



## DE Systems Symposium 2018

Preliminary Agenda  
September 24-27, 2018

### Monday

#### 0800-1700

##### Short Courses at the *Renaissance Portsmouth*

1. Systems Engineering for Directed Energy Systems (0800-1200) *Madison*
2. High Power Fiber Lasers (0800-1200) *Portsmouth II*
3. An Intuitive Introduction to the Physics of HEL (0800-1200) *Portsmouth III*
4. Warfighter 101 (0800-1200) *Portsmouth I*
5. M&S Verification, Validation, and Accreditation (0800-1200) *Jefferson*
6. Intellectual Property Considerations (1300-1700) **(CANCELLED)** *Jefferson*
7. Aero Optics (1300-1700) *Madison*
8. Directed Energy Design of Tests (1300-1700) *Portsmouth I*
9. Directed Energy Bio-Effects (1300-1700) *Lee*
10. Introduction to Counter Directed Energy (1300-1700) *Portsmouth II*
11. Infrared Countermeasures (1300-1700) *Portsmouth III*

#### \*Boxed Lunch Break 1200-1300

1000-1630- HPM Sensor Calibration Workshop (*Edward Trzcienski*) (Invitation Only- *In the Amphitheatre*)

### Tuesday Plenary

at Offsite Location

\*Plenary talks will be 45 minutes with 10 min of Q&A.

0815-0835- DEPS Introduction (*David Stoudt/ Mark Neice*)

0835-0930- Traditional Electronic Attack Capabilities and Gaps- *Dr. Bill Conley, Deputy Director for Electronic Warfare, Assistant Secretary of Defense Research & Engineering*

0930-1015- Keynote- *Dr. Thomas J. Karr, Assistant Director of Defense Research & Engineering for Directed Energy*

#### \*Break 1015-1035

1035-1130- Navy High Power Microwave Program- *Mr. Ryan Hoffman, Office of Naval Research*

\*\*Bus back to Hotel

\*Lunch Break- 1200-1330 PM

Revision 11 (9/14)

**1330-1425- Mobile Counter UAS HEL Systems-** *Dr. Craig Robin, Chief Scientist for Directed Energy, U.S. Army*

**1425-1520- Counter UAS HPM Systems-** *Dr. Don Shiffler, Chief Scientist for Directed Energy, U.S. Air Force, and Mr. Ryan Hoffman, Office of Naval Research*

**\*Break 1520-1540**

**1540- 1635- Navy Laser Family of Systems–** *Dr. Frank Peterkin, Chief Scientist for Directed Energy, U.S. Navy*

**1635-1730- FY19 Non-Lethal Directed Energy Weapon Achievements-** *Mr. David Law, Chief Scientist Joint Non-Lethal Weapons Directorate*

**1800-** There will be an evening reception following the plenary session at the **Renaissance Portsmouth-Norfolk Waterfront Hotel**

### Wednesday AM

#### *JOINT SESSION @ Hotel Portsmouth I*

**0800-1030- DEW Policy Environment (@ Hotel)**

- **Overview/Update on DEW Policy-** *Jesse "Judge" Bourque, Association of Old Crows*
- **Management of Illumination of Objects in Space by Lasers-** *Christopher Behre, NSWC Dahlgren*
- **Laser Safety and DoDD 6055.12, Radiofrequency Radiation Safety-** *John Seibert, OASD(EI&E)/ESOH*
- **CJCSI 3230.01A, DEW Initial Operational Employment Review & Approval Process-** *Jeff Todd, Joint Staff J39*
- **Service Perspectives on Test and Development of DEW-** *Lt. Col. Pete Johnson, PhD, USAF Safety Center*

**1030-1100- Joint Laser Systems Effectiveness (JLaSE)-** *Clifton Boyd*

**1100-1200- Rapid Acquisition: Is DE Ready for It? Is it Ready for DE?-** *With Q&A, Bill Decker*

**1030-1300- Poster Session (Open/ Limited Distribution)**

- *Will take place in Portsmouth VI*
- 6 additional tables with a representative from each of the Plenary System Talks

