AT THE HEART OF THE MISSION

NDIA

1919 2019

2019 ROBOTICS CAPABILITIES CONFERENCE & EXHIBITION

Multi-Domain Operational Robotics

April 24 – 25 | Columbus, GA | NDIA.org/Robotics

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SPUR

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QINETIQ
North America

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WHO WE ARE

The National Defense Industrial Association is the trusted leader in defense and national security associations. As a 501(c)(3) corporate and individual membership association, NDIA engages thoughtful and innovative leaders to exchange ideas, information, and capabilities that lead to the development of the best policies, practices, products, and technologies to ensure the safety and security of our nation. NDIA's membership embodies the full spectrum of corporate, government, academic, and individual stakeholders who form a vigorous, responsive, and collaborative community in support of defense and national security. NDIA is proud to celebrate 100 years in support of our warfighters and national security. The technology used by today's modern warfighter was unimaginable 100 years ago. In 1919, BG Benedict Crowell's vision of a collaborative team working at the intersection of science, industry, government and defense began what was to become the National Defense Industrial Association. For the past century, NDIA and its predecessor organizations have been at the heart of the mission by dedicating their time, expertise and energy to ensuring our warfighters have the best training, equipment and support. For more information visit **NDIA.org**

ROBOTICS DIVISION

WHO WE ARE

The Robotics Division focuses on security-related robotics technology. The group covers development, acquisition, application, integration and sustainment of unmanned ground systems to improve war fighters' capabilities and survivability — with an emphasis on underlying technologies that will yield integrated, interoperable unmanned systems to meet present and future operational requirements.

EVENT INFORMATION

LOCATION

Columbus Georgia Convention & Trade Center
801 Front Avenue
Columbus, GA 31901

ATTIRE

Civilian: Business
Military: Uniform of the day

WI-FI

Network: 2019 Robotics
Password: NDIA

SLI.DO

Join the conversation! Submit questions during the general session, visit **slido.com** and enter event code **ROBOTICS**, then click "join".

SURVEY AND PARTICIPANT LIST

You'll receive via email a survey and list of attendees (name and organization) after the conference. Please complete the survey, which helps make our event even more successful in the future.

EVENT CONTACT

Abby Abdala
Exhibits & Sponsorship
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Conference Program
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Conference Logistics
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HARASSMENT STATEMENT

NDIA is committed to providing a professional environment free from physical, psychological and verbal harassment. NDIA will not tolerate harassment of any kind, including but not limited to harassment based on ethnicity, religion, disability, physical appearance, gender, or sexual orientation. This policy applies to all participants and attendees at NDIA conferences, meetings and events. Harassment includes offensive gestures and verbal comments, deliberate intimidation, stalking, following, inappropriate photography and recording, sustained disruption of talks or other events, inappropriate physical contact, and unwelcome attention. Participants requested to cease harassing behavior are expected to comply immediately, and failure will serve as grounds for revoking access to the NDIA event.

SCHEDULE AT A GLANCE

TUESDAY, APRIL 23

Registration
South Hall Lobby
12:00 – 5:00 pm

Welcome Reception Hosted by NAMC
Coca-Cola Space Science Center
6:00 – 9:00 pm

WEDNESDAY, APRIL 24

Registration
South Hall Lobby
7:00 am – 6:30 pm

Networking Breakfast
South Hall Lobby
7:00 – 8:00 am

General Session
Center Hall
8:00 am – 5:30 pm

Exhibit Hall Open
South Hall
9:00 am – 7:00 pm

Networking Lunch
South Hall
12:30 – 1:30 pm

Networking Reception in the Exhibit Hall
South Hall
5:30 – 7:00 pm

THURSDAY, APRIL 25

Networking Breakfast
South Hall Lobby
7:00 – 8:00 am

Technical Sessions
Center Hall and Room 211
8:00 am – 12:00 pm

Exhibit Hall Open
South Hall
9:00 am – 12:00 pm

AGENDA

TUESDAY, APRIL 23

12:00 – 5:00 pm

REGISTRATION
SOUTH HALL LOBBY

6:00 – 9:00 pm

WELCOME RECEPTION
Hosted by NAMC
COCA-COLA SPACE SCIENCE CENTER

WEDNESDAY, APRIL 24

7:00 am – 6:30 pm

REGISTRATION
SOUTH HALL LOBBY

7:00 – 8:00 am

NETWORKING BREAKFAST
SOUTH HALL LOBBY

8:00 – 8:15 am

OPENING REMARKS
CENTER HALL

LTC Matt Dooley, USA (Ret)
Chair, NDIA Robotics Division

MG James Boozer, USA (Ret)
Chief of Staff, National Defense Industrial Association

