# GMF 2016

Global Maritime Forum: 11/15 - 11/16

## Challenges and Opportunities of Current and Emergent Maritime Capabilities: Exploring the Intersection of Technology and Policy

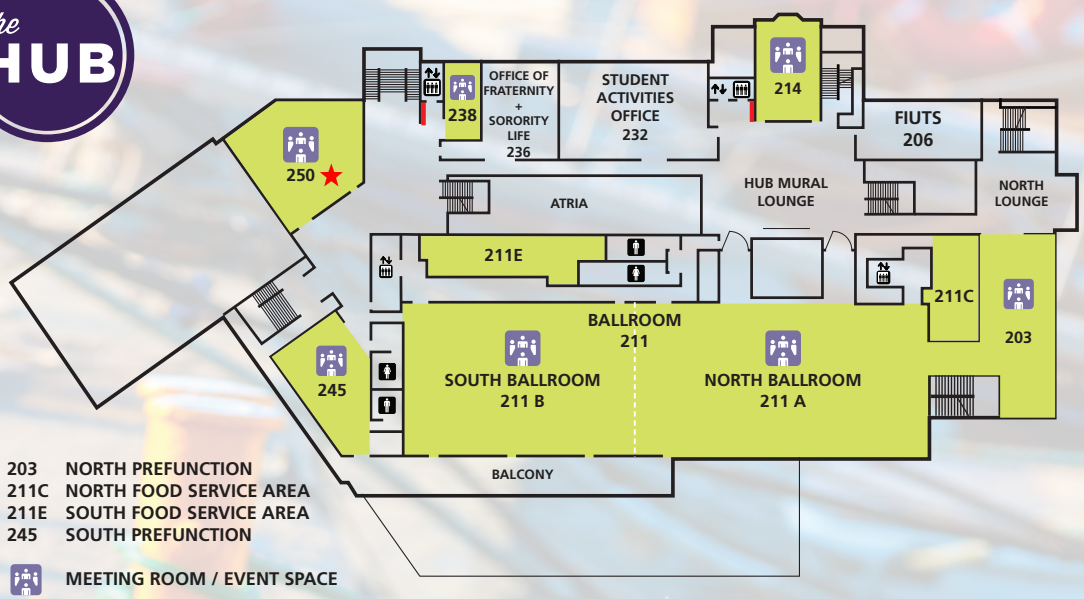
# GMF 2016

Evolving technologies and capabilities are providing the Global Maritime Community of Interest (GMCOI) with great opportunities to enhance the defense, safety and protection of the maritime domain. Current and emergent technological advancements can help to better detect, interdict and provide surveillance to the maritime domain, but such advancements can also pose challenges, even as policy and regulation race to keep up with and leverage these technologies for the mission. As we advance maritime technology such as autonomous maritime vehicles, we must consider not only capabilities to defend and protect, but also the potential regulatory or statutory implications associated with such use. Similarly, in the areas of information sharing and interoperability, the dual mission of sharing and safeguarding information poses additional potentially conflicting opportunities and threats.

While government and the maritime industry have taken incremental steps towards developing maritime technology and capabilities that collect, fuse, visualize, and share data relevant to operations and security in the maritime domain, achieving superior operational awareness has been elusive. At the same time, a broad spectrum of private industries has achieved rapid progress with technologies such as the cloud and social media platforms. The intersection of technology, policy, and mission will require innovative thinking and unique collaboration to advance to the next art of the possible.

Day One presentations will highlight available and emerging autonomous vehicles and associated cyber innovations that create opportunities while posing challenges. Day Two will focus on legal and policy implications of technology innovations to enhance sharing and safeguarding of information to achieve a more holistic view of the complex operational maritime environment. Together, we will forge a greater understanding of how the continued advancements of emergent technologies can best be integrated within the maritime domain.

