

Technical Program



Joint Conference on T&E Support to Prototyping & Experimentation

Hosted by
International Test and
Evaluation Association
and
Directed Energy
Professional Society

30 January–2 February 2023

Short Courses / Tutorials

0700 **Registration**

0800 **Morning Tutorials Begin**

T&E of HEL Systems

(Limited Distribution C) *Todd Steiner*

T&E of HPM Systems

(Limited Distribution C) *Jeff Schleher*

Introduction to the DoD Test & Evaluation Process

(Limited Distribution D) *Robert Newton*

1200 **Lunch**

1300 **Afternoon Tutorials Begin**

Design of Tests for Transitioning DE

Weapon Systems *VIRTUAL*

(Limited Distribution D) *Dan Isbell*

HPM M&S Tools for T&E

(Limited Distribution D) *Walter Clover*

Test and Training Solutions with

TENA, JMETC, and BDKM

(Open) *Gene Hudgins*

TUESDAY MORNING

Plenary Session

Yucatan Room

- 0700 **Registration Desk Opens**
Continental Breakfast in the Exhibit Area
- 0800 **Welcome**
Mr. Edward Trzcienski, 2023 Conference Program Co-Chair
Posting of the Colors and National Anthem
- 0815 **Opening Remarks**
Mr. Tim Morey, ITEA Chairman
Dr. Sandra Biedron, DEPS Executive Director
- 0825 **Remote Video Remarks**
U.S. Senator Martin Heinrich (D-N.M.)
- 0830 *LTG Robert Rasch, Director, Rapid Capabilities and Critical Technologies Office*
- 0915 **White Sands Missile Range Joint Capabilities**
Jerry Tyree, Stephen Squires and Gus Sierra
- 1015 **Break**
- 1045 *BG William T Rawls, Air Force Operational Test and Evaluation Center Commander*
- 1130 *Mr. Quentin Saulter, Office of Naval Research Program Officer, Directed Energy Weapons*
- 1200 **Announcements and Introduction to Afternoon Technical Sessions, Introduction of Lunch Speaker**
Dr. James Horkovich, Conference Technical Program Chair
- 1200 **Lunch**
Mr. Steve Woffinden, STEAM Speaker

TUESDAY AFTERNOON

T&E Capabilities for Directed Energy Systems

Session Chair: *Chris Valenta, GTRI*

Yucatan Room

- 1300 **Simulation of Directed Energy (DE) through Digital Engineering (DE) (A)**
Robert Oxendine, Integration Innovation, Inc. (i3)
- 1330 **Scientific Test and Analysis Techniques (STAT) in Prototyping & Experimentation (A)**
Kyle Kolsti, STAT COE
- 1400 **Supporting P&E with an Agile, Scalable Evaluation Framework: Experiment Design, Prototype Evaluation and Decision Support (A)**
Suzanne Beers, The MITRE Corporation
- 1430 **At UCF, the Center for Directed Energy and its TISTEF Laser Range (A)**
Martin Richardson, CDE@UCF
- 1500 **Break**
- 1530 **Directed Energy Studies and Experimentation at the Naval Postgraduate School (D)**
Bonnie Johnson, Naval Postgraduate School
- 1600 **Electromagnetic Disruption Recovery and Battle Damage Assessment (C)**
Dustin Heath, Vigilant Cyber Systems Inc.
- 1630 **American Systems Mobile Advanced GPS Instrumentation and Collection System (MAGIC) (C)**
Christopher Martin, American Systems
- 1700 **Session Adjourns**
- 1730 **Exhibitors Reception**

TUESDAY AFTERNOON

Atmospheric Characterization 1

Session Chair: *Dr. Steve Hammel*, NIWC Pacific
Taos Room

- 1300 **Overview of an Open-Air Laser and Atmospheric Experimental Data Collection Event Conducted at TISTEF (D)**
Evan Bates, Naval Surface Warfare Center Dahlgren Division
- 1325 **LIDS HEL Test Suite: Multi-Spectral Transmission and Extinction Initial Test Results (C)**
Casey Reynolds, AFIT/ENP
- 1350 **Integration of Numerical Weather Prediction (NWP) Parameters and Real-Time Data and their Contribution to Weather Integration Prototype (WIP) Performance (C)**
Casey Reynolds, AFIT/ENP
- 1415 **Nexus: A DoD Web Tool for Environmental Site Surveys and DE Test Planning (D)**
Yakov Diskin, MZA Associates Corporation
- 1440 **High Energy Laser Test and Evaluation Assessment with HEL-PETT Software (C)**
Svetlana Lachinova, II-VI Aerospace & Defense
- 1505 **Break**
- 1530 **Measurements and Modeling of Optical Turbulence in the Surface Layer (A)**
Joseph Blau, Naval Postgraduate School
- 1555 **Nodal Atmospheric Characterization Sensor Use and Applications (A)**
Alex Clark, BlueHalo
- 1620 **Aerial Transmissometer for EO Atmospheric Measurement (A)**
Skylar Lilledahl, Naval Information Warfare Center Pacific
- 1645 **Real Time Atmospheric Monitoring Capabilities at the TISTEF Laser Range (A)**
Thomas Miletich, CDE@UCF
- 1710 **Session Adjourns**
- 1730 **Exhibitors Reception**

