Innovations in Aerospace and Beyond

10th Annual Pacific Northwest AIAA Technical Symposium

Shaping the Future of Aerospace

Saturday November 19th, 2016
Future of Flight Aviation Center • Paine Field • Everett, Washington
Program at a Glance

Registration & Continental Breakfast

Welcome

Aerospace in Washington

Electric Propulsion and Emerging Aviation Market Opportunities

Enabling Low-Cost Space Missions using Emerging Propulsion Technologies
Real-time Optimization for Guidance and Control of Autonomous Aerospace Vehicles
RISING LEADERS 7 Tips to Take Your Career Sky High

Innovation towards Sustainable Aviation
Electric Propulsion Programs at Aerojet Rocketdyne
Speed Mentoring 1

SmartSky Networks’ High Bandwidth Wi-Fi in the Sky
ChARMS – Revenue Management for the Air Charter Industry

To Live and to Love on Mars

An Update on Blue Origin’s New Shepard Program

PANEL: Wake up genius!
Connected Cockpits and The Future of Apps for Aviation
Speed Mentoring 2

Regional Sky Transit: The Future Mass Market for Electric Aircraft

PANEL: What The Future May Hold for On-Demand Air Mobility
Managing Risk in a Dynamic Cyber Environment
PANEL: Cyber Security

Challenges in Aviation Innovation

Networking Social
Welcome

We are very proud to welcome you at the 10th edition of our annual AIAA-PNW technical symposium! Ten years ago a group of young professionals within the PNW section decided to organize an event for our local membership that would encourage young people to pursue a career in aerospace, that would reinforce the enthusiasm and expand the horizons of people already engaged in aerospace, and that would give the leaders in the industry a forum for sharing their knowledge and experience.

Our first edition was a 2-day event at the University of Washington, with Joe Sutter, Father of the 747, as our keynote speaker. The success of that first edition was followed by many more, with CEO’s, astronauts, technical specialists and visionaries contributing to our program. The role of the space industry has drastically grown over the past decade, making it ever more interesting to organize and attend this symposium.

This year we again managed to attract high-class speakers and panelists to contribute to our symposium titled “Innovations in Aerospace and Beyond”.

We hope you will enjoy the program, engage with fellow aerospace professionals, and join us next year on November 11th for the 11th edition!

2016 AIAA-PNW Technical Symposium Organizing Committee
Aerospace in Washington

John Thornquist, Director, Office of Aerospace – Governor’s Aerospace Sector Lead

The Office of Aerospace, headed by Director John Thornquist, is part of the Washington State Department of Commerce. The Office has three strategic goals in supporting the State of Washington. First, is to maintain and strengthen the Aerospace ecosystem, which includes not only aviation, but also space and unmanned systems. Second, the Director is a liaison between aerospace stakeholders and the Governor, his policy staff and legislators. Third, the Office of Aerospace supports the continuous development of a strong workforce in aerospace and advanced manufacturing. Mr. Thornquist works with aerospace companies in the State as well as prospective companies looking to locate within Washington’s boundaries. John also supports County Economic Development Councils, labor groups, technical colleges and universities, and others to understand how the State can support growth in the Aerospace Sector. Growth not only in employment, but growth in the aerospace workforce pipeline, which is one of the strongest and deepest in the nation. The Office of Aerospace also oversees two industry groups; The Washington State Space Coalition, and the Unmanned Systems Industry Council. Both groups purpose is to further the commercialization of their industries in Washington, by supporting company collaboration, connecting businesses with research and development opportunities, interfacing with investment groups, and having direct contact with state government.

Electric Propulsion and Emerging Aviation Market Opportunities

Dr. Mark Moore, NASA Langley Research Center

Electric propulsion is an emerging technology that remains poorly understood as it begins to be applied to aviation markets. The characteristics of this new technology are so different from existing turbine and reciprocating engines that the integration tends to favor alternative approaches from those in use today. As various energy storage, energy transmission, and power system approaches are investigated and tested, distributed propulsion is showcasing ways to achieve synergistic multi-disciplinary integration due the compactness, reliability, and the scale-invariance of motor specific power and efficiency. This presentation will discuss strategies to achieve compelling integration electric propulsion solutions, while also matching the inherent technology characteristics to market strategies that can achieve rapid certification pathways and technology adoption.