# Map of the HUB



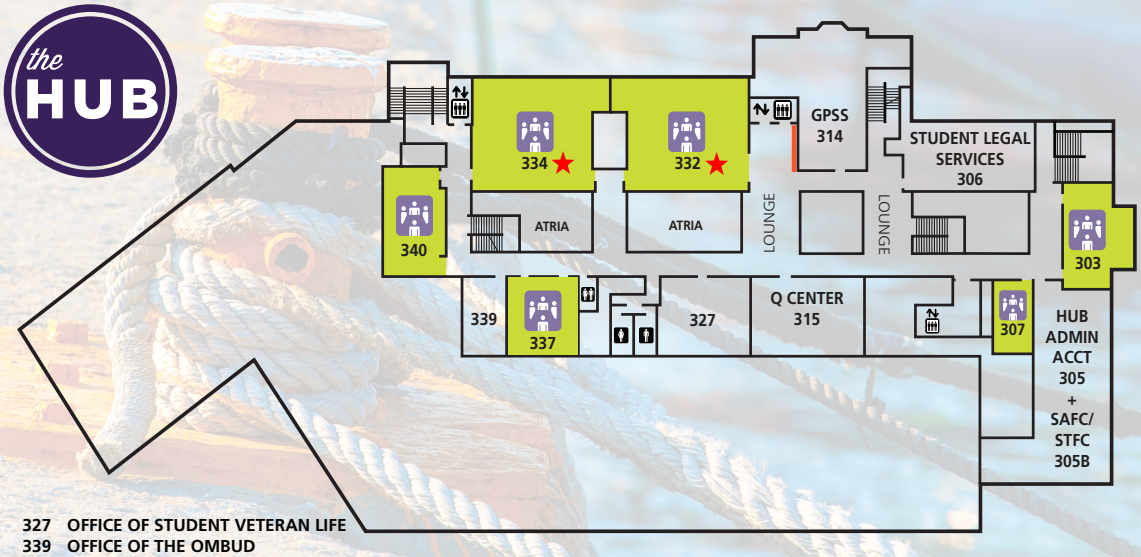

203 NORTH PREFUNCTION
211C NORTH FOOD SERVICE AREA
211E SOUTH FOOD SERVICE AREA
245 SOUTH PREFUNCTION

MEETING ROOM / EVENT SPACE

BULLETIN BOARD

GMF ROOMS

## SECOND FLOOR




327 OFFICE OF STUDENT VETERAN LIFE
339 OFFICE OF THE OMBUD

BULLETIN BOARD

MEETING / EVENT ROOM

GMF ROOMS

## THIRD FLOOR

# Agenda: Day One

| | | |
|---|---|---|
| 0730 - 0830 | **Registration & Morning Coffee/Continental Breakfast** | HUB 250 |
| 0830 - 0845 | **Welcome Remarks**<br>with Ms. Mekisha Marshall and Dr. Mark Haselkorn | HUB 250 |
| 0845 - 0930 | **Welcome Address**<br>with Dr. Michael Bragg, Captian Joe Raymond, and Rear Admiral Robert Sharp | HUB 250 |
| 0930 - 1000 | **Keynote Speaker**<br>with Mr. Lewis Shepherd | HUB 250 |
| 1000 - 1030 | **How the Proliferation of Unmanned Aerial Vehicles affected Airspace and FAA Policy and set the stage for New Regulation for the safety of the Aviation Transportation System**<br>with Mr. Joshua Holtzman | HUB 250 |
| 1030 - 1045 | **Break** | |
| 1045 - 1145 | **Panel I: Unmanned Underwater Vehicles (UUVs)**<br>Mr. David Jones - Panel Chair<br>Dr. Robert Touchton, Dr. Aaron Marburg, and Dr. Sarah Webster - Speakers | HUB 250 |
| 1145 - 1245 | **Panel II: The Emergence of Space-Based Capabilities for Maritime Domain Awareness (MDA)**<br>Dr. John Mittleman - Panel Chair<br>Dr. Jana Robinson, Mr. Peter Marquez, and Dr. John Hornsby - Speakers | HUB 250 |
| 1245 - 1300 | **Workshop Photo** | HUB 250 |
| 1300 - 1400 | **Lunch** | HUB 332, 334 |
| 1400 - 1500 | **Panel III: Securing Unmanned Autonomous Systems from Cyber Threats**<br>Dr. Paul Shapiro - Chair<br>Mr. Egan Greenstien, Mr. David Aucsmith, and Dr. Karl Koscher - Speakers | HUB 250 |
| 1500 - 1700 | **Group Parallel Collaboration Sessions for Day One Topics** | HUB 332, 334 |
| 1700 - 1730 | **Group Parallel Collaboration Session Report Out & Wrap Up** | HUB 250 |
| 1800 - 2200 | **Globla Maritime Forum Reception** | Burke Museum |

# Day Two

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|---|---|---|
| **0730 - 0800** | **Administrative Remarks & Morning Coffee/Continental Breakfast** | **HUB 334** |
| **0800 - 0830** | **Introductory Speaker**<br>with Mr. Nicholas Andersen | **HUB 334** |
| **0830 - 0930** | **Panel IV: Integrated Policy & Technology Issues**<br>Dr. Mark Haselkorn - Chair<br>Mr. Sean Wheeler, Ms. Melissa Braxton, and Mr. Shawn McDonald - Speakers | **HUB 334** |
| **0930 - 1030** | **Panel V: Technology Innovation & Trust-Based Information Sharing In Support of MDA**<br>Dr. Sonia Savelli - Chair<br>Dr. Lilian Alessa, Mr. John Sanford, and Dr. Mark Haselkorn - Speakers | **HUB 334** |
| **1030 - 1045** | **Break** | |
| **1045 - 1145** | **Parallel Collaboration Sessions for Day 2 Topics** | **HUB 211A** |
| **1145 - 1230** | **Lunch** | **HUB 211A** |
| **1230 - 1330** | **Parallel Collaboration Sessions for Day 2 Topics (Continued)** | **HUB 211A** |
| **1330 - 1515** | **Report out on Parallel Collaboration Sessions and Takeaways & the Path Forward** | **HUB 211A** |
| **1515 - 1530** | **Closing Remarks** | **HUB 211A** |

