



# Instrumentation in a Constrained Environment

**May 22-25, 2023**

**Tuscany Suites &  
Conference Center**

**Las Vegas, NV**





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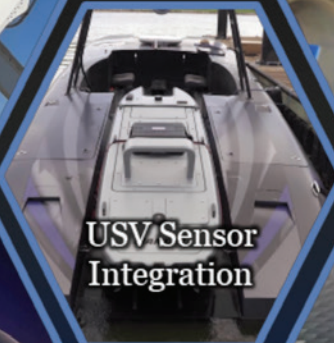
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**USV Sensor  
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# SCHEDULE-AT-A-GLANCE

## EVENTS

## DAY/TIME

### Tutorials

- Monday, May 22  
1:00 p.m. - 5:00 p.m.
- Tuesday, May 23  
8:00 a.m. - 12:00 p.m.  
8:00 a.m. - 5:00 p.m.

### Exhibit Hours

- Tuesday, May 23  
1:00 p.m. - 5:00 p.m.
- Wednesday, May 24  
9:00 a.m. - 5:00 p.m.
- Thursday, May 25  
9:00 a.m. - 4:00 p.m.

### Hands-on-Lab

- Tuesday, May 23  
1:00 p.m. - 5:00 p.m.
- Wednesday, May 24  
1:30 p.m. - 3:30 p.m.
- Thursday, May 25  
10:00 a.m. - 12:30 p.m.

### Technical Sessions

- Wednesday, May 24  
10:30 a.m. - 12:30 p.m.
- Thursday, May 25  
10:30 a.m. - 12:30 p.m.  
1:30 p.m. - 3:30 p.m.

### Opening Ceremony & Keynote

- Wednesday, May 24  
8:00 a.m. - 10:00 a.m.

### Panel: Digital Engineering in Support of T&E

- Wednesday, May 24  
3:30 p.m. - 5:00 p.m.

### Reception in Exhibit Hall

- Wednesday, May 24  
5:00 p.m. - 6:30 p.m.

### Featured Speakers

- Thursday, May 25  
8:00 a.m. - 10:00 a.m.  
4:00 p.m. - 5:30 p.m.

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Hands-on-Lab

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### *Themes for 2023 / 2024*

#### **Test and Evaluation Across the Acquisition Life Cycle**

March 2023 (Volume 44 / Issue 1)

#### **Test the Way We Operate – Best Practices and Lesson Learned**

June 2023 (Volume 44 / Issue 2)

**Manuscript Deadline:** March 1, 2023

#### **DATAWorks Special Issue**

September 2023 (Volume 44 / Issue 3)

**Manuscript Deadline:** May 15, 2023

#### **T&E for Emerging Technologies**

December 2023 (Volume 44 / Issue 4)

**Manuscript Deadline:** September 1, 2023

#### **T&E for AI Enabled Systems**

March 2024 (Volume 45 / Issue 1)

**Manuscript Deadline:** December 1, 2023

# ABOUT ITEA

**The premier professional association of the international test and evaluation community.**

For over 40 years, the International Test and Evaluation Association (ITEA), a 501(c)(3) not-for-profit education organization, has been advancing the exchange of technical, programmatic, and acquisition information among the test and evaluation community.

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- Specific T&E education and training.
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# PRE-WORKSHOP TUTORIALS

**MONDAY, MAY 22**

**AFTERNOON SESSIONS | 1:00 p.m. to 5:00 p.m.**

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## **5G NR Specification and System Engineering Aspects**

 **Florentine G**

Achilles Kogiantis, PhD & Ankur Sharma, Peraton Labs

5G wireless cellular networks, based on the 3GPP standard, are being widely deployed in the United States and the rest of the world. 5G is expected to increasingly dominate the worldwide cellular communication market due to its flexibility, wide adoption, and an ever-expanding supplier global ecosystem. The flexible 5G architecture allows multiple networks widely differing in physical, reliability and power characteristics to be supported over a common infrastructure. This flexibility will be particularly useful to Testing Ranges where subnetworks simultaneously supporting high-bandwidth terrestrial communications, low-power sensors and broadband airborne telemetry systems can be flexibly implemented over a common 5G platform. This tutorial is intended to familiarize the Testing Range professionals with a) the key features of the 5G standards specifications – the basic vision, network architecture, the physical and MAC-layer characteristics of the air-interface, and b) the 5G system engineering aspects of deploying a new private network, dimensioning and planning, and its performance assessment. The first half of the tutorial will discuss the 5G standards specifications, while the second half will cover the 5G systems engineering aspects.

## **Electro-Optics/InfraRed Fundamentals**

 **Florentine E**

Vu Hoang, 775TS/ENVD

This tutorial is designed to provide an overview of the general concepts and principles of electro-optics and infrared (EO/IR) technology. The tutorial will cover essential topics that are relevant for flight test applications, including electromagnetic waves, optics and optical concepts, resolution, detecting/sampling light, human eye, image processing, pointing, tracking, control and electronics, lasers, and radar vs. EO/IR comparison.

The tutorial will begin with an introduction to EO/IR and its significance in flight test applications before delving into the other topics mentioned above. By the end of the tutorial, the learners will have a broad understanding of EO/IR technology and its relevance in flight test applications. They will also gain insight into the different components and principles that are involved in EO/IR systems, enabling them to make informed decisions when working with such systems.



## Fundamentals of Aeronautical Telemetry Ground Stations



Firenze

Mark McWhorter, V.P. of Sales & Marketing, Lumistar Inc.