TUESDAY AFTERNOON

HPM Sources

Session Chair: *Mr. Jeff Schleher*, American Systems
Tampico Room

- 1300 **Joint Agile Non-kinetic Upgradeable System (JANUS) Project - Status Update (C)**
John Osowski, Verus Research
- 1330 **Verification of VIRCATOR and NLTL Sources for Effects Testing (D)**
Leonardo Rossetti, Naval Research Laboratory
- 1400 **Free Field Test Source - Project Update (C)**
John Osowski, Verus Research
- 1430 **High Average Power Pulsed (HAPP) Project (A)**
Jonathon Heinrich, Verus Research
- 1500 **Break**
- 1530 **S-Band Test and Evaluation Source (STES) Project (C)**
Patrick Wong, Verus Research
- 1600 **Recoverable, Reusable Airborne Engagement (RRAE) (C)**
William White, Verus Research
- 1630 **Status Update: Electromagnetic Interactive Tool for Test & Evaluation of Radio-frequency Systems (EMITTERS) (C)**
Walter Clover, Verus Research
- 1700 **Session Adjourns**
- 1730 **Exhibitors Reception**

WEDNESDAY MORNING

Plenary Session

Yucatan Room

- 0700 **Registration Desk Opens**
Continental Breakfast in the Exhibit Area
- 0800 **Welcome**
Ms. Whitney Winchester, 2023 Conference Program Co-Chair
Posting of the Colors and National Anthem, Sendoff for the STEAM Competition Teams
- 0815 *Mr. Geoff Wilson*, Program Manager, Test Resource Management Center, T&E/S&T Program
- 0900 *Mr. Matt Fetrow*, Director of Strategic Communications, Space Rapid Capabilities Office
- 0945 **Break - Visit STEAM Competition**
- 1015 **Workforce Pipeline Panel: Meeting the Future Needs Today**
Moderated by *Dr. Sandra Biedron*, DEPS Executive Director and Professor of ME and ECE, University of New Mexico

Panelists:

- *James Hadaway*, Principal Research Scientist, Center for Applied Optics, The University of Alabama in Huntsville
 - *Justin Martin*, Chief Engineer, Raytheon High Energy Laser Product Line
 - *Laura McGill*, Deputy Lab Director and Chief Technology Officer, Sandia National Labs
 - *Martin Richardson*, Director, Center for Directed Energy, Pegasus and Northrop Grumman Professor of Optics, Physics Electrical and Computer Engineering, University of Central Florida
 - *Stephen Squires*, Director High Energy Laser Systems Test Facility (HELSTF), White Sands Missile Range (WSMR)
- 1130 **Lessons Learned from SDPE DE Deployments**
Mr. Peter Finlay, Air Force Research Laboratory
- 1200 **Announcements**
Dr. Tim Andreadis - Conference Technical Program Co-Chair
- 1200 **Lunch**
Announcement of STEAM Competition Awards
STEAM Co-Chairs

WEDNESDAY AFTERNOON

HEL Manufacturing Subsystem and Component Testing and Verification

Session Chair: *Joseph Grobmyer*, RCCTO

Yucatan Room

- 1300 **Results, Action Items, and Plan Forward from the 2022 HEL Optics Metrology Workshop (D)**
James Hadaway, The University of Alabama in Huntsville
- 1330 **Best Practices for Specifying HEL Small Beam Space Optics (C)**
Joseph Randi, Penn State Applied Research Laboratory
- 1400 **Updates to the Manufacturing and Acceptance Testing of kW-Class Fiber Amplifiers and Spectral Beam Combiners (D)**
Benjamin Johnson, Coherent
- 1430 **Manufacturing and Testing of Coated Optical HEL Components (D)**
Kevin Kearney, Optimax SI
- 1500 **Break**
- 1530 **Development of Independent HEL Optic Metrology Labs at the University of Alabama in Huntsville (D)**
Milan Buncick, Bluehalo
- 1600 **Next Level Testing - Raytheon Technology's Approach to Directed Energy Critical Qualification During Integration (A)**
Jason Lavine and *Anthony DiChiara*, Raytheon Intelligence and Space
- 1630 **Automated System for Combinatorial Discovery of Coatings from Compound Semiconductors and High Entropy Alloys (A)**
George Atanasoff, AccuStrata, Inc.
- 1700 **Session Adjourns**

