



AUGUST 11-12, 2020
LONG BEACH, CA, USA

Tuesday August 11

Track 1: Collaborators & Innovators

- Welcome Remarks

Speakers

Eric Stallmer, President, Commercial Spaceflight Federation

- Plenary Keynotes

Speakers

James 'Jim' Reuter, Associate Administrator, Space Technology Mission Directorate, NASA

Dan Hart, CEO, Virgin Orbit

- Morning Break

Fireside Chats: Securing the Future of the US in Space: Advancing Sustainable Partnerships Between Civil, Military and Commercial Space

- Leveraging Commercial Technology and Rapid Innovation for US National Security to Enable a Safe Environment

In order to remain on top of technology trends and ahead of threats, US national security organizations will increasingly collaborate with commercial players to ensure agile, rapid technology development at a low cost.

This fireside chat brings together key players in the US from a defense and commercial perspective.

Topics to discuss:

- Developments in the US defense space: Space Command, Space Development Agency, Space Force – where are we at and how will they work with the commercial supply chain?
- How will these partnerships impact the supply chain?
- How to further leverage commercial technologies to enhance a stronger, faster position of the US in space?
- Utilizing new technologies for the benefit of collaboration, data sharing and communications, such as cloud computing, optical communications, satellite servicing and more

Moderator

Eric Stallmer, President, Commercial Spaceflight Federation

Speakers

Maj Gen (Ret.) Thomas 'Tav' Taverney, Senior Vice President, Space Payloads, Leidos

Melanie Stricklan, Chief Strategy Officer, Co-founder, Slingshot

- **Combining Commercial and Civil Knowledge and Technology to Establish a Strong and Thriving Earth-Moon Space Economy**

Globally the space industry is moving forward at great strides. Low-Earth orbit (LEO) economy development is setting the standards for how we move to a sustainable use and exploration of space. The new and future space technologies utilized in LEO and on the ISS enable us to move towards cislunar orbit, to lunar settlement, to asteroids, to beyond. With the industry's great ambitions to return to the Moon with crewed missions, this fireside chat brings together key players in establishing the foundations for this new in-space infrastructure.

Topics to discuss:

- The status of civil programmes, including Artemis, and its requirements from commercial players in the market
- The status of commercial programs, such as crewed mission development and launch vehicles
- Utilizing new technologies for the benefit of collaboration, including blockchain and autonomous decision making among others
- The importance of international collaboration to evolve technology

Moderator

Eric Stallmer, President, Commercial Spaceflight Federation

Speakers

Andrew Rush, CEO & President, Made In Space

Richard French, Director, Global Government Launch Services, Rocket Lab

- **Lunch Break**

- **Panel: The Time is Now: Prolonging Missions, Reducing Costs and Contributing to Space Safety with On-orbit Servicing**

On-orbit servicing (OOS) is maturing as interest in servicing technology and its business case grows at key commercial and defense organizations. 2019 has been a pivotal year for on-orbit servicing and rendezvous operations, with the launch of servicing vehicle MEV-1, while there are active contributions from commercial and military players regarding developing this service for commercial and national security interests.

As more organizations collaborate on the development of procuring on-orbit servicing capabilities, this panel brings together a mix of on-orbit service providers and end-users to discuss the following:

- The growing applications and new requirements of servicing and rendezvous missions for a variety of end-user markets
- Developments in satellite servicing procurement to reduce costs, increase satellite lifetime and resiliency, contributions to space domain awareness and the reduction of space debris
- Technology advancements regarding on-orbit robotics, docking interfaces, RPO technologies for safety and ease of dock, etc.
- Updates on current servicing missions

Moderator

Dave Barnhart, Director, Space Technology and Systems Group & Research Professor, Department of Astronautical Engineering, USC University of Southern California, Information Science Institute

Speakers

Joseph D. Anderson, Vice President of Operations and Business Development, SpaceLogistics LLC

Jean-Luc Froeliger, Vice President, Space Systems Engineering and Operations, Intelsat

Jonathan Goff, President & CEO, Altius Space Machines, Inc.

- Afternoon Break

- Panel: Defining the Shape of In-space Infrastructures to Return Back to the Moon

The Artemis program excites commercial and civil entities alike as they work together to deliver key elements to cislunar orbit. In order to make this happen, all pieces of this 'gateway' such as propulsion systems, power elements, communications technologies, structures and many more, require putting together – something that has not been done before this far away from Earth. How are we going to do it?

This panel brings together the key players who share their progress and vision on future in-space infrastructures beyond low-Earth orbit – from communications to landers. The panel examines the following topics:

- Updates in on-orbit manufacturing technologies including advanced robotics, communications, materials, electronics, power management and lander technology
- The importance of design thinking and lightweight materials
- Legislation and regulation to ensure a safe environment for technology and people

Moderator

Moderator Soon to be announced, Office of the Associate Administrator, International and Interagency Relations, NASA

Speakers

Kevin Lynaugh, CEO, Vulcan Wireless Inc.

