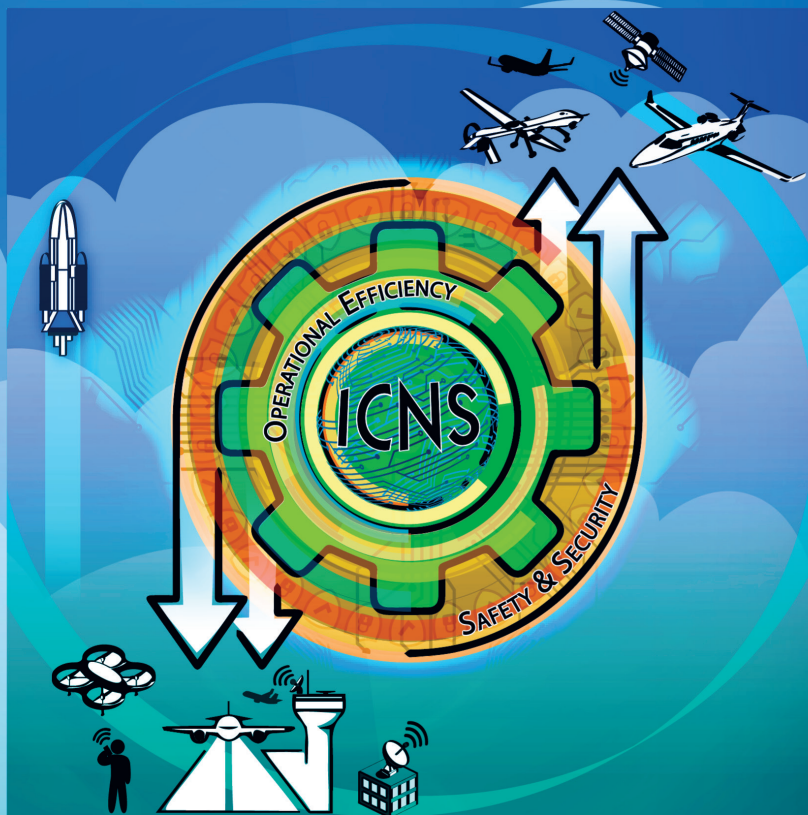


ICNS 2



ICNS for Operational Efficiency

April 18-20, 2023

Westin Washington Dulles Airport • Herndon, Virginia • **i-cns.org**

ICNS 2023 Conference

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Welcome to ICNS Conference 2023!

Greetings! As general chairs of the 23rd Integrated Communications, Navigation and Surveillance (ICNS) Conference, we thank you for joining us for an exciting week to explore how cutting-edge CNS technologies improve operational efficiency in the national airspace (NAS) as well as around the globe.

ICNS started in 2001 as a NASA workshop in Cleveland, Ohio, during the onset of NextGen in the U.S., but it didn't stop there. The ICNS Conference has expanded into a premier international ground systems and aviation conference focusing on CNS/ATM. In the spirit of safer, agile, intelligent, secure, and open airspace, the 2023 conference illustrates CNS, aided by artificial intelligence and automation, to be an enabler for the integration of advanced air mobility (AAM) into the managed air spaces.



Thomas Redling



Aloke Roy

To lead off these discussions, we are pleased to announce two keynote speakers: Mr. Paul Fontaine, acting assistant administrator for NextGen at the FAA; and Mr. Justin Taylor, vice president of AI Center at Lockheed Martin. On 18th April, Mr. Fontaine highlights FAA's strategies "Beyond NextGen." On 19th April, Mr. Taylor's keynote will address "Artificial Intelligence for Aviation."

Each morning, the conference offers plenaries and workshops featuring speakers from academia, industry, and the government. Each afternoon there are technical presentations selected for publication in IEEE Xplore. Networking opportunities abound during our breaks, meals, and evening dinner events. On Tuesday evening, Dr. Missy Cummings, one of the first female fighter pilots, will present a keynote address on "The Promise and Perils of AI and Autonomy in Aviation." A fun-filled trivia madness will be hosted on Wednesday evening.

In summary, ICNS 2023 provides an informative forum for thought leaders, policymakers, researchers, and other technical experts from government, industry, and academia around the world. Together they are able to address significant challenges of new entrants and new types of efficient operations, while ensuring the safety, and sustainability of air traffic management.

Many thanks go out to our generous sponsors and registrants for making this conference possible. Also, sincere thanks to the ICNS Executive Committee and the 2023 ICNS Conference Committee, all of whom are volunteers who worked many extra, long hours to make this year's completely in-person event possible. We also thank our plenary chairs and workshop chairs, as well as our visionary CNS and air traffic management panelists and authors. Finally, we thank our keynote speakers on Tuesday morning and Wednesday morning. You can read more about them on the ICNS website and this program booklet.

Thomas Redling & Aloke Roy

ICNS 2023

Conference General Co-chairs

Conference General Chairs



Thomas Redling, L3Harris Space and Airborne Systems, Mission Avionics

Tom Redling is a versatile leader with comprehensive experience in program management, technology portfolio management, systems engineering, product development, innovation, and business development across commercial, military, and space industries. Tom is currently a scientist at L3HARRIS in Palm Bay, FL. There he is an advanced concept engineer in the avionics business area, devoted to the technology side of capturing new business. He holds a Bachelor of Science in electrical engineering focused on special research in solid state electronics from Rutgers University in 1988. He continued with a Master of Science in electrical engineering &

biomedical systems from the New Jersey Institute of Technology in 1993. His education was completed with a Master of Science in management of technology from the Stevens Institute of Technology in 1997.

He is a strong communicator that delivered presentations at conferences and published 18 papers on avionics in IEEE Xplore, IEEE Systems Magazine, AIAA conference proceedings, and INCOSE journals. He is currently the ICNS Executive Committee (IEC) chair. He was also ICNS conference general chair in 2012 and is Co-conference general chair for this year's ICNS Conference.



Alope Roy, VisionAR Systems, LLC

Mr. Alope Roy is the managing partner at VisionAR Systems, LLC, which provides systems engineering services to the aerospace industry. Mr. Roy covers technology research on artificial intelligence, machine learning, cybersecurity and wireless communications. Prior to this, Mr. Roy was with Honeywell Advanced Technology organization managing data communication, information security and radio technology development programs supporting Honeywell Aerospace.

Previously, Mr. Roy was director of programs at Flextronics Corporation managing several major telecommunications OEM accounts. In this role, Mr. Roy was responsible for business development, outsourcing, and globalization of hardware design activities supporting large volume contract electronic manufacturing. His prior experiences include various positions at AT&T Bell Laboratories and ARINC Aviation Systems Division. As systems engineering director at ARINC, Mr. Roy oversaw development of SATCOM, HF, VDL, ATIS, and PDC standards and services. Currently, Mr. Roy chairs RTCA Special Committee 223, which is developing the Aviation Internet Protocol and Aeronautical Mobile Airport Communication System requirements and operational performance standards.

Mr. Roy is an advisor to FAA on communication and cyber security technologies and participates at ICAO Communications Panel on behalf of FAA. Mr. Roy holds several patents on aeronautical, wireless and secure communications. He was the President (2017-2018) of a Maryland-DC-Virginia volunteer cultural organization with 1000+ members; the chair of IEEE AECS Avionics Systems Panel (2019-2020); general conference chair of DASC 2019 and ICNS 2017.

Technical Program Chairs



Prof.dr.ir Erik Theunissen, Netherlands Defence Academy (NLDA)

Prof. Theunissen has been active in the field of avionics for over 30 years. He is a member of the AIAA/IEEE Digital Avionics Technical Committee and RTCA Special Committee 228. Since 2003 he is a professor (part-time) at the Netherlands Defence Academy (NLDA). The company ISD, which he founded in 1988, has designed synthetic vision systems for Rockwell Collins that have been flight-tested in the Boeing 727 from the FAA, the Boeing 737-900 Technology Demonstrator, the NASA Boeing 757 ARIES, and several other test aircraft). Since 2008 he has been involved in the design and evaluation of Detect and Avoid systems for unmanned aircraft, and since 2010 his company ISD is

involved in the design of the GA-ASI Conflict Prediction and Display System (CPDS). Between 2014 and 2018 he supported flight testing of CPDS, a prototype self-separation system, at NASA Armstrong. For his research, he has received over 20 international awards among which two times the MITRE-sponsored David Lubkowski Award for Best of Conference.



Dr. Michael Schnell, German Aerospace Center (DLR)

Michael Schnell is senior scientist at the Institute of Communications and Navigation of the German Aerospace Center (DLR). His main research interests are the development and modernization of CNS technologies for civil aviation and unmanned aerial systems.