# Rear Admiral Robert D. Sharp

## Director, National Maritime Intelligence-Integration Office Commander

### Office of Navel Intelligence

Rear Admiral Bob Sharp assumed command of the Office of Naval Intelligence (ONI) and became Director, National Maritime Intelligence-Integration Office (NMIO) in April 2016. ONI and NMIO are the leading providers of global maritime intelligence and intelligence integration, respectively, for the U.S. Navy, the Department of Defense, and the national interagency policy community. During his initial flag assignment he served as Director for Intelligence (J2), U.S. Special Operations Command. A native of San Jose, California, RADM Sharp graduated from the University of the Pacific with a B.A. in English and was commissioned through Officer Candidate School in 1988. He holds a Naval War College diploma, and earned a Master of Science in National Resource Strategy from the Industrial College of the Armed Forces (ICAF) in 2008. His previous operational tours include deployments with USS Ranger (CV 61), Carrier Air Wing 2 embarked on USS Constellation (CV 64), and Carrier Group 2 embarked on USS Harry S. Truman (CVN 75). Additionally, he conducted multiple deployments to Afghanistan as a J2 of a Special Operations Task Force, leading joint, inter-agency intelligence professionals supporting Operation Enduring Freedom. Sharp's shore tours include assistant intelligence officer for Commander Naval Air Forces, Pacific, instructor duty at the Fleet Intelligence Center, Pacific, targeting officer on the Joint Staff, Intelligence Operations officer with U.S. Fleet Forces Command, Director of Intelligence for Naval Special Warfare Development Group, Director of Intelligence and Deputy Director for the Maritime Operations Center for Commander U.S. Naval Forces Central Command, U.S. 5th Fleet, and senior fellow on the CNO Strategic Studies Group. He commanded Joint Intelligence Center, U.S. Central Command from August 2010 to August 2012. In addition to multiple personal, unit and campaign awards he has been the recipient of the Vice Admiral Rufus L. Taylor award for excellence in instruction, the U.S. Army's Knowlton Award for Military Intelligence, the Rear Admiral Edwin T. Layton leadership award, and the Naval Intelligence Foundation award for excellence in operational intelligence support to the Fleet.

SPEAKER BIOS

# Dr. Lilian Alessa

Professor & Director - University of Idaho: Center for Resilient Communities

CBONS Program Lead - University of Alaska: The Arctic Domain Awareness Center

Dr. Alessa is President's Professor and Director of the Center for Resilient Communities (CRC) at the University of Idaho. Prior to this she was the Director of the Alaska Experimental Program to Stimulate Competitive Research (EPSCoR) at the University of Alaska. She is the Community Based Observing Networks and Systems (CBONS) Program Lead and International Liaison for the Arctic Domain Awareness Center (ADAC), a Department of Homeland Security Center of Excellence. Trained as both a physical and social scientist she pioneered human sensor networks (CBONS) and developed the only Arctic freshwater security assessment index. At the U of Idaho she established the Center for Resilient Communities (CRC), a multi-Institutional partnership focused on helping communities thrive in rapidly changing environments. She received her PhDs from the University of British Columbia and sits on several national advisory committees including the National Ecological Observing Network (NEON). She is a co-author of the NSF Decadal Vision "America's Future: Environmental Research and Education for a Thriving Century. During the U.S. Chairmanship of the Arctic Council she serves as Project Lead for Arctic freshwater security assessments and Chairs the Arctic Adaptation Exchange Portal (AAEP). Her team's other work includes developing innovative training programs to off-set technology induced vulnerabilities in combat forces, as well as providing guidelines on designing and securing resilient landscapes using social, ecological and technological systems science.

# Mr. Nicholas Andersen

## Senior Expert for SCI Networks and CIO

US Navy

Mr. Nicholas Andersen is the Senior Expert for Sensitive Compartmented Information (SCI) Network Consolidation for the Deputy Chief of Naval Operations (DCNO) for Information Warfare (N2/N6). Mr. Andersen also serves as the Navy's Intelligence Community Chief Information Officer (CIO) and the Navy's senior representative to a myriad of Intelligence Community Boards and Councils. Prior to becoming a Department of the Navy Senior Executive in March 2016, Mr. Andersen served as the CIO for U.S. Coast Guard (USCG) Intelligence and Chief of the Coast Guard's Office of Intelligence, Surveillance and Reconnaissance Systems and Technology. In this capacity he was the senior technical authority for all USCG intelligence, classified maritime domain awareness and information sharing technology. Mr. Andersen started his career of government service in the U.S. Marine Corps serving on Active Duty in various capacities throughout the Marine Corps Intelligence Enterprise. His assignments included managing systems and assets for intelligence missions in Iraq, Europe and Africa and supporting enterprise developments as a Systems Engineer. His education includes a Bachelor of Science degree in IT Management and a Master of Science degree in Information Security and Assurance. He has received awards from the U.S. Marine Corps, U.S. Coast Guard and the Intelligence Community.