RISING LEADERS KEYNOTE

7 Tips to Take Your Career Sky High

Kristina Hayek, EdD, Regional Instructional Design & Development Manager, Hexcel Corporation

The 7 Tips include goal-setting, good habits, developing a global mindset and career mapping as proactive strategies to take your life and career sky high.
Enabling Low-Cost Space Missions using Emerging Propulsion Technologies

Dr. Roger Myers, Space technology and business consultant, former Executive Director at Aerojet Rocketdyne

Recent developments in spacecraft missions, technologies, and capabilities have driven the creation of several new spacecraft propulsion and power technologies. Including both chemical and electric propulsion systems, these new capabilities leverage recent developments in additive manufacturing, green propellant chemistry, micro-manufacturing, space power systems and electric propulsion. The talk will summarize recent market trends and technology developments that support the next-generation space missions, ranging from CubeSats to human missions to Mars.

Real-time Optimization for Guidance and Control of Autonomous Aerospace Vehicles

Dr. Behçet Açıkmese, Assistant Professor in the Bill Boeing Aeronautics and Astronautics Department at the University of Washington

Many future engineering applications will require dramatic increases in our existing autonomous control capabilities. These include robotic sample return missions to planets, comets, and asteroids, formation ying spacecraft applications, applications utilizing swarms of autonomous agents, unmanned aerial, ground, and underwater vehicles, and autonomous commercial robotic applications. A key control challenge for many autonomous systems is to achieve the performance goals safely with minimal resource use in the presence of mission constraints and uncertainties. In principle these problems can be formulated and solved as optimization problems. The challenge is solving them reliably onboard the autonomous system in real time. Our research has provided new analytical results that enabled the formulation of many autonomous control problems in a convex optimization framework, i.e., convexication of the control problem. The main mathematical theory used in achieving convexication is the duality theory of optimization. Duality theory manifests itself as Pontryagin’s Maximum Principle in infinite dimensional optimization problems and as KKT conditions in finite dimensional parameter optimization problems. Both theories were instrumental in our developments. Our analytical framework also allowed the computation of the precise bounds of performance for a control system in term of constrained controllability/reachability sets. This proved to be an important step in rigorous V&V of the resulting control decision making algorithms. This presentation introduces several real-world aerospace engineering applications, where this approach either produced dramatically improved performance over the heritage technology or enabled a fundamentally new technology. A particularly important application is the fuel optimal control for planetary soft landing, whose complete solution has been an open problem since the Apollo Moon landings of 1960s. We developed a novel “lossless convexication” method, which enables the next generation planetary missions, such as Mars robotic sample return and manned missions. Another application is in Markov chain synthesis with “safety” constraints, which enabled the development of new decentralized coordination and control methods for spacecraft swarms.
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Innovation towards Sustainable Aviation

Jeanne Yu, Director, Technology Integration, Boeing Commercial Airplanes

How does innovation advance sustainable aviation? Jeanne Yu will discuss the aviation industry as innovation pioneers; how we need both invention and innovation to effectively transition technologies onto products and services. She will provide progress through innovation examples on Boeing ecoDemonstrator technologies, biofuel and other programs to illustrate acceleration of technologies and integration on the path to sustainable aviation.

Electric Propulsion Programs At Aerojet Rocketdyne

Dr. Keith Goodfellow, Chief Engineer, Arcjet Thruster System – Aerojet Rocketdyne

There are over 240 spacecraft currently operating in space with Electric Propulsion (EP) systems, and about 66% of them are using EP systems built by Aerojet Rocketdyne in Redmond, WA. These flight systems include Resistojet Thrusters, Arcjet thrusters, Hall Current Thrusters, Pulsed Power Thrusters and the power electronics to operate them. The Resistojet and Arcjet systems have been flying for over 20 years, and the Hall Current systems for over 6 years. The next generation of gridded ion engines and high-power Hall Current thrusters to support planetary missions and asteroid sample-return missions are in development now. The presentation will cover the specific thruster systems and a brief overview of their flight heritage.