After his studies at the University Erlangen-Nuremberg he joined DLR in 1990 with a Master of Science in electrical engineering. Since then he has been working as scientific researcher and earned a doctoral degree for his work on wireless communications in 1997 from University of Essen (today University of

Duisburg-Essen). Dr. Schnell is a lecturer for multi-carrier communications as well as for aeronautical communications and acts as selected advisor for the German Air Navigation Service Provider (DFS GmbH) on various committees at EUROCONTROL and ICAO. As rapporteur of the project team "Terrestrial Data Link" within the ICAO Communications Panel he is organizing the international standardization of the future terrestrial data link LDACS. He has authored/co-authored over 120 publications, including more than 20 journal articles. He is a senior member IEEE as well as member of AIAA and VDE/ITG.

Plenary Program Chair



Brent Phillips, FAA

Brent Phillips is a senior systems engineer with the Federal Aviation Administration's NextGen Organization and the U.S. panel member to the International Civil Aviation Organization (ICAO) Communications Panel. Mr. Phillips is also the program co-lead for the joint FAA/SESAR Future Communications Infrastructure Study including the development of the Aeronautical Mobile Airport Communications System (AeroMACS) and the Next Generation SATCOM Systems. He is currently leading the Internet Protocol Suite (IPS) standards development for aviation use in the FAA. He is also serving as the communications lead on the NAS Enterprise Architecture Roadmap Team.

Workshop Chair



Lance Sherry, George Mason University

Lance Sherry is an associate professor of systems engineering and operations research at George Mason University. Dr. Sherry also serves as the director of the Center for Air Transportation Systems Research at George Mason University. Dr. Sherry has over 30 years of experience in the aviation industry serving as a flight-test engineer, flight control engineer, system engineer, lead system architect, program manager, strategic planning and business development. Dr. Sherry served as a fellow at RAND Corporation 1999-2001. He has published over 100 papers and journal articles, holds several patents, and has received awards for his work.

ICNS Agenda 2023

Time (EDT)	Tues., 18 April	Weds., 19 April	Thurs., 20 April
	Morning Social & Breakfast		
7:00-8:30	Pre-program Messages		
	Plenary Program		
	8:30 – 8:40 Conference Welcome and Introductions Aloke Roy & Tom Redling, Conference General Co-chairs		
8:30 – 9:15	Opening Keynote: “Beyond NextGen” 8:40 – 9:15 Paul Fontaine , Acting Assistant Administrator for NextGen, FAA	Keynote: “Artificial Intelligence for Aviation” 8:40 – 9:15 Justin Taylor , Vice President Lockheed Martin Artificial Intelligence Center	Plenary V: Position, Navigation, and Timing 9:00 – 10:10 Co-chairs: Mitch Narins , Principal Consultant, Strategic Synergies, LLC Ludovic Aron , USA Representative, European Aviation Safety Agency (EASA) Panelists: Dr. Sherman Lo , Senior Research Engineer, Stanford University GPS Laboratory “Providing Authentication for SBAS” Michael Weiler , Group Leader, FAA Spectrum Engineering Services, “Spectrum Engineering’s Impact on Aviation” Dr. Okuary Osechas , Group Leader German Aerospace Center, DLR, “Improving Efficient Use of the L-Band Spectrum”
9:15 – 11:00	Plenary I: ICNS Accelerating Operational Change – Challenges & Opportunities 9:15 – 10:45 Co-chairs: Paul Bosman , Head of Infrastructure Division, Network Manager Directorate, EUROCONTROL Dave Knorr , Division Manager, NextGen Systems Analysis, FAA Panelists: Chris Collings , Director of Business Development for Air Traffic Management Technology, L3Harris, “Operational Benefits of NextGen Data Comm” Didier Delibes , Head of ATM Deployment, Airbus, “The Business Case Challenge for the OEM” Dr. Martin Durbin , Operations Research Analyst, FAA, “Measured Benefits and Improvement Opportunities for CNS”	Plenary III: Future of ATM 9:15 – 10:30 Co-chairs: Steve Bradford , Chief Scientist, NextGen, FAA Luc Emberger , Communication and Surveillance Senior Expert, AIRBUS Panelists: Steve Bradford/Luc Emberger , “Future Connectivity for Aviation” Greg Saccone , Technical Fellow, Airspace Operational Efficiency, Boeing, “Transition to Trajectory-based Operations” Stephen Van Trees , Senior Engineer, Comm. & Surv. Technologies, FAA Aviation Safety – Aircraft Certification Service, “Certification Perspective on Hyper Connected Aircraft” Paul Bosman , Head of Infrastructure Division, Network Manager Directorate, EUROCONTROL, “European Air-Ground Datacom Way Forward”	Plenary IV: The Role of Information Centricity in the Future of ATM 10:50 – 12:00 Co-chairs: Dr. Stéphane Mondoloni , Chief Engineer, NAS Vision and Research, MITRE Dr. Parimal Kopardekar , Director, NASA Aeronautics Research Institute (NARI) Panelists: Jon Jenkins , Senior Director for FMS and Flight Controls products, Honeywell, “Cloud-based FMS” Paul Hoyt Nelson , Senior Cybersecurity Advisor, Aeronautics Research Mission, NASA, “Security” Brandon Suarez , Vice President of UAS Integration Reliable Robotics, “Digital Flight”
	Plenary II: ATM and Third-Party Service Providers for AAM – Urban Air Mobility and Regional Air Mobility 11:00 – 12:00 Chair: Brandon Suarez , Vice President of UAS Integration, Reliable Robotics Panelists: Fabrice Kunzi , COO, SkyGrid, “The Role of Third Party Services Providers in AAM” [US UAM/RAM] Tamara Casey , President, Aura Network Systems, “Perspectives of a C2 Link Communication Service Provider” [US Service Provider] Usmaan Javed , RPAS Technical Officer, Air Navigation Bureau (ICAO), “ICAO’s Role in Global Harmonization of AAM” [ICAO AAM SG Rep.]	Social & Coffee Break 10:30 – 10:50	Social & Coffee Break 10:10 – 10:30
	Social & Coffee Break 10:45 – 11:00	Workshop: Minimum Viable ICNS Infrastructure (MVI) for Statewide Support for UAS and AAM Operations 10:30 – 11:45 Moderator: Dr. Lance Sherry , Center for Air Transportation Research, George Mason University View full details at the Workshop Overview	Awards Ceremonies Presentation of Best Paper Awards 11:45 – 12:00
11:00 – 12:00			
	Social & Lunch		
12:00-13:00	12:00 – 13:00 Sponsor Commercials – Tuesday and Wednesday		
	Technical Program		
	13:00-17:30 Chaired by Prof. Dr. Ir. Erik Theunissen and Dr. Michael Schnell Technical Program Overview Technical Program Detail		
13:00-17:30			
	Evening Programs		
17:30-19:30	Sponsors & Exhibitors Reception with Dinner 17:30 – 18:30 Evening Keynote: “The Promise and Perils of AI and Autonomy in Aviation” Dr. Missy Cummings , George Mason University 18:30 – 19:30	Evening Networking Event with Dinner Trivia Madness 17:30 – 19:30	

Event	Location
Plenaries & Workshop	Rivanna ABC
Breakfast & Lunches	Rivanna D
Registration	Pre-function Area
Tuesday Reception & Dinner	Pre-function Area
Tuesday Evening Keynote	Rivanna BC
Wednesday Networking Event & Dinner	Rivanna D

(All times and programming are subject to change. Please visit <http://i-cns.org> for the latest updates.)



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DAY 1 • ICNS 2023 • April 18th

Opening Keynote: “Beyond NextGen”

Paul Fontaine, Acting Assistant Administrator for NextGen, FAA



Paul Fontaine is the assistant administrator for NextGen (acting) and is responsible for championing the evolution of the National Airspace System (NAS). He provides strategic direction and executive oversight to more than 800 federal employees in the Office of NextGen (ANG) and is responsible for implementing the air transportation system modernization, executing the aviation research portfolio, and delivering results to support the overall advancement of aviation. Mr. Fontaine has experience harmonizing the implementation of aviation technologies with stakeholder priorities and ensuring risks are collaboratively addressed to facilitate delivery of Next Generation Air Transportation System (NextGen) capabilities and benefits.

Previously, Mr. Fontaine was the director of ANG Portfolio Management & Technology Development. He led the FAA Enterprise Planning effort in collaboration with aviation stakeholders, identified strategies, developed integrated solutions, coordinated investments to evolve and sustain a world class aviation system, and established NextGen integration goals, strategies, budgets, and priorities.

Mr. Fontaine was also responsible for the formulation, management, and coordination of the agency's research and advanced technology development program in human factors, communications, navigation, surveillance, and air traffic management.