This short-course is designed to provide a fundamental high-level overview of aeronautical flight telemetry ground stations, followed by a brief presentation of actual ground station hardware. The student will see how ground stations are set up to operate in real time, including the many basic parameters required to successfully receiver telemetry data at the ground station. Ideas related to Mission Planning and techniques for insuring System Maintenance and Readiness will be offered.

## IRIG 106-17 Chapter 7 Packet Telemetry Downlink Basis and Implementation Fundamentals



Florentine A

Johnny Pappas, Safran Data Systems, Inc.

This course will focus on presenting information to establish a basic understanding of the 2017 release of the IRIG 106, Chapter 7, Packet Telemetry Downlink Standard. It will also focus on the implementation of airborne and ground system hardware and methods to handle IRIG 106, Chapter 7, Packet Telemetry data. The presentation will address the implementation of special features necessary to support legacy RF Transmission, data recording, RF Receiving, Ground Reproduction, and Chapter 10 data processing methods.

## Laser System Test & Evaluation Atmospheric Challenges



Tuscany

Douglas H. Nelson, Senior Combat Systems Engineer, Teknikare, Inc. & Mark Stevens, Systems Engineering Department, NPS

An introduction to the challenges of testing and evaluating Laser Systems in various atmospheric conditions. An overview of the basic physics and terminology of these systems is included. The unique effects of Laser Systems are also discussed to provide a foundation for test objectives. Test and evaluation needs for Laser Systems including required diagnostic beam propagation and atmospheric measurements are briefly examined.

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## Phased Array Systems for Telemetry Applications

 **Sienna**

Jerrett Eastburg, Raven Defense

This short course will cover modern phased array design concepts and trades as they relate to telemetry systems and other applications. This course will cover the basics of array design along with the specific performance parameters associated with phased arrays. With a focus on applications and design concepts, the course will cover analog beamforming, digital beamforming, and true time delay along with the associated pros and cons for each technique. This course will include a design example in which design trades and their implications will be discussed in detail. At the conclusion of the course, the student will be equipped with an understanding of this technology and how it can be applied to meet future communication and telemetry needs. The course is intended to spark excitement and intrigue for entry-level to mid-level engineering students and professionals.

## Troubleshooting Ethernet Data with Wireshark

 **Florentine F**

Paul Ferrill, ATAC

The “Troubleshooting Ethernet Data with Wireshark” tutorial will use real-world aircraft data to demonstrate how to use the open source program Wireshark to both view data and troubleshoot problems. The class will include presentation and hands-on usage of Wireshark to look at data as if you were connected to the Ethernet network on an airplane and if you were connected to an IIRG 106 Chapter 10 recorder broadcasting data over UDP. We'll start out with a brief overview of Ethernet fundamentals and then get right on to using Wireshark.

**TUESDAY, MAY 23**

**FULL DAY TUTORIALS | 8:00 a.m. to 5:00 p.m.**

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## Basics of Aircraft Instrumentation Systems

 **Siena**

Jim Alich, 812 Aircraft Instrumentation Test Squadron (AITS) 412<sup>th</sup> TW

This course provides an introduction to the full measurement chain, from sensor to graphic display. It also covers modern airborne data acquisition, recording, RF telemetry, and data reduction/processing systems. This course is intended for scientists, engineers, special instrumentation technicians, and anyone whose work depends on the output from measurement systems to support their mission.

## Test Foundations for Flight Test

 **Tuscany**

Jessica Peterson, Technical Director 412<sup>th</sup> Operations Group/Assistant Professor USAF TPS

The Test Foundations curriculum is designed to equip students with an introduction to the knowledge and skills necessary to be successful flight testers. The curriculum introduces the basic

“vocabulary” of the various phases of a flight test program, from program initiation through final reporting. The curriculum begins with a basic Systems Engineering problem decomposition approach applied to various flight test programs. Next the various stages of the lifecycle of a normal test program are decomposed into the subparts of Planning, Execution, Analysis, and Reporting (PEAR). Planning: the basic development strategy for test planning with specific and achievable objectives and the concepts of hazard and risk identification in safety planning will be introduced. Execution: the fundamentals of flight test control and conduct will be presented with an emphasis on the elements required for safe and efficient test control and conduct. Consideration for test execution will include required personnel, mission preparation, test card generation, communications plans, execution techniques, and post-test debrief. Finally, basic analysis methods and approaches to presenting technical results will be presented. The course will culminate with an in-class exercise to apply the Test Foundations content to test vignettes based on real-world scenarios.

## **TUESDAY, MAY 23**

**MORNING TUTORIALS | 8:00 a.m. to 12:00 p.m.**

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### **Basic Overview of Telemetry**

 **Florentine A**

Gary Thom, Delta Information Systems, Inc.

This course provides an introduction to the full measurement chain, from sensor to graphic display. It also covers modern airborne data acquisition, recording, RF telemetry, and data reduction/processing systems. This course is intended for scientists, engineers, special instrumentation technicians, and anyone whose work depends on the output from measurement systems to support their mission.

### **TRMC Solutions for Test and Training**

 **Firenze**

Gene Hudgins, TRMC JMETC/TENA

The Test and Training Enabling Architecture (TENA) was developed as a DoD CTEIP project to enable interoperability among ranges, facilities, and simulations in a timely and cost-efficient manner, as well as to foster reuse of range assets and future software systems. TENA provides for real-time software system interoperability, as well as interfaces to existing range assets, C4ISR systems, and simulations. TENA, selected for use in JMETC events, is well designed for its role in prototyping demonstrations and distributed testing.

