

Welcome to WSTS 2025

Celebrating 33 Years

Marc Weiss | WSTS Founder and Chair, Marc Weiss Consulting

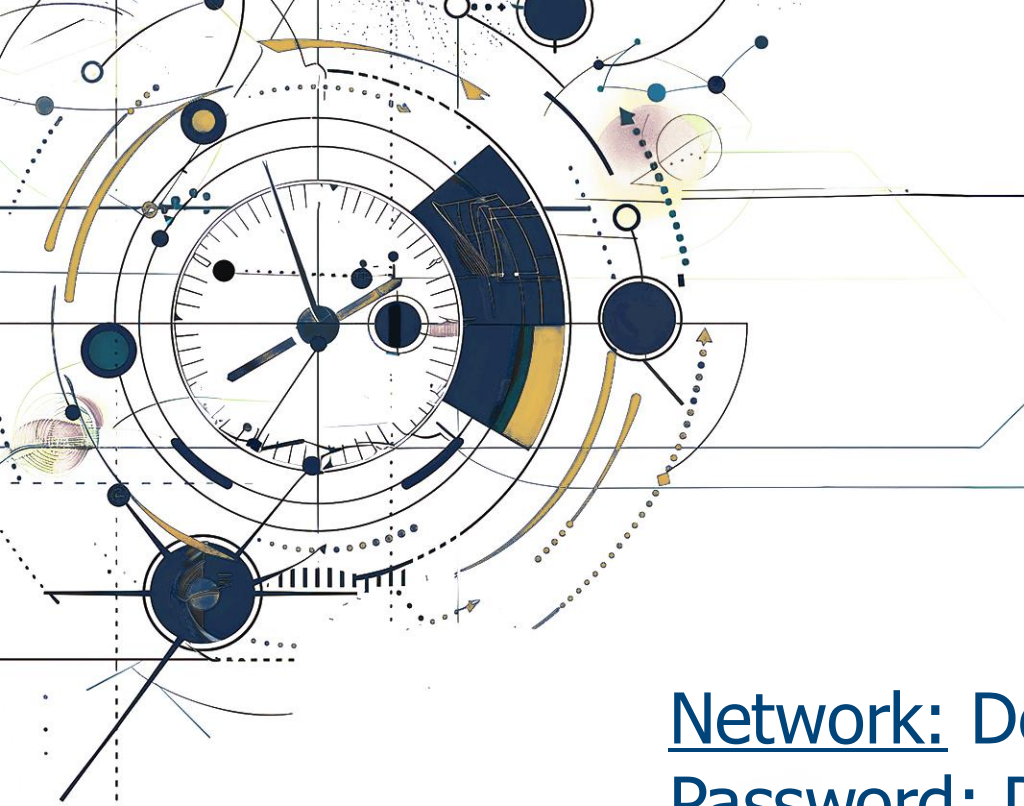
May 13, 2025





2025 Sponsors and Exhibitors





WiFi Information

Network: DeSoto_WiFi

Password: DESOTO25

Charging Stations can be found at the back
of this room.

- 1) Download *Aventri Events*
Using QR Code
- 2) Access Code: 366854
- 3) Username: Your email address
- 4) Password: Your last name
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 - Password: Seibel



WSTS

WSTS 2025 – Share Photos!

[WSTS on LinkedIn](#)

Take photos of your time at WSTS this year!
Post them in the Mobile App and tag us on
LinkedIn.

@Workshop on Synchronization and Timing
Systems

#WSTS2025

WSTS

WSTS 2025 Presentation Library



The [2025 Presentation Library](#) is now
exclusively available to attendees.

Password: WSTS2025

WSTS started in 1992 as a telecom sync workshop. It has now expanded to timing and sync in industry.