### Wednesday PM

#### HEL System Demo Results (Dan Marker) *at Hotel- Portsmouth I*

**1330- Army Update on the High Energy Laser Mobile Test Truck (D)** *Adam Aberle, US Army SMDC/ARSTRAT*

Revision 11 (9/14)

**1400- HADES (D)** *Jeffery Barchers, Nutronics Inc.*

**1430- ABCD Field Test Plans and Initial Results (D)** *Darren Forman, Nutronics Inc.*

**1500- Ground Based Air Defense (GBAD) Directed Energy (DE) On-the-Move (OTM) Program Update (D)**  
*Jorge Hernandez, NSWC Dahlgren*

**\*Break 1530-1600**

**1600- Submarine High Energy Laser System Integration and Demonstration (D)** *Brent Blaha, NNS and Jeff Maloney, L3 Brashear*

**1630- ONR's Laser Weapon System Demonstrator Overview (D)** *Patrick Cantwell, NSWCDD*

### T&E Capabilities for DE Systems (Edward Trzcienski)

*At Hotel- Lee Room*

**1300- TRMC's DE Test and Evaluation S&T Capabilities, Efforts, and Future Thrusts (D)** *Whitney Winchester, PEO-STRI*

**1330- DoD Electric Weapons: Measurements, Standards, Traceability (D)** *Subrata Sanyal, NSWC Corona*

**1400- Mobile High Energy Laser Measurement (MHELM) Program (D)** *Trung Nguyen, PEO-STRI*

**1430- Calibration of Advanced Science and Technology High Power Microwave Instrumentation (A)** *Jeff Schleher, American Systems*

**\*Break 1500-1530**

**1530- Advances in RF Power Measurements Through Radiation Pressure and Rydberg Atom Spectroscopy (A)** *Matthew Simons, NIST*

**1600- Extended Atmospheric Turbulence Profiling Solutions (D)** *Matt Whiteley, MZA*

**1630- Investigation of Multiple-slab Path for Turbulence Profiling Using the IACS LIDAR (D)** *Cody Fernandez, Georgia Tech Research Institute*

### HEL Modeling & Effects I (Steve Fiorino)

*At Hotel- Amphitheatre*

**1300- Feasibility and Utility of Airborne Solid-state Lasers against Ground Ordnance (A)** *Joseph Fasone, U.S. Military Academy*

Revision 11 (9/14)

1325- First Look at Profiling Atmospheric Turbulence along a Path using the Hartmann Turbulence Sensor (A) *Santasri Bose-Pillai, AFIT*

1350- Propagation Path Characterization System (PCS) for LWS Fire Control Support (D) *Louis Marquet, Marquet Consulting*

1415- Combining HPC and 4D Weather Cubes for Practical DE Decision Aids and System Performance Trades (D) *Jaclyn Schmidt, AFIT*

1440- HEL Field Test Forensic Analysis: Advances through combination of in-situ range measurements and DE-JTO M&S Tools (D) *Steve Fiorino, AFIT*

\*Break 1505-1520

1520- Evaluation of Aerosol Models in Emerging High Energy Laser Modeling Technologies (D) *Jaclyn Schmidt, AFIT*

1545- HEL System Performance using Numerical Weather Prediction (D) *Eric Magee, MZA*

1610- Profiling Atmospheric Turbulence with Moon Imagery (D) *Jack McCrae, AFIT*

1635- Modeling and Simulation of Aircraft Survivability to HEL Irradiation (MSAS) (D) *Ron Dexter, SURVICE*

#### HIJENKS (Ryan Hoffman)

*At Offsite*

1330- Virtual prototyping results for the HIJENKS HPM source

1400- Brassboard Technology Assessment Overview and Navy Team Design

1430- Multi-Pulse Marx Driver

\*Break 1500-1530

1530- Low Duty Factor High Voltage Power Supply for Direct Drive of High Power Microwave Source

1600- Wave Propagation in Enclosures for DE Counter-facility Missions

1630- HIJENKS Surrogate Target Development and Waveform Development Effects Testing Results

1700- HIJENKS Technology Innovation Game (TIG) and Operational Analysis

Wargaming (Diana Loree)