MG Gary Brito, USA
Commanding General, Maneuver Capability Development and Integration Directorate, U.S. Army Futures Command, Ft. Benning

8:15 – 9:10 am

KEYNOTE: PREPARING FOR MULTI-DOMAIN OPERATIONS
CENTER HALL

LTG Eric Wesley, USA
Deputy Commanding General, Futures and Concepts Center, U.S. Army Futures Command

9:10 – 10:05 am

KEYNOTE: HELPING INDUSTRY UNDERSTAND THE ARMY'S EFFORT TO TRANSFORM ACQUISITIONS
CENTER HALL

Helen Greiner, SES
Army Highly Qualified Expert, Robotics, Autonomous Systems and Artificial Intelligence, Assistant Secretary of the Army (Acquisition, Logistics and Technology)

9:00 am – 7:00 pm

EXHIBIT HALL OPEN
SOUTH HALL

10:05 –10:35 am

NETWORKING BREAK IN THE EXHIBIT HALL

SOUTH HALL

10:35 – 11:20 am

PURSUING ROBOTIC AUTONOMY THROUGH TRANSFORMATION

CENTER HALL

Paul Decker
Deputy Chief Roboticist
U.S. Army Combat Capability Development Command, Ground Vehicle Systems Center

LTC Stu Hatfield, USA (Ret)
Robotics Branch Chief, Force Development Directorate, Army G-8

11:20 am – 12:20 pm

ADVANCING AUTONOMY: INDUSTRY PERSPECTIVE

CENTER HALL

Ted Maciuba
Deputy Director, Robotics Requirements, Maneuver Capability Development and Integration Directorate, U.S. Army Futures Command
Moderator

Carl Conti
Technical Director, Spatial Integrated Systems

Jeff Schneider
Research Professor, Carnegie Mellon University

Buck Tanner
Program Director, Combat Vehicle Chief Engineer, BAE Systems

Mack Traynor
Chief Executive Officer, ReconRobotics

12:20 – 12:30 pm

AWARDS CEREMONY

CENTER HALL

12:30 – 1:30 pm

NETWORKING LUNCH IN THE EXHIBIT HALL

SOUTH HALL

1:30 – 2:30 pm

NEXT GENERATION COMBAT VEHICLE & ROBOTIC COMBAT VEHICLE UPDATES

CENTER HALL

LTC Stu Hatfield, USA (Ret)
Robotics Branch Chief, Force Development Directorate, Army G-8
Moderator

COL Warren Sponsler, USA
Deputy Director, Next Generation Combat Vehicle Cross-Functional Team, U.S. Army Futures Command

LTC Jon St. John, USA
Product Lead Robotic Combat Vehicle, Program Manager NGCV, PEO GCS

COL Kevin Vanyo, USA
Military Deputy, Combat Capabilities Development Command, Ground Vehicle Systems Center

2:30 – 3:15 pm

A CONSTELLATION OF MULTI-DOMAIN ROBOTIC CAPABILITIES

CENTER HALL

Ted Maciuba
Deputy Director, Robotics Requirements, Maneuver Capability Development and Integration Directorate, U.S. Army Futures Command

3:15 – 3:45 pm

NETWORKING BREAK IN EXHIBIT HALL

SOUTH HALL

3:45 – 4:45 pm

ROBOTICS UPDATES BY SERVICE

CENTER HALL

LTC Matt Dooley, USA (Ret)
Chair, NDIA Robotics Division
Moderator

COL Johnny Cochran, USA
Deputy Director, Close Combat Lethality Task Force, Office of the Secretary of Defense

CAPT Christian Dunbar, USN
Director, Future Concepts and Innovation, Naval Special Warfare Command

Col Kevin Murray, USMC
Director, Science & Technology, Rapid Capabilities Office, Marine Corps Warfighting Lab

4:45 – 5:15 pm

ROBOTICS AND AUTONOMOUS SYSTEMS IN ARMY SUSTAINMENT

CENTER HALL

MAJ Harry Terzic, USA
Manager, JTAARS & JCTD, Sustainment Capabilities Development and Integration Directorate, U.S. Army Futures Command

