

Technical Program



DE Systems  
Symposium

25 - 28 August 2014  
Monterey, California

# General Information

## Security

- DE Systems Symposium is SECRET/ NOFORN
- Attendees will be issued conference specific badges on site and must have valid gov't ID available at all Symposium events
- Wireless electronic devices are prohibited in classified sessions
- Classified materials must be processed through DEPS security
- Classified notes **MAY ONLY BE TAKEN IN NOTEBOOKS PROVIDED BY SECURITY STAFF** at certain conference venues  
(No note-taking in Opening and Closing Plenary)
- Classified discussions and sensitive unclassified discussions are restricted to designated meeting rooms only
- Cameras and photography must be authorized by the DEPS Symposium security manager
- Audio and video recording is prohibited
- Security concerns should be addressed to a DEPS Security Team member
- Failure to adhere to security standards could result in denied/revoked Symposium registration

## Buses

NPS is a short walk from the Hyatt Hotel and attendees are encouraged to walk. For those unable to walk, buses will run approx every 20 mins during the following hours:

Tuesday - Thursday 0730 - 1730

Buses will leave from the Hyatt and drop off at various locations at NPS. Do not bring cell phones, laptops, or notebooks to NPS. DEPS staff will not be responsible for your items.

## Important Phone Numbers:

Monterey Police 831-646-3914

NPS Emergency Police 831-656-2555

Community Hospital of Monterey 831-625-4900

NPS Quarterdeck 831-656-2441

General Symposium Info 505-450-1165

MONDAY

## Short Courses

0700 Registration at Hyatt

0800 Morning and all day short courses begin

### MORNING COURSES

1. Introduction to High Energy Laser Systems  
Hyatt

2. Introduction to Wave Optics Beam Propagation  
Hyatt

3. Transitioning DE Technology to the Warfighter  
Hyatt

### ALL DAY COURSES

4. Introduction to Beam Control  
Hyatt

5. Tri-Service Lethality  
Limited Distribution D, US Only  
Hyatt

1200 Break for Lunch

1300 Afternoon short courses begin and all day courses resume

### AFTERNOON COURSES

6. Laser Deconfliction  
Limited Distribution C, US Only  
Hyatt

8. Introduction to Using GASP for the Simulation of Solid State Lasers  
Limited Distribution C, US Only  
Hyatt

## TUESDAY MORNING

### JOINT SESSION

#### Opening Plenary

NPS, King Hall

- 0630 Breakfast at Hyatt Regency
- 0700 Registration at Hyatt Regency
- 0730 Limited Buses to NPS
- 0800 Welcome  
*CAPT David Kiel and RADM Nevin Carr*
- 0810 Naval Postgraduate School Welcome  
*VADM Route (retired), NPS President*
- 0815 Security Comments  
*Ms Rhonda Peyton*
- 0825 Special Operations DE Requirements  
*Mr Karl Rovelsky, SOCOM*
- 0855 **DARPA DE Efforts**  
*Dr Rich Bagnell, DARPA*
- 0925 CRS perspective on Directed Energy  
*Mr Ron O'Rourke, Congressional Research Service*
- 0955 Break
- 1015 Navy DE Programs  
*Mr Tom Beutner, ONR Code 35*
- 1045 **Navy Operational and Affordability Considerations**  
*RADM Nevin Carr (ret)*
- 1115 LaWS QRC and the RAP Process  
*CDR Vince Chernesky, PMS 405*
- 1145 Navy DE Roadmap  
*Mr Thomas Callender, DUSN (Policy)*
- 1200 Lunch at Hyatt