SPEAKER BIOS

# Mr. David Aucsmith

## Senior Principal Research Scientst

### University of Washington Applied Physics Labaratory

David Aucsmith is currently both Chief Scientist at root9B, where he works on science to support manned active cyber defense and adversary pursuit, and a Senior Principal Research Scientist at the Applied Physics Laboratory of the University of Washington, where he does research in cyber-physical systems security. He is also an independent consultant and advisor to agencies of the US Government. Previously, David Aucsmith was the Senior Director of Microsoft's Institute for Advanced Technology in Governments where he was responsible for technical relationships with agencies of the United States and other Governments. Before joining Microsoft, Aucsmith was the chief security architect for Intel Corporation from 1994 to 2002. He has worked in a variety of security technology areas including cyber-physical systems, secure computer systems, secure communications systems, random number generation, cryptography, steganography and network intrusion detection. Aucsmith is a former officer in the U.S. Navy and has been heavily involved in computer security and cybercrime issues for more than 30 years. He has been an industry representative to numerous organizations including the technical advisory boards of the National Security Agency, the National Reconnaissance Office, the National Academy advisory board on Survivability and Lethality, and is co-chairman of the FBI's Information Technology Study Group. He currently lectures at the Naval Postgraduate School, the Naval War College, and the Air Command and Staff College.

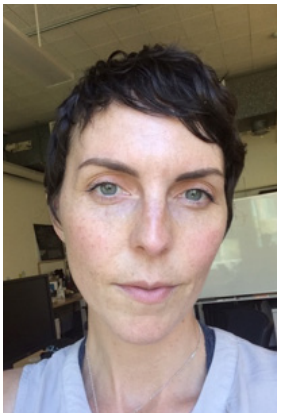
# Dr. Michael B. Bragg

## Frank & Julie Jungers Dean of Engineering

### University of Washington: College of Engineering

Dr. Michael B. Bragg, Frank & Julie Jungers Dean of Engineering, joined the University of Washington in 2013. He serves as the chief academic officer of the college, providing leadership to over 250 faculty and more than 7,400 students. Bragg is an international expert on the effect of ice accretion on aircraft aerodynamics and flight safety who has been nationally recognized for his research and teaching. He has authored over 200 technical publications, and continues to maintain an active research program. Under his guidance more than 60 graduate students and five post-doctoral researchers received their advanced degrees. He is a fellow of the American Institute of Aeronautics & Astronautics and has received the AIAA Aerodynamics Award and Losey Atmospheric Science Award. Prior to joining UW, Bragg held numerous leadership positions in the College of Engineering at the University of Illinois at Urbana-Champaign, including head of the aerospace engineering department, associate dean for research and administrative affairs, executive associate dean for academic affairs, and interim dean. Bragg earned his bachelor's and master's degrees in aeronautical and astronautical engineering at the University of Illinois at Urbana-Champaign and a Ph.D. from The Ohio State University.

# Ms. Melissa O. Braxton



## User Experience Designer

### General Services Administration's Technology Transformation Service

Melissa O. Braxton is a User Experience Designer for 18F, the General Services Administration's Technology Transformation Service, where she uses agile methodologies and human centered design to help make people's interactions with government easier. She is also a PhD Candidate in the University of Washington's (UW) Department of Human Centered Design & Engineering (HCDE). She has worked as a UX Researcher and Designer for the University of Washington's Center for Collaborative Systems for Security, Safety, and Regional Resilience (CoSSaR). At CoSSaR, she worked on technology innovation projects for federal government agencies including the Veteran's Health Administration and the Department of Homeland Security. Her current research focuses on understanding and managing the complexities of applying human centered approaches to design in the public sector.

# Mr. David Jones

## Director, Center For Environmental & Information Systems

### University of Washington Applied Physics Labaratory

David Jones is the Director of the Center for Environmental and Information Systems (CEIS) at the Applied Physics Laboratory, University of Washington (APL-UW). CEIS, APL-UW's largest research center, has over 50 scientists and engineers active in applied and basic research in three main thrust areas: ocean acoustics and signal processing; environmental sensing and modeling; and information science and systems. Examples of research projects in CEIS include: a computer program that produces simulated sonar signals, enabling users to build an artificial ocean that sounds like a real ocean; development of observational systems for Washington state inland and coastal waters; and the development of educational programs that help improve student understanding of cybersecurity issues. In his own research, David studies decision-making in settings affected by rapid operational change. His research team studies the information flow needed by a particular user community and then develops software tools that improve the user's decision-making process. A current example of his team's efforts is the Unmanned Systems Interface (USI), which is used by the Naval Oceanographic Office to control its fleet of unmanned, underwater and surface vehicles.  Prior to his position at APL-UW, David served as a U.S. Navy officer for twenty-one years, specializing in operational meteorology and oceanography.