Trent Martin, VP of Aerospace, Intuitive Machines

Frank Slazer, Vice President, Strategy, Aerojet Rocketdyne

- End of Space Tech Expo Conference Day 1

Track 2: Technology Enablers

- Plenary Session taking place on Track 1: Collaborators & Innovators

- Showcase: Selecting COTS vs Custom Built Electrical Systems for All Missions

Space probes and satellites will increasingly require high-end electronics as more spacecraft will need on-board processors for data analysis and communication management. This requires better electrical systems and power management than ever before. At the same time, the smallsat market has brought along cheaper commercial-off-the-shelf (COTS) components, which reduce cost of electronics and electrical systems and the overall spacecraft.

This session brings together experts in the field of electronics and electrical systems, to showcase their innovative technologies and discuss the following topics:

- Meeting requirements to enhance increased on-board computing capabilities
- The trade-off between high-end applications and COTS components - what are the challenges and opportunities?
- Updates in technologies, including Field Programmable Gate Arrays (FPGAs), Application Specific Integrated Circuits (ASICs) and many more

Speakers

Bruce Webb, Director Engineering, Fralock

Omar Sacchet, Key Account Manager, IST AG

Ragun Desai, Product Line Manager, Skyworks, Defense & Space

- Lunch Break

- Tech Talks: Advancing Robotics to Progress Manufacturing Management and Mission Optimization

From the factory floor to on-orbit assembly and exploration missions, robotics are of great value to the space industry. While advanced robotics are currently used to facilitate high-speed manufacturing, complex assemblies and on-orbit assembly, the need for even more advanced capabilities arises due to the market opening up to satellite rendezvous and operations, as well as assembling structures in cislunar orbit and on the Moon.

Bringing together experts in the field of robotic development for various applications, this Tech Talk explores the following:

- Using robotics to enhance manufacturing processes: from terrestrial factory floors to extra-terrestrial assemblies
- What role will robotics play in the space industry by 2030?
- Technical challenges and opportunities

Speakers

Shashank Samala, Co-founder & Head of Technology, Tempo Automation

Chris Thayer, CEO, Motiv Space Systems, Inc.

- Afternoon Break

- Tech Talks: Utilizing Smart Manufacturing and Rapid Fabrication to Reduce Production Times

Smart manufacturing helps bring down cost and achieve a faster time to market. New manufacturing processes, such as additive manufacturing and integrating COTS components are key technologies utilized by entrepreneurs and NewSpace players. It is forcing primes, civil and military organizations to rethink the approach to manufacturing and design.

Bringing together experts in the field of production optimization this technical panel discusses the following topics:

- Enabling a smart factory: from utilizing open source software to security flaws and data management
- Developments in the field of automation and other tools to rethink design approaches and optimize processes
- Preparing the workforce for a new approach to manufacturing

Speakers

Rodney Rusk, Industry 4.0 Leader, Bosch Rexroth Corporation

Mark Gallagher, Senior Manager, Operations and Partner Development, Xometry

Stephen Samuel, CEO and Founder, Design Visionaries

Slade Gardner, President & Founder, Big Metal Additive

- End of Space Tech Expo Conference Day 1

Wednesday August 12

Track 1: Collaborators & Innovators

- Welcome Remarks and Panel: Strengthening the Communications Backbone to Enhance Security and Faster Signals

Communications systems are the key to successful mission on Earth, orbit and beyond. The possibilities in communication technologies are rapidly evolving and allow us to communicate via radiofrequency and optical signals between ground stations, Earth-orbiting satellites and spacecraft further afield. Orbits become increasingly crowded with more communication methods and more players offering different types of services including broadband internet and IoT constellations. Securing these signals remains a key challenge and urgent point for military and commercial players alike.

Bringing together ground station developers, satellite manufacturers and operators, this panel session will examine technological developments and challenges, including:

- Advancements in (optical) communications and pointing control systems
- Allowing for enhanced (inter)satellite, spacecraft and terrestrial networks for fast communication methods and collaboration
- The need for broader spectra and bigger bandwidth

Moderator

Dan Adams, Director of Government Programs for KSAT USA, Kongsberg Satellite Services

Speakers

Christopher Richins, CEO, RBC Signals

David Mitlyng, Chief Operating Officer, SpeQtral

Enrico (Rico) Attanasio, Director, Tactical Military Satellite Communications, The Boeing Company

- Morning Break

- Panel: Additive Manufacturing: Accomplishing Large Formats and Standards Qualification Agreements to Realize Fast Integral Space System Design

Additive manufacturing (AM) is gaining an increasing foothold in the space industry. As industry is moving to higher volume production, questions and challenges arise, including the production of larger formats, safety and qualifications of materials.