Established in 2006 under the TRMC, JMETC provides readily-available connectivity to the Services' distributed test capabilities and simulations. JMETC also provides connectivity for testing resources in the Defense industry and incorporation of distributed testing and leveraging of JMETC-provided capabilities by programs and users has repeatedly proven to reduce risk, cost, and schedule. JMETC is a distributed LVC testing capability developed to support the acquisition community during program development, developmental testing, operational testing, and interoperability certification, and to demonstrate Net-Ready Key Performance

Parameters (KPP) requirements in a customer-specific Joint Mission Environment.

JMETC is the T&E enterprise network solution for secret testing, and uses a hybrid network architecture - the JMETC Secret Network (JSN), based on the SDREN. The JMETC MILS Network (JMN) is the T&E enterprise network solution for all classifications and cyber testing. JMETC provides readily available connectivity to the Services' distributed test capabilities and simulations, as well as industry test resources. JMETC is also aligned with JNTC integration solutions to foster test, training, and experimental collaboration.

TRMC Enterprise Big Data Analytics (BDA) and Knowledge Management (BDKM) has the capacity to improve acquisition efficiency, keep up with the rapid pace of acquisition technological advancement, ensure that effective weapon systems are delivered to warfighters at the speed of relevance, and enable T&E analysts across the acquisition lifecycle to make better and faster decisions using data that was previously inaccessible, or unusable. BDA is the application of advanced tools and techniques to help quickly process, visualize, understand, and report on data. JMETC has demonstrated that applying enterprise-distributed BDA tools and techniques to T&E leads to faster and more informed decision-making that reduces overall program cost and risk.

TRMC has been working with Joint Staff and Air Force JADC2 Cross-Functional Teams (CFTs) regarding JADC2 and Multi-Domain Operations (MDO), to inform them on TENA/JMETC and other TRMC capabilities that could be leveraged to support the emerging Joint Staff Joint Domain Environment (JDE). Additionally, TRMC has been engaged with Army Futures Command (AFC) throughout the year in a number of areas including assessing TENA/JMETC Support coupled with Big Data Analytics (BDA), expanding OSD TRMC collaboration and cooperation to other mission areas including, but not limited to, Cyber, BDA, Knowledge Management (KM), Machine Learning (ML), and Artificial Intelligence (AI).

This tutorial addresses using the well-established TENA and JMETC tools and capabilities combined with BDA tools and techniques to reduce risk in an often-uncertain environment; regularly saving ranges time and money in the process.

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# JOIN US for the Hands-on-Lab today 1:00 P.M. - 5:00 P.M.

The Hands on Lab (HOL) is a holistic journey through the entire flight test process. HOL represents seven different phases of flight test. Each of the phases is supported by a government Subject Matter Expert (SME) and partnering industry vendors. The SME provides an educational overview and the partnering industry vendors share a Hands-On experience with technical insight related to the specific phase they are representing. This experience was designed to allow attendees an opportunity to follow the flight test process through visualization of the signals, sampling of the data, interaction with the processes, understanding how changes in the test article translate to results in the test data, and how system formats are designed to be standardized for improved test interoperability, providing the integration of different vendors to achieve Development Test & Evaluation (DT&E) success.

## Hands-on-Lab Drawing

**Complete all 7 phases of the Hands-on-Lab  
for a chance to win prizes!**

*Drawing will be held at the Wednesday evening  
Networking Reception in the exhibit hall.*

## INTEGRATED TELEMETRY RANGE SOLUTIONS

**ACROAMATICS**  
TELEMETRY SYSTEMS

Ground Telemetry Data  
Processing, Analysis & Display



Ground Telemetry Data Acquisition  
& Data Transport

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& Encryption



Tracking Antenna  
Systems

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Ground Telemetry  
Recorders

### HANDS ON LAB

TUES, MAY 23, 1300-1700  
WED, MAY 24, 1300-1530  
THURS, MAY 25, 1030-1230

1

AIRBORNE  
INSTRUMENTATION

2

DATA ACQUISITION

3

DATA TRANSPORT

4

DATA PROCESSING

5

DATA DISPLAY & ANALYSIS



**Gary Thom**

Delta Information Systems  
President

### TUESDAY MORNING COURSE

TUES, MAY 23, 0800-1200

### BASIC OVERVIEW OF TELEMETRY

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# PLENARY SPEAKERS

**Wednesday, May 24 | 8:00 a.m. - 10:00 a.m.**

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 **Florentine A**



**George Rumford**, (SES) Director,  
Test Resource Management Center



**Karen D. H. Saunders**, (SES)  
Program Executive Officer, U.S. Army  
Program Executive Office Simulation,  
Training and Instrumentation (PEO STRI)

**Wednesday, May 24 | 3:30 p.m. - 5:00 p.m.**

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 **Florentine A**

**Digital Engineering in support of T&E**



**MODERATOR:**

**Dr. Policarpo Soberanis**, Chief PO, Virtual  
Simulation & Test, Northrop Grumman



**Adam Butler**, Senior Principle AI Systems  
Engineer, Northrop Grumman



**Tamara Hambrick**, Deputy Functional Chief  
Engineer for Systems Engineering, Boeing  
Enterprise Strategy and Operations



**James Sabino**, Senior Principle Systems  
Engineer, Raytheon



**Dr. David "Fuzzy" Wells**, CMSP, Principle  
Cyber Simulationist, MITRE

**Thursday, May 25 | 8:00 a.m. - 10:00 a.m.**

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 **Florentine A**



**Dr. Eileen A. Bjorkman**, (SES) Executive Director, Air Force Test Center (AFTC)



**Rick Quade**, (SES) Department of Navy Test and Evaluation Executive and Acting Department of the Navy Chief Engineer



**Bradley Thomason**, Director, Threat Systems Management Office (TSMO)

**Thursday, May 25 | 4:00 p.m. - 5:30 a.m.**

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 **Florentine A**



**Stephen Jensen**, (SES) Director, R&E, NASA Armstrong Research Center



**George Rumford**, (SES) Director, Test Resource Management Center

***Scan QR code to read speaker bios***






# AGENDA

## Wednesday, May 24

8:00 a.m.