*At Offsite*

1330- Evaluation of Collateral Effects for Directed Energy Weapons

1400- The Development of Common Target Models for Wargaming Assessments

1430- Galaxy Software Simulations of Directed Energy: Source Design through Mission Impact

1500- HyDRA Table Top Wargames

\*Break 1530-1600

1555- Futures Analytical Science and Technology Wargame Series: Air Base Air Defense

1620- Advanced Concept Experiment 17

1645- Wargaming to Support HVAA Protection Modeling and Simulation Analyses

1710- Joint BADASS (Base Air Defense using Asymmetric Systems Synergies)

1800- DE Outreach Meeting @ Hotel- Amphitheatre

Thursday AM

HPM Modeling & Effects (Andy Greenwood)

*At Hotel- Lee Room*

0800- Radio Frequency Directed Energy Design Tool (A) *John Tatum, SURVICE Engineering Company*

0830- Vessel Stopping Prototype (D) *James Meadows, NSWCCD*

0900- Beam Propagation Model Selection for Millimeter-Wave Directed Energy Weapons (D) *John Biddle, IDA*

0930- Attenuation Statistics Derivation in the V&W Bands Using 4D Weather Cubes (D) *Lt. Bertus Shelters, AFIT*

\*Break 1000-1030

1030- Characterization of the Electromagnetic Coupling to UAVs (D) *James Hunter, Missouri University of Science & Technology*

HEL Modeling & Effects II (Steve Fiorino)

*At Hotel- Amphitheatre*

**0800-** WaveTrain Simulation of Non-Linear Effects (A) *Jason Tellez, MZA Associates*

**0825-** Transient Thermal Effects on a Directed Energy Weapon Model (A) *Travis Michalak, AFRL/RQQM*

**0850-** Modeling Energy Storage Requirements for High-Energy Lasers on Navy Ships (A) *Daniel Michnewich, US Navy*

**0915-** Experimental Analysis of Atmospheric Optical Turbulence and Laser Beam Scintillation in a Near-Maritime Environment (A) *Miles Oakley, United States Naval Academy*

**0940-** Modeling & Simulation in the Development for Electro-Optical and Laser Systems (A) *Bryan Kelchner, Teknicare Inc.*

**\*Break 1005-1020**

**1020-** In-Situ, Field Profiling of Turbulence Conservative Passive Scalars Using 3D Sonic Anemometers (D) *Steve Fiorino, AFIT*

**1045-** Measurements of Ship-Induced Optical Turbulence on an Underway Arleigh Burke-Class Destroyer in Support of HELIOS (D) *Jacob Busby, NPS*

**1110-** Overview of the Navy Atmospheric Vertical Surface Layer Model (NAVSLaM) Version 2.0 (D) *Paul Fredrickson, NPS*

**1135-** Line-of-Sight Modeling Electro-Optical and Laser Weapon Systems (D) *John Blackburn, Teknicare Inc.*

DE Airspace Deconfliction Tools (LeAnn Brasure)

*At Hotel- Portsmouth I*

**0800-** Commensurate Treatment of Emerging DEWs- Test Range Methods (HEL & HPM) (D) *HEL- Michelle Hedrick, AFRL/RD, HPM- Stephen Yan, AFRL/RD*

**0900-** High Energy Laser (HEL) Collateral Hazards and Modeling, Simulation & Analysis Tools (D) *Dr. Semih Kumru, 711 HPW/RHDO (AFRL)*

**0930-** Potential for World-Wide Lasers to Pose On-Orbit Inadvertent Illumination Hazards (D) *Dr. Patrick Shriver, Metatech Corporation*

**\*Break 1000-1030**

**1030-** Overview and Status of AFRL SatAC PRA Capability (D) *Dr. Patrick Shriver, Metatech Corporation*

Revision 11 (9/14)

1100- Development of a Laser Deconfliction Product to Meet Joint Service Needs (D) *Stephen Dause, NSWCDahlgren*

1130- Overview of NATO Task Group SCI-264 - HEL Weapons: Tactical Employment in the Shared Battlespace (D) *LeAnn Brasure, Belcan Corporation*