STEAM Competition Participating Schools

| Middle Schools | High Schools |
|------------------------------|---|
| Cien Aguas Int'l School | Albuquerque HS |
| Bosque School | West Mesa HS |
| Ernie Pyle Middle School | Technology Leadership HS |
| Nuclear Museum Homeschoolers | Albuquerque Institute for Mathematics and Science |

Atmospheric Characterization 2

Session Chair: *Dr. Steve Hammel*, NIWC Pacific
Taos Room

- 1300 **Airborne Measurement of Atmospheric-Induced Beam Jitter (A)**
Eric Jumper, University of Notre Dame
- 1325 **Comprehensive Approaches to Measuring Air-Turbulence at TISTEF (A)**
Matthew Salfer-Hobbs, CDE@UCF
- 1350 **Long-Term monitoring at the Naval Research Laboratory's Coastal Environmental Observation Station (NRL-CEOBS) for Cn2 Observations and Model Validation from Remote Sensing (A)**
Jerome Schmidt, Naval Research Laboratory
- 1415 **The Sea-Based High Energy Laser Atmospheric Characterization (SHELAC) System (A)**
Don Harris, Georgia Tech Research Institute
- 1440 **Numerical Weather Prediction Model Data Assimilation for Improved HEL Atmospheric Characterization (A)**
Clark Amerault, Naval Research Laboratory
- 1505 **Break**
- 1530 **SAEL lidar Recent Deployments and Outlook for Integrated HEL Atmospheric Characterization Suite (D)**
David Sonnenfroh, Physical Sciences Inc.
- 1555 **On the Necessity to Standardize Optical Turbulence Measurements (C)**
Christopher Valenta, Georgia Tech Research Institute, Electro-Optical Systems Laboratory
- 1620 **A Temporal Covariance Method for Calculating Optical Turbulence (C)**
Christopher Valenta, Georgia Tech Research Institute, Electro-Optical Systems Laboratory
- 1645 **DELTA-PRO: Integrated Imaging and Wavefront Turbulence Profiling (D)**
Matthew Whiteley, MZA Associates Corporation
- 1710 **Session Adjourns**

Measurement and Calibration 1

Session Chair: *Dr. Subrata Sanyal*, NSWC Corona
Tampico Room

- 1300 **Performance Measurement Trust = Operational Trust (C)**
Subrata Sanyal, Naval Surface Warfare Center, Corona Division (NSWC Corona)
- 1330 **Calibrated Spectral Measurements of Supercontinuum in Bulk Dielectric Media (C)**
Bryan Holtsberry, DEVCOM Analysis Center
- 1400 **Navy Low Energy Laser Test Equipment (C)**
Marshall Mullins, Naval Surface Warfare Center, Crane Division (NSWC Crane)
- 1430 **Dynamic Target Reflection Measurements for Range Safety Considerations (C)**
Richard Preston, Sensing Strategies
- 1500 **Break**
- 1530 **Design and Delivery of Laser Instrumentation Diagnostic Suite (LIDS) Units (D)**
Andrew Hall, BlueHalo
- 1600 **Dynamic Target Tracking for Remote Data Acquisition (D)**
Peter Wick, Naval Surface Warfare Center, Dalgren Division
- 1630 **Field Measurements of HPM Systems using sUAS (A)**
Zachary Levine, Epirus, Inc.
- 1700 **Design of Experiments and Statistical Methods for Directed Energy Test and Validation (A)**
Bill Thomas, Radiance Technology
- 1730 **Session Adjourns**

THURSDAY MORNING

DoD Experimentation Campaigns & Programs

Session Chair: *Zack George*, Modern Technology
Solutions, Inc.

