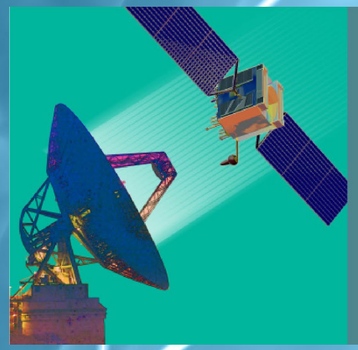


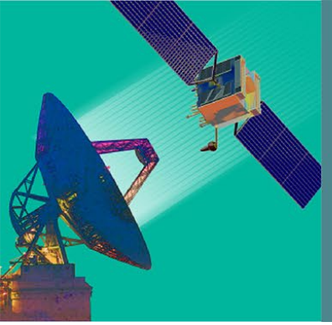
Ground System Architectures Workshop

Driving Innovation for Enterprise Integration

February 23–March 3, 2022 | Virtual Event

Commercialization, Innovation, & Synergies: A Reimagined Approach to Communications and Navigation Enterprise Integration

Working Group Leads:
Alexandra Hale, The Aerospace Corporation
Bob Menrad, NASA's Goddard Space Flight Center



Session Goals

Working Group E

The goal of Working Group E was to evaluate the following question on the enterprise level:

HOW *is NASA, the Department of Defense, and beyond approaching the future of space communications and navigation to promote commercialization across our enterprise in a way that will foster an interoperable space ecosystem to advance exploration efforts and protect our warfighters?*

- During this interactive workshop, NASA leadership was joined by a host of strategic government and DOD partners to explore the future of enterprise integration and discuss the work being done throughout the community to identify opportunities, nurture diverse relationships, and implement collaborative solutions to enable or enhance needed capabilities and technologies in support of exploration and space communications.
- The discussion was focused on the importance of fostering synergistic collaboration to accelerate infusion opportunities by leveraging private industry, other government agencies, and international partners.
- This workshop was presented in three parts (NASA, DOD, and Academia) to effectively address this robust topic.

Distinguished Speakers

Working Group E

Robert J. “Bob” Menrad
Associate Director of Flight Projects
Exploration and Space Communications
NASA’s Goddard Space Flight Center

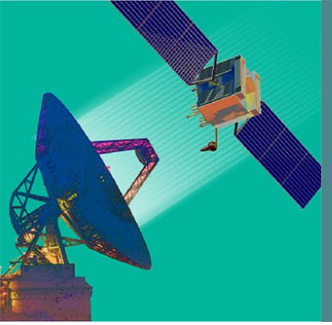
Gregory Heckler
Director, Commercial Services Office
Space Communications and Navigation Program (SCaN)
NASA Headquarters

Col Albert O. Olagbemiro
Space Systems Command
United States Space Force

Dr. Scott Pace
Director of the Space Policy Institute
The Elliott School of International Affairs
The George Washington University

Former Executive Secretary, National Space Council

Four dialogues were facilitated by Alexandra Hale of the Aerospace Corporation to address overarching session goals from three perspectives: NASA, DOD, and academia.



Key Points

Working Group E

NASA

- NASA has concluded that the market has reached sufficient maturity to enable 100% commercialization of direct-to-Earth radio frequency communications services.
- The Office of Management and Budget (OMB) has directed NASA to rapidly commercialize Earth proximity networks.
- As a result, NASA's Goddard Space Flight Center's Exploration and Space Communications Projects Division reorganized the communications and navigation workforce at Goddard and charged the new organization to engage with industry to establish new partnerships and encourage the growth of the U.S. space communications marketplace.
- NASA is looking to work toward a holistic approach to space communications and navigation that leans on heavy collaboration with other government agencies to reach commercialization goals.
- Speakers addressed NASA's interest in advancing efforts in the areas of 3GPP, wideband, and spectrum.