Simultaneously, the impact on its design and the wide variety in standards that prime organizations set for AM materials are a cause for concern for the future of additive manufacturing. If implemented in the right way, AM is set to disrupt the way we approach space system development, testing and cost management.

Bringing together experts in the field of additive manufacturing for aerospace, they will highlight the following topics as part of the ongoing discussions around the topic:

- The need for large formats and structures – how do we get there?
- (Faster) qualification, quality assurance and the challenge of different material standards between AM component manufacturers and OEMs
- The impact of AM on design thinking and the future of engineers approaches to developing systems
- Moving to a higher level of integration and its impact on new business cases in space organizations

Moderator

Dr. Mohsen Seifi, Director, Global Additive Manufacturing Programs, ASTM International

Speakers

Bryan McEnerney, Manager, Materials Engineering, Test & Evaluation, NASA Jet Propulsion Laboratory

Gregory Hayes, Senior Vice President Applied Technology, EOS North America

Alex Weaner, AddWorks Design Manager, GE Additive

Franck Mouriaux, Chief Innovation Officer, Morf3D

- Lunch Break

- Panel: Getting Our Heads in the (Data) Clouds: Overcoming Security Challenges and Entering New Markets through Space Software and Data Analysis

As we make our spacecraft and manufacturing processes smarter with the use of computers, clouds and on-board processing for increased flexibility, various challenges remain. The prime concern for many is cyber security and how to protect satellites, spacecraft and other space assets from threats.

At the same time, the possibilities we can achieve with computing, software and data are expanding tremendously, examples including strides in quantum computing and other quantum technologies, faster Earth-imagery analysis and the use of clouds and composable infrastructures to optimize manufacturing process.

This panel brings together experts in the fields of software and data experts for space applications, to examine the following:

- Cloud integration and safety for manufacturing optimization
- Use of open source software: opportunities and security challenges
- Smarter spacecraft: on-board processing, quick analysis of data, fast turnaround and better data links for commercially competitive satellites and enhanced national security
- Security risks and solutions including the use of disseminated data
- The opportunities for quantum technologies for space applications

Speakers

Adam Johnson, Software Engineering Director, Lockheed Martin Space

Laurine Bruthers, Vice President, Program Management and Systems Engineering, Kythera Space Solutions

James Slifierz, CEO, SkyWatch Space Applications

Naomi Kurahara, Co-founder & CEO, Infostellar

Gaurav Pal, Principal, stackArmor, Inc

- Fireside Chat: Expanding Use-cases and Enhancing Missions with Artificial Intelligence and Autonomous Systems

Artificial intelligence (AI) and autonomous systems make a change to space systems manufacturing, mission optimization and data analysis, however there remains unclarity about the role of AI compared to humans and the issue on how to trust these systems. The potentials of AI in developments such as space debris management, mission control and optimization, exploration and many others are being recognized by space agencies and commercial organizations worldwide.

The conversation on the topic continues, as there remain challenges that the industry would need to overcome together, in order to create a safe and sustainable use of this developing technology.

This interview session will focus on the following questions:

- The expanding use-cases of AI in space: instrumentation calibration, controlling subsystems (such as propulsion systems) and others
- Requirements from downstream markets for enhanced data analysis and on-board processing
- Requirements, development and updates on certification of artificial intelligence and machine learning techniques
- What role will AI and autonomous systems play in the space industry by 2030?

Speakers

Nathan Eskue, AI Architect, Northrop Grumman

- Plenary Closing Panel: New Space - Shaping Innovation in an Increasing Commercial Space Environment

The space industry is always on the forefront of technological innovation, but what is the most intelligent way to innovate? What is the role that startups are already playing in the race to accelerate innovation in the United States, and what role might they continue to play in the future? What are an entrepreneur's options for funding, and what risks and benefits accompany those options? What is the growing role of commercial companies in space, and how will this affect the economic landscape?

These topics will be discussed by a panel of venture capitalists, startup founders, and accelerator leads who will provide insights into successful startup fundraising, the role of startups and commercial companies in space, and the path forward for innovation in a new space economy.

- Industry transformation - how the growing role of commercial companies, particularly startups, in space has the potential to accelerate innovation for the military.

- How has the space startup fundraising landscape changed? What advice to founders need to know in order to stay competitive?
- Nondilutive funding options – SBIR will be discussed as an additional source of funding. Panelists will also weigh in on the benefits and pitfalls of a dual use company.