As the former manager of the Safe Flight 21 Program, his work led to the current nationwide deployment of the Automatic Dependent Surveillance – Broadcast (ADS-B) program.

Mr. Fontaine has more than 30 years of FAA and Department of Defense program management experience. He earned his commission as a Distinguished Graduate of the Air Force Reserve Officer Training Corps program. He holds an MBA in finance from Marymount University and a Bachelor of Science in managerial economics from Rhode Island College.

Plenary I: ICNS Accelerating Operational Change – Challenges & Opportunities

Co-chairs:



Paul Bosman, Head of Infrastructure Division, Network Manager Directorate, EUROCONTROL

Paul Bosman has been with EUROCONTROL for nearly 30 years, working in many different technical and managerial positions in different locations. He is currently the head of the Network Manager – Infrastructure Division. He is responsible for planning, deploying, and monitoring European infrastructure and aiming to digitise the SES European Sky through activities such as CNS, information management, AI and overall resilience (cyber, interference), as well managing major pan-European common services such as ARTAS/SDDS/SASS-C, EAD, NewPENS and air-ground datalink common procurement.



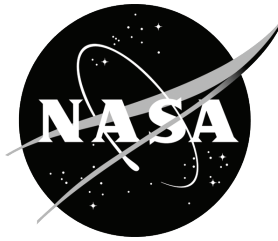
Dave Knorr, Division Manager, NextGen Systems Analysis, FAA

Mr. Knorr has more than 30 years' experience with the FAA. He is currently the division manager for NextGen Systems Analysis and Modeling. His organization is responsible for developing a post operational assessment of key NextGen capabilities, NextGen enterprise level shortfalls and benefit assessments, and special studies related to aircraft equipage and ATM. Mr. Knorr also co-leads the NextGen advisory committee's Joint Analysis Team (JAT) charged with reaching FAA/industry agreement on the value NextGen implementations at key sites.

Mr. Knorr's group evaluates potential benefits of new capabilities supporting Trajectory Based Operations through historical data analysis and simulations. His division is one of FAA's biggest users of ATO's large vast trove of post operational data.

Before working in the FAA's NextGen organization, he served as the FAA senior representative in Paris where the portfolio included coordinating international aviation relations with more than 20 European and 3 North African States. Mr. Knorr managed a broad spectrum of issues including agreements on commercial space, safety of exported aviation goods, technical training, air space security, environment, pilot violations, certifications, as well as managing FAA Executive visits to Europe.

Prior to Paris, Mr. Knorr was the FAA liaison to Germany's air traffic organization. He also was the FAA's focal point with the EUROCONTROL Performance Review Unit where he initiated the US Europe Operational Performance Comparisons for airspace and major airports.



NASA's Glenn Research Center started the ICNS Conference in 2001 to enable a forum for national and international discussion and collaboration towards the goal of a future integrated, highly efficient, capable, and secure CNS infrastructure for the nation and the world and provide input to NASA's aeronautical CNS R&D program.

NASA Glenn has performed research and development in aeronautical communications, navigation, surveillance and information technologies for the national airspace system (NAS) for more than 20 years, building on more than 40 years of experience in advanced communications systems research and development: The Emmy award-winning Communications Technology Satellite, CTS (1976), the Advanced Communications Technology Satellite, ACTS (1993-2003), technologies for space missions and infrastructure such as the Cassini mission, TDRSS, and International Space Station, and many others.

NASA Glenn's accomplishments in aeronautical CNS includes: the demonstration of the first networked broadband airborne satellite communications; development, testing, and demonstration of the Aeronautical Mobile Airport Communications System (AeroMACS) airport surface wireless communications network; next generation network protocol standards for secure mobile networks; satellite-based distribution of aviation weather information; spectrum allocations for future ground and air-mobile aviation communications; future global aviation communications under the EUROCONTROL/ FAA Future Communications Study; next-generation mobile communications network architecture for aviation; advanced simulation capabilities for NASA's Shadow Mode Assessment using Realistic Technologies for the National Airspace System (SMART NAS) project; and development and testing of the first prototype L-Band/C-Band UAS control and non-payload communications radio.

NASA Glenn has unique research facilities enabling development and testing of next-generation secure wireless aeronautical mobile communications and network standards and extensive modeling and simulation and system analysis capabilities covering all aspects of communications, navigation, surveillance, and information. A staff of over 30 experienced CNS research engineers are engaged in the development of the nation's next-generation CNS infrastructure, in collaboration with government, academic and industrial partners.

www.nasa.gov

Panelists:



Chris Collings, Director of Business Development for Air Traffic Management Technology, L3Harris, “Operational Benefits of NextGen Data Comm”

Chris Collings is director of Air Traffic Management Business Development for the Mission Networks Sector of L3Harris Technologies. Mission Networks specializes in managed networks, surveillance, and air traffic management systems for the Federal Aviation Administration and global air navigation service providers. Mission Networks reports into the Space and Airborne Systems Segment of L3Harris.

Collings assumed the position of director business development for Mission Networks Global Air Traffic Management portfolio including airground communications, networks, surveillance, and information management. Collings continues to be responsible for the customer and industry engagement on the FAA's Data Communications program. Previously, he served as program manager supporting multiple projects within L3Harris' portfolio of FAA programs.

Collings is a subject matter expert in Controller Pilot Data Link Communications (CDPLC) having supported projects in this technology since joining L3Harris in 2006. He has held various technical and management roles including software engineer, systems engineer, program manager, operations manager, and business development director.



Didier Delibes, Head of ATM Deployment, Airbus, “The Business Case Challenge for the OEM”

Didier Delibes has a background of engineer in automatics & electrotechnics. He started his career in the Airbus design office to work on auto flight control system, where he eventually led their development on the A330/A340 program. He then moved to the Airbus Office of Airworthiness where he led the avionics certification for various Airbus programs including the A400M and A380. He was then qualified as an Airbus aircraft multi-systems architect, and he is now working in the Airbus multi-program-project & air traffic management program. His focus is on SESAR and NextGen ATM modernization programs, the worldwide harmonization, and the Airbus group ATM/UTM strategy.

Didier is also member of the ICCAIA CSN/ATM committee for the ICAO affairs, the SESAR ATM Master Plan Committee, the “Single European Sky” Industry Consultation Body, and ATM committee of the ASD (Aerospace, Security and Defence Industries Association of Europe).



Dr. Martin Durbin, Operations Research Analyst, FAA, “Measured Benefits and Improvement Opportunities for CNS”

Dr. Martin Durbin has been with the FAA for 14 years. He is currently the manager of the Operations Performance Assessment Branch in the Office of NEXTGEN. His organization is responsible for assessing the potential operational impact of NextGen technologies and procedures. This work investigates large amounts of historical data to assess operational shortfalls that may be addressed by future implementations. His branch also plays a major role in post-operational analyses of NAS implementations. Many of these analyses support the Joint Analysis Team, such as escape routes from Northeast Corridor airports, RNP benefits at Denver, and the Dallas Metroplex re-design.

Prior to working at the FAA, Dr. Durbin was the technical director and co-founder of Decisive Analytics Corporation. In this position, Dr. Durbin led the development of real-time scheduling software for multiple applications, including teacher-to-web session assignments for Rosetta Stone, satellite resource scheduling, and bus/driver/route combinations for Walt Disney World. Dr. Durbin also led the development of the first combinatorial auction solver for the Federal Communications Commission spectrum auctions.

Dr. Durbin holds a Bachelor of Science in engineering-physics with a specialization in computer science from Murray State University, and both a Master of Science in operations research and a doctorate in information technology from George Mason University.

Plenary I:

Website: [slido.com](https://www.slido.com)

Event Code: #3035846





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LOCKHEED MARTIN



Plenary II: Advanced Air Mobility

Chair:



Brandon Suarez, Vice President of UAS Integration, Reliable Robotics

At Reliable Robotics, Brandon leads the development of technical standards and global aviation policy for the company. He is focused on defining key aspects of the development roadmap, including airspace integration and international operational approval, and supports product strategy plans and future aircraft programs.

Prior to joining Reliable, Suarez was the technical director for UAS Civil Airspace Integration at General Atomics Aeronautical Systems, Inc. where he led the company's efforts to safely integrate remotely piloted aircraft systems (RPAS) into domestic, foreign, and international airspace. He also led a collaborative team of experts from the FAA, NASA, and several

industry partners to bring together the technology needed for a Detect and Avoid (DAA) system on a Predator B RPAS.

Suarez is deeply involved in the aviation community. He serves as a co-chair of the Aerospace Industry Association's Advanced Air Mobility Subcommittee bringing together diverse segments of the industry to advocate for common policies. He is an advisor to the International Civil Aviation Organization (ICAO), working to make RPAS a normal part of the global aviation ecosystem. He is a co-chair of RTCA Special Committee 228, which has developed FAA-recognized standards for DAA systems and UAS datalinks, two critical enabling technologies. He is also active in several NASA research activities seeking to advance future aviation concepts.