DOD

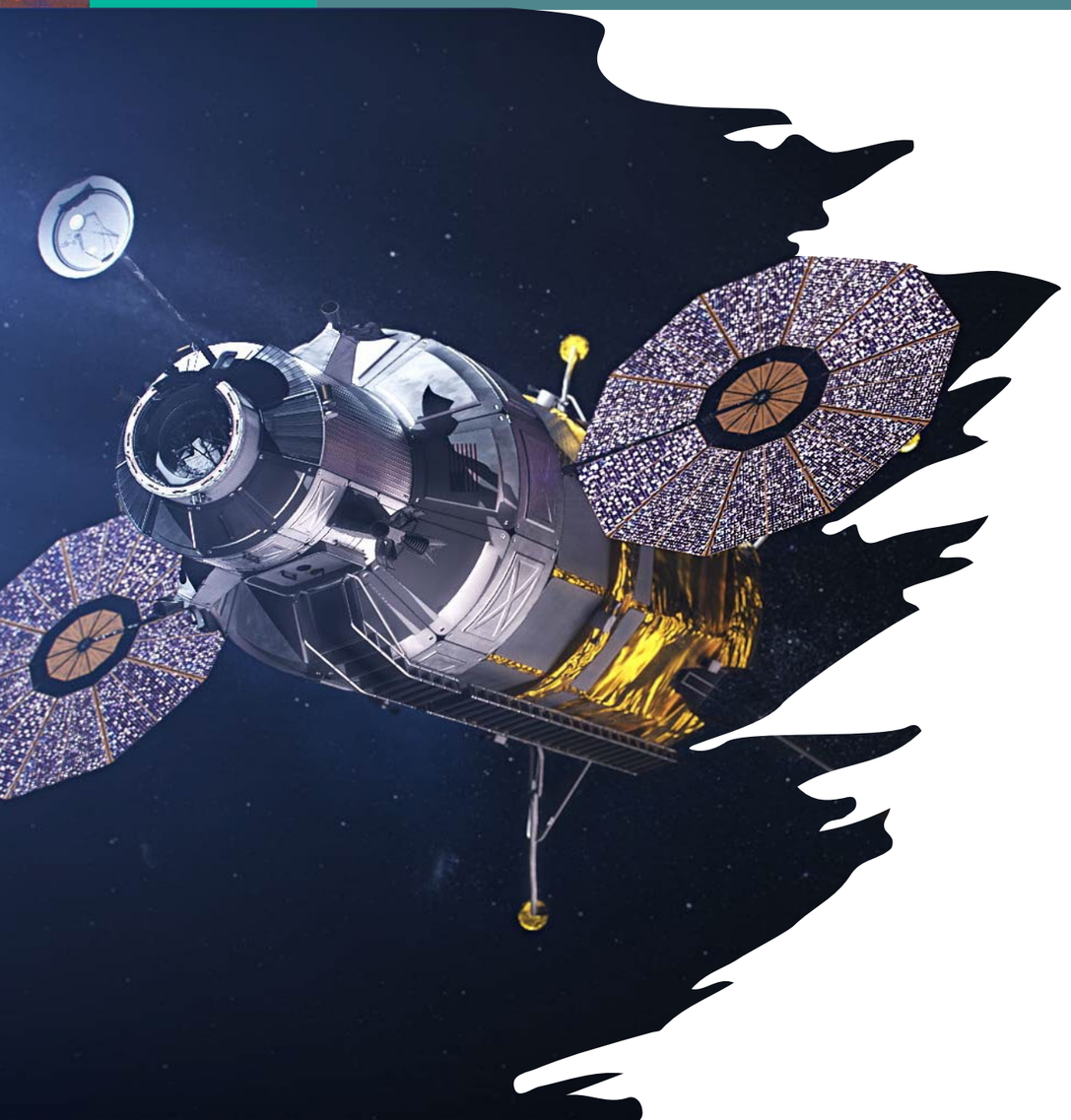
- The Department of Defense (DOD) is looking for ways to work together to establish the standards, technology, and mechanisms to make commercialization successful and create an interoperable space communications ecosystem around the Earth, to the Moon, and beyond that will serve to protect our warfighters at home and abroad.
- The United States Space Force, the Defense Innovation Unit, and the Space Warfighting Analysis Center is working together to develop a "Hybrid Space Architecture" that will lean heavily on commercial solutions.
- The Space Development Agency has developed an optical communications standard that industry will be asked to reference when engaging with their Transport Layer.

Academia

- Leveraging commercial solutions for government space missions must be a key priority for NASA, DOD, and beyond moving forward.
- United States National Space Policy 2020 and Space Policy Directives dating back to 2017 outline very clearly national goals and high-level policy guidance for leveraging commercial solutions for government space missions. This is being practiced across the board as agencies and organizations are working to incorporate hybrid architectures into their roadmaps.
- Our adversaries are moving fast – the United States must adapt to a holistic approach to space architectures to secure our national space interests. How? Through the maintenance of security, international partnerships, and the fostering of resilient, interoperable systems.
- Standards and forward thinking acquisition approaches will be key in advancing commercialization efforts. NASA, DOD, and beyond must "understand what motivates industry and assume an MBA perspective."

Conclusions

Working Group E



NASA

NASA's approach to commercialization is one that is integrated in an interagency fashion that follows two coordinated, parallel tracks focusing on ground networks and space relay.

DOD

The Department of Defense (DoD) seeks a hybrid space architecture to integrate emergent commercial space sensor and communications capabilities with U.S. Government space systems while incorporating best-in-class commercial practices to secure and defend the network across multiple domains.

Academia

Academia advises NASA, DOD, and beyond to solidify and streamline community standards that will define the level of resiliency in the systems that will serve to protect our national space interests at home and abroad.

Contact Information

Working Group E

Alexandra Hale

Senior Technical Advisor & Industry Engagement Lead
Commercialization, Innovation, and Synergies Office, NASA's Goddard Space Flight Center
The Aerospace Corporation

alexandra.g.hale@aero.org
alexandra.g.hale@nasa.gov
Phone: 571-344-5752