WSTS 2025 – Time and Sync: Catalysts for Modern Innovation

> For our themes each year, we try to find a brief statement that captures the latest role that Time and Frequency has on industry. “[Catalysts for Modern Innovation](#)” captures that we are seeing Time and Synchronization becoming more fundamental to many industries than ever before:

1. PNT and Alt-PNT
2. Telecom
3. Data Centers
4. Power Grid
5. Financial Services
6. Broadcast
7. ...

WSTS

About the Conference

NIST

NIST

Synchronization Standards Workshop for Telecommunications Systems

Boulder, Colorado, August 3-5, 1992

in conjunction with possible interim T1X1.3 meeting

August 6-7, 1992

- * Characteristics of Precision Oscillators
- * Noise Sources, Types, and Simulation
- * Network Characterization and Simulation
- * TVAR Theory and Analysis Software
- * MTIE, ZTIE and Spectral Relationships
- * Special Problems of Telecommunications Equipment
- * Cost: \$1000. Fee includes a full Workshop Notebook, Refreshments, Reception, Lab Tours, and TVAR software.

Location: On-site at NIST, 325 Broadway, Boulder, Colorado

This is the first “WSTS”
info slide from 1992

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WSTS 2024



WSTS 2024 was held in San Diego

Registration Total: 165

Speakers: 54

Countries Represented: 13

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WSTS 2025



WSTS 2025 in Savannah

Registration Total: 144
Speakers: 56

Countries Represented: 12

% International Attendees: 29%

WSTS

Tuesday Seated Luncheon

A dark blue rectangular graphic with a complex, futuristic design. On the left, there's a circular motif resembling a clock face with various colored dots and lines radiating from it. The text 'WORKSHOP ON SYNCHRONIZATION AND TIMING SYSTEMS' is centered in white, bold, sans-serif font, with horizontal lines separating the words. Below this, in a smaller white font, it says 'North America's Premier Timing & Sync Event'. At the bottom, in a yellow font, it says 'May 12-15, 2025 | Savannah, GA'. In the top right corner, the website 'wsts.atis.org' is written in white.

wsts.atis.org

WORKSHOP ON SYNCHRONIZATION AND TIMING SYSTEMS

North America's Premier Timing & Sync Event
May 12-15, 2025 | Savannah, GA

Time: 11:45 am – 12:55 pm
Location: Pulaski Room
Sponsored by

The Calnex logo, featuring a red swoosh above the word 'Calnex' in a bold, red, sans-serif font.

Calnex

WSTS

Tuesday Networking Reception

A graphic for the Workshop on Synchronization and Timing Systems. It features a dark blue background with a complex, futuristic design of glowing orange and white lines, circles, and a clock-like face. The text is in white and yellow.

wsts.atis.org

WORKSHOP
ON
SYNCHRONIZATION
AND
TIMING SYSTEMS

North America's Premier Timing & Sync Event
May 12-15, 2025 | Savannah, GA

Time: 6:30 – 8:00 pm
Location: Oglethorpe Ballroom
Sponsored by



WSTS

Wednesday Breakfast & Breaks

A graphic for the 'Workshop on Synchronization and Timing Systems'. It features a dark blue background with a complex, futuristic design of glowing orange and white lines, circles, and dots, resembling a technical or astronomical diagram. The text 'wsts.atis.org' is in the top right corner. The main title 'WORKSHOP ON SYNCHRONIZATION AND TIMING SYSTEMS' is centered in white, bold, sans-serif font, with 'ON' and 'AND' in smaller font. At the bottom, it says 'North America's Premier Timing & Sync Event' and 'May 12-15, 2025 | Savannah, GA' in a smaller white font.

wsts.atis.org

WORKSHOP
ON
SYNCHRONIZATION
AND
TIMING SYSTEMS

North America's Premier Timing & Sync Event
May 12-15, 2025 | Savannah, GA

Breakfast: 7:30 – 8:30 am

Location: Pulaski Room

Breaks: 10:15 – 10:45 am; 2:30 – 3:00 pm

Location: Oglethorpe Ballroom

Sponsored by



VIAVI Solutions

WSTS

Wednesday Lunch

A dark blue rectangular graphic with a complex, futuristic design. On the left, there's a circular clock face with multiple hands and various colored dots (yellow, orange, blue) around it, connected by thin lines. The text "WORKSHOP ON SYNCHRONIZATION AND TIMING SYSTEMS" is centered in white, bold, sans-serif font, with horizontal lines separating the words. In the top right corner, the website "wsts.atis.org" is written in white. At the bottom, the text "North America's Premier Timing & Sync Event" is in white, and "May 12-15, 2025 | Savannah, GA" is in a yellow-gold color.