Panelists:



Fabrice Kunzi, COO, SkyGrid, "The Role of Third Party Services Providers in AAM"

Fabrice Kunzi is the chief operating officer of SkyGrid, a Boeing and SparkCognition Joint Venture. SkyGrid enables the operation of remotely piloted aircraft by the providing third party services needed to maintain the safety of a given flight. Prior to his role as COO, Fabrice served as the chief engineer for GA-ASI's Detect and Avoid (DAA) system, leading the transition from prototype to product and operational fielding. Notably, Fabrice currently serves on RTCA, ICAO, EUROCAE and NATO industry committees, enabling the standardization of key systems required to operate remotely piloted aircraft.

He earned his Bachelor of Science in mechanical engineering from the University of North Dakota and holds both master's and doctorate degrees in aeronautical engineering from the Massachusetts Institute of Technology (MIT). He also holds an FAA commercial pilot's license with an IFR and multi-engine rating, as well as a Swiss private pilot's license.



Tamara Casey, President, Aura Network Systems, "Perspectives of a C2 Link Communication Service Provider"

After cofounding AURA and serving as its president for more than three years, Tamara serves in the same capacity for the company's subsidiary, AURA Ventures, where she leads efforts to identify, develop, and implement strategic opportunities that advance AURA's mission. During her more than 35 years of experience in telecommunications and technology, she has been intricately involved in the development of standards designed to safely integrate UAS into the NAS.

As the granddaughter of a distinguished World War II veteran/U.S. Air Force Lt. Colonel, Tamara has been passionate about aviation her entire life. A licensed, multi-engine rated pilot, she has been intricately involved in the development of standards designed to safely integrate uncrewed aircraft systems (UAS) into the National Airspace System (NAS). She served on the RTCA Drone Advisory Committee to help develop minimum operational performance standards for C2 data links utilizing aviation-allocated spectrum resources. As CTO for Ligado Networks, she led successful demonstrations of control and non-payload communications (CNPC) capabilities for UAS and was also actively involved in supporting the evolving communications needs of the Helicopter Emergency Medical Services (HEMS) community and other mission-critical infrastructure customers.

Tamara's experience as a technology strategy consultant to numerous private equity firms and telecom giants provides cutting-edge insights to the innovation and capital that can be harnessed for the execution of AURA's vision. She holds an executive leadership certificate from Georgetown University's McDonough School of Business and studied media communications at Laney College.

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MITRE operates the Center for Advanced Aviation System Development, which has supported the FAA for more than 60 years. In addition, MITRE provides technical expertise to various international civil aviation authorities, airport operators, airlines, and other aviation organizations in air traffic management systems engineering, aviation operations, airspace design, and systems automation and integration.

www.mitre.org

Panelists—continued:



Usmaan Javed, RPAS Technical Officer, Air Navigation Bureau (ICAO), “ICAO’s Role in Global Harmonization of AAM”

Usmaan Javed currently works as a technical officer at ICAO in the RPAS group. He will also be a part of the Advanced Air Mobility Study Group, that will debut next month at ICAO. At ICAO, Usmaan serves as the primary focal point for airworthiness, C2 link, and detect and avoid (DAA) aspects of RPAS vehicles.

Previously, he worked at the FAA as an aerospace engineer, engaged in the flight test and certification of aircraft, avionics, flight data recorders, UAS/RPAS, eVTOL, as well as providing technical assistance for all aspects of Boeing 767 and Boeing 777 aircrafts.

Usmaan serves on various RTCA, Eurocae, and ICAO technical committees, enabling the development and operation of both piloted, and remotely piloted aircraft. He is also a certified accident investigator and holds a private pilot’s license.

Sponsors and Exhibitors Reception with Dinner

**Evening Keynote: “The Promise and Perils of AI
and Autonomy in Aviation”**



Dr. Missy Cummings, George Mason University

Dr. Mary (Missy) Cummings is a professor in the George Mason University College of Engineering and Computing and is the director of the Mason Autonomy and Robotics Center (MARC). She is an American Institute of Aeronautics and Astronautics (AIAA) Fellow, and recently served as the senior safety advisor to the National Highway Traffic Safety Administration. Her research interests include the application of artificial intelligence in safety-critical systems, assured autonomy, human-systems engineering, and the ethical and social impact of technology.

A naval officer and military pilot from 1988-1999, Dr. Cummings was one of the U.S. Navy’s first female fighter pilots. She received a Bachelor of Science in mathematics from the U.S. Naval Academy in 1988, a Master of Science in space systems engineering from the Naval Postgraduate School in 1994, and her doctorate in systems engineering from the University of Virginia in 2004.

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- Frequentis ATM applications include:
- ATC Voice-over-IP communications systems and networks
 - ATM-grade networks via Software Defined Networking (SDN)
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 - UAS – ATC communications solutions
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 - Tower automation applications including ATIS, Data Link terminals, NavAids monitoring, AFTN and AMHS

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Intelligent Fusion Technology Inc. is a small business DoD contractor with a specialization in innovative adaptable solutions. This includes RF spectrum monitoring, cybersecurity, ML/AI, PNT, SATCOM, robotics, data analytics, and unmanned system technologies. The innovative mindsets and proactive approach of the IFT team have led the company towards successfully delivering numerous DoD projects, patents, and patent disclosures.

IFT has a reputation for going above and beyond in deliverables. We actively work and meet the demands of our customers by communicating our efforts through means of periodic status presentations, software simulations, hardware-in-the-loop prototyping, and intermediate and final demos. While we have already established collaborations with various prime contractors, we welcome new partnership opportunities.

Morning Keynote: “Artificial Intelligence for Aviation”



Justin Taylor, Vice President, Lockheed Martin Artificial Intelligence Center

Justin Taylor is vice president of Artificial Intelligence for Lockheed Martin within Corporate Engineering & Technology. In this capacity, he is responsible for driving artificial intelligence (AI) and machine learning (ML) as an engineering discipline, coordinating the corporation's AI/ML technology strategy, and leading the LM AI Center (LAIC).

Previously, Mr. Taylor was engineering director, Lockheed Martin Aeronautics, for the Advanced Development Programs (ADP) Skunk Works ISR portfolio. In that role, he was responsible for the weapon systems development of the ISR portfolio of platforms. He also served as the program manager for the corporate-level Joint All Domain Operations (JADO) program, in which he coordinated technology development and integration of multi-domain capabilities across all business areas, with an emphasis on accelerating the fielding of system of systems capabilities.

He previously served as program management director, Lockheed Martin Aeronautics, for the Skunk Works Mission Systems Roadmaps organization. In that role, he was responsible for identifying, maturing, demonstrating, and transitioning key technology to address mission needs for all aeronautics platforms.

Plenary III: Future of ATM

Co-chairs:



Steve Bradford, Chief Scientist for Architecture and NextGen Development, FAA

Steve Bradford is chief scientist for architecture and NextGen development, Office of NextGen, at the Federal Aviation Administration. He is the chair of the technical review board that monitors technical decisions related to investments and enterprise architecture. He is the FAA lead for the FAA/NASA Research Transition Team (RTT) process that supports collaboration between the FAA and NAS on ATM related activities. A current focus of the RTT process is collaboration on UAS-in-the-NAS supporting vehicles operating in ATM, and UAS traffic management supporting operation in uncontrolled airspace, and AAM. The RTT process depends on direct partnership with the UAS industry and provide many opportunities to look at new technology options for both new entrants and traditional manned aircraft operations.

He also has a leading role in NextGen's International engagement activities with SESAR Joint Undertaking and has led several co-operative international efforts with EUROCONTROL. He was a member of the International Civil Aviation Organization's (ICAO) technical team that authored the Global Air Navigation Plan, the past U.S. panel member to the ICAO Air Traffic Management Requirements and Performance Panel, and the Chair for the ICAO GANP Study Group.



Luc Emberger, Communication and Surveillance Senior Expert, AIRBUS

Luc Emberger was appointed communication and surveillance senior expert in 2019 after more than 20 years working on data link project with Airbus. In this function, he contributes to air/ground communications roadmaps and connectivity strategy at aircraft level. He also contributes to R&T activities to mature the future ATM concepts and pave the way to a more connected aircraft.

Among his main responsibilities, he represents Airbus in several Standardization bodies (AEEC, RTCA, EUROCAE), as chairman for EUROCAE WG-78 on air traffic services and AEEC ATN/IPS. He contributes to frequency and spectrum topics coordination across all Airbus divisions.