 **Florentine A**

Opening Ceremony  
Presentation of Colors  
National Anthem  
**Tim Morey**, ITEA Chairman

8:10 a.m.

**Welcome**  
**Wendy Peterson**  
Antelope Valley Chapter President

8:30 a.m.

**George Rumford (SES)**  
Director, Test Resource  
Management Center (TRMC)

9:15 a.m.

**Karen D. H. Saunders (SES)**  
Program Executive Officer,  
U.S. Army Program Executive  
Office Simulation, Training and  
Instrumentation (PEO STRI)

10:00 a.m.

**BREAK IN THE EXHIBIT HALL**

10:30 a.m.

**Technical Track Sessions**

### **SESSION 1: Cybersecurity**

 **Florentine A**

Chair: **Steve Seiden**, Acquired Data Solutions

**Start Time:** 10:30 a.m.

**Presenter(s):** Jeff Kalibjian, Peraton Labs

**Presentation:** *Endpoint Cyber Tool Considerations in Constrained Environments*

**Start Time:** 11:00 a.m.

**Presenter(s):** Jason Schalow, 412<sup>th</sup> Communications Squadron, Edwards AFB

**Presentation:** *Cybersecurity and the Rise of AI: Risks and Opportunities*

**Start Time:** 11:30 a.m.

**Presenter(s):** Steve Seiden, President, Acquired Data Solutions, Inc.

**Presentation:** *Automated Cybersecurity Risk Management Framework (RMF) for DoD*

**Start Time:** 12:00 p.m.

**Presenter(s):** Jacob Burch, Systems Engineer, Command Post Technology

**Presentation:** *Testing and Training at the Tactical Edge*

**SESSION 2: Leveraging Data Analytics/Machine Learning to Gain Efficiencies in T&E**

 **Firenze**

Chair: **Robert Poulson, 812 TSS**

Start Time:	10:30 a.m.
Presenter(s):	Dr. James Brownlow, 812 TSS/ENTR
Presentation:	<i>Application of Artificial Intelligence to Aviation Communication</i>
Start Time:	11:00 a.m.
Presenter(s):	Andrew Zastovnik, 812 TSS/ENTR
Presentation:	<i>Firth's Maximum Likelihood Bias Reduction for Rare Events: A Case Study of Onboard Oxygen System Events</i>
Start Time:	11:30 a.m.
Presenter(s):	Michael Kidman & Leo Salgado,773 <sup>rd</sup> TS/ENFS
Presentation:	<i>Predicting Flight Loads with Deep Neural Networks</i>
Start Time:	12:00 p.m.
Presenter(s):	Dr. Nelson Walker & Ms. Michelle Ouellette, 812 TSS/ENTR
Presentation:	<i>Under Pressure? Using Unsupervised Machine Learning for Classification May Help</i>

**SESSION 3: Spectrum Limitations**

 **Tuscany**

Chair: **Allen Hagopian, 812 TSS/ENTI**

Start Time:	10:30 a.m.
Presenter(s):	Achilles Kogiantis, Peraton Labs
Presentation:	<i>5G Cellular Airborne Transceiver for AMT: Integration and Deployment Update</i>
Start Time:	11:00 a.m.
Presenter(s):	Mark Wigent, Laulima Systems
Presentation:	<i>Spectrum Sharing in Aeronautical Mobile Telemetry</i>
Start Time:	11:30 a.m.
Presenter(s):	Scott Kujiraoka, GBL Systems
Presentation:	<i>Updated Status on the Ground Based Phased Array Telemetry Antenna (gPATMA) System</i>
Start Time:	12:00 p.m.
Presenter(s):	Jade Long & Jim Wargo, CRFS, Inc.
Presentation:	<i>Spectrum Management and Geolocation in Complex RF Environments</i>

**SESSION 4: Aircraft Instrumentation**

 **Siena**

Chair: **Larry (Joe) Dale**, Director, 812<sup>th</sup> AITS

Start Time:	10:30 a.m.
Presenter(s):	Mike Delaney, 812 <sup>th</sup> AITS/ENIE
Presentation:	<i>Network Telemetry Development at Edwards Air Force Base</i>
Start Time:	11:00 a.m.
Presenter(s):	Grecia Roman and Clinton Mazone, 812 <sup>th</sup> AITS/ENIE
Presentation:	<i>TmNS Rascal Pod</i>
Start Time:	11:30 a.m.
Presenter(s):	Rocco Docimo & Ben Kupferschmidt, Curtiss-Wright
Presentation:	<i>Using TmNS to Request Recorded Data That Was Not Telemetered</i>
Start Time:	12:00 p.m.
Presenter(s):	Mike Delaney, 812 <sup>th</sup> AITS/ENIE
Presentation:	<i>Packet Telemetry at Edwards AFB with IRIG 106 Chapter 7</i>

**SESSION 5: Techniques for Enhancing Data Collection**

 **PISA**

Chair: **Mike Cook**, 412<sup>th</sup> Communications Squadron

Start Time:	10:30 a.m.
Presenter(s):	Mark Radke, Bevilacqua Research Corporation (BRC)
Presentation:	<i>Determining Antenna Performance via Comparative Methods</i>
Start Time:	11:00 a.m.
Presenter(s):	Tiffany Johnson, 896 TSS/RNME
Presentation:	<i>Airborne Instrumentation Technical Training Curriculum</i>
Start Time:	11:30 a.m.
Presenter(s):	Jerry Jost, Star Dynamics Corporation
Presentation:	<i>Ka-band Transmit/Receive Aperture (KaTRA)</i>