SmartSky Networks’ High Bandwidth Wi-Fi in the Sky

Bill Van Valkenberg, Vice President, SmartSky Networks, LLC

Several years ago, SmartSky Networks’ team of aviation professionals became frustrated by the lack of an office-like Internet for airborne passengers. Despite many “broadband” marketing claims, they found off-the-shelf commercial offerings to be less than satisfying. In 2009 they decided to do something about it. Their work resulted in breakthroughs that pushed the envelope of performance with advanced communications technologies. Now they are launching SmartSky 4G with proprietary beamforming technology that stands apart as the only inflight network capable of offering internet access with real-time bidirectional connectivity without the latency of satellite-based solutions.
**ChARMS – Revenue Management for the Air Charter Industry**

Dr. Roger Parker, CTO, AirMarkets Corporation

Revenue management in the context of air travel means the setting of ticket prices to balance demand and availability in a specific city pair market in the face of widely varying day-over-day demand. If demand for a specific flight is high, ticket prices are set higher to earn more revenue from each seat, but if demand is low, then seat prices stay down. A seat that’s empty when the plane takes off is worth nothing to the airline. Revenue management in scheduled airlines has increased gross revenue approximately 2%, with no increase in cost. It’s pure profit. There is a different, but similar, fair/demand relationship in the air charter industry. It’s not empty seats that are the risk, however. It is empty flight legs. This presentation will describe the ChARMS application developed by AirMarkets Corporation, a unique approach to pricing management for on-demand charter services. The opportunity exists for considerable charter revenue improvement, at almost no additional cost, and this presentation will describe how this can be achieved.

**To Live and to Love on Mars**

Vera Mulyani, Founder & CEO of Mars City Design

A substantive platform that addresses issues of how people will live off-planet is becoming increasingly relevant due to game-changing developments in the aerospace industry that is nothing short of a space race. SpaceX’s Elon Musk recently revealed his momentous progress towards putting humans on Mars to stay. In response, Boeing CEO asserted their manned mission with NASA would land first. The European Space Agency and others such as China, have expressed interest in establishing a Moon Village, and Amazon billionaire Jeff Bezos announced plans for a large rocket that could take them there. Now President Obama has declared: “a clear goal...of.. sending humans to Mars by the 2030s...with the ultimate ambition to one day remain there for an extended time. Getting to Mars will require continued cooperation between government and private innovators, and we’re already well on our way.” And Mars City Design is helping to create a blueprint for the important questions of what will we do and build when we get there. "It is not enough to just travel to Mars and survive, now we must develop a way in which we can sustainably live and love on Mars. It is essential that we call on a new generation of thinkers and innovators to make this a reality." -VM Mars City Design serves as a collaborative platform to make this development possible. Founded in Silicon Beach in Los Angeles, California, Mars City Design has become the action step to realizing not just the exploration of Mars, but making Mars a second home for humans. Individuals and companies who aim to pioneer the development of human necessities, are encouraged to adapt their designs to the Martian condition. Examples of architecture that will be 3D printed and tested in Mojave will be projected / shown during this conference. Audience are also invited to experience the VR available online.
An Update on Blue Origin’s New Shepard Program

Dr. Nicholas Patrick, Human Integration Architect, Blue Origin

The last year has been a busy one for Blue Origin: we’ve conducted 4 more test flights of our reusable New Shepard spacecraft, successfully recovering our booster and crew capsule after each flight. Our most recent flight included a test of the capsule’s escape system during ascent. We’ve also announced our New Glenn orbital launch system. Dr. Patrick will review Blue Origin’s recent steps on the path to human spaceflight.

Wake Up Genius!

Dr. Rachelle Ornan-Stone,
Boeing Sales & Marketing, Regional Director of Cabin Experience
Vera Mulyani,
Founder & CEO of Mars City Design

Never has it been truer than now: aerospace and aviation are no longer the sole domain of engineers and scientists. Two dynamic, phenomenal women, one from corporate, one from start-up, will discuss their non-traditional backgrounds, experiences, challenges and wins in the aerospace industry. By the end of this immersive Q&A session, you too will embrace the excitement uncovered by opportunities in STEAM, that’s right...Science Technology Art and Math. All we have to do is collectively, wake up!