SPEAKER BIOS

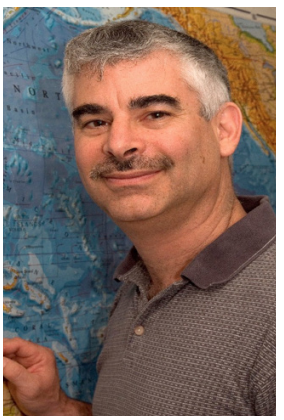
# Mr. Egan Greenstien

## Senior Director, Autonomous Maritime Systems

### Boeing Military Aircraft

Egan Greenstein is the senior director of Autonomous Maritime Systems for Boeing Military Aircraft. He is leading a cross-enterprise team, together with industry partners, in the development of advanced, scalable, autonomous solutions for maritime security and intelligence, surveillance, and reconnaissance in the civil, commercial, and defense markets. Previously, Egan served as the director of Business Development for Navy and Marine Corps programs, with responsibility for the global marketing, sales activities, growth strategy, and research and development investments for the P-8 program, including the P-8A Poseidon for the U.S. Navy and the P-8I for the Indian Navy. Egan also served as the Business Development lead for Boeing's business jet-based Intelligence, Surveillance, Targeting, and Reconnaissance (ISTAR) solutions, a technology initiative aimed at leveraging advanced technologies and developing innovative processes to deliver high-end, affordable solutions for the international market. Egan served as an active duty U.S. Naval Flight Officer and Mission Commander in the P-3C Orion, with operational experience leading maritime patrol and reconnaissance combat operations in the U.S. Navy's FIFTH and SEVENTH Fleet areas. He also served as liaison officer to the Japan Maritime Self-Defense Force and Royal Australian Air Force for regional maritime patrol coordination.

# Professor Mark Haselkorn



## Director

### Center on Collaborative Systems for Security, Safety & Regional Resilience

Mark Haselkorn is a Professor of Human Centered Design & Engineering at the University of Washington and Director of the Center on Collaborative Systems for Security, Safety & Regional Resilience (CoSSaR). Dr. Hasselkorn also leads the Project Interoperability in Puget Sound (PIPS) project to increase interoperability for regional information sharing. He recently led the Maritime Operations Information Sharing Analysis (MOISA) project, with the goal of better understanding and enhancing the information sharing requirements for regional maritime safety and security, and an AHRQ R01 to develop work and information centered methods for achieving evidence-based health information technology and conducted research for the Red Cross Global Disaster Preparedness Center. Previously, Dr. Haselkorn led an NSF initiative to define the emerging frontier of "Humanitarian Service Science & Engineering." He has worked with the military on a number of projects, including the integration of DOD and VA electronic medical records and the Air Force's strategic management of ICT under the threat of Y2K (a study published by the National Research Council). Dr. Haselkorn has conducted foundational research in the area of intelligent transportation systems, including development of the first Web-based real-time traveler information system (Traffic Reporter, 1990). He is Past President of the IEEE Professional Communication Society, and was a founding Board Member of the International Community on Information Systems for Crisis Response and Management (ISCRAM).

# Mr. Joshua P. Holtzman

## Director, National Security Programs & Incidence Response

### Federal Aviation Administration

Mr. Holtzman is the Director for National Security Programs and Incident Response (AEO) at the Federal Aviation Administration. He manages a diverse cadre of highly-skilled professionals that operate the FAA's 24/7 Washington Operations Center; plan, coordinate, and exercise the Agency's crisis management and emergency response and recovery capabilities; provide intelligence analysis and threat indications and warning to senior FAA leadership; and conduct regulatory and administrative investigations. He is also a co-chair of the Aviation Government Coordinating Council (AGCC), an interagency body that coordinates strategies, activities, policy and communications across government entities within the Aviation Sub-Sector under the Transportation System Sector for Critical Infrastructure. While on detail to the Office of the Director of National Intelligence's Global Maritime and Air Intelligence Integration, Mr. Holtzman supported interagency efforts to improve the integration of Air Domain Intelligence across the Intelligence, Law Enforcement, Defense, and Non-Title 50 communities and develop an Air Domain Awareness Community of Interest. Prior to joining the FAA, he completed a 26 year career in the U.S Navy as an Intelligence Officer and Naval Flight Officer in Maritime Patrol Aviation.

# Dr. Aaron Marburg

## Research Scientist

### University of Washington Applied Physics Labaratory

Dr. Marburg's research focuses on the development of robotic platforms for ocean exploration and science, with a focus on perception, situational awareness, and mission planning. He also has a background in remote sensing, photogrammetry and precision navigation, and a strong interest in human-machine interfaces, and data and metadata management. He has over 15 years experience in electrical and software design for robotics, scientific instrumentation and high-performance computing. Dr. Marburg joined APL-UW as a SEED postdoctoral researcher in 2015 after completing his Ph.D. at the University of Canterbury in Christchurch, New Zealand.

SPEAKER BIOS

# Mr. Shawn McDonald

## Program Manager, Borders and Maritime Security Division
### DHS Science and Technology

Mr. McDonald is a Program Manager in the Borders and Maritime Security Division within the Department of Homeland Security's (DHS) Science and Technology Directorate (S&T), Homeland Security Advanced Research Projects Agency. He is currently leading programs focused on multi-domain information sharing and maritime domain awareness, specifically as it relates to non-emitting vessel threats. Mr. McDonald spent the first 15 years of his career supporting the Naval Sea Systems Command as a senior systems engineer leading sensor system research, development and integration projects in support of joint, interagency and international programs. His expertise includes both active and passive electro-optical sensor systems including missile seekers, LADAR/LIDAR systems and maritime surveillance technologies. He served as the lead Navy technical project officer to numerous international projects involving weapon systems, modeling and simulation and missile defense. Mr. McDonald received the Navy's Engineer of the Year award in 2012 for developing, testing and transitioning remotely operated sensors tailored for riverine and intercoastal environments to the US Navy and various partner nations. In 2014 he transferred to DHS S&T to become a program manager in the Borders and Maritime Security Division. Mr. McDonald graduated with honors from the University of Wisconsin Eau Claire with a Bachelor of Science in Physics, and graduated with honors from the University of Dayton with a Masters of Science in Electro-Optical Engineering.