Taos Room

- 0700 **Registration Desk Opens**
Continental Breakfast in the Exhibit Area
- 0800 **Probability of Weapon Effectiveness**
Experiment (PWEX) Program Summary (D)
Zack George, Modern Technology Solutions,
Inc. (MTSI)
- 0830 **PWEX Illumination of Aerial Targets (C)**
Christopher Beirsto, US Army, WSMR (HELSTF)
- 0900 **Integrated DE Test and Evaluation**
Modernization - An Innovative Approach
Integrated DE Architecture (IDEA)(D)
Raquel Astorga, Leidos
- 0930 **Aircraft and Beam Director Integrated**
Testing (D)
Matthew Whiteley, MZA Associates Corporation
- 1000 **Break**
- 1030 **Advancements in RF-Telemetry for**
Hypersonic Projectiles in Highly Reflective
Environments (C)
Sameer Hemmady, Verus Research
- 1100 **Innovative Assessment of DE Effects via**
Microelectronics RF Emission Analysis (C)
Ken Munson, Nokomis, Inc.
- 1130 **DE Effects to the Part Level on Ground**
Vehicle Engine Control Units using RF
Emission Signature Analysis (C)
Walter Keller, Nokomis, Inc.
- 1200 **Lunch**

THURSDAY MORNING

Measurement and Calibration 2

Session Chair: *Dr. Subrata Sanyal*, NSWC Corona
Tampico Room

- 0800 **Advanced Ceramic Target Board (C)**
Bo Henderson, Scientic, Inc.
- 0830 **Calibration Techniques for Non-Planar High**
Energy Laser Target Boards (C)
Kristen Parker and *Eric Duff*, SemQuest Inc.
- 0900 **sUAS HEL Target Boards for Gathering**
Outdoor HEL Data (C)
Caleb Hoover, SemQuest
- 0930 **Testing of HEL Targets on Flight Platforms (C)**
Caleb Hoover, SemQuest
- 1000 **Break**
- 1030 **Ground Targets for Quantifying Laser System**
Tracking Capabilities (D)
David Hubble, Naval Surface Warfare Center,
Dahlgren Division (NSWC Dahlgren)
- 1100 **Visibility Measurements Use Cases, Data**
Reproducibility, and Calibration Approach of
a Novel Open-Path Optical Extinction
Analyzer (A)
Nabil Saad, Nikira Labs Inc.
- 1130 **Session Adjourns**
- 1200 **Lunch**

THURSDAY MORNING

HPM Sensors

Session Chair: *Jeff Schleher*, American Systems
Yucatan Room

- 0800 **HPM Beam Evaluation Tool Project (HBET) (C)**
John Sanchez, Verus Research
- 0830 **Directed Energy Test Science and Technology Fast Acquisition Effects Testing System (FAETS) (C)**
Jennifer Sloane-Warren, Verus Research
- 0900 **High-Frequency High-Power Microwave Diagnostic Suite (HF-HDS) Project (C)**
Laury Decker, Verus Research
- 0930 **Airborne High-Power Microwave Instrumentation (AirHI) Project (C)**
John Sanchez, Verus Research
- 1000 **Break**
- 1030 **HPRF and HPM Field Tests of a Non-Intrusive Single-Axis and Three-Axis Electro-Optic Field sensor (C)**
Dong Wu, Naval Research Laboratory
- 1100 **Optically Based Sensing of RF Fields and Induced Currents for Directed-Energy Testing (C)**
John Whitaker, Advanced Fiber Sensors, Inc.
- 1130 **Integration and Field Testing of a Tethered sUAS for HPM Field Characterization (A)**
Michael Kranz, EngeniusMicro
- 1200 **Lunch**

THURSDAY AFTERNOON

General Session

Session Chair: *Dr. Diana Loree*, AFRL
Offsite Location

- 1330 **Intelligence Brief**
Garrett Nokes, AFRL/RDOI
- 1430 **Directed Energy Separating from Radio Frequency Electronic Warfare - How Did We Get Here (C)**
Jeffrey Schleher, American Systems
- 1500 **Merged Directed Energy and Electronic Warfare Testing**
Tim Andreadis, Naval Research Laboratory
- 1530 **Break**
- 1550 **Predictive Performance Modeling and Simulation Baseline of the Directed Energy Weapons Mission Analysis Tool Set (DEWMATS) to Operational Test Results**
Daniel Levy, Georgia Tech Research Institute
- 1615 **High Energy Laser Engagement Analysis with RADHEL and Experiment Driven Modeling Requirements**
Aaron Defreitas, Air Force Research Laboratory
- 1640 **Multi-Physics Modeling Framework**
Michael Sheyka, Air Force Research Laboratory
- 1705 **Characterization of a High Power Microwave Antenna System**
Eric Berry, Raytheon Technologies
- 1730 **Conference Adjourns**

Conference Organizers

Conference Co-Chairs

Edward Trzeciński, Whitney Winchester

Conference Technical Co-Chairs

Jim Horkovich, Tim Andreadis

Technical Program Committee

*Alexis Clark, Zachary George, Joseph Grobmyer,
Steve Hammel, Diana Loree, Roger Russell, Subrata
Sanyal, Jeffrey Schleher, Chris Valenta*

Technical Program Coordinator

Cristina Crowson

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Lena Moran, Cristina Crowson

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