RISEING LEADERS – SPEED MENTORING – SESSION 2

Take the opportunity to talk to some of the speakers, ask questions about their road to success, and discuss hot topics in aerospace one-on-one with industry leaders.
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**Connected Cockpits and The Future of Apps for Aviation**

**Dr. Bruce Holmes, NextGen AeroSciences**

In his prophetic book of 2000, *Telecosm*, the futurist George Gilder writes: “Chips and software will continue to make great contributions to our lives, but the action is elsewhere. To seek the key to great wealth and to understand the bewildering ways that high tech is restructuring our lives, look not to chip speed, but to communication power or bandwidth. Bandwidth is exploding, and its abundance is the most important social and economic factor of our time.” The implications of Gilder’s forecast have profoundly changed the ways connected devices work. In particular, the bandwidth revolution has hollowed out our computers and mobile devices, making them portals to the Internet instead of simply self-contained machines. This revolution has taken place most everywhere... except in aviation. Now, it is our turn. You will all be familiar with the increasing use of the term, “connected aircraft.” At SmartSky Networks, the Skyelligence™ Group hosts the development and management of aviation apps and services to advance comfort, safety and efficiency of flying. In 2017, SmartSky will go live with the first 4G air-to-ground WiFi network, enabling secure, lower-cost, private Internet connectivity between pilots, airspace managers, the cabin, the Cloud, and home base. Apps and services integrated through the Skyelligence™ platform and Service Oriented Architecture will ride on the SmartSky bandwidth to change the way we fly. In the near term, bandwidth can be employed to improve efficiencies in airspace and flight path management. These improvements promise savings in flight path distance, time and costs for individual aircraft and fleets by 10- to 15-percent, according to research in both the U.S. and Europe. Other apps promise improvements in MRO, logistics, fleet tracking and performance management, airspace management, and numerous other web-enabled aerospace tools. In the longer term, coupled with advancements in propulsion and automation, further savings in aviation operating costs are possible. Taken as a whole, these innovations can lower costs that in turn lead to increased consumption of air travel, along with the prospects of increased safety and reduced carbon footprints for aviation.

**Regional Sky Transit: The Future Mass Market for Electric Aircraft**

**Dr. Brien Seeley, President, Sustainable Aviation Foundation**

Regional Sky Transit (RST) is the name applied to a future system of ubiquitous, short-range, on-demand, affordable, point-to-point delivery of people by electrically-powered, autonomous, ultra-quiet Sky Taxis. The RST system will rely upon easily accessible small, “pocket airparks” adequate for vertical or extremely short take off and landing (V/ESTOL) that allow the public to minimize ground travel time (GTT) on short trips within highly populated mega-regions. This presentation will describe RST’s environmental and economic viability, operational details, Sky Taxi performance requirements and the emerging technologies that will enable them. An implementation model for the San Francisco metropolitan region will be presented, including traffic volumes and system capacity with safe aircraft separations. The effect of trip length and ridership on profitability will be explored relative to alternative modes of surface travel and on a cost per km basis. The total regional electrical energy demand that would attend a full-fledged, electrically-powered Sky Transit system is estimated. The substantial effects of Sky Transit in easing surface gridlock, reducing greenhouse gas emissions and other societal benefits will be described.
**PANEL**

