Welcome to the 8th Annual AIAA Pacific Northwest Technical Symposium

Welcome to the 8th year of the Pacific Northwest AIAA Section’s Technical Symposium.

This year’s Technical Symposium focuses on breakthroughs at the edges of our knowledge and imagination that solve new problems and extend beyond prior limits to find new solutions, new business models and new ways of thinking that illuminate the paths to surprising new futures that—in many ways—are already under way.

There are lessons in these experiences valuable to every professional, whether technical or management, that prepare us for breaking through the technical, business, social and political barriers we face every day.

Symposium Volunteers

Events of this type are the result of the efforts of a large team of volunteers who have given generously of their time and talent to bring this to our local AIAA membership and broader aerospace community.

Planning Committee:
Patrick Remy, Symposium Chair
Elana Slagle
Alex Kreul
Marcus Kruger
Kimber Hinson
Emmanuel Domingo
Bill Van Valkenberg
Kimberly Hicks
Karl Rein-Weston
George Dawood
Carson Mailler
Priscilla Martinez

Student Volunteers from:
Orting High School
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Student Scholarship Sponsor:
John M. Somerville, Technical Principal
Boeing Ed Wells Partnership
BCA-ONE Advisory Board
Welcome by Marcus Kruger, 2014-2015 Pacific Northwest AIAA Section Chair

Symposium Overview by Patrick Remy, 2014 Symposium Chair

Opening Plenary Session

Aquarius: A Practical Engineering Framework for Interplanetary Human Space Flight
Daniel Adamo
Astrodynamics Consultant

This presentation reviews major challenges to interplanetary human spaceflight and suggests strategies to address them. These include pre-emplaced Earth return consumables at the interplanetary destination, water used as a high-efficiency/high-thrust propellant and crew radiation shielding, and transport servicing in a distant retrograde moon orbit. Applied to a hypothetical transport—Aquarius—the strategies are shown to enable routine and sustainable round trips between Earth and Deimos, the outer moon of Mars. Knowledge gaps are identified with the intent of motivating changes in current technology roadmaps. With this introduction, those interested in interplanetary human spaceflight will be conversant with the associated technology issues and plausible means by which those might be resolved.

Daniel R. Adamo is a recognized authority in human space flight trajectory design and operations, with extensive experience in associated operations concept formulation, training, documentation, and software development. Since retiring in 2008 from 29 years as a NASA-Johnson Space Center contractor, Dan has been engaged in full-time astrodynamics research, consulting and outreach. Clients include NASA, the Review of U.S. Human Space Flight Plans Committee, the Jet Propulsion Laboratory, and the Keck Institute for Space Studies.

Dan developed real-time Shuttle Mission Simulator dynamics software, managed the Shuttle Portable Computer's post-Challenger return to flight operations and supported 60 Space Shuttle missions from the Flight Dynamics Officer console at Mission Control, including Flight Lead for 10 Shuttle missions, primary U.S. trajectory point-of-contact with Russian counterparts during Shuttle-Mir and International Space Station joint operations, and as editor and a major contributing author of the 1000-page Orbit FDO Console Handbook for 18 years. Dan has made numerous technical presentations on space mission design, trajectory modeling/reconstruction, and architecture development, and his work has been extensively published in white papers, editorials, newsletters, conference proceedings, and refereed journals.
Power