Prior to assuming this position, he served as data link communication expert, and as communication equipment's development leader at the Airbus design office, and he certified the first Airbus data link system flying in Europe.

Plenary III:

Website: [sli.do.com](https://www.sli.do.com)

Event Code: #4120165





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 - Communications Availability Analysis
 - End to end surveillance systems
 - AeroMACS™ spectrum coordination
 - Specialized Consulting

Panelists:

Steve Bradford and Luc Emberger, “Future Connectivity for Aviation”

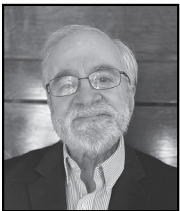
See biographies on page 16.



Greg Saccone, Technical Fellow, Airspace Operational Efficiency, Boeing Research & Technology, “Transition to Trajectory-based Operations”

Greg Saccone has worked for more than 30 years in the aeronautical data link communication area. At Boeing he works in the Airspace Operational Efficiency group on advanced air traffic management concepts, research, operational trials, and implementation, specializing in data link communication and flight data processing. He is the focal for Internet protocol suite projects at Boeing, leading both internal and joint industry research projects, and is currently the co-chair of the Airlines Electronics Engineering Committee (AEEC) Internet Protocol Suite for Aviation Safety Services group. Additionally, he has been active in the ICAO Aeronautical Communications Panel and the RTCA SC-214 NextGen Data Link group, serving as co-chair of the Validation Subgroup.

Prior to joining Boeing, he was the technical director of data link research and development projects at Raytheon Canada, investigating implementing and integrating data link applications into flight data processor functionality of Raytheon commercial and military air traffic control systems. He also authored various Aeronautical Telecommunications Network (ATN) data link industry standards and acted as the air-ground applications sub-group chairman for the ICAO ATN Panel.



Stephen Van Trees, Senior Engineer, Comm. & Surv. Technologies, FAA Aviation Safety – Aircraft Certification Service, “Certification Perspective on Hyper Connected Aircraft”

Stephen P. Van Trees is a senior engineer in the Avionics and Electrical Systems section, Technical Policy Branch, Policy and Standards Division, Aircraft Certification Service, Aviation Safety Service, Federal Aviation Administration, Washington, DC. His group works in data communications, weather systems, and unmanned aircraft systems (UAS).

He is a charter member of RTCA SC-228, the government-industry body responsible for developing means of compliance and performance standards for operation of large UAS in controlled airspace. He is currently GAR for SC-228. He is also co-chair of WG2, Command and Control.

Over the last ten years SC-228 has produced the suite of MOPS for both Detect and Avoid (DAA) and Command and Control. These standards have been recognized by the RPAS Panel at ICAO. The FCC has also recently proposed recognition of SC-228 MOPS in C-Band spectrum considerations.

Steve is also a charter member of the NAS Enterprise Architecture work. He works as aircraft roadmap lead, which serves to integrate avionics advancements with NAS evolution.

Over the last 27 years with the FAA, he has held a variety of technical and management positions, including six years as manager, Avionics Systems Branch (AIR-130). The branch was the first in the FAA to manage UAS integration.

He joined the FAA as an engineer in the data communication area, after working in a lead role in the US teams for development of the ICAO SARPs for the Aeronautical Telecommunication Network (ATN), and the FANS-1 specification.



Paul Bosman, Head of Infrastructure Division, Network Manager Directorate, EUROCONTROL, “European Air-Ground Datacom Way Forward”

Paul Bosman has been with EUROCONTROL for nearly 30 years, working in many different technical and managerial positions in different locations. He is currently the head of the Network Manager – Infrastructure Division. He is responsible for planning, deploying, and monitoring European infrastructure and aiming to digitise the SES European Sky through activities such as CNS, information management, AI and overall resilience (cyber, interference), as well managing major pan-European common services such as ARTAS/SDDS/SASS-C, EAD, NewPENS and air-ground datalink common procurement.



The purpose of the American Institute of Aeronautics and Astronautics Digital Avionics Technical Committee (DATC) is to provide a forum for the exchange of new knowledge in digital avionics among professionals and students in the fields of commercial, military and general aviation and space applications.

The DATC serves the needs and professional interests of AIAA members and promotes through progressive projects and meetings their contributions and achievements in the arts, sciences and technology of aeronautics and astronautics.

The AIAA Digital Avionics Technical Committee cosponsors two technical conferences, the Digital Avionics Systems Conference (DASC) and the Integrated Communication, Navigation and Surveillance (ICNS) Conference.

If you are interested in joining the AIAA DATC, we are always looking for new, motivated members. Please visit our website for contact information:

aiaadatc.org



The Institute of Electrical and Electronics Engineers (IEEE)

The IEEE is the world's largest technical society, bringing members access to the industry's most essential technical information, networking opportunities, career development tools, and many other exclusive benefits. Through its global membership, the IEEE is a leading authority on areas ranging from aerospace systems, computers and telecommunications to biomedical engineering, electric power and consumer electronics among others.

To foster an interest in the engineering profession, the IEEE also serves student members in colleges and universities around the world. Other important constituencies include prospective members and organizations that purchase IEEE products and participate in conferences or other IEEE programs.

Aerospace & Electronics Systems Society (AESS)

AESS is one of 45 technical societies and councils within IEEE. Members of AESS are interested in the design, integration, test, and analysis of large, complex systems consisting of major subsystems that contain dissimilar electronic devices. Most of our members work on sensor systems (radar, sonar, optics, and navigation), communications systems, command and control centers, avionics, space systems, military systems, digital signal processing simulators, and software development. Some members work on robotics, energy, and transportation systems.

AESS is the only professional society addressing total integrated electronic systems and the enabling technologies. AESS pioneered large-scale integrated interoperable systems. AESS is the sponsor/cosponsor of 15 conferences a year including ICNS.

The AESS is proud to be a sponsor of the ICNS Conference with our partner the DATC. Besides the ICNS Conference, we also partner on the Digital Avionics Systems Conference (DASC) and look forward to the long-term growth of the ICNS Conference.

DAY 2 • ICNS 2023 • April 19th

Plenary IV: The Role of Information Centricity in the Future of ATM

Co-chairs:



Dr. Stéphane Mondoloni, Chief Engineer, NAS Vision and Research, MITRE
Dr. Stéphane Mondoloni leads the Aviation Future Concepts & Architecture Outcome at the MITRE Corporation. In this role, he works with FAA sponsors to define and execute research and analysis seeking to achieve the Info-Centric NAS. This includes research into the feasibility and applications for the Connected Aircraft concept. Previously, he led the MITRE team collaborating with the FAA to define this future Info-Centric NAS vision.

He has conducted research in air traffic management (ATM) for over 20 years and authored over 50 technical publications and future concepts. Research interests include ATM simulation, optimization, and operational performance evaluation and improvement. For over 15 years, he has participated on an ICAO panel to develop visionary ATM concepts including the Connected

Aircraft, Trajectory-Based Operations (TBO), and the Flight and Flow Information for a Collaborative Environment (FF-ICE). Dr. Mondoloni has collaborated with international partners to mature these concepts with several on the path to implementation.

Dr. Mondoloni received his doctorate from MIT in aeronautical engineering and an MBA from the IESE Business School. He is a fellow of the Royal Aeronautical Society and an associate fellow of the American Institute for Aeronautics and Astronautics.



Dr. Parimal Kopardekar, Director, NASA Aeronautics Research Institute (NARI)

Parimal Kopardekar (PK) serves as the director of NASA Aeronautics Research Institute (NARI). In this capacity, he is responsible for exploring new trends, research areas, collaborations, and partnerships relevant to aeronautics enterprise. Recently, he co-led a comprehensive needs assessment study for wildfire mitigations. In the past, he served as NASA's senior technologist for Air Transportation Systems. He invented Unmanned Aircraft System Traffic Management (UTM) to safely enable large-scale drone operations at lower altitudes, which is now being globally adopted. He also chairs the International Civil Aviation Organization (ICAO)'s unmanned aircraft system advisory group.

He is a recipient of many awards, including the NASA Government Invention of the Year, NASA Exceptional Technology Achievement Medal, NASA Outstanding Leadership Award, NASA Engineer of the Year Award, and the prestigious Samuel J. Heyman Service to America's Promising Innovation Award. PK was named among 25 most influential people in the drone industry. He serves as the co-editor-in-chief of Journal of Aerospace Operations and is a fellow of the American Institute of Aeronautics and Astronautics.

He also serves as an adjunct faculty and teaches undergraduate and graduate-level courses related to operations management, supply chain management, and innovation. He holds a doctorate and Master of Science degrees in industrial engineering and a bachelor's degree in production engineering.