*What The Future May Hold for On-Demand Air Mobility*

Dr. Mark Moore, NASA Langley Research Center

Dr. Bruce Holmes, NextGen AeroSciences

Dr. Brien Seeley, President, Sustainable Aviation Foundation

Recent headlines are intriguing: “Uber for Flying,” “Uber for Jets,” and “Uber for Planes” appear in the Wall Street Journal, The Economist, Financial Times, and others. The reality (“Someday, maybe”) is different – so far. The challenges to creating a Business-to-Customer (B-to-C) operation are daunting. The data required, the connectivity bandwidth needed, the algorithms that solve an “Uber-like” problem in three dimensions of flight (with other traffic, winds, weather, and airspace structures) versus on the two-dimensional streets of Seattle; and the regulatory satisfaction issues all require innovation at every step. The problem solved would be a boon to a public frustrated with every-growing congestion on our streets and highways. Entrepreneurs around the world are exploring a spectrum of new air vehicle concepts, business models, fleet mixes, logistics management tools, and target markets seeking the formulas for success. Our panelists will share insiders’ views of the landscape in which the future of more widely distributed, personal air mobility could flourish. That landscape includes investments in aircraft technology concepts being pursued by NASA, the FAA, and European research center counterparts affecting new propulsion systems, airspace automation, and airport capabilities. Taken together, these investments could change the reality from “Someday, maybe” to “Get ready soon.”

**PRESENTATION, followed by PANEL**

*Managing Risk in a Dynamic Cyber Environment*

David Shaw, CEO of Global Business Analysis

Russ Syphert, Vice President of Global Business Analysis

Threats from cyber-attacks and subsequent breaches are no longer something new; it’s the new normal. Remote network intrusion is being used to steal valuable intellectual property (industrial espionage) and personal identifiable information (PII). Most recently we are experiencing massive denial of service attacks causing considerable financial damage. Fact: 60% of business suffering a breach fail after 6 months. Recent leaks from political mail servers have shown the havoc and chaos that can be created from hacktivist’s or nationally sponsored actors. The GBA presentation will focus on the most target rich environment for hackers - the Cloud, and will help our audience understand the threat and ways companies and individuals defend against these threats, protecting the things that are the most valuable to them.
Challenges in Aviation Innovation

Kourosh Hadi, Director Airplane Product Development for Boeing Commercial Airplanes

Boeing has over 100 year history of innovation in commercial aviation. Grounded in the Pacific Northwest, Boeing’s commercial aviation has been the main innovator in passenger aircraft configuration, design, technology and manufacturing. Some distinct examples of Boeing’s innovative aircraft designs are the B707, B737, B747, B777 and B787. These distinct airplanes, each with major technology and manufacturing innovations relative to competitors, have become trendsetters in global aviation. Significant innovations continue to be introduced in future Boeing products such as the B737MAX and B777X. This presentation provides a perspective and overview of innovation opportunities to address challenges in commercial aviation – starting with the competitive landscape, it reviews major innovations on recent and near-term new Boeing aircraft and describes the major innovation challenges that need to be addressed to promote future air travel advances.

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SmartSky Networks, a next-generation aviation communications provider, is launching the United States’ first airborne 4G air-to-ground (ATG) network later this year with full nationwide coverage slated for 2017. SmartSky’s patented spectrum-reuse technology leverages 60 MHz of spectrum and beamforming to provide more than 10 times the typical speed and capacity of the current industry standard ATG network. With system hardware designed for multiple frequencies, SmartSky is positioned to expand internationally in the future where different frequency bands might be required.
**Presenters and Panel Members**

**Behçet Açıkmeşe**

Behçet Açıkmeşe is an Associate Professor in William E. Boeing Department of Aeronautics and Astronautics at University of Washington (UW), Seattle. He is also an adjunct professor of Electrical Engineering at UW. He received his Ph.D. in Aerospace Engineering in 2002 from Purdue University. He was a Visiting Assistant Professor of Aerospace Engineering at Purdue University before joining NASA Jet Propulsion Laboratory (JPL) in 2003. He was a senior technologist at JPL and a lecturer at Caltech until 2012. At JPL Dr. Açıkmeşe developed Guidance, Navigation, and Control (GN&C) algorithms for planetary landing, formation flying, and asteroid and comet sample return missions. He was the developer of the “flyaway” control algorithms for NASA’s Mars Science Laboratory mission, which landed on Mars in 2012. He was with the faculty of University of Texas at Austin from 2012-2016. His current research interests include real-time optimization based control, autonomous guidance and control systems, Markov decision processes, convex optimization, and control of multi-agent systems. He is an Associate Fellow of AIAA and a Senior Member of IEEE.