5:15 – 5:45 pm

ROBOTICS REAL-TIME RESULTS

CENTER HALL

COL Thomas Nelson, USA
Director, Robotics Requirements, Maneuver Capability Development and Integration Directorate, U.S. Army Futures Command

LTC Jonathan Bodenhamer, USA
Product Manager, Applique and Large Unmanned Ground Systems, PM-FP

5:45 – 7:15 pm

NETWORKING RECEPTION IN THE EXHIBIT HALL

SOUTH HALL

THURSDAY, APRIL 25

7:00 am – 12:00 pm **REGISTRATION**
SOUTH HALL LOBBY

7:00 – 8:00 am **NETWORKING BREAKFAST**
SOUTH HALL LOBBY

9:00 am – 12:00 pm **EXHIBIT HALL OPEN**
SOUTH HALL

TECHNICAL SESSIONS

8:00 am – 12:00 pm

TRACK I: ADVANCED AUTONOMY: OPERATIONAL AUTONOMOUS BEHAVIORS IN APPLICATION
CENTER HALL

8:00 – 8:25 am
Advanced GNSS Positioning for Cooperative Adaptive Cruise Control (CACC) Truck Platooning
Patrick Smith
Graduate Research Assistant, Auburn University

8:25 – 8:50 am
Towards a Multi-Agent/Multi-Domain World Model
Mark Hinton
Senior Systems Engineer, Johns Hopkins APL

8:50 – 9:15 am
Unmanned System (UxS) and Engineering Precepts for Safe Autonomy
Robert Alex
Engineer, Booz Allen Hamilton

9:15 – 9:40 am
Autonomy
Alberto Lacaze
President, Lead Engineer, Robotic Research

TRACK II: ROBOTICS IN APPLICATION AT THE TACTICAL LEVEL– PLATOON AND SQUAD
ROOM 211

8:00 – 8:25 am
GEDI Crazy Turtle- Stealth Performance Communication
Daniel Reyes
Chief Executive Officer, Crazy Turtle Robotics

8:25 – 8:50 am
Organic Precision Strike Using Robustly Networked Loitering Munitions and Robotic ISR
Dr. Adam MacDonald
Director, Business Development, AeroVironment

8:50 – 9:15 am
AI for Maneuver: Artificially Intelligent Robots in the Last Mile of Combat
Brandon Tseng
Chief Operating Officer & Co-Founder, Shield AI

9:15 – 9:40 am
Modular Mission Payloads for Small Unmanned Ground Vehicles (SUGV)
Dr. Richard Pettegrew
General Manager, IEC Infrared Systems

9:40 – 10:20 am **NETWORKING BREAK IN THE EXHIBIT HALL**
SOUTH HALL

10:20 – 10:45 am

Adapting NASA Mars Rover Autonomy to Army Vehicles for Intelligent Autonomous Control

Carl Conti
Technical Director, Spatial Integrated Systems

Towards Autonomous Robotic Manipulation

Amanda Sgroi
Principal Research Scientist, RE2 Robotics

10:45 – 11:10 am

An Approach to the Development of Greater Autonomy for Combat Vehicles

Buck Tanner and Thomas McLoud
BAE Systems Land and Armaments L.P.

UAS Deployment of Micro UGV with Tactical Payloads

Mack Traynor
Chief Executive Officer, ReconRobotics

11:10 – 11:35 am

Autonomous Topography Localization and Analysis System (ATLAS)

Javier Rodriguez
Aerospace Engineer, Air Force Research Lab (AFRL)

Autonomous Precision Landing of sUAS onto Moving Vehicles at Night

David Twining
Chief Operating Officer, Planck Aerosystems, Inc.

11:35 am – 12:00 pm

Modular Multi-Purpose Autonomy-Enabled Platforms

Kevin Mulrenin
Director, Pratt & Miller Engineering

12:00 pm

PROGRAM CONCLUDES

The NDIA has a policy of strict compliance with federal and state antitrust laws. The antitrust laws prohibit competitors from engaging in actions that could result in an unreasonable restraint of trade. Consequently, NDIA members must avoid discussing certain topics when they are together at formal association membership, board, committee, and other meetings and in informal contacts with other industry members: prices, fees, rates, profit margins, or other terms or conditions of sale (including allowances, credit terms, and warranties); allocation of markets or customers or division of territories; or refusals to deal with or boycotts of suppliers, customers or other third parties, or topics that may lead participants not to deal with a particular supplier, customer or third party.