**Scan QR code to read abstract descriptions**



12:30 p.m.	LUNCH IN THE EXHIBIT HALL
1:30 p.m.	Hands-on-Lab
3:00 p.m. - 3:30 p.m.	BREAK IN THE EXHIBIT HALL
3:30 p.m.	<p>Digital Engineering in Support of T&amp;E</p> <p>Moderated by: Dr. Policarpio Soberanis, Chief PO, Virtual Simulation &amp; Test, Northrop Grumman</p> <p>Panelists:</p> <ul style="list-style-type: none"> <li>• Adam Butler, Senior Principle AI Systems Engineer, Northrop Grumman</li> <li>• Tamara Hambrick, Deputy Functional Chief Engineer for Systems Engineering, Boeing Enterprise Strategy and Operations</li> <li>• James Sabino, Senior Principle Systems Engineer, Raytheon</li> <li>• Dr. David (Fuzzy) Wells, CMSP, Principle Cyber Simulationist, MITRE</li> </ul>
5:00 p.m.	RECEPTION IN THE EXHIBIT HALL



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# AGENDA

## Thursday, May 25

8:00 a.m.

 **Florentine A**

**Welcome**

**Overview of the day's events**

**Dr. Policarpio Soberanis,**  
Workshop Chair

8:05 a.m.

**Dr. Eileen A. Bjorkman, (SES)**  
Executive Director, Air Force Test  
Center (AFTC)

8:45 a.m.

**Rick Quade, (SES)**  
Department of Navy Test and  
Evaluation Executive and Acting  
Department of the navy Chief  
Engineer

9:25 a.m.

**Bradley Thomason, Director,**  
Threat Systems Management  
Office (TSMO)

10:00 a.m.

**BREAK IN THE EXHIBIT HALL**

10:00 a.m.

**Hands-on-Lab**

*Lab will be open until 12:30pm.*

10:30 a.m.

**Technical Track Sessions**

### **SESSION 6: Range Instrumentation**

 **Florentine A**

Chair: **Doug Nelson, Teknicare**

**Start Time:** 10:30 a.m.

**Presenter(s):** Pearson Wade & Cameron Bertram, 96  
Range Control Squadron

**Presentation:** *Eos - A Software TMoIP Decommutator to  
Increase Test Agility*

**Start Time:** 11:00 a.m.

**Presenter(s):** Madalyn Danielak, 96 Range Control  
Squadron/RNCEE

**Presentation:** *NetAcquire Advanced Correlating Source  
Selector (A-CSS) - A New Approach to  
Best Source Selection*

**Start Time:** 11:30 a.m.

**Presenter(s):** Ben Kupferschmidt, Curtiss-Wright

**Presentation:** *Miniature High-Accuracy Time Space  
Position Information (TSPI) Data Acquisition*

**Start Time:** 12:00 p.m.

**Presenter(s):** Tres Thurston, Haigh-Farr

**Presentation:** *Electronically Steerable Arrays for Range  
Applications*

SESSION 7: Electronic Warfare

 Firenze

Chair: **Jeff Weisz**, Global Power Fighters Combined Test Force

Start Time:	10:30 a.m.
Presenter(s):	Gregory Tauer, Principle Engineer, CUBRC, Inc.
Presentation:	<i>Generating Insights from Test and Evaluation Data (GIFTED)</i> <b>*CUI: Limited C</b>
Start Time:	11:00 a.m.
Presenter(s):	John Matthews, Mercury Defense Systems
Presentation:	<i>Advanced Airborne DRFM (A2DRFM)</i> <b>*CUI: Limited C</b>
Start Time:	11:30 a.m.
Presenter(s):	Jay Grove & Noel Lopez, Viasat
Presentation:	<i>Low Cost AESAs for Test and Training</i>

SESSION 8: Hypersonics

 Tuscany

Chair: **Ben Tomlinson**, NASA

Start Time:	10:30 a.m.
Presenter(s):	Jackson Winter, NASA
Presentation:	<i>Development of a Low SWaP Non-Contact Temperature Measurement System</i> <b>*CUI: Limited C</b>
Start Time:	11:00 a.m.
Presenter(s):	Nic Heersema, NASA
Presentation:	<i>Pursuing the Digital Transformation of Large Scale Thermal Testing</i> <b>*CUI: Limited C</b>
Start Time:	11:30 a.m.
Presenter(s):	Paul Cook, Curtiss-Wright
Presentation:	<i>Unique Requirements for a Hypersonic Telemetry System</i>
Start Time:	12:00 p.m.
Presenter(s):	Paul Phillipsen, CTO, Fenix Space, Inc.
Presentation:	<i>Hypersonic High Cadence Airborne Launch Platform</i>

SESSION 9: Wireless Airborne Instrumentation

 Siena

Chair: **Chris Stewart**, 896 TSS, Eglin AFB Force

Start Time:	10:30 a.m.
Presenter(s):	Kurt Rasmussen, RF Systems Engineer, NextGen Aeronautics
Presentation:	<i>Wireless Instrumentation System for Aircraft Testing</i>
Start Time:	11:00 a.m.
Presenter(s):	Paul Cast, 896 TSS, USAF
Presentation:	<i>Airborne Instrumentation in a Time Constrained Environment</i>
Start Time:	11:30 a.m.
Presenter(s):	Benjamin Baird, 896 TSS, USAF
Presentation:	<i>Wireless Airborne Instrumentation</i>
Start Time:	12:00 p.m.
Presenter(s):	Wendy Yang, NASA
Presentation:	<i>Wireless Hub for Wireless Sensors</i>