**Keith Goodfellow**

Dr. Keith Goodfellow is the Chief Engineer for the Arcjet Propulsion System and a Subject Matter Expert for electric propulsion and plasma physics at Aerojet Rocketdyne (AR). He has also been a part time faculty member in the Astronautical Engineering Department at the University of Southern California (USC) for 16 years, developing and teaching courses in Spacecraft Propulsion and Advanced Spacecraft Propulsion. Prior to joining AR, he was a senior engineer in the Electric and Advanced Propulsion Group at the Jet Propulsion Laboratory (JPL) for 15 years and a senior engineer at the Lockheed Martin Skunk Works for 10 years. At JPL he was involved with testing a wide variety of electric thruster types, planetary vehicle mission studies, and ion engine integration and testing for the Deep Space One spacecraft. Dr. Goodfellow received a BS in Mechanical Engineering from the University of Utah, a MS in Mechanical Engineering from Purdue University and a PhD in Aerospace Engineering from USC.

**Kourosh Hadi**

Kourosh Hadi is the director of Airplane Product Development for Boeing Commercial Airplanes. In this role he is responsible for the development of all new and derivative airplanes, advanced concept development and competitive analysis. Prior to 2012 Hadi was the 767 Chief Project Engineer, responsible for the technical integrity, quality of engineering design, certification and safety of the 767 fleet. Hadi also served as Chief of Product Development for derivatives of all BCA models, where he led the preliminary design and successful launch of programs including 747-8, 777F, 747 Large Cargo Freighter, and 787-9. Hadi received his BSc and MSc degrees in Aeronautical and Astronautical Engineering from University of Washington, and completed the Stanford Executive Program. He serves as the Boeing Executive focal working with the University of Washington.

**Kristina Hayek**

Kristina Hayek has been in the Human Resources and Training arena for over 20 years. Kristina is the U.S. Instructional Design and Development Manager for Hxcel Corporation, where she oversees the training and workforce development efforts for nine plants. She serves as the Learning Technology and Innovation Interest Group Leader for the Puget Sound Chapter of the Association for Talent Development (ATD). Kristina has her Doctorate in Educational Leadership and Master’s in Managing HR and Training from Seattle University. She is a SHRM-Certified Professional (SHRM-CP).

**Bruce Holmes**

Bruce Holmes is the co-founder of two software firms, AirMarkets Corporation, and NextGen AeroSciences, Inc.. The firms offer state-of-the-art modeling and asset optimization solutions for market demand forecasting and airspace flight path management. As a consultant, he also supports a variety of industry, government and university clients in strategy, technology development, and partnerships. He serves on multiple boards and advisory councils, including an FAA Administrator’s Advisor Committee and the U.S. National Academies - Aeronautics Research Roundtable and Intelligence Science and Technology Experts Group. He serves as Senior Advisor to an investment banking firm. He spent 33 years in public service with the NASA, and served in the White House Office of Science and Technology Policy in aviation policy analysis, and helped found the U.S. Joint Planning and Development Office (JPDO), leading the development of the strategies for the Next Generation Air Transportation System (NextGen).
Presenters and Panel Members

Mark Moore

Mark Moore has been at NASA 32 years specializing in the design and development of powered-lift aircraft and their technologies. Over the past decade he’s focused on applying electric propulsion to enable significant reductions in operating costs, community noise, and carbon emissions. He currently has two roles at NASA Langley Research Center as the Senior Advisor for On-Demand Mobility, as well as the Principal Investigator for the Scalable Convergent Electric Propulsion Technology Operations Research X-Plane (SCePTOR). He previously led the LEAPTech Mobile Ground Rig and GL-10 UAV demonstrators. He graduated from Stanford University with a Master’s in Aeronautical Engineering, and is currently completing his PhD at Georgia Tech on Synergistic Electric Propulsion Aircraft Integration.