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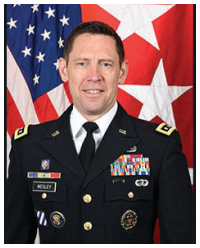
BIOGRAPHIES



LTG ERIC WESLEY, USA

Deputy Commanding General, Futures and Concepts Center
United States Futures Command

LTG Eric Wesley is currently serving as Deputy Commanding General, Futures and Concepts Center, United States Army Futures Command, Joint Base Langley-Eustis, Virginia.

LTG Wesley was commissioned as an Armor Officer from the United States Military Academy in 1986. He began his career as a Tank Platoon Leader, Scout Platoon Leader, and Battalion Logistics Officer in 2nd Battalion, 70th Armor Regiment, of the 1st Armored Division in Germany. In May 1991, he was assigned to the 1st Infantry Division at Fort Riley, Kansas where he commanded a tank company in 1st Battalion, 34th Armor, until Dec 1993. He then spent three and a half years with the United States Army Special Operations Command during which he deployed in support of OPERATION JOINT GUARD/ENDEAVOR in Bosnia-Herzegovina.

In June of 1998, he was assigned to the 2nd Brigade of the 3rd Infantry Division at Fort Stewart, Georgia, where he served as a Battalion and Brigade Operations Officer and the Brigade Executive Officer. In September 2002, he deployed with 2nd Brigade to OPERATION DESERT SPRING in Kuwait, followed by OPERATION IRAQI FREEDOM (OIF) where 2nd Brigade led the 3rd Infantry Division's attack into Baghdad. Upon redeployment, he led the staff effort to move the division to a modular organization.

LTG Wesley returned to Fort Riley in June 2004 and assumed command of a tank battalion, the 1st Battalion, 13th Armor. He deployed the "13th Tank" back to Iraq conducting combat operations in Baghdad in support of OIF from January 2005 to January 2006. Upon relinquishing command, he remained at Fort Riley serving as the Operations Officer of the 1st Infantry Division until June 2007. One year later, he returned to the "Big Red One" and assumed command of the 1st Brigade Combat Team, 1st Infantry Division. After command, he deployed to Kabul, Afghanistan serving as Chief of Current Plans for the International Security Assistance Force (ISAF) in support of OPERATION ENDURING FREEDOM. He then served for two years in the White House on the National Security Council as the Director for Afghanistan-Pakistan Policy. He later returned to Afghanistan where he was the Director for Future Plans for ISAF Joint Command in Afghanistan. He then served as the Deputy Commanding General (Support) for the 1st Infantry Division followed by duty on the Army Staff as the Deputy Director for Program Analysis and Evaluation (PAE) for the Army G8. LTG Wesley most recently served as the Commanding General, U.S. Army Maneuver Center of Excellence and Fort Benning, Georgia.

LTG Wesley's military education includes the Armor Officer Basic Course, the Armor Officer Advanced Course, and the U.S. Army Command and General Staff College. He is a graduate of the National War College, earning a Master's Degree in National Security and Strategic Studies. LTG Wesley also holds a Master's Degree in International Relations from Troy State University.

His awards and decorations include the Legion of Merit, the Bronze Star Medal for Valor, the Bronze Star Medal, the Meritorious Service Medal, and the Joint Service Commendation Medal. He has also earned the Combat Action Badge, the Parachutist Badge, and the Ranger Tab.

HELEN GREINER, SES

Army Highly Qualified Expert, Robotics, Autonomous Systems, and AI
Assistant Secretary of the Army (Acquisition, Logistics and Technology)

Helen Greiner was born in London in 1967. Her father came to England as a refugee from Hungary, and met his wife, Helen's mother, at the University of London. When Helen was five, her family moved to Southampton, New York. At the age of ten, Greiner went to see the popular film Star Wars and has said she was inspired to work with robots by R2-D2 in the film. Greiner graduated from the Massachusetts Institute of Technology in 1989 and earned her master's degree there in 1990.