## TUESDAY AFTERNOON

### JOINT SESSION

#### Employment and M&S Conference Session

Limited Distribution D / Open

Hyatt, Windjammer II - IV

Chair: *Dave Kashinski, US Military Academy*

- 1300 Modeling and Simulation (A)  
*Edwin Ahn, Air Force Research Laboratory*
- 1330 Modeling Methodologies and Advancement (A)  
*Eric Magee, MZA Associates Corporation*
- 1400 Integration of the Hazard Analysis of Directed Energy Simulation (HADES) into the Endgame Framework Concept (A)  
*TBD*
- 1430 Break
- 1500 Computational Thermal Model of Laser Penetration through Layered Materials (D)  
*Gunnar Tamm, U.S. Military Academy*
- 1530 Computational Thermal Model for the Loss of Mass due to Absorption of Laser Energy (D)  
*Kyle Okular, U.S. Military Academy*
- 1600 **High Energy Laser Effects on Elevated Multilayer Surfaces (A)**  
*Chris Wink, U.S. Military Academy*
- 1630 **The Effects of Rotation on Heat Dissipation in Steel (A)**  
*Ian De Mallie, U.S. Military Academy*
- 1700 Reception

## TUESDAY AFTERNOON

### JOINT SESSION

#### T&E and Lethality Conference Session: Counter ISR

Limited Distribution D / Open

Hyatt, Cypress I - II

Chair: *Woody Shortt*, AEGIS Technologies Group

- 1300 HELMD Testing (D)  
*Randy Lewis*, Space and Missile Defense
- 1330 Testing and Evaluation of the Navy's First  
Deployed HEL System (D)  
*David Carter*, Naval Surface Warfare Center
- 1400 HEL JTO C-ISR Testing (D)  
*Woody Shortt*, AEGIS Technologies Group

#### SESSION IS NOW OPEN

- 1430 Comprehensive Systems-Based Plan for an  
Integrated HEL Test Bed (A)  
*Bonnie Young*, Naval Postgraduate School
- 1500 Break

#### T&E and M&S Conference Session: T&E Simulation and Analysis

Limited Distribution D / Open

Hyatt, Cypress I - II

Chair: *Frank Donovan*, AEGIS Technologies Group

- 1530 Approaches to Include Directed Energy  
Reflection Effects in Various Distributed  
Interactive Simulation Protocol Data Units (D)  
*Frank Donovan*, AEGIS Technologies Group
- 1600 Testable and Effective Laser Metrics for  
Source Selection Using Power in the Bucket  
Curves (D)  
*Matt Leigh*, Naval Surface Warfare Center
- 1630 IED Detection and/or Pre-Detonation with  
Magnetic Fields (D)  
*Thomas Camp*, Naval Surface Warfare Center

#### SESSION IS NOW OPEN

- 1700 High Energy Laser Probabilistic Reflection  
Injury Model (HELPRIM) (A)  
*Albert Bailey*, TASC
- 1730 Reception

## TUESDAY AFTERNOON

### BEAM CONTROL

#### Beam Control Systems, Experiments, and Demonstrations

Limited Distribution D

Hyatt, Spyglass I

Chairs: *Albert Ogloza*, Dept. of Navy

- 1300 Partial Spatial and Temporal Coherence  
and Implications for Active Track and  
Active Imaging (A)  
*Richard Holmes*, Boeing Laser Technical  
Services
- 1325 Design of Deformable Mirrors for Aberration  
Compensation (A)  
*Justin Mansell*, MZA Associates Corporation
- 1355 High Energy Laser Beam Control Testbed:  
Status and Capabilities (C)  
*Lew DeSandre*, Naval Postgraduate School
- 1420 NPS SE High Energy Laser Cavalry  
Autonomous Vehicle (HELCAV) (D)  
*Douglas Nelson*, Naval Postgraduate School
- 1445 Development and Challenges of a US Navy  
Shipboard Deployed, High Energy Laser  
Active Imaging System (D)  
*David Newton*, Naval Surface Warfare Center
- 1510 Break
- 1525 Adaptive Tactical Laser System  
(ATLAS) Field Test Results (C)  
*Jeff Barchers*, Nutronics, Inc.
- 1550 Analysis of Optical Performance for a  
Refractive Lightweight Beam Director  
for GBAD (D)  
*Jeremiah Lange*, Naval Surface Warfare  
Center
- 1730 Reception