Moderator

Ellen Chang, Partner, Syndicate 708

Speakers

Jackie Space, Senior Vice President, Programs, BMNT Partners

Teresa Segura, Portfolio Development Principal - Space & Connectivity, HorizonX Ventures, The Boeing Company

Gabe Mounce, Director, Air Force Space Accelerator Program | Technology Commercialization Lead, Air Force Research Laboratory

- End of Space Tech Expo Conference 2020

Track 2: Technology Enablers

- Tech Talks: Going Further in Space with Advanced Materials: Optimizing Properties for Resilient and Affordable Space-grade Applications

Lightweighting, managing extreme environments and ensuring durability are only a few of the key applications and properties that space-grade materials should deliver. With technologies such as additive manufacturing entering the market, and the requirement to be low-cost, many developments in the field of materials for space are taking place. One example is the developments in standards and qualifications for new materials, and how they can vary between different OEMs.

This technical panel brings together material experts for space grade components, discussing the following topics:

- Developments in material requirements, including thermal management, vibration harshness, conductivity, absorption and reabsorption among many others, and how to ensure the right chemical properties
- Technological developments in metal powder beds, ceramics, carbon-fiber, graphite epoxies and composites
- The challenges regarding different standards and qualifications by different customers

Speakers

Xiaochun Li, Founder, MetaLi

Sean Johnson, Product Manager, Thermosets, Toray Composite Materials America, Inc.

Timothy S Dyer, President, Elcon Precision LLC

Denver Schaffarzick, Director of Engineering, ERG Aerospace Corp.

- Morning Break

- Showcase: Providing Specialty Components for High-end Missions with Precision Machining

This session brings together experts in the field of precision machining for space-grade components. With the arrival of smallsats, commercial-off-the-shelf (COTS) components have gained strong foothold the space supply chain. COTS drive down the costs of components but are also perceived as a threat to specialized piece parts and components, as they set an expectancy for lower prices, while there are also fewer companies specializing in specialized parts.

Due to the specific nature of space missions, where components have to be able to withstand extreme environments, there remains a strong need for specialized, custom components that will make up space system assemblies.

This session gives the stage to leading organizations in the field of precision machining, showcasing their innovations as well as discussing key topics, including:

- The trade-off between COTS and specialty components, and its impact on suppliers in terms of cost and rapid turnaround
- How to sustain a supply chain with specialty components suppliers to ensure no gaps in the market appear
- Promising technological advancements in the field of precision components

Speakers

Roy Luoma, Vice President, Engineering, 3-D Engineerring Corp/ 3-D Precision Machine

Kurt Ponsor, Manufacturing Engineer, Mindrum Precision

- Tech Talks: Cheaper, Better, Faster, Stronger Space Systems Design

New manufacturing technologies including additive manufacturing, materials, advanced robotics on the factory floors and the integration of software defined payloads have brought a different challenge and opportunity with them: the need to re-think how we design spacecraft. Led by the New Space approach of building cheap and fast, making correct decisions about design is crucial for for the quality and lifetime of your spacecraft.

This session discusses the topic of systems thinking, how to reapproach spacecraft design and other topics related to design optimization, including:

- Considering non-traditional approaches in space system design, including piece part reduction and COTS components
- Rethinking requirements for piece parts and components by analyzing the space system design upfront, from system, to subsystem and individual unit level
- Outweighing COTS vs rad-hard components risks and opportunities

Speakers

Matthew Wielenga, Managing Director, Zenith Tecnica

Ryan O'Hara, PhD, Technical Director Aerospace and Defense, nTopology

Jon Shick, Staff Systems Engineer, Radiation Effects Engineering, Honeywell Aerospace

Klaus Schilling, President, Zentrum für Telematik / S4 - Smart Small Satellite Systems GmbH

- Lunch Break

- Showcase: Testing in a Time of New Designs

Testing is a crucial step in the development of spacecraft, and this development is constantly changing as we move towards the use of new, advanced materials, reduced production timelines and the implementation of commercial-off-the-shelf (COTS) components, to name a few. These changes force engineers to investigate ways of optimizing the spacecraft from a design point of view, making the structures of these systems more complex to analyze for potential faulty parts or materials.

This panel brings together experts in the field of structural, environmental, software analysis and non-destructive testing to discuss how complex designs, and consequently the use of new materials, reduced production timelines and COTS components impact the testing process, and how these challenges can be overcome.

Speakers

John Holler, Application Engineer, VIBRATION RESEARCH

Alan Merrick, Acoustic Engineer Specialist, MSI DFAT Systems

Daniel Sullivan, Account Executive, EAG Laboratories

Ian Bates, Sales Engineer, Zemarc Fluid Power

- Plenary Session taking place on Track 1: Collaborators & Innovators

- End of Space Tech Conference 2020

Smarter Shows reserves the right to amend speakers, topics and scheduling at any time. This document is updated regularly to reflect such changes.