wsts.atis.org

WORKSHOP
ON
SYNCHRONIZATION
AND
TIMING SYSTEMS

North America's Premier Timing & Sync Event
May 12-15, 2025 | Savannah, GA

Time: 12:20 – 1:35 pm
Location: Pulaski Room
Sponsored by



WSTS

Wednesday Gala Dinner

A dark blue rectangular graphic with a complex, futuristic design. On the left, there's a circular motif resembling a clock face with various colored dots and lines radiating from it. The text is centered in white, with 'WORKSHOP' in large bold letters, followed by 'ON' in smaller letters between two horizontal lines, then 'SYNCHRONIZATION' in large bold letters, followed by 'AND' in smaller letters between two horizontal lines, and finally 'TIMING SYSTEMS' in large bold letters. At the top right, the website 'wsts.atis.org' is written in white. At the bottom, the text 'North America's Premier Timing & Sync Event' is written in white, followed by 'May 12-15, 2025 | Savannah, GA' in a yellow-gold color.

wsts.atis.org

WORKSHOP
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SYNCHRONIZATION
AND
TIMING SYSTEMS

North America's Premier Timing & Sync Event
May 12-15, 2025 | Savannah, GA

Time: 7:00 – 9:00 pm
Location: Savannah Taphouse
Sponsored by



WSTS

Lanyards

The poster features a dark blue background with a complex, futuristic graphic on the left side. This graphic includes a clock face with multiple hands, overlaid with various geometric shapes like circles, lines, and dots in shades of orange, yellow, and white, suggesting a high-tech or space-themed aesthetic. The text is centered and right-aligned in a clean, sans-serif font.

wsts.atis.org

WORKSHOP
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AND
TIMING SYSTEMS

North America's Premier Timing & Sync Event
May 12-15, 2025 | Savannah, GA

Sponsored by



Monday, May 12 (Yesterday)

- Welcome Reception – Sponsored by Oscilloquartz

Tuesday, May 13

- **Opening Keynote** (Virtual): “Insights for Position, Navigation, and Timing at the Moon” – Cheryl Gramling, Lunar Strategist & PNT Lead, NASA
- **Session 1: Alt-PNT and Aerospace Defense** (Chair: Magnus Danielson, Net Insight)
 - Session Co-Chairs: Steve Bedrosian (MITRE), Doug Arnold (Meinberg), Barry Dropping (Microchip), Alon Stern (Oscilloquartz), Marc Weiss (WSTS Chair)
- **Keynote:** “Past, Present, and Future of Space Clocks” – Thejesh Bandi, Professor, University of Alabama
- **Keynote :** “The Proposed EU C-PNT Ecosystem and UTC Terrestrial Time Transfer” – Lukasz Bonenberg, Space Policy and Scientific Officer, EC Joint Research Centre (JRC)
- **Lunch** – Sponsored by Calnex
- **Session 2: Data Centers** (Chair: Ankur Sharma, Equinix)
 - Session Co-Chairs: Ahmad Byagowi (Turba), Allan Armstrong (Meinberg), Tommy Cook (Calnex)
- **Keynote:** “Precision Timing as the Backbone of AI in Hyper Scale” - Ahmad Byagowi, Research Scientist, Turba
- **Keynote:** “The Brain Computes Using Time, and So Should Neural Networks” – Jason Eshraghian, Assistant Professor in Electrical and Computer Engineering, University of California Santa Cruz
- **Keynote:** “Democratizing and Scaling Accurate Time for Distributed Applications” – Joshua Levinson, Principal Product Manager Technical, Amazon Web Services