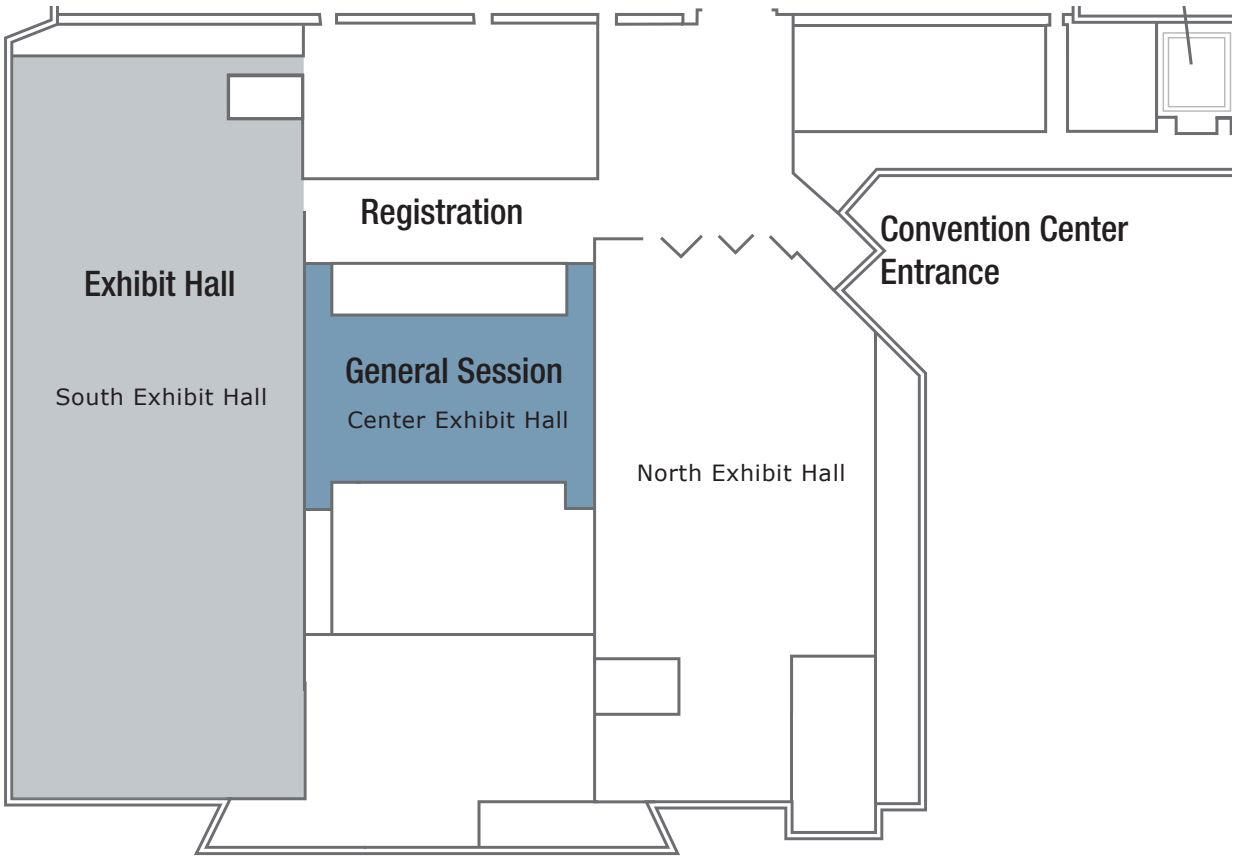
In 1990, along with Rodney Brooks and Colin Angle, Greiner co-founded iRobot, a robotics company headquartered in Bedford, Massachusetts, which delivers robots into the consumer market. She co-designed the first version of the iRobot Roomba.

Greiner served as President of iRobot (NASDAQ: IRBT) until 2004 and Chairman until 2008. During her tenure, iRobot released the Roomba, the PackBot and SUGV military robots. She built a culture of practical innovation and delivery that led to the deployment of 6,000 PackBots with the United States armed forces. In addition, Greiner headed up iRobot's financing projects, raising $35M in venture capital for a $75M initial public offering. She has worked at NASA's Jet Propulsion Laboratory and the MIT Artificial Intelligence Laboratory.

Greiner was recently CTO of CyPhy Works, home to the Persistent Aerial Reconnaissance and Communications (PARC) and Pocket Flyer multi-rotor drones. She also served on the board of the Open Source Robotics Foundation (OSRF). As of 2018, she works as an advisor to the United States Army.