Vera Mulyani

Vera Mulyani is the CEO & Founder, Lead architect for Mars City Design, President for Mars City Foundation and Co-Founder, Executive Director for SpaceportLA. Recognized as “Santa Monica Renaissance Woman”, Mulyani’s innovative visions as a conceptual architect brought her to become a critically acclaimed filmmaker, photographer, author of fantasy children books, Mars poem book and an architectural research thesis. Mulyani had her master’s degree both in architecture, and Visual Arts (Cinematography). Mulyani has developed a distinct concept of Recycling Cities, an urban design concept focusing on self-sustainability. Mulyani’s contribution for the next generation’s great adventure to live on Mars, debuted in creating Mars City Design™, a collaborative competition platform, uniting innovative thinkers to design the blueprint for future self-sustaining, autonomous cities on Mars.

Roger Myers

Dr. Roger Myers is a space technology and business consultant with 29 years of hands-on and leadership experience. Until July 2016 he served as the Executive Director of Advanced In-Space Programs at Aerojet Rocketdyne, where he oversaw programs and strategic planning for next-generation in-space missions and architectures, propulsion, power and integrated systems. Prior to this appointment, Dr. Myers was the Executive Director of Electric Propulsion and Integrated Systems, and served as Deputy Lead of Space and Launch Systems and General Manager of Aerojet Rocketdyne’s Redmond Operations, the world’s leading supplier of spacecraft propulsion systems and thrusters. Prior to joining Aerojet Rocketdyne in 1996, he worked at NASA’s Glenn Research Center. He has led dozens of development and flight programs and published over 80 papers on electric and chemical propulsion technology and in-space transportation architectures.

Rachelle Ornan-Stone

Dr. Rachelle N. Ornan-Stone is a design researcher / experience designer for aerospace and alternative environments. She has a diverse aerospace background including the design development of aircraft flight decks, International Space Station on-board processes and systems, space hotel concepts for NASA, and CST-100 Starliner concept interior and lighting. Currently, she directs research related to Boeing aircraft interiors and bridges communication between sales, marketing, engineering and airlines to ensure a commercially viable, preferred product which maximizes revenue. Ornan-Stone holds a PhD in experimental psychology, a master’s in Industrial Design from North Carolina State University. She is an avid hiker, backpacker and competitive synchronized swimmer.

Roger Parker

Dr. Roger Parker is the Chief Technology Officer and one of the founders of AirMarkets Corporation, a firm specializing in air travel demand analysis using agent-based modeling methods. Prior to that, he served as Chief of Technology and Senior Marketing Scientist for Boeing Commercial Airplanes, after a 30-year career in all aspects of quantitative market research methods development and applications. He has taught market research methods to business graduate students and consulted with various air travel industry organizations. He has published over three dozen papers in the field, and has presented numerous advanced topics to the Airline Group of the International Federation of Operational Research Societies (AGIFORS), the Institute for Operations Research and the Management Sciences (INFORMS), the World Society of Market Research (ESOMAR), American Marketing Association (AMA) and other related professional organizations. He also holds several patents in the field of air passenger analysis and air travel demand methodology.
Ed Wells Partnership

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2016 PNWAIAA Technical Symposium
Presenters and Panel Members

Nicholas Patrick

Dr. Nicholas Patrick is the Human Integration Architect at Blue Origin. In this role he is responsible for the human-centered aspects of Blue Origin’s designs and launch operations. Before joining Blue Origin, Dr. Patrick was a NASA astronaut and flew as a mission specialist on STS-116 and STS-130, two construction missions to the International Space Station. On STS-130, Dr. Patrick performed three spacewalks to complete installation of the ISS’s Node 3 and Cupola. Prior to becoming an astronaut, he worked at Boeing in Everett on the design of commercial aircraft flight decks. Born in the UK, Dr. Patrick studied engineering at Cambridge University, and earned a PhD in Mechanical Engineering from the Massachusetts Institute of Technology. Blue Origin, based in Kent WA, is a private company developing vehicles and technologies to enable commercial human space transportation. Blue Origin has the long-term goal of greatly increasing the number of people who live and work in space.