Tuesday, May 13

- **Poster Introductions & Session** (Chair: Donna Kurt, Bell MTS)
 - Session Co-Chairs: Ullas Kumar (Rakon), Stephen Bedrosian (MITRE)
- **Session 3: Telecom** (Chair: Stefano Ruffini, Calnex)
 - Session Co-Chairs: Kishan Shenoi (Shenoi Consulting), Silvana Rodrigues (Huawei), Pedro Antao Martins (NOS), Donna Kurt (Bell MTS), Ramana Reddy (Rakuten Symphony)
- **Keynote** – “Telecom Standards for Resilient Timing” – Douglas Arnold, Principal Technologist, Meinberg USA
- **Exhibitor Talks #1**
- **Networking Reception** – Sponsored by Microchip

Wednesday, May 14

- **Keynote** (Virtual): “It's About Time” – Warren Walls, United States Naval Observatory, Department of Defense
- **Session 3 (cont.): Telecom** (Chair: Stefano Ruffini, Calnex)
 - Session Co-Chairs: Kishan Shenoi (Shenoi Consulting) Silvana Rodriguez (Huawei), Pedro Antao Martins (NOS), Donna Kurt (Bell MTS), Ramana Reddy (Rakuten Symphony)
- **Session 4: Broadcast** (Chair: Ankur Sharma, Equinix)
 - Session Co-Chairs: Ahmad Byagowi (Turba), Allan Armstrong (Meinberg), Tommy Cook (Calnex)
- **Lunch** – Sponsored by Keysight
- **Keynote:** “The Technology Issues of Providing PNT from LEO Satellite Systems” – Rohit Braggs, VP of PNT, Iridium
- **Session 5: Sources & Sync** (Chair: Greg Armstrong, Renesas Electronics)
 - Session Co-Chairs: Lee Cosart (Microchip), Chris Farrow (Chronos), Ullas Kumar (Rakon), Kishan Shenoi (Shenoi Consulting), Chris McCormick (Epson)
- **Exhibitor Talks #2**
- **Gala Dinner** – Hosted by Meinberg (Offsite)

Thursday, May 15

- **Session 6 (cont.): Sources & Sync** (Chair: Greg Armstrong, Renesas Electronics)
 - Session Co-Chairs: Lee Cosart (Microchip), Chris Farrow (Chronos), Ullas Kumar (Rakon), Kishan Shenoi (Shenoi Consulting), Chris McCormick (Epson)
- **Session 7: Emerging Applications** (Chair: Steve Bedrosian, MITRE)
 - Session Co-Chairs: Doug Arnold (Meinberg), Ahmad Byagowi (Turba), Michael Mayer (Huawei), Pat Diamond (Diamond Consulting), Allan Armstrong (Meinberg), Kevin Stanton (Stanton Consulting), Ken Hann (Timebeat.app)
- **Keynote:** "An Integrated Quantum & Optimal Terminal for Resilient PNT" - David Mitlyng, CEO, Xairos
- **Closing Remarks** – Marc Weiss, WSTS Chair

- The Alliance for Telecommunications Industry Solutions (ATIS) is a Standards Development Organization (SDO) and the North American Organizational Partner for the 3rd Generation Partnership Project (3GPP).
 - ATIS hosts WSTS and other industry events. One does not have to be a member of ATIS to attend these events. WSTS is annual and meets in-person. WSTS addresses timing's role across several industries.
 - ATIS has a variety of telecom industry initiatives, which companies must be ATIS members to participate in. Groups meet on a regular basis, 8-10x a year, mostly virtual.
- ATIS Synchronization Committee (SYNC) develops and recommends standards and solutions related to telecommunications network technology pertaining to network synchronization.
 - Current Work:
 - **Comments to the FCC** re: Promoting the Development of Positioning, Navigation, and Timing Technologies and Solutions
 - **Upcoming Technical Report:** Resilient Timing Architecture
 - Related: Technical Report: GPS Vulnerability (2017)
- SYNC Chair: Lee Cosart