# Ms. Mekisha Marshall

## Chief Science & Technology Advisor
### NMIO

Mekisha Marshall currently serves as the Chief Science and Technology (S&T) Advisor at the National Maritime Intelligence-Integration Office (NMIO). In this capacity, she advises the Director of NMIO on the implications of new and emerging technologies. Ms. Marshall fosters engagement and information sharing amongst the global maritime stakeholders focusing on areas of S&T. Prior to her current position, Ms. Marshall spent 13 years at the Johns Hopkins University Applied Physics Laboratory (JHU/APL) as a Senior Systems Engineer and member of the Senior Professional Staff. Mekisha was the Project Manager and Technical Lead for the Unmanned Global War on Terror (GWOT) Warfighting System program with the Department of Defense (DOD). Additionally she has served as S&T advisor and lead test engineer and manager for DOD domestic and international maritime technology development programs where she led test, evaluation, and operational assessments with technology end-users on maritime, air and ground technological advancements. Ms. Marshall started her career as a systems analyst on the Navy's Tomahawk Cruise Missiles Program. Her education includes a BS, Computer and Information Systems, MS in Systems Engineering from The George Washington University and an MBA from the University of Maryland. Mekisha has received numerous special achievement awards from JHU/APL, outstanding job performance certificates and recognition from the Department of Defense for her support in International Maritime Detection Programs and for outstanding support of the NASA New Horizons Pluto Mission.

# Mr. Peter J. Marquez

## Vice President of Global Engagement

### Planetary REsources, Inc.

Mr. Peter J. Marquez serves as Vice President of Global Engagement at Planetary Resources, Inc. Mr. Marquez served as a Vice President of Strategy & Planning at Orbital Sciences Corp. since December 1, 2010. For the past decade, Mr. Marquez has held senior positions with government and commercial organizations involved in U.S. space policy and programs. He served as the White House Director of Space Policy, a position he held since late 2007. Mr. Marquez served as the Space Policy Advisor to two President and has an extensive background in civil and national security space activities of the U.S. Mr. Marquez transitioned to the White House from the Department of Defense, where he entered government service in 2002. He worked in the Office of the Under Secretary of Defense for Policy, first as a Space Policy Analyst, in which he helped formulate space policy and maintained oversight of the space control portfolio, eventually rising to Director of Special Programs, a role in which he oversaw all operational Defense Department Special Access Programs. He served as the Director of Space Policy for President Bush and Obama. He was responsible for the development and execution of U.S. national space policy. Mr. Marquez came to the government from the private sector, where he began his career in 2000 with AT&T Government Solutions as an analyst for policy and programs for classified space and cyber capabilities. Mr. Marquez earned a B.A. degree in Political Science and a M.A. degree in Space Policy and Science and Technology Policy, both from The George Washington University in Washington, DC.

# Dr. John Mittleman

## US Navy Research Laboratory

Dr. Mittleman addresses the intersection of technology and policy related to maritime safety, security, and governance, for the Naval Research Laboratory. His work emphasizes international relations related to the use of space for Maritime Domain Awareness (MDA), and the technologies and policies that enable robust information sharing. Dr. Mittleman led a White House commissioned interagency team to develop opportunities to foster international collaboration, using civil and commercial space systems, to enhance global MDA. Dr. Mittleman served as Science Advisor to COMNAVEUR-COMSIXTHFLEET. He partook in the development of the Maritime Safety and Security Information System (MSSIS) and developed concepts for the use of satellite-based synthetic aperture radar to gain a strategic understanding of maritime activity in developing countries'. Dr. Mittleman served as the Associate Director for Technology Engagement for the Office of Naval Research (ONR) Global where he assisted the Chief of Naval Research in defining technology and engagement strategies. From 1998 to 2001, Dr. Mittleman was the Science Advisor to VADM C.W. Moore, Commander U.S. Central Command (COMNAVCENT) and Commander U.S. FIFTH Fleet (C5F). Much of this work focused on Force Protection in the years surrounding attacks on the Khobar Towers in Saudi Arabia and the USS COLE in Yemen. He is widely recognized as one of the founders of underwater nondestructive testing for ship hull and fixed ocean structure evaluation.