Brien Seeley

Dr. Brien Seeley has 40 years of experience as an experimental aircraft builder, pilot, designer of technology prizes and visionary leader of aviation progress. He founded many well-known aircraft design organizations and events, such as the Comparative Aircraft Flight Efficiency (CAFE) Foundation, the Personal Aircraft Design Academy (PADA), the Electric Aircraft Symposium and the Sustainable Aviation Foundation (SA). Dr. Seeley also designed and wrote the competition rules for all of the NASA Centennial Challenges for aeronautics, including the acclaimed 2011 Green Flight Challenge sponsored by Google. He encourages the industry to advance technologies and innovations pertinent to environmentally friendly, practical electrically powered aircraft.

David Shaw

David Shaw is the Founder and CEO for Global Business Analysis (GBA). For over a decade, GBA has been providing executable cyber security and information assurance solutions for near term and sustainable long term security and growth in the face of advanced cyber and associated business threats. Our concentration is protecting our critical infrastructures (aviation, land and maritime domains on the energy grid) and others to include the Healthcare domain. Prior to founding GBA, David held many senior positions to include a Principal/Partner for Arthur Andersen Worldwide Consulting, has led three technology firms and is the Past Chairman of the University of Washington’s Center for Information Assurance Advisory Board and serves as an adjunct lecturer at UWT in risk management. He has earned multiple undergraduate and advanced degrees, is an Associate Fellow with AIAA, has earned certification in Information Assurance and Cybersecurity, and is a retired USAF senior officer and a combat veteran fighter pilot.

Russ Syphert

Russ Syphert joined GBA last year as he was exiting from a 12-year career in the military. During that time, he was assigned to work as a signals intelligence analyst at the National Security Agency (NSA). Those assignments led to him working with and helping to develop the emerging cyber capability within the army. Russ assisted with the development of the cyber centric military operational specialties, and with offensive cyber operations. In addition to cyber operations Russ served as an intelligence analyst, developing network analytics products against national level targets. Those products aided in kinetic operations which neutralized the capabilities of our nations enemy’s. Currently Russ serves as GBA’s Vice President for Technology housing our PandorasBox suite of cybersecurity tools and associated services. Russ holds multiple certifications to include CISSP, Certified Ethical Hacker, and ISRM.

John Thornquist

John Thornquist serves as the Director of the Office of Aerospace, appointed to the role by Governor Jay Inslee in April of 2016. As the director, John serves as the principal adviser on aerospace related issues and coordinates activities that promote growth of the industry throughout the state. John directs the Washington State Space Coalition, an industry group which includes large and small businesses, Universities and government focused on the growth of the Space subsector in Washington State. Mr. Thornquist also participates on the board of the Washington Aerospace Partnership, a collaboration between Government and business working to protect and grow the aerospace sector in Washington State.
Bill Van Valkenberg

Bill Van Valkenberg is CEO of NextGen AeroSciences, an early-stage company that he co-founded to develop flight planning and trajectory management software. Bill brings 40 years as a business lawyer, entrepreneur and manager, and his longstanding passion for innovation to the company’s team. As an attorney, Bill represented private and publicly-held companies in corporate finance, M&A and other business matters in fast-paced, rapidly changing business environments. He was Chief Legal Officer of RealPage, Inc. and DayJet Corporation, and a senior partner in the Holland & Knight law firm.

Jeanne Yu

Jeanne Yu is the Director of Technology Integration for Boeing Commercial Airplanes (BCA). Yu’s responsibilities are planning and executing Product Development technology R&D portfolio to meet the needs of current and future commercial airplanes and services. This includes the innovative ecoDemonstrator Program, a flight test program to accelerate technology implementation and programs for Design for Environment and Operational Efficiency involving environmental improvements for energy, emissions, materials and community noise. She was a key industry leader responsible for conducting first flight tests of sustainable biofuel blends, establishing viability of sustainable Biofuel for commercial aircraft. Yu has previous experience in Environmental Control Systems, air quality, 787 cabin environment, fire protection systems and certification. Yu has served on the National Academies Transportation Research Board committee, FAA Research Engineering and Development Advisory Committee, International UK advisory for Aviation and Environment, OMEGA and FAA Center of Excellence Aircraft - Cabin Environment.

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