12:30 p.m. **LUNCH IN THE EXHIBIT HALL**

1:30 p.m. **Technical Track Sessions**

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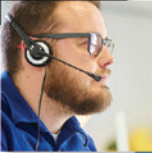
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**SESSION 10: Instrumentation under PEO STRI**

**\*CUI: Limited C**

 **Florentine A**

Chair: **Kyle Platt**, Director IMO, U.S. Army Program Executive Office for Simulation Training and Instrumentation (PEO-STRI)

Start Time:	1:30 p.m.
Presenter(s):	Whitney Winchester, Assistant Program Manager (APM), U.S. Army Program Executive Office for Simulation Training and Instrumentation (PEO-STRI)
Presentation:	<i>Directed Energy T&amp;E Technologies</i>
Start Time:	2:00 p.m.
Presenter(s):	Nicole Bui, U.S. Army Program Executive Office for Simulation Training and Instrumentation (PEO-STRI) & Philip Kiel, Photo-sonics
Presentation:	<i>Advanced Range Tracking and Imaging System (ARTIS)</i>
Start Time:	2:30 p.m.
Presenter(s):	Michel Berry, U.S. Army Program Executive Office for Simulation Training and Instrumentation (PEO-STRI) & John Beene, Chief Engineer, GAN
Presentation:	<i>System of Systems Controlled Environment Test Infrastructure (SCETI)</i>
Start Time:	3:00 p.m.
Presenter(s):	Trung Nguyen, Executing Agent, TRMC's Electronic Warfare Test (EWT)
Presentation:	<i>Roadmapping Future T&amp;E Needs</i>

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## SESSION 11: Current /Future Secure Telemetry Directions 2023 Update

**\*CUI: Limited C**

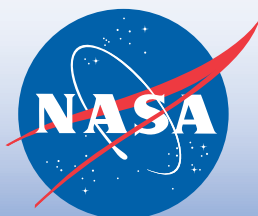
 **Firenze**

Chair: **Ronald Pozmantier**, Chief Engineer, 812<sup>th</sup> Aircraft  
Instrumentation Test Squadron (812 AITS/ENI)

Start Time:	1:30 p.m. CHECK IN. Please have CAC/PIV or submitted visitor request via DISS prior to deadline
Start Time:	2:00 p.m.
Presenter(s):	Ken Ottaviano, General Dynamics - Mission Systems
Presentation:	<i>Type 1 HAIPE Encryption for Securing Current and Future Telemetry Data Distribution and Transmission</i>
Start Time:	2:30 p.m.
Presenter(s):	Dr. Scott Wolfson & Mr. Greysen Blumkin
Presentation:	<i>Commercial AES256 block encryption applied to streaming telemetry - Methodology and Results</i>
Start Time:	3:00 p.m.
Presenter(s):	Ronald Pozmantier, 812 AITS/ENI & Jon Morgan, Laulima Systems
Presentation:	<i>Future Secure Telemetry (TM) Directions, Bulk Encryption: 2023 Updates</i>

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SESSION 12: Data Analytics

Tuscany

Chair: Jenny Green, KBR

Start Time:	1:30 p.m.
Presenter(s):	Dale Jones, Curtiss-Wright
Presentation:	<i>Advances in Developing a Unified Post-Flight Data Analysis System</i>
Start Time:	2:00 p.m.
Presenter(s):	Ben Kupferschmidt, Curtiss-Wright
Presentation:	<i>Optimizing PCM Telemetry Bandwidth by Performing Onboard FFTs</i>
Start Time:	2:30 p.m.
Presenter(s):	Dr. Seth Harvey, Bluestaq, LLC & Rob Patterson, One Dev, LLC
Presentation:	<i>Providing Real Time Inter-Range Data Portability using a Unified Data Library</i>
Start Time:	3:00 p.m.
Presenter(s):	Steve Seiden & Sanjib Sarkar, Acquired Data Solutions, Inc.
Presentation:	<i>Accelerated Signal Processing with Graphics Processing Unit (GPU) and Deep Learning Algorithms to Enhance Both Real-time and Post Flight Data Analytics</i>



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**SESSION 13: Digital Engineering**

 **Sierra**

Chair: **Larry (Joe) Dale**, Director, 812<sup>th</sup> AITS

<b>Start Time:</b>	1:30 p.m.
<b>Presenter(s):</b>	Thomas A. O’Brien, 2d Lt USAF, Georgia Tech Research Institute
<b>Presentation:</b>	<i>Comparative Vacuum Monitoring Sensors as an introduction to Condition Based Maintenance Plus for the KC-46</i>
<b>Start Time:</b>	2:00 p.m.
<b>Presenter(s):</b>	Joseph Lopez, 812th Airborne Instrumentation Test Squadron
<b>Presentation:</b>	<i>Digital Engineering 3D Scanned Models for Airborne Instrumentation</i>
<b>Start Time:</b>	2:30 p.m.
<b>Presenter(s):</b>	Mike McAlister, 896TSS/RNMEF
<b>Presentation:</b>	<i>Digital Engineering Innovation Approach for Airborne Instrumentation</i>
<b>Start Time:</b>	3:00 p.m.
<b>Presenter(s):</b>	Frank Cruz, 412th RANS/Applied Spectrum Technology Research Office (ASTRO)
<b>Presentation:</b>	<i>Digital Twinning Process for T&amp;E Telemetry Applications</i>