VENUE MAP

LEVEL 1



LEVEL 2

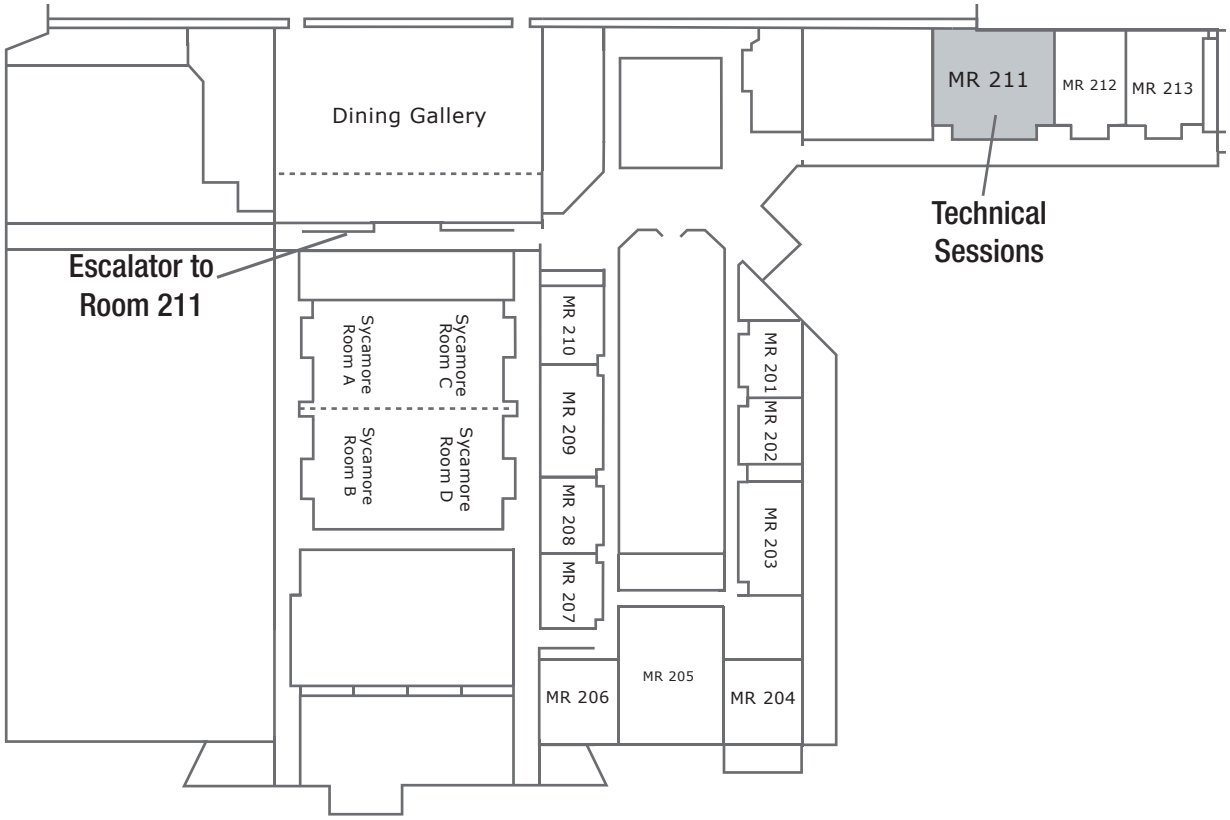


EXHIBIT HALL HOURS

WEDNESDAY, APRIL 24
9:00 am – 7:00 pm

THURSDAY, APRIL 25
9:00 am – 12:00 pm

EXHIBITORS BY COMPANY

EXHIBITOR DESCRIPTIONS

ALTAVIAN 201

Altavian is a privately held U.S.-based Unmanned Aircraft System design, manufacturing, and solutions provider. Founded in 2011, our extensive history includes working alongside organizations including U.S. Army Corps of Engineers, NASA, and the U.S. Army. We embrace open architectures in our systems design to bring proven commercial concepts to Group I UAS. Altavian is headquartered in Gainesville, FL.

DEFENSE MOBILITY ENTERPRISE 213

DME's mission is to provide the Government with ready, quality access to the broadest population of U.S. ground vehicle system (GVS), sub-system, and component technology developers and providers in a competitive environment; working in partnership with the Government to implement and refine business processes and tools to streamline individual project contract administration; and to expedite the innovation, development, and production of new GVS capabilities for U.S. warfighters.