SPEAKER BIOS

# Captian M. W. Joe Raymond

## Sector Commander, Puget Sound

### U.S. Coast Guard

Captain Raymond is Commander of Coast Guard Sector Puget Sound. His most recent assignment was with CG Congressional and Governmental Affairs where he served as Liaison to the U.S. Senate and then as Deputy Chief of Congressional and Governmental Affairs. Captain Raymond graduated with honors from the U.S. Coast Guard Academy. He received his Master of Science of Strategic Intelligence from the Joint Military Intelligence College and graduated with distinction from the U.S. Naval War College, College of Naval Command and Staff. Captain Raymond's afloat assignments include Deck Watch Officer on CG Cutter NORTHLAND (WMEC 904), Executive Officer of CG Cutter ATTU (WPB 1317), Commanding Officer of CG Cutter SAPELO (WPB 1314), and Commanding Officer and Plankowner of CG Cutter SHAMAL (WPC 13). He has also served as the Commanding Officer of CG Maritime Force Protection Unit (MFPU) Kings Bay. Captain Raymond's staff assignments include the Office of Intelligence at CG Headquarters; a three year detail to Senator John McCain's staff for the U.S. Senate Committee on Commerce, Science, and Transportation; and a tour as the CG Military Assistant to the Director of Net Assessment within the Office of the Secretary of Defense. His military awards include the Defense Meritorious Service Medal, five Meritorious Service Medals, the CG Commendation Medal, the CG Achievement Medal, and various unit and campaign awards.

# Dr. Jana Robinson

## Space Security Program Director

### Prague Security Studies Institute

Jana Robinson is currently Space Security Program Director at the Prague Security Studies Institute (PSSI). She previously served as a Space Policy Officer at the European External Action Service (EEAS) in Brussels, as well as a Space Security Advisor to the Foreign Ministry of the Czech Republic. From 2009 to 2013, Dr. Robinson worked as Resident Fellow at the European Space Policy Institute (ESPI), seconded from the European Space Agency (ESA), leading the Institute's Space Security Research Programme. Prior to joining ESPI, Dr. Robinson served as Development Director at PSSI from 2005 to 2009. Ms. Robinson is an elected member of the International Institute of Space Law (IISL) and the International Academy of Astronautics (IAA). She is also a member of the Advisory Board of the George C. Marshall Missile Defense Project of the Center for Strategic and International Studies (CSIS) in Washington, D.C. Ms. Robinson holds a PhD from the Charles University's Faculty of Social Sciences, Institute of Political Studies, in the field of space security. She also holds two Master's Degrees, from George Washington University's Elliott School of International Affairs and Palacky University in Olomouc, respectively.

# Mr. John M. Sanford

## Director, Integrated Maritime Domain Awareness

### NIMITZ Operational Intelligence Center

Mr. Sanford currently serves as the Director, iMDA. He is responsible for the ONI enterprise MDA program portfolio as well as directing Advanced Analytics to deliver an effective understanding of the maritime domain. During his 35 year Naval career, he had increasingly responsible assignments ashore and afloat with Tactical Electronic Warfare Squadron (VAQ-131); USS Abraham Lincoln (CVN-72); USCENTCOM J2 and JICCENT staff; Amphibious Force, U.S. Seventh Fleet (Assistant Chief of Staff, N2); and as the U.S. Naval Attaché to Korea and culminating at DIA as a Joint Staff Deputy Director of Intelligence and Director of Operations, Joint Intelligence Task Force for Combating Terrorism. After retiring in 2009 as a US Navy Captain, he worked as a senior consultant for McMunn Associates Incorporated (MAI) where he directed ONI Innovation Office efforts in integrating spiral one MDA tools to ONI analysts. In May 2011, he accepted a government position (GG-15) as Director, MD-ID Outreach responsible for interagency, intelligence community, academia, industry and international engagement. He has Master's and Bachelor's degrees as well as numerous certifications to include Project Manager Professional, and has published items on Korean security issues. Mr. Sanford is married to the former Kwang Ae Choe. They have three children, Elisha, Elisabeth and John and three grandchildren, Allisyn, Leonardo and Viktor.

# Dr. Sonia Savelli

## Senior Research Scientist

### University of Washington Applied Physics Labaratory

Sonia Savelli is a Center for Collaborative Systems for Security, Safety & Regional Resilience (CoSSaR) research scientist from the Applied Physics Laboratory at the University of Washington. She is a cognitive psychologist with an understanding of the behavioral mechanisms that are relevant to applied decision-making under uncertainty and risk. Her past research on weather-related decision-making investigated how providing individuals with probabilistic information helps to inform their decisions, increases their trust in information sources, and improves confidence in their decisions. Dr. Savelli is currently a member of the Project Interoperability in the Puget Sound (PIPS) project to provide federal agencies with an understanding of and plan of action for increased interoperability for regional information sharing. She was also a member of the Maritime Operations Information Sharing Analysis (MOISA) project, a research partnership sponsored by the DHS Interagency Operations Center (IOC), Program Manager for the Information Sharing Environment (PM-ISE), and National Maritime Intelligence-Integration Office (NMIO), with the goal of better understanding and enhancing the information sharing requirements for regional maritime safety, security and regional resilience.