3:30 p.m. **BREAK IN THE EXHIBIT HALL**

4:00 p.m. **Stephen Jensen (SES)** – Director, R&E, NASA Armstrong Research Center

4:50 p.m. **George Rumford (SES)** – Director, Test Resource Management Center

5:30 p.m. Workshop Concludes



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### Tom Dowd, SES

Director, Ranges & Target Operations,  
Instrumentation and Labs, Naval Air Warfare  
Center, Weapons Division

### Paul Mann, SES

Sea Based Weapons, Director, AEGIS BMD

### Chris Collins, SES

Executive Director, Developmental Test,  
Evaluation, and Assessments, Office of the  
Undersecretary of Defense (Research and  
Engineering)

### George Rumford, SES

Director, Test Resource Management Center

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### Hands-on-Lab Opportunities

 **Exhibit Hall**

<b>Tuesday, May 23</b>	<b>1:00 p.m. - 5:00 p.m.</b>
<b>Wednesday, May 24</b>	<b>1:30 p.m. - 3:30 p.m.</b>
<b>Thursday, May 25</b>	<b>10:00 a.m. - 12:30 p.m.</b>

### Hands-on-Lab Drawing

**Complete all 7 phases of the Hands-on-Lab for a chance to win prizes!**

*Drawing will be held at the Wednesday evening Networking Reception in the exhibit hall.*

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## PHASE 2 Aircraft

- Data Acquisition
- Data Multiplexing
- Onboard Data Recording

## PHASE 3 Aircraft

- Airborne Transmission



## PHASE 4 Ground Station

- Data Receiving
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## PHASE 5 Ground Station

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## Apogee Labs

Table Top 1

North Wales, PA | [www.apogeelabs.com](http://www.apogeelabs.com)

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Table Top 3

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Niceville, FL | [www.avtest.com](http://www.avtest.com)

Avionics Test and Analysis Corporation (ATAC) is a woman-owned small business that provides expert support for weapon and aircraft operational flight plan (OFP) development and testing. We helped develop the IRIG 106 Chapter 10 standard and provide turnkey and custom software solutions for Chapter 10 and Ethernet data reduction and visualization. For more information contact John McCormick at [john.mccormick@avtest.com](mailto:john.mccormick@avtest.com).

**CALCULEX, Inc.**

**Booth 214**

Las Cruces, NM | [www.calculex.com](http://www.calculex.com)

For over 35 years, CALCULEX has provided integrated, interoperable Airborne Flight and Mission Data Recording, Processing, and Routing systems. CALCULEX is an agile, quick-to-market small business with a verifiable track record of rapidly supplying affordable solutions to the USAF, USN, USMC, and US Army, and other international forces. For more information contact Dan Eckiss, Director of Business Development, at [dane@calculex.com](mailto:dane@calculex.com).

**CalypsoAI**

**Booth 203**

San Francisco, CA | [www.calypsoai.com](http://www.calypsoai.com)

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Horsham, PA | [www.delta-info.com](http://www.delta-info.com)

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**Marshall Radio Telemetry**

**Table Top 6**

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**Booth 304**

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**Nomad GCS**

**Booth 117**

Columbia Falls, MT | [www.nomadgcs.com](http://www.nomadgcs.com)

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**Photo-Sonics****Booth 204**

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**Quintron****Booth 200**

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**Raven Defense Corporation****Booth 213/312**

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Albuquerque, NM | [www.ravendefense.com](http://www.ravendefense.com)

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Norcross, VA | [www.safrandatasystems.com](http://www.safrandatasystems.com)

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SEMCO designs and manufactures RF and FPGA-based digital products supporting U.S. Government Department of Defense (DOD), Government Research Agencies, International Government entities, DOD Prime Contractors, and companies with DOD-related contracts. Products include Rack Mount and Portable Telemetry Receivers, Simulators, Demodulators, Up/Down Converters, RF Multi-Couplers, Re-Radiation Systems, Mobile Telemetry Systems, Automated Telemetry Test Stations, Digital Transmitters, and Custom Antennas. For more information contact Bill Tin cup at [bill.tincup@semco.com](mailto:bill.tincup@semco.com) for more information.

Telspan Data

Booth 212

Centennial, CO | [www.telspandata.com](http://www.telspandata.com)

Telspan Data is a leader in telemetry technologies for airborne, range and laboratory environments. Their standards based, “multi-disciplined” product architecture leverages the latest SoC, data transmission and processing technologies. These products give Instrumentation & Test Engineers unparalleled flexibility and capability as the testing requirements change and grow. For more information contact Chris Lloyd at [clloyd@telspandata.com](mailto:clloyd@telspandata.com).

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Virginia Beach, VA



# Cybersecurity Workshop

Securing the Future: Navigating the  
Evolving Threat Landscape

## FEATURED SPEAKERS:

### Bradley Thomason

Director, Threat Systems Management Office  
(TSMO)

### Dr. Sandra Hobson, SES

Deputy Director for Strategic Initiatives, Policy and  
Emerging Technologies, Office of the Director,  
Operational Test and Evaluation, Office of the  
Secretary of Defense,

### Geoff Wilson

Program Manager, Test & Evaluation/Science &  
Technology Program, Test Resource Management  
Center (TRMC)

### Cyber T&E of Generative AI Panel

## TECHNICAL SESSIONS:

- Cyberspace Test Technology
- Cyber & Spectrum Warfare Considerations  
in 5G/6G

