,

Particle Image Velocimetry and Its Advantages in Imaging Multiphase
- Charles M. Jenkins

Exploiting Electrical Power Delivery Devices for Damage Mechanisms
- Geremy Kleiser (US Air Force Research Laboratory, Eglin AFB, FL)
- Ian Kowalczyk,
- David Pugh, and
- Jason Gilliam

Advanced Mortar Warhead Development
- Joseph DeGezelle (Northrop Grumman - Innovation Systems Sector, Plymouth, MN)

BLU-139/B 500 lb. Penetrator
- Derek Plymate (Northrop Grumman - Innovation Systems Sector, Plymouth, MN)

Session VII: Protection Systems

A Body Armor Model to Evaluate Change of Back Face Deformation Requirement
- Sikhanda Satapathy (U.S. Army Research Laboratory APG, MD)
- Timothy Zhang,
- Jason McDonald and
- Brian Schuster