Panelists:



Jon Jenkins, Senior Director for FMS and Flight Controls products, Honeywell, "Cloud-based FMS"

Jon Jenkins is the senior director of engineering for the Flight Systems Center of Excellence (COE) at Honeywell Aerospace. The Flight Systems COE is responsible for flight management systems, flight control systems, and air data systems. In this role Jon is responsible for program execution, supporting pursuits of new business, and quality improvement initiatives for the product lines. Honeywell Flight Systems develops products for air transport, business & regional jets, helicopters, and defense & space segments.

Jon brings extensive experience in leadership and engineering management development to Honeywell. Prior to his current role Jon led the formation of the Engineering Execution Transformation (EET) organization for Honeywell Aerospace Electronic Solutions. As director of EET he helped standardize how we plan track and execute large scale engineering development programs.

Before EET Jon was the director of engineering for our Next Generation Flight Management System (NGFMS). NGFMS is a software product line designed to maximize re-use of not only software but all artifacts including requirement and verification documentation.

Jon has 25 years of experience with Honeywell including experience in systems, software, test, and certification activities. His teams have been major innovation drivers for Honeywell and have won multiple technical achievement awards and hundreds of patents.

Plenary IV: The Role of Information Centricity in the Future of ATM

DAY 2 • ICNS 2023 • April 19th

Panelists—continued:



Paul Hoyt Nelson, Senior Cybersecurity Advisor, Aeronautics Research Mission, NASA, “Security”

Paul Hoyt Nelson currently leads the NASA Aeronautics Research Mission’s cybersecurity efforts as the senior cybersecurity advisor. This is a multifaceted architect and management role that includes leading the research and development of aviation cybersecurity capabilities as well as ensuring that all R&D work results in secure and securable technologies for NASA’s diverse stakeholders. He also serves as NASA’s principal aviation cybersecurity liaison to U.S. government agencies and industry stakeholders. In addition, Paul works as an integration program manager in the Airspace Operations and Safety Program where he addresses the difficulties in cross-cutting integration of security and communications across the airspace ecosystem.

He has previously been a NASA chief information security officer (CISO), director of research and development for the NASA Office of Inspector General Computer Crimes Division (CCD) (federal law enforcement), a CCD investigator and has been lead systems and security architect, as well as personnel manager, for many NASA and industry initiatives. With over 35 years of experience in systems, network and security architecture, as well development and operations, he has consistently designed his roles to include staff mentoring and development and program management. This has provided a strong basis for success in these fast-changing technology areas as well as helping to ensure the continued development of scarce talent.

Paul earned a dual degree from Bowling Green State University in computer science and chemistry. He holds a Certified Information Systems Security Professional (CISSP) certification from (ISC)2 and a Seized Computer Evidence Recovery Specialist (SCERS) certification from the Federal Law Enforcement Training Center (FLETC). He has publications with IEEE, SANS, and other security industry conference proceedings.



Brandon Suarez, Vice President of UAS Integration Reliable Robotics, “Digital Flight”

At Reliable Robotics, Brandon leads the development of technical standards and global aviation policy for the company. He is focused on defining key aspects of the development roadmap, including airspace integration and international operational approval, and supports product strategy plans and future aircraft programs.

Prior to joining Reliable, Suarez was the technical director for UAS Civil Airspace Integration at General Atomics Aeronautical Systems, Inc. where he led the company’s efforts to safely integrate remotely piloted aircraft systems (RPAS) into domestic, foreign, and international airspace. He also led a collaborative team of experts from the FAA, NASA, and several industry partners to bring together the technology needed for a Detect and Avoid (DAA) system on a Predator B RPAS.

Suarez is deeply involved in the aviation community. He serves as a co-chair of the Aerospace Industry Association’s Advanced Air Mobility Subcommittee bringing together diverse segments of the industry to advocate for common policies. He is an advisor to the International Civil Aviation Organization (ICAO), working to make RPAS a normal part of the global aviation ecosystem. He is a c-chair of RTCA Special Committee 228, which has developed FAA-recognized standards for DAA systems and UAS datalinks, two critical enabling technologies. He is also active in several NASA research activities seeking to advance future aviation concepts.

Suarez earned a Bachelor of Science and a Master of Science in aerospace engineering from the Massachusetts Institute of Technology. He is also an instrument-rated commercial pilot.

Plenary IV:

Website: slido.com

Event Code: #2237931



Evening Networking Event with Dinner

Trivia Madness 17:30 to 19:30

Plenary V: Position, Navigation, and Timing

Co-chairs:



Mitch Narins, Principal Consultant, Strategic Synergies, LLC

Mitch Narins is the principal consultant/owner of Strategic Synergies, LLC, a technical and management consultancy that he formed following over four decades of U.S. government service at the Federal Communications Commission, the Department of Defense, and finally for over two and a half decades as a program manager and systems engineer at the Federal Aviation Administration, where his last position was as the FAA chief systems engineer for navigation.

Mr. Narins is recognized as a world class expert in position, navigation, and timing (PNT), who has published and presented numerous papers in international forums on the criticality of ensuring the resilience of PNT services. In 2017, his name was added to the Smithsonian National Air and Space Museum's Wall of Honor. He serves on GPS World Magazine's editorial advisory board, which recognized him as one of the "50+ Leaders to Watch." He is a Certified Information Systems Security Professional (CISSP), a fellow of the Royal Institute of Navigation (RIN), a senior member of the Institute of Electrical and Electronic Engineers (IEEE), a member of the Institute of Navigation (ION) and its Washington, DC section head, and a member of RTCA, RTCM, IEEE, and SAE Standards Committees.

Mr. Narins holds a Bachelor of Science in electrical engineering from the City College of New York and a Master of Science in engineering management from George Washington University (GWU). He is an adjunct professor in GWU's Mechanical and Aerospace Engineering Department instructing in their senior Capstone Project and mechanical systems design classes, as well as a mentor to Clark Scholars.



Ludovic Aron, USA Representative, European Aviation Safety Agency (EASA)

Ludovic Aron is the European Union Aviation Safety Agency (EASA) representative in the United States of America, based in Washington D.C. He has over 20 years of experience in aircraft design engineering and certification. After his military service in the French Navy, he joined Dassault-Aviation, working as an aircraft systems engineer, first in the Military Customer Support division and then in the Business Jets division. After 10 years, Ludovic joined new French airplane maker Sky Aircraft (GECL Aviation Group) as head of Aircraft Systems. In 2013, Ludovic came to the European Union Aviation Safety Agency (EASA) and soon after he was appointed head of the Business Aeroplanes Certification. Thereafter he became head of the Large Aeroplanes Certification, in charge of the European certification of the most modern airliners. He held this position for about 5 years and was namely responsible for the return

to service of the B737 Max in Europe after its worldwide grounding in March 2019.

Ludovic holds a Master of Science in aeronautical and aerospace engineering with a focus on space-based telecommunications that he obtained after studying both at the Institut Supérieur de l'Aéronautique et de l'Espace – ISAE-SUPAERO (Toulouse, France) and at the Technische Universität München – TUM (Munich, Germany).

Plenary V: Position, Navigation, and Timing—continued:

DAY 3 • ICNS 2023 • April 20th

Panelists:



Dr. Sherman Lo, Senior Research Engineer, Stanford University GPS Laboratory, “Providing Authentication for SBAS”

Sherman Lo is a senior research engineer at the Stanford GPS Laboratory. He also is executive director of the Stanford Center for Position Navigation and Time (SCPNT) and a Stanford instructor. His research work focuses on navigation safety, security, and robustness. At Stanford, he was associate investigator for the FAA evaluation of enhanced Loran and alternative position navigation and timing (APNT) systems for aviation. He currently leads work examining GNSS resiliency, interference and spoofing detection and mitigation. He has over 130 conferences, 28 journal, 14 magazine publications and 8 issued US patents.



Michael W. Weiler, Group Leader, FAA Spectrum Engineering Services, “Spectrum Engineering’s Impact on Aviation”

Michael Weiler is manager of the Spectrum Engineering Services at the FAA and is responsible for leading this team that secures, manages, and protects all civil aviation radio frequency spectrum resources. This ensures the safe transport of all individual flights between airports by protecting the National Airspace System (NAS) from potential sources of interference.

In 2001, Michael joined the FAA and served in numerous leadership capacities within the Air Traffic Services Directorate. Michael held the position of Manager for Surveillance Systems and Sensor Programs where he was responsible for leading a contractor

and government workforce to plan, execute, implement, and sustain various systems in the NAS. Prior to this, he served as the Program Manager for Terminal Automation Modernization Replacement Phase One.

Michael holds a Master of Business Administration from Marymount University, and a Bachelor of Science and associate degree in computer networking from Strayer University.