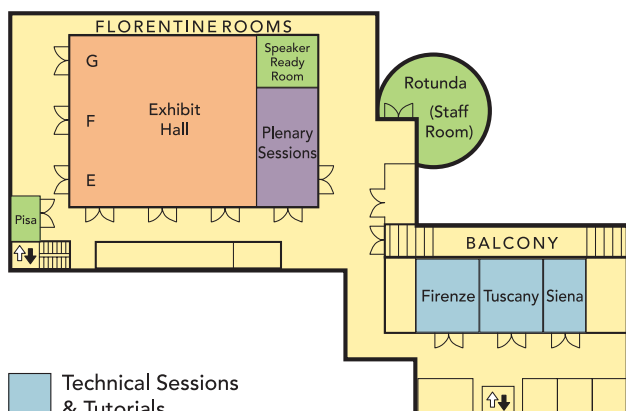


Tutorials | Tech Sessions | Speakers | Exhibits

*Currently accepting abstracts for the technical sessions.*

**REGISTER NOW**

# TIW 2023 MEETING ROOMS



## Exhibit Hall Hours

**Tuesday, May 23**

**1:00 p.m. - 5:00 p.m.**

**Wednesday, May 24**

**9:00 a.m. - 5:00 p.m.**

- Break in the Exhibit Hall 10:00 a.m.
- Reception in the Exhibit Hall 5:00 p.m.

**Thursday, May 25**

**9:00 p.m. - 4:00 p.m.**

- Break in the Exhibit Hall 10:00 a.m.
- Break in the Exhibit Hall 3:30 p.m.

## Hands-on-Lab (HOL)

**Tuesday, May 23**

**1:00 p.m. - 5:00 p.m.**

**Wednesday, May 24**

**1:30 p.m. - 3:30 p.m.**

**Thursday, May 25**

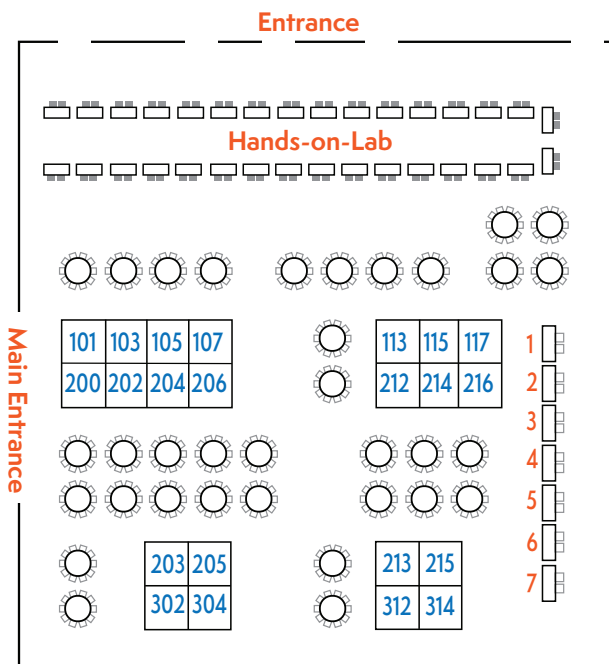
**10:00 a.m. - 12:30 p.m.**

## Hands-on-Lab Drawing

**Complete all 7 phases of the Hands-on-Lab for a chance to win prizes!**

*Drawing will be held at the Wednesday evening Networking Reception in the exhibit hall.*

# TIW 2023 EXHIBIT HALL



## Exhibitors

Advanced Test Equipment  
Rentals (ATEC) ..... TT 5

Apogee Labs ..... TT 1

Astrohaven ..... TT 4

Avionics Interface  
Technologies (AIT) ..... TT 3

Avionics Test and Analysis  
Corporation (ATAC) ..... TT 2

Calculux ..... 214

CalypsoAI ..... 203

Creative Digital Systems  
Integration Inc.  
(CDSI) ..... 215/314

Curtiss-Wright ..... 101

Dell Technologies ..... 103

Delta Information  
Systems ..... 206

Dewesoft ..... 107

EWA Government  
Systems, Inc. .... 216

Georgia Tech Research  
Institute ..... 205

Haigh-Farr ..... 105

JT4 ..... 202

Lumistar ..... TT 7

Marshall Radio  
Telemetry ..... TT 6

NASA Neil A. Armstrong  
Flight Research Center ..... 304

Nomad GCS ..... 117

Parraid, LLC ..... 115

Photo-sonics ..... 204

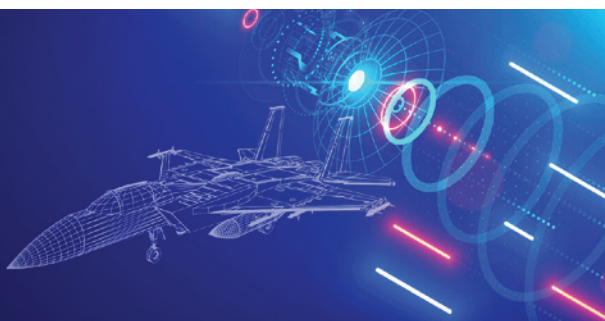
Quintron Systems Inc. .... 200

Raven Defense ..... 213/312

Safran Data Systems ..... 113

SEMCO ..... 302

Telspan Data ..... 212



# 40<sup>th</sup> International T&E Symposium: Next Generation Test Dominance

**December 5-8, 2023 | Destin, FL**

## FEATURED SPEAKERS:

**James S. Wells, SES**

Director, T&E/ S&T Directorate, Department  
of Homeland Security

**George Rumford, SES**

Director, Test Resource Management Center  
(TRMC)

**Brig Gen Rawls**

Commander, Air Force Operational Test and  
Evaluation Center

## TECHNICAL SESSIONS:

- Agile Testing
- Cognitive EW
- Machine Learning
- Artificial Intelligence



**Tutorials | Tech Sessions | Speakers | Exhibits**

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