DE Integration Lessons Learned (Harry Sinsheimer)

*At Offsite*

0800- A Lessons Learned Perspective on a Megawatt Class High Energy Laser Systems Integration

0830- ATL Lessons for Tactical Airborne HEL Weapons Systems

0900- Past Experiences in DE Jitter Control and Verification

0930- Lessons from CCS-Bright

\*Break 1000-1030

1030- DE Systems Test on NAVAIR Ranges

1100- AFRL's Fiber Laser Beam Combining Program Overview and Current Achievements

1130- Irradiance Collection and Reporting System (ICRS) HEL Mortar Target Development

Deployed or Warfighter Tested Weapons (Chris Behre)

*At Offsite*

0800- Navy Laser Weapon System (LaWS), a Historical Perspective

0825- Deployed Laser Weapon System - A Field Service Representative's Perspective

0850- AN/SEQ-3 XN-1 LaWS

0915- Operational Availability of LaWS, and the use of Product Support M&S for the NLFoS

0940- Summary of At-Sea Test Events Onboard the USS PONCE using the Navy LaWS

\*Break 1005-1030

1030- Denali Field Test Results for Large Aperture Imaging

1055- Self-Protect High Energy Laser Demonstrator (SHIELD)

Thursday PM

Power & Thermal (Sean Ross)

*At Hotel- Portsmouth I*

1300- Integrated Thermal and Power Management Technology for Compact and Light Weight HEL Systems (D) *Kaveh Khalili, Rocky Research*

1325- Open Systems for Control of Integrated Propulsion, Power and Thermal (OSCIPTT) Overview (D) *Jeffrey DesRoches, AFRL/RQQI*

1350- Status of Tri-Service Effort: 'Thermally Enabling Architectures for Pulse Power Systems' (D) *Travis Michalak, AFRL/RQQM*

1415- Transient Thermal Management of Directed Energy Modules (A) *Lauren Boteler, U.S. Army Research Laboratory*

1440- Ultra-Compact Aircraft Turbine based Electrical Power Generation and Thermal Management Designed for High Transient Loads (D) *Eric Lewis, QinetiQ North America*

1505- Power and Thermal Challenges of Directed Energy Weapons in Airborne Platforms: Considerations for Field Deployability (D) *Avijit Bhunia, Teledyne*

1530- Two-Phase Cooling: A Stable Maneuverable Airborne Thermal Cooling System (SMARTCool) for DE Applications (D) *Steven Isaacs, Rocco*

DE Systems Engineering Processes (JP Sena)

*At Hotel- Amphitheatre*

1300- A Full-Scale Thermal Management System with Integrated Thermal Storage for High Energy Lasers (D) *Howard Pearlman, Advanced Cooling Technologies, Inc.*

1330- Using SBIRs to Develop Transitionable Solutions: HADES, Digital Holography, Membrane Optics (D) *Dan Marker, AFRL/RDL*

1400- Vessel Incapacitating Power Effect Radiation System and Specifications, Computational Electromagnetic Modeling & Simulation, and Conceptual Design (D) *Adam Clark, NSWC-Dahlgren*

1430- Directed Energy Industrial Base Analysis and Sustainment (IBAS) (D) *K. Bryan Mitsdarffer, NAVSEA, PEO IWS 2*



HPM System Demo Results (Mary Lou Robinson)

*At Offsite*

1330- Reconfigurable, High-Gain, Ultrashort Microwave Pulse Compression System based on Electromagnetic Time-Reversal Techniques

1355- Komodo's (CIED System) Dynamic Effectiveness Test Results

1420- Short Pulse Research and Evaluation for sUAS (OSPRES): Status Update

1445- NSWC Dahlgren Results for ONR Short Pulse Research and Experimentation for Small-UAS (OSPRES)

\*Break 1510-1530

1530- Air Force HPM Rapid Prototype Programs Status Update: THOR, CHIMERA

1555- Spectrum Warfare Anti-UAS Testing and Research

1530- 1800 Outbriefs @ *Offsite Location*