## TUESDAY AFTERNOON

### COUNTER DE WEAPONS

#### Introduction

Secret

NPS, ME Auditorium

- 1300 Overview of ONRs Counter-Directed Energy Weapons Program (C)
- 1330 45 Years of C-HEL: Re-Inventing the Wheel ... Again! (C)
- 1400 CDEW Education and Research at the United States Naval Academy (A)
- 1430 Current and Emerging Threats from Ground-Based Directed Energy Weapons (DEW)
- 1500 Break

#### RF and High Energy Particle Beams Hardening

Secret

- 1530 Countering DEW Capabilities Which Rely on Degradation Mechanisms Other than Thermal
- 1600 Nonlinear Artificial Impedance Surfaces to Counter HPM Effects (A)
- 1630 Using BLT Topology with the Random Coupling Model to Guide the Design of Shielding and Absorption from High Power RF (A)
- 1700 Active Nonlinear Metamaterials to Counter High Power Microwave Directed Energy Weapons
- 1730 Reception

## TUESDAY AFTERNOON

### EMPLOYMENT OF DE WEAPONS

#### Employment Session

Secret

NPS, Ingersol

- 1300 Ultra-Wide Band Directed Energy Interactions with Materials and Systems of Interest for Department of Defense Applications (S-F)
- 1330 Refurbishment and Target Testing with the ORION HPRF System at NSWC Dahlgren (S-F)

### INTEL

#### INTEL Session

Secret

NPS, Ingersol

- 1400 Worldwide Laser Weapon Developments
- 1500 Worldwide Radio Frequency Weapon (RFW) Developments
- 1730 Reception

## TUESDAY AFTERNOON

### HEL LETHALITY

#### System / Subsystem Test Results

Secret

NPS, Glasgow

- 1300 Laser Heating and Penetration of Aluminum Alloys at 0.8-micron Wavelength (A)
- 1330 2013 Navy C-RAM Test Results and Analysis (S-D)
- 1400 UAS Tail Boom Vulnerability Testing & Analysis (D)
- 1430 Break
- 1500 2013 Navy HEL Test on Topside Ordnance and Components (S-D)
- 1530 Counter Sensor Lethality (S-D)
- 1730 Reception

## WEDNESDAY MORNING

### BEAM CONTROL

#### Characterization and Compensation

Limited Distribution D

Hyatt, Spyglass I

Chair: *Doug Nelson*, Naval Postgraduate School

- 0630 Breakfast at Hyatt Regency
- 0700 Registration at Hyatt Regency
- 0900 Sensor Exploitation for Atmospheric Turbulence Characterization (D)  
*Matthew Whitely*, MZA Associates Corporation
- 0925 NPS SE Atmospheric Turbulence Measurements 2014 (D)  
*Douglas Nelson*, Naval Postgraduate School
- 0950 Characterization of Horizontal Laser Propagation at the Limor Site at the HELSTF (C)  
*Jessie Hazen*, UAH Systems Management and Production Center
- 1015 Break
- 1030 Site Turbulence Evaluation Profile Set (STEPS) (D)  
*Matthew Whitely*, MZA Associates Corporation
- 1055 Stochastic Parallel Gradient Descent Algorithm with Adaptive Gain for Atmospheric Turbulence Compensation (A)  
*Daniel Whitley*, University of Alabama
- 1120 A Wave-Optics Study of Wavefront Compensation using a Hotspot Beacon (D)  
*Robert Praus*, MZA Associates Corporation
- 1200 Lunch at Hyatt

## WEDNESDAY MORNING

### BEAM CONTROL

#### Phased Arrays

Limited Distribution D

Hyatt, Spyglass II

Chairs: *Andy Motes*, Schafer Corporation

0630 Breakfast at Hyatt Regency

0700 Registration at Hyatt Regency

0800 **Factors Affecting Coherent Synthetic-Aperture Lidar System Performance (D)**  
*Eric Magee*, MZA Associates Corporation

0825 **Deep Turbulence and Speckle Effects in Coherently Combined Fiber Array Systems: Analysis and Experimental Demonstration (A)**  
*Mikhail Vorontsov*, University of Dayton

0850 **CLAWS and HBC-CLAWS Laboratory Test Results and Field Testing Planning (C)**  
*Jeff Barchers*, Nutronics, Inc.