Dr. Okuary Osechas, Group Leader, German Aerospace Center, DLR, “Improving Efficient Use of the L-Band Spectrum”

Okuary (pronounced oh-kwa-REE) Osechas is a researcher at the German Aerospace Center, known as DLR. At DLR Okuary leads the effort in developing navigation services for civil aviation that are independent of GNSS, yet provide a comparable service level.

In addition to being a researcher, Okuary is active in standardization, chairing the working group at EUROCAE dedicated to 4-D Trajectories, as well as supporting ICAO in developing LDACS for APNT.

He received a doctorate in electrical engineering from Tufts University in 2014, courtesy of the FAA.

His thesis focused on various aspects of integrity monitoring for GBAS.

Plenary V:

Website: [slide.com](https://www.slide.com)

Event Code: #2187451



DAY 3 • ICNS 2023 • April 20th

Workshop: Minimum Viable ICNS Infrastructure (MVII) for Statewide Support for UAS and AAM Operations

Several states are investigating the funding and implementation of ICNS Infrastructure for supporting UAS operations (e.g., package delivery, inspections), AAM operations (e.g., airport to downtown passenger transport), and regional AAM operations (e.g., city-to-city passenger transportation). North Dakota have installed a ubiquitous state-wide ICNS infrastructure. New York are testing ICNS for a high-reliability corridor.

This workshop panel of experts will discuss the range of technical options, decision criteria, and alternate architectures for a Minimum Viable ICNS Infrastructure (MVII) for Statewide Support for UAS, local AAM, and regional AAM. Panel members include private venture capital, equipment vendors, and UAS/AAM operators.

Chair:



Dr. Lance Sherry, Center for Air Transportation Systems Research at GMU

Lance Sherry is an associate professor of systems engineering and operations research at George Mason University. Dr. Sherry also serves as the director of the Center for Air Transportation Systems Research at George Mason University. Dr. Sherry has over 30 years of experience in the aviation industry serving as a flight-test engineer, flight control engineer, system engineer, lead system architect, program manager, strategic planning and business development. Dr. Sherry served as a fellow at RAND Corporation 1999-2001. He has published over 100 papers and journal articles, holds several patents, and has received awards for his work.

Panelists:

Michael Dymant, Managing Partner, NEXA Capital Partners, “The Business Case for the Regional AAM”

Jody Dobson, Head of Sales, Health Systems, Matternet, “The Business Case for the Operators and Examples of Operations”

Adrian Solomon, UTM Systems Engineering, Thales, “Overview of ICNS Infrastructure for BVLOS UAS Operations”

Christian Zarzar, Meteorology Specialist, TruWeather, “Weather Forecasting Infrastructure for AAM”

Michael Hieb, Research Professor, C4I & Cyber Center at George Mason University, “Surveillance Sensor Infrastructure and Trade-offs for an AAM Corridor”

Awards Ceremony

Presentation of Best Paper Awards 11:45 – 12:00

Technical Session Track Overview

Track 1 – Traffic Management

Co-chairs

Bernd Korn, German Aerospace Center (DLR)

Brian Stein, MITRE

In this track, sessions will address developments in the areas of UAS Traffic Integration, Separation Management and Collision Avoidance, ATM Concepts, Terminal Operations and Advanced Air Mobility/ Urban Air Mobility.

Track 2 – Operational Efficiency

Co-chairs

Dongsong Zeng, MITRE

Rainer Koelle, EUROCONTROL

In this track, sessions will address methods for Efficiency, Data Driven Concepts, OPS Plan and Separation. Topics include Autonomous Forecast Trend Monitoring, Conflict resolution using Machine Learning and Multi-objective Collaborative Trajectory Deconfliction.

Track 3 – CNS for UAS and UAS Applications

Co-chairs

Rafael Apaza, NASA

Fred Wieland, Mosaic ATM

In this track, sessions will address developments in the areas of UAS Landing and Surveillance, UAS Comm and Navigation, and issues for UAS Integration in the NAS. Topics include 4G/5G communication links and analysis of multipath impact.

Track 4 – Communications and Cybersecurity

Chair

Greg Saconne, Boeing

In this track, sessions will address developments in the areas of Cyber Security Modelling and Architecture, Communications Performance, Future Communications, and Communication System Implementation Considerations.

Track 5 – Navigation, APNT, and Surveillance

Co-chairs

Matt Moser, Boeing

Adrian Solomon, Thales

In this track, sessions will address developments in the areas of ADS-B Performance, Monitoring, and Analysis, Alternative Position- Navigation-Timing (PNT) Concepts and Evaluation, and Existing PNT & Surveillance. Topics include detecting of drones by their RF signature using deep learning and detection of GNSS interference through analysis of ADS-B reports.

Track 6 – Special Topics

Chair

Paul Prisaznuk, ARINC Legacy

In this track, sessions will address the Evolution of the NAS using innovative solutions, Space Ops, Autonomy, Security, Machine Learning and Electric Aircraft.

Technical Sessions – April 18, 2023

Room	Track	18-Apr	13:00	13:30	14:00	14:30
Rivanna BC	1	Traffic Management (ATM, UTM, STM) UAS Traffic Integration Tom Becher	On the Impact of UAS Contingencies on ATC Operations in Shared Airspace Juergen Teutsch, Royal Netherlands Aerospace Centre (NLR)	Flight Testing Drone Contingencies during Runway Inspection in U-space Shared Airspace Gunnar Schwoch, German Aerospace Center (DLR)	UAS Air-Risk Assessment In and Around Airports Sreejith Vidhyadharan, University of North Dakota	Development and Evaluation of a U-space Route Structure for the City of Frankfurt Connecting Airport and Trade Fair Via Fast-Time Simulation Christian Kallies, German Aerospace Center (DLR)
Rivanna EF	2	Operational Efficiency Methods for Efficiency Anuja Verma	Adaptable Graph Networks for Air Traffic Analysis Applications Jonathan Hoffman, MITRE Corporation	Studying the impact of COVID-19 on the European Flight Network Rainer Koelle, Eurocontrol, Performance Review Unit	Method for Formal Analysis of the Type and Content of Airline Standard Operating Procedures Jomana Bashatah, George Mason University	
Rivanna A	3	CNS for UAS and UAS Applications UAS Landing and Surveillance Rafael Apaza	Development of an Airspace Simulation and Modeling Tool for Enhanced Spectrum Management Rafael Apaza, NASA Glenn Research Center	System of Unmanned Aerial Vehicles for road safety improvement Najett Neji; Sana Bouassida; Jamel Neji - Paris-Saclay University		
	4	No presentations				
	5	No presentations				
Rivanna G	6	Special Topics EVOLUTION OF NAS USING INNOVATIVE SOLUTIONS P. Prisaznuk	Coarse Grained FLS-based Processor with Prognostic Malfunction Feature for UAM Drones using FPGA Hossam Ahmed, American University of the Middle East (AUM)	Benefits of Satellite Navigation to US Airports using Ground Based Augmentation System (GBAS) Jasenka Rakas, University of California Berkeley	Using Surveillance Flight Track Data and Terrestrial Sky Imaging to Record Airspace Contrail Statistics: The Washington D.C. Airspace Brian Romero Lopez; Lance Sherry Center for Air Transportation Systems Research at George Mason University	Software-Defined Architecture and Front-End Optimization For DO-178B Compliant Distance Measuring Equipment Farzan Farhangian, Ecole de Technologie Supérieure, CA