DEFENSE SYSTEMS INFORMATION ANALYSIS CENTER DSIAC 312

The Defense Systems Information Analysis Center (DSIAC) is a component of the U.S. Department of Defense's Information Analysis Center (IAC) enterprise.

The purpose of DSIAC is to provide information research and analysis for DoD and Federal government users to stimulate innovation, foster collaboration, and eliminate redundancy.

DSIAC aims to be the premier information research partner and curator of technology advancements and trends for the defense systems community.

FLIR 205

FLIR UIS Division comprises the largest global provider of tactical unmanned ground vehicles as well as leading nano and Class-1 unmanned aircraft systems (UAS). We design and build the most trusted, rugged, easiest-to-operate robots used to safeguard life and property around the world. Whatever the mission, our advanced robots are out there every day supporting US and international military, law enforcement, and industrial users.

GHOST ROBOTICS 311

Robots That Feel the World® Ghost Robotics™ is revolutionizing legged robotics and the market for autonomous unmanned ground vehicles (Q-UGVs) used in unstructured terrain and harsh environments. Our Q-UGVs are unstoppable. Beyond all terrain operation, a core design principle for our legged robots is size-scalability, and reduced mechanical complexity with total software (SDK) control when compared to other legged and traditional wheeled and tracked UGVs on the market.

HARRIS CORPORATION 211

Harris Corporation is a leading technology innovator, solving customers' toughest mission-critical challenges by providing solutions that connect, inform and protect. Harris supports government and commercial customers around the world. Learn more at harris.com.

NEYA SYSTEMS 310

Neya Systems, LLC, is a 40-person unmanned systems company in Warrendale (Pittsburgh), PA. Our expertise includes off-road autonomy in unstructured natural environments, multi-robot mission planning and collaboration, interoperability, and open architectures. Neya works with Government and industry customers to provide custom autonomy solutions to challenging outdoor problem. Neya is a wholly owned subsidiary of Applied Research Associates.

ODU USA 217

ODU is a worldwide leader in designing and manufacturing high-performance connector solutions and cable assemblies for various industries including medical, military, industrial, test and measurement, eMobility, energy and broadcasting. ODU Advanced Connector Solutions: lightweight & compact, robust design, high speed data transmission, watertight protection and cable assembly integrated solutions.

QINETIQ NORTH AMERICA 306

Around the world, our land robots such as TALON and Dragon Runner have provided safety and support to the military and first responders. We offer robots in various sizes and capabilities to support specific tasks, such as IED defeat, CBRN/hazmat, reconnaissance, security, dismounted troop support and route clearance. We are proud to be named the winners of the RCIS (Route Clearance Interrogation System) and CRS-I (Common Robotic System-Individual) Program of Record by the US Army.

REAL-TIME INNOVATIONS 314

Real-Time Innovations (RTI) is the Industrial Internet of Things (IIoT) connectivity company.

The RTI Connext® databus is a software framework that shares information in real time, making applications work together as one, integrated system. RTI is the largest vendor of products based on the Object Management Group (OMG) Data Distribution ServiceTM (DDS) standard.

RECONROBOTICS, INC. 307

ReconRobotics is the world leader in tactical micro-robot and personal sensor systems. Worldwide, over 6,000 of the company's robots have been deployed to the U.S. military and international friendly forces, federal, state and local law enforcement agencies, bomb squads and fire/rescue teams. The Recon Scout® and Throwbot® devices are used daily to protect their personnel, minimize collateral damage, and gain immediate reconnaissance within dangerous and hostile environments.

SHIELD AI 215

Shield AI is an artificial intelligence robotics company building products for the DoD and first responders. Our mission is to protect service members and civilians with artificially intelligent systems. Shield AI's current products are Hivemind and Nova. Hivemind is an AI framework that enables robots to see, reason about, and search the world. Nova is a Hivemind-powered, robotic quadcopter that autonomously searches buildings while streaming video and building maps back to the user.

TOMAHAWK ROBOTICS 203

Tomahawk Robotics is a leading innovator of unmanned systems control solutions- reducing cost, optimizing system performance and improving ease of use through intuitive, user-centric design. This customer-focused approach is captured in Kinesis, addressing the many challenges of operating multi-domain robotic systems beyond line-of-sight. From desktop to mobile, Kinesis delivers a collaborative, one-to-many, control system enabling users to seamlessly interact with their environment.