0915 **Optimal and Adaptive Filtering for Phase Prediction and Correction with Mod n $\pi$  Measurements (A)**  
*Steve Gibson*, UCLA

0940 Break

1010 **Imaging with Digital Holography for DE Applications (C)**  
*Phil Gatt*, Lockheed Martin STAR Lab

1035 **Actuation Requirements for Tiled Arrays in Supersonic Flow (D)**  
*Matthew Whiteley*, MZA Associates Corporation

1100 **Maturing Risley Prism Technology for Directed Energy Applications (C)**  
*Aaron Seibel*, Lockheed Martin Corporation

1200 Lunch at Hyatt

## WEDNESDAY MORNING

### COUNTER DE WEAPONS

#### HEL Detection and Avoidance

Limited Distribution D / Open

Hyatt, Cypress I - II

Chairs: *Joe Watkins*, US Naval Academy

0630 Breakfast at Hyatt Regency

0700 Registration at Hyatt Regency

0800 **Program Status on the Helios Counter Directed Energy Weapon System (D)**  
*Brian Goldberg*, Adsys Controls, Inc

#### SESSION IS NOW OPEN

0825 **Atmospheric Absorption and Thermal Blooming Measurements using High-Power, Single-Mode Fiber Lasers (A)**  
*Richard Fischer*, Naval Research Laboratory

0850 **Development of a Digital Evaluation Methodology for C-DEW Assessment (A)**  
*Michael Cathcart*, Georgia Tech

0915 **A COMSOL Model of Laser Damage Evolution due to High Energy Laser Irradiation of Partially Absorptive Materials (A)**  
*Peter Joyce*, U.S. Naval Academy

0940 Break

1005 **Isolating Thermal and Strain Responses in Composites Using an Array of Embedded Fiber Bragg Grating Temperature Sensors (A)**  
*Brian Jenkins*, US Naval Academy

1030 **Detection of Optical Radiation Using Photoconductors in an RF Switching Network (A)**  
*Deborah Mechtel*, US Naval Academy

1055 **High Energy Laser Mitigation by Degrading Atmospheric Transmission (A)**  
*Jonathan Gustafsson*, NPS

1120 **Inversion Method for Laser Parameter Extraction with Phenomenological Model Based on Off-Axis Sensor Measurements (A)**  
*Vaibhav Kukreja*, NPS

1200 Lunch at Hyatt

# Conference Overview by Room Assignment

	Tues AM	Tues PM	Wed AM	Wed PM	Thurs AM	Thurs Noon	Thurs PM
NPS King Hall	Opening Plenary					Joint Poster Session	Closing Plenary Session
NPS ME Aud		COUNTER DEW		COUNTER DEW			
NPS Glasgow		LETHALITY	LETHALITY				
NPS Ingersol		EMPLOYMENT	INTEL		RFDEW		
		INTEL					
Spyglass I		BEAM CONTROL	BEAM CONTROL	BEAM CONTROL	BEAM CONTROL		
Spyglass II			BEAM CONTROL	M&S	COUNTER DEW		
Windjammer II - IV		JOINT EMP / M&S	EMPLOYMENT	EMPLOYMENT	EMPLOYMENT		
Cypress I & II		JOINT T&E / Leth	COUNTER DEW	T&E	T&E		
		JOINT T&E / M&S					