Technical Sessions – April 18, 2023

Room	Track	18-Apr	15:20	15:50	16:20	16:50
Rivanna BC	1	Traffic Management (ATM, UTM, STM) Separation Management and Collision Avoidance Jürgen Teutsch	BUBBLES Separation Management Environment: architecture and Validation of a Separation Management Tool for UTM Cecilia Claramunt Puchol, Universitat Politècnica de València	Performance Based Determination of Detect-and-Avoid Ranges in a Constrained Airspace Niklas Peinecke, German Aerospace Center (DLR)	Image-based Conflict Detection with Convolutional Neural Network under Weather Uncertainty Phuoc Dang, Nanyang Technological University Singapore	Decentralized Autonomous Conflict-Free Operation of Quadrotors with Control Barrier Functions Anahita Imanian, MITRE Corporate
Rivanna EF	2	Operational Efficiency Data Driven Concepts William Symionow	Aviation Data for Machine Learning Paul H Comitz, Raytheon Technologies Collins Aerospace	The impact of implementing Remote Air Traffic Services (Digital Towers) to Increase Efficiency, Safety, and Revenue at Air Traffic Navigation Services South Africa Nhlakanipho Mnguni, Air Traffic Navigation Services, South Africa	Operational Efficiency of Arrival Management with Open Data Rainer Koelle, Eurocontrol, Performance Review Unit	
Rivanna A	3	CNS for UAS and UAS Applications UAS Comm and Navigation David Matolak	Statistical Description of Multipath Components in Air-Ground Channels for Wireless Communications in Unmanned Aviation Daniel Mielke, German Aerospace Center DLR	A Predictive Control Framework for UAS Trajectory Planning Considering 4G/5G Communication Link Quality Adrian Solomon, THALES, US	Quantifying AAM Communications Quality using Machine Learning Frederick Wieland, Mosaic ATM	Tracking Performance Analysis of Ground-Based Radar Networks for Urban Air Mobility Rosario Aievola, University of Naples Federico II
Rivanna G	4	Communications and Cybersecurity Cyber Security – Modelling and Architecture Mike Vanguardia	ACPS: Design of an Integrated Architecture for Airborne System and Cyber-Physical System Zhi-jun Wu, Civil Aviation University of China	Using Trusted Responders in Constrained Aviation Environments to Reduce Authentication Overhead Jonathan Graefe, Collins Aerospace	Applying the Zero Trust Framework, Christine Horwege CGI,US	
Luray II	5	Navigation, APNT, and Surveillance ADS-B Performance, Monitoring, and Analysis Lisa Kusakabe	On the Effect of Uncompensated Latencies on Trajectory Reconstruction for Surveillance Performance Monitoring Carlos Alexander Chuquitarco-Jiménez, Universitat Politècnica de València	A Machine Learning GNSS Interference Detection Method based on ADS-B Multi-index Features Di Zuo, University of Beihang,CN	Mode N – A promising Approach for Future Navigation Steffen Marquard, DFS Deutsche Flugsicherung GmbH	Real-Time Visual Navigation for UAVs in Dynamic Environments using Deep Learning and Kalman Filtering Mohamed Akremi; Hedi Tabia, University Paris-Saclay
	6	No presentations				

Technical Sessions – April 19, 2023

Room	Track	19-Apr	13:00	13:30	14:00	14:30
Rivanna BC	1	Traffic Management (ATM, UTM, STM) ATM Concepts Brian Stein, MITRE	Air Traffic Control System Cyber Security Using Humans and Machine Learning Garrett Atkins, Embry-Riddle Aeronautical University, Prescott, Arizona US	Roadmap towards an ECAC-wide Flight Centric ATC Implementation Carmo Klunker, German Aerospace Center	Conceptual Analysis of Allocation Strategies for Air Traffic Control Concepts without Conventional Sector Boundaries Tobias Finck, German Aerospace Center	Dynamic and Cooperative Optimization of Entry and Exit Points for Multiple Sectors in Free Route Airspace Considering Wind Forecasts Jue Huang, Nanjing University of Aeronautics and Astronautics
	2	No presentations				
	3	No presentations				
Rivanna G	4	Communications and Cybersecurity Communications Performance Lisa Bee	Dual-band Air-Ground Radio Performance: Example Flight Test Results David Matolak, University of South Carolina	Smart Connected Operations to Foster Innovation at the Airport Surface Declan Byrne, AeroMACS – WiMAX Forum, USA	Air Traffic Management – ATN/OSI and ATN/IPS Data Link Comparison Frank O'Connor, Airtel ATN Limited, Ireland	
	5	No presentations				
Luray II	6	Special Topics SPACE OPS, AUTONOMY, AND SECURITY Anuja Verma	Dimensional Role Analysis: The Role of Humans and Automation for Increasingly Autonomous Aviation Systems Andrew Lacher, NASA Langley Research Center	A Framework for Uncertainty Assessment in Event Tree Safety Models Sara Nikdel, George Mason University	Trust Framework for Data Sharing between Industry and Government Steven Hacker, United States Navy	

Technical Sessions – April 19, 2023

Room	Track	19-Apr	15:20	15:50	16:20	16:50
Rivanna BC	1	Traffic Management (ATM, UTM, STM) Terminal Operations Niklas Peinecke	Capacity Finder – A Machine Learning-Based, Real-Time Predictive Tool for Departure Routing Decision Support in Metroplex Airspaces Aditya Saraf, ATAC Corporation, USA	Air-to-Air Collision Risk Models (CRM) in the Terminal Airspace: Opportunities for AI and Data Analytics Ashim Thapa, Center for Air Transportation Systems Research at George Mason University		
Rivanna EF	2	Operational Efficiency OPS Plan Tobias Finck	Multi-objective Collaborative Trajectory Deconfliction Incorporating Equity and Airline Priorities Yi Zhou, Nanjing University of Aeronautics and Astronautics	Privacy-Preserving Implementation of an Auction Mechanism for ATFM Slot Swapping Paul Feichtenschlager, Johannes Kepler University Linz	Safety and Security Considerations on the Airbus Wake Energy Retrieval Program “fello’fly” Thomas Ewert, German Aerospace Center – DLR	Autonomous Forecast Trend Monitoring in Support of Air Traffic Management Efficacy Improvements Alexander Klein, AvMet Applications Inc.
Rivanna A	3	CNS for UAS and UAS Applications Issues for UAS Integration Fred Wieland	Differences between URClearED Remain Well Clear and DO-365 Eric Theunissen, Netherlands Defence Academy	Current Challenges in Mission Planning Systems for UAVs: A Systematic Review Jan-Paul Huttner, German Aerospace Center (DLR)	Towards Full Integration of Manned and Unmanned Air Traffic: A Test Case Study – Performance Results of Future All Aviation CNS Technology (FACT) Project Ramazan Yeniceri, Istanbul Technical University	A Survey of Physical Layer-Aided UAV Security Raju Dhakal, Embry-Riddle Aeronautical University
Rivanna G	4	Communications and Cybersecurity Future Communications – LDACS Mike Olive	An Air-Ground Channel Modeling Approach for Multiple Antenna Systems Ayten Guerbuez, German Aerospace Center	A Software Framework for Synthetic Aeronautical Data Traffic Generation in Support of LDACS Evaluation Activities Leonardus Jansen, German Aerospace Center (DLR)	LDACS Flight Trials: Demonstration of ATS-B2, IPS, and Seamless Mobility Thomas Gräupl, German Aerospace Center (DLR)	International LDACS Security Validation Activities - A Cooperation Effort between DLR and ENRI Nils Mäurer, German Aerospace Center (DLR)
	5	No presentations				
Luray II	6	Special Topics MACHINE LEARNING AND ELECTRIC AIRCRAFT Lance Sherry	Towards Trajectory Conflict Prediction Using AI/ML For V&V Test Case Generation Lance Sherry, Center for Air Transport Systems Research at George Mason University	Quantifying Noise Footprint Benefits of Electric Aviation at Regional Airports Jasenka Rakas, University of California Berkeley	Noise Measurements of Unmanned Aircraft Vehicles: Experiences, Challenges and Recommendations for Standards taken from Flight Trials Teemu Joonas Lieb, German Aerospace Center (DLR)	

Technical Sessions – April 20, 2023

Room	Track	20-Apr	13:00	13:30	14:00	14:30
Rivanna BC	1	Traffic Management (ATM, UTM, STM) AAM / UAM Gunnar Schwoch	Development of a Weather Capability for the Urban Air Mobility Airspace Research Roadmap Timothy Bonin, MIT Lincoln Laboratory	Uncrewed Urban Air Mobility Concept of Operations Chip Meserole, The Boeing Company	BB-Planner: An Urban Traffic Dataset Generation Tool Joaquin Vico Navarro, Universitat Politècnica de València	A Digital Twin Mixed-reality System for Testing Future Advanced Air Mobility Concepts: A Prototype Christopher Conrad, Cranfield University
Rivanna EF	2	Operational Efficiency Separation Jonas Lieb	Resolution of Potential Conflicts caused by Contingency Events in an AAM Traffic Network Arinc Tutku Altun, Cranfield University	Testing Operating Procedures for Large UAS with Detect and Avoid Capabilities in Civil Air Traffic Management Environments Tim Bleakley, GA-ASI		
	3	No presentations				
Rivanna G	4	Communications and Cybersecurity Communication System Implementation Considerations Jonathan Graefe	Agile or V-model – Can Modern IT Frameworks and Tools Deliver Software Assurance for ATM-grade Applications Dieter Eier, Frequentis USA, Inc.	Network Communications Evolution's Effects on Air Traffic Systems Kenneth Duncan; David Hoenigmann, L3Harris, US	ESAT: Experimental Testing and COR Analysis of a Potential Backward-Compatible Aviation Standard for Secure ADS-B Mikaela Ngamboe, Université Polytechnique de Montréal, Canada	RODAD: Resilience Oriented Decentralized Anomaly Detection for Urban Air Mobility Networks Genshe Chen, Intelligent Fusion Technology, Inc.
	5	No presentations				
	6	No presentations				

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