NOTES

LOWEST-SWAP M-CODE IS HERE

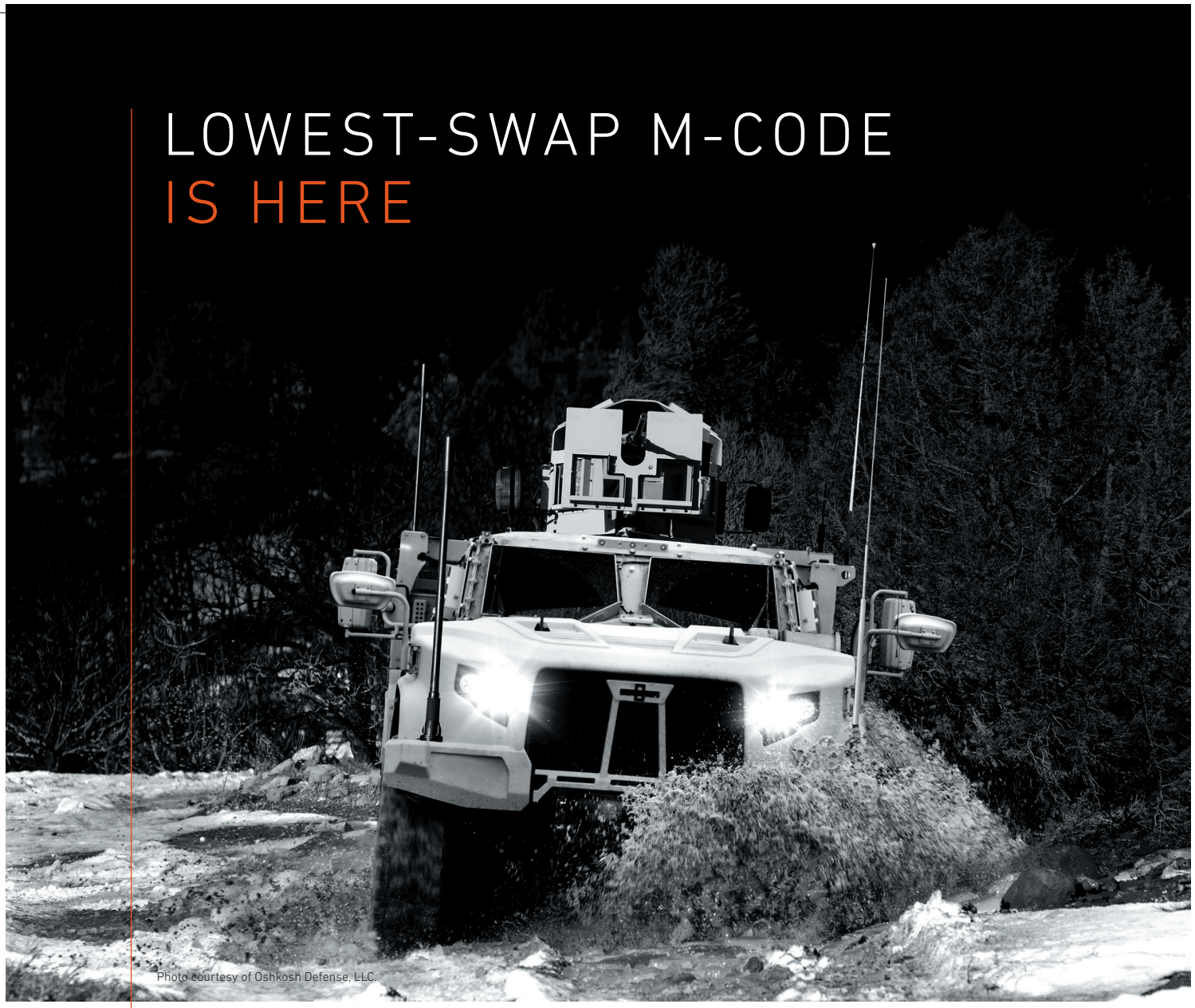


Photo courtesy of Oshkosh Defense, LLC.

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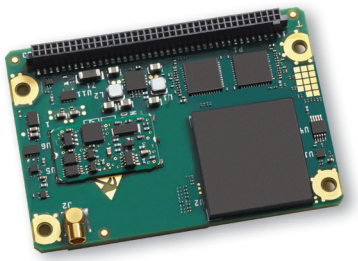

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Collins Aerospace

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