## WEDNESDAY MORNING

### EMPLOYMENT OF DE WEAPONS

#### Operational Integration I

Limited Distribution D

Hyatt, Windjammer II - IV

Chair: *Kraig Sheetz*, US Military Academy

- 0630 Breakfast at Hyatt Regency
- 0700 Registration at Hyatt Regency
- 0800 HELM D Testing, Employment, and the Challenges that Accompany Directed Energy Weapon Systems (C)  
*Randy Lewis*, USA SMDC
- 0830 Improvised Microwave System (D)  
*Gunnar Tamm*, U.S. Military Academy
- 0900 Integration of the High Energy Laser into the Virginia Class Submarine (D)  
*James Johnson*, Naval Postgraduate School
- 1000 Standoff Detection of Explosives by Laser Raman Spectroscopy (D)  
*Paul Pelligrino*, Army Research Laboratory
- 1200 Lunch at Hyatt

### INTEL

#### INTEL Session

Secret

NPS, Ingersol

- 0900 Worldwide Laser Weapon Developments
- 1000 Worldwide Radio Frequency Weapon (RFW) Developments
- 1200 Lunch at Hyatt

## WENESDAY MORNING

### HEL LETHALITY

#### Material Interaction / High Fidelity Modeling

Limited Distribution D

NPS, Glasgow Hall

Chair: *TBD*

- 0630 Breakfast at Hyatt Regency
- 0700 Registration at Hyatt Regency
- 0730 Limited Buses to NPS
- 0800 Penetration Analysis of Experimental Data with Analytical Methods (D)  
*Mike Libeau*, Naval Surface Warfare Center
- 0830 **Modeling the Effect of Laser Interactions on the Strength and Failure of High Strength Aluminum Alloys (A)**  
*Jeffrey Florando*, Lawrence Livermore National Laboratory
- 0900 Break

#### Target Vulnerability Assessment

Secret

- 0930 An Analysis of High Energy Laser (HEL) Effects on a Unmanned Aerial System Aimpoint of Interest (S-C)
- 1000 HEL Vulnerability Assessment of an Unmanned Aerial System (S-D)
- 1030 Dynamic Engagement Modeling in the Effectiveness ToolBox (ETB) (C)
- 1200 Lunch at Hyatt

## WEDNESDAY AFTERNOON

### BEAM CONTROL

#### Models and Components

Limited Distribution D

Hyatt, Spyglass I

Chair: *Leslie Chrzan*, Moog CSA Engineering

1300 Methods for Latency-Tolerant Adaptive Optics (A)

*William Burns*, University of Notre Dame

1325 Experimental Characterization of Radiation Distribution in a Power-Scalable Phase-Locked Fiber Laser Array (A)

*Andy Motes*, Schafer Corporation

1355 Membrane-Based Deformable Mirrors for High Power Laser Systems (D)

*Jesse Jameson*, MZA Associates Corporation

1420 Fast Real-Time Shack-Hartmann Wavefront Sensor using COTS Hardware (C)

*Justin Mansell*, MZA Associates Corporation

1445 Use of High Speed Tip/tilt/Focus Optical Phase Array for Jitter Correction of a Hybrid Beam Director (C)

*Andrew McKie*, Raytheon

1510 Ultrashort Pulse Laser Beacon for Deep Turbulence HEL Propagation (C)

*Joseph Penano*, Naval Research Laboratory

## WEDNESDAY AFTERNOON

### EMPLOYMENT OF DE WEAPONS

#### Operational Integration II

Open

Hyatt, Windjammer II - IV

Chair: *Lou Florence*, US Military Academy

1300 Assessment of Laser Kill Chain and Inclusion in Layered Defense (A)

*Mitch Pawlowski and Bradley Fiedler*, Naval Postgraduate School

1330 Design and Construction of Pre-Stage Magnetic Coil to Enhance Helicon Mode Excitation and Data Acquisition Software on the Helicon Plasma Experiment (HPX) (A)

*Justin Sherman*, US Coast Guard Academy

1400 Updates on the Optical Emission Spectroscopy and Thomson Scattering Investigations on the Helicon Plasma Experiment (HPX) (A)

*Omar Duke-Tinson*, US Coast Guard Academy

## WEDNESDAY AFTERNOON

### COUNTER DE WEAPONS

#### Hardened Materials and Structures I

Secret

NPS, ME Auditorium

- 1300 AFRL Materials and Manufacturing  
Directorate Directed Energy Structural  
Hardening Program Overview (S-N/F-D)
- 1330 Materials Coatings and Structures to  
Counter the Effects of HEL Weapons  
(S-N/F-D)
- 1400 Measurement of Carbon-Fiber Epoxy-Matrix  
Laminate Recession Rates in High-  
Irradiance Laser Exposures (S-D)
- 1430 Break
- 1500 Understanding and Improving the HEL  
Survivability of Lightweight Structural  
Composite Materials (S-D)
- 1450 Susceptibility of Graphene Devices
- 1600 Mitigation Analysis for High Energy Electron  
Impact on Electronic Systems (C)

## WEDNESDAY AFTERNOON

### DE MODELING & SIMULATION

#### Physics Based Modeling and Simulation

Open / Limited Distribution D

Hyatt, Spyglass II

Chair: *TBD*

- 1300 Partial Spatial and Temporal Coherence and  
Implications for Active Track and Active  
Imaging (A)  
*Richard Holmes, Boeing*
- 1330 Practical Optically Pumped Gas Lasers for  
MIDIR and LWIR Applications (A)  
*Robert Campbell, irptechnology*
- 1400 Signal Distortion Control in Transmission  
Lines Coupled to Nonlinear Circuits (A)  
*Ioana Triandaf, Naval Research Laboratory*
- 1430 Computational and Experimental Study on  
Laser Ablation in Aluminum and Ni-Based  
Metal Alloys (D)  
*Sangwook Sohn, University of Dayton  
Research Inst.*
- 1500 Break
- 1530 Microphysical Models of Thermal Dynamic  
BRDF (C)  
*Brian Hoover, Advanced Optical, Inc.*
- 1600 Performance of Coherent Beam Combining  
and Power Usage (A)  
*Andy Motes, Schafer Corporation*

## WEDNESDAY AFTERNOON

### TEST AND EVALUATION

#### Test Capabilities and Instrumentation

Open / Limited Distribution D

Hyatt, Cypress I - II

Chair: *Pat Cannon*, AEGIS Technologies

1300 Directed Energy Test Science and Technology (DET S&T) Project Overview (A)  
*Trung Nguyen*, PEO STRI

1330 Irradiance Collection and Reporting System (ICRS) (A)  
*John Le Sage*, SemQuest Inc

1400 The Integrated Atmospheric Characterization System (IACS) (A)  
*Gary Gimmestad*, Georgia Tech Research Institute

1430 MACS Development Update: the Maritime Atmospheric Characterization System  
*Steve Hammel*, SPAWAR Systems Center

1500 Break

1530 Reconfigurable Target Board and In-Situ Irradiance Sensors (D)  
*Melissa Archuleta*, AEGIS Technologies Group

1600 Reconfigurable Onboard DE Sensor Suite (D)  
*Jim Luke*, AEGIS Technologies Group

SESSION IS NOW OPEN

1630 SoCal2013--Propagation Measurements in a Maritime Environment (A)  
*Kevin McBryde*, SPAWAR Systems Center

1700 On-Board Irradiance Diagnostics (OBID) Mortar for Airborne HEL Beam Profile Measurement (A)  
*Saivosh Hamadani*, SARA, Inc

## THURSDAY MORNING

### BEAM CONTROL

#### Aero-Optics/Aero-Effects

Limited Distribution D

Hyatt, Spyglass I

Chair: *Lewis DeSandre*, Naval Postgraduate School

0630 Breakfast at Hyatt Regency

0700 Registration at Hyatt Regency

0800 Deformable Mirror Requirements for Compensating Aero-Optic Wavefronts in Subsonic and Transonic Conditions (D)  
*Jason Schmidt*, MZA Associates Corporation

0825 Supersonic Turret Aero-Optics Testing (D)  
*David Gorskey*, MZA Associates Corporation

0850 Aero-Optical Tilt Compensation using High Speed Wavefront Sensing (D)  
*Joseph Riley*, MZA Associates Corporation

0915 Break

#### Acquisition, Pointing and Tracking

Limited Distribution D

Chair: *David Dayton*, Applied Technology Associates

0945 Results of the Hybrid Tracker Field Demonstration (C)  
*David Dayton*, Applied Technology Associates

1010 Mitigation of Illuminator Scintillation in Laser Illuminated Tracking Systems (D)  
*David Dayton*, Applied Technology Associates

1035 Target Rotation and Aimpoint Correction using Enhanced Reconstruction (TRACER) (C)  
*Eric Magee*, MZA Associates Corporation

1100 Development of a Hardware-in-the-Loop Tracker Evaluation System Using the MZA TRADES Platform (D)  
*Brian Henderson*, MZA Associates Corporation

1130 Poster Session and Box Lunch

## THURSDAY MORNING

### COUNTER DE WEAPONS

#### Hardened Materials and Structures II

Limited Distribution D / Open

Hyatt, Spyglass II

Chair: *Jonathon Vernon*, Air Force Research Laboratory

0630 Breakfast at Hyatt Regency

0700 Registration at Hyatt Regency

0800 **Effect of Thermally Conductive Interfaces on Damage Evolution in Composites Under HEL Exposure (D)**  
*Keith Slinker*, Air Force Research Laboratory

0830 **New Broadband Nonlinear Optical Dyes for Laser Damage Protection in Various Pulse Width Regimes (D)**  
*Timothy Pritchett*, Army Research Laboratory

0900 **Nonlinear Optical Bulk Nano-Composites for C-DEW Applications (C)**  
*Antonio Ting*, Naval Research Laboratory

0930 Break

#### SESSION IS NOW OPEN

1000 **Metamaterials for Perfect Reflection (A)**  
*Brian Slovick*, SRI International

1030 **Numerical Studies of Beam Propagation in a Metamaterial-Driven Lens (A)**  
*Hong Zhou*, Naval Postgraduate School

1100 **Nanoscale Technique for Enhanced Heat Transfer for Material Protection (A)**  
*Keith Prussing*, Georgia Institute of Technology

1130 Poster Session and Box Lunch

## THURSDAY MORNING

### EMPLOYMENT OF DE WEAPONS

#### DE System Support and Employment Policy

Limited Distribution D

Hyatt, Windjammer II-IV

Chair: *Lou Florence*, US Military Academy

0800 **Space Deconfliction Readiness for "Pivot to the Pacific" Laser Weapons (C)**  
*Heather Witts*, SERCO, Inc.

0830 **The Impact of Satellite Safety Solutions on Laser Weapon Combat Effectiveness (C)**  
*Jerry Buckley*, SERCO, Inc.

0900 **Distance Support In-Service Engineering for the High Energy Laser (A)**  
*Matthew Sheehan*, Naval Postgraduate School

0930 Break

1000 **Operation of an Integrated 400kW Electrical Power System and a 240kW Thermal Management System with an Emulated SS HEL Weapon (C)**  
*Fernando Rodriguez*, Air Force Research Laboratory

### RFDEW CONFERENCE

Secret

NPS, Ingersol

0800 **Directed Energy Directorate Survey of Available MIL STD 464C Test Sources (C)**

0825 **Refurbishment and Target Testing with the ORION System at NSWC Dahlgren (C)**

0850 **PHASER System Design and Demonstration (C)**

0915 **Impact of Frequency, Aspect Angle, and Polarization on HPM Susceptibility of Generic Electronic Targets (C)**

0940 Break

1010 **HPM Susceptibility of Certain Foreign Transmitters (C)**

1035 **Tests and Demonstration of a United Kingdom Prototype DE System at NSWC Dahlgren (C)**

1100 **Coupling of Electrostatic Discharge into Buried Wires (C)**

## THURSDAY MORNING

### TEST AND EVALUATION

#### Instrumentation

Open

Hyatt, Cypress I - II

Chair: *Pat Cannon*, AEGIS Technologies

0630 Breakfast at Hyatt Regency

0700 Registration at Hyatt Regency

0800 Remote HPM Data Acquisition Science and Technology (A)

*Jeffrey Schleher*, American Systems

0830 Fiber Optic Sensors for Non-Intrusive Diagnostic Measurements of Rail Gun Electric and Magnetic Fields (A)

*Tony Garzarella*, Naval Research Laboratory

0900 High Sensitivity, All-Dielectric Electric and Magnetic Field Sensors for RF and HPM Applications up to 20 GHz (A)

*Dong Ho Wu*, Naval Research Laboratory

0930 Break

1000 Non-Intrusive High Voltage Measurement Inside of a Coaxial Cable using a Slab Coupled Optical Sensor (A)

*Frederick Seng*, Brigham Young University

1030 Compact Hard Tube Vircator (CHTV) High Rep Rate System for In-Chamber Testing (A)

*John Mankowski*, Texas Tech University

1100 Advanced Non-Intrusive HPM Sensors (A)

*Jeffrey Schleher*, American Systems

1130 Poster Session and Box Lunch

## THURSDAY LUNCH

### JOINT SESSION

#### Poster Session

NPS, King Hall

1130 Poster Session Begins

#### OPEN POSTERS

2013 Navy C-RAM Test Results and Analysis (A)  
*Mike Libeau*, Naval Surface Warfare Center

#### LIMITED DISTRIBUTION POSTERS

UAS Tail Boom Vulnerability Testing & Analysis (D)  
*Chris Heflin*, Naval Surface Warfare Center

Penetration Analysis of Experimental Data with Analytical Methods (D)

*Mike Libeau*, Naval Surface Warfare Center

#### CLASSIFIED POSTERS

High Energy Laser (HEL) Effects on Copper

## THURSDAY AFTERNOON

### JOINT SESSION

#### Wrap Up Plenary Session

NPS, King Hall

1300 HEL Lethality Conference  
*Christopher Lloyd*, NSWCCD

1330 Counter DE Weapons Conference and RF DE Weapons Conference  
*Sylvia Dorato*, HEL Joint Technology Office

1400 Employment of DE Weapons Conference  
*Lou Florence*, US Military Academy

1430 Beam Control Conference  
*Jim Lasche*, Air Force Research Laboratory

1500 Break

1530 DE Modeling and Simulation Conference  
*Linda Lamberson*, Air Force Research Laboratory

1600 DE T&E Conference  
*Patrick Cannon*, AEGIS Technologies

1630 RF DE Weapons Workshop  
*Diana Loree*, Air Force Research Laboratory

1700 Symposium Adjourns

# Symposium Organizing Committee

Symposium Chairs  
*Dave Kiel, Nevin Carr*

Beam Control Conference  
*Jim Lasche, Chris Washer*

Counter DE Weapons Conference  
*Sylvia Dorato, Robert Cozzens*

DE Modeling and Simulation Conference  
*Linda Lamberson, Lawrence Lee*

Employment of DE Weapons  
*David Kashinski, Kraig Sheetz, Lou Florence*

High Energy Laser Lethality Conference  
*Robert Roybal , Robert Ulibarri , Dave Loomis*

RF DE Weapons Workshop  
*Diana Loree, Michael Lambrecht*

DE T&E Conference  
*Patrick Cannon, James Keith, Woody Shortt*

Security Coordinator  
*Rhonda Peyton*

Symposium Coordinator  
*Cynnamon Spain*

Registration and Payments  
*Tiffany Bjelke*

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