SPEAKER BIOS

# Dr. Paul Shapiro

## Faculty

### National Defense University Information Resources Management College

Dr. Shapiro is currently on faculty at National Defense University (NDU) Information Resources Management College (IRMC). He leads the Information Technology Program Management (ITPM) certificate and concentration in the Government Information Leadership Master of Science Degree Program. Prior to teaching at NDU, Dr. Shapiro served as the Science and Technology Advisor at the National Maritime Intelligence-Integration Office (NMIO). His accomplishments include organizing and facilitating the 2015 and 2014 Global Maritime Forum workshops and producing Volumes 7, 8, 9, and 10 of the NMIO Technical Bulletin. Prior to joining NMIO, Dr. Shapiro was the Chief of Program Controls for the National Geospatial-Intelligence Agency (NGA), managing agency-wide budget data and financial controls encompassing data management and coordination with agency directorates and oversight. Before joining federal service, Dr. Shapiro was the Director of Business Operations for the Corporation for Public Broadcasting (CPB), a Senior Manager of Technology at the Public Broadcasting Service (PBS), and a systems analyst in support of NAVSEA. Dr. Shapiro obtained his Ph.D. in Systems Engineering from The George Washington University (GWU), Master of Business Administration from George Mason University, and Bachelor of Science in Mechanical Engineering, University at Buffalo. Dr. Shapiro's published work focuses on the emergent behavior of the U.S. government workforce through an agent-based model of worker departure. He is currently lecturing for GWU as adjunct faculty.

# Mr. Lewis Shepherd

## Adjunct Professor

### George Mason University

Lewis Shepherd consults for defense & intelligence agencies and for selected companies on advanced technologies. He currently teaches the Intelligence Community's own internal Ph.D.-level course on "Big Data Analytics and Architectures" for intelligence professionals, and serves on the Defense Science Board's 2016 Study. Formerly the Director of the Microsoft Institute for Advanced Technology in Governments, a global practice providing disruptive R&D innovations for enterprise-scale mission problems, Shepherd led a team working diverse projects in AI, big data, cyber defense, and holographic computing.  From 2003-2007 he was Senior Technology Officer at the Defense Intelligence Agency and the flag-rank senior civilian leading Requirements and Research. He began his career in Silicon Valley in the 1990s, with a successful startup background and as senior advisor for the Mayors of San Jose and San Francisco on technology policy.

# Dr. Bob Touchton

## Chief Autonomy Scientist

### Leidos Maritime Solutions Division

Dr. Bob Touchton is the Chief Autonomy Scientist for the Leidos Maritime Solutions Division where he serves as their Autonomy Lead. He has over 40 years of experience in technology innovation and leadership, engineering, software development, and project management, spanning autonomous robotics, artificial intelligence, decision support systems, and intelligent control. He has led and participated in numerous robotic, autonomous perception and control, and unmanned system projects sponsored by the US military and private industry. Dr. Touchton was a team member and Finalist at both DARPA Grand Challenge Events and the DARPA Urban Challenge, events which catalyzed the movement towards self-driving automobiles. Prior to joining Leidos in 2016, Dr. Touchton headed the Autonomy, Perception and Cognition Department of the Applied Research Lab at Penn State University. Past positions included Vice President of Business Innovation and Robotics at Prioria Robotics and Managing Director of Autonomous Systems for Honeywell's Business Innovation Center. Touchton began his career as a Nuclear Engineer in the commercial nuclear energy sector. Dr. Touchton holds two MS degrees, one in Nuclear Engineering from Carnegie Melon University and the other in Computer Science from the University of North Florida. In 2006, he received a Ph.D. from the University of Florida in Mechanical Engineering where his doctoral research focused on autonomous robotics.

# Dr. Sarah Webster

## Senior Engineer

### University of Washington Applied Physics Labaratory

Dr. Sarah Webster is a Senior Engineer in the Center for Environmental and Information Systems (EIS) at the Applied Physics Laboratory, University of Washington. Her specialty is underwater and under-ice navigation for autonomous underwater vehicles, including combined communication and navigation and multi-vehicle coordinated navigation. She is interested in persistent autonomy, in particular heterogeneous combinations of autonomous vehicles--underwater, surface, and aerial vehicles--that can harvest energy and provide a long-duration or persistent presence in the ocean. Recently, much of her work has focused on the use and operation of Seaglider, and autonomous underwater glider, including incorporating real-time acoustic Doppler current profiler (ADCP) measurements into the Seaglider navigation algorithm. She is currently involved in developing a navigation algorithm for low frequency, long distance acoustic navigation by low-cost autonomous underwater vehicles (AUVs). In addition, she has strong ties to NOAA and is involved in several fisheries-related technology projects.

SPEAKER BIOS

# Mr. Sean Wheeler

## Operations Coordinator, Marine Security Operations Centre
### Royal Canadian Mounted Police

Mr. Sean Wheeler is a Civilian Member of the Royal Canadian Mounted Police (RCMP). As Operations Coordinator for the Marine Security Operations Centre, he is responsible for the RCMP's technology initiatives and surveillance coordination that secures Canada's Pacific maritime border. He is the Project Manager for the design and implementation of the RCMP's radar program which supports Canada and US law enforcement and small vessel maritime domain awareness. Prior to the RCMP, Mr. Wheeler obtained significant experience over seven years in marine Search and Rescue operations, has a BA in Criminology and Masters Certificate in Project Management (PMP).

# Dr. John Hornsby

## Vice President Sales and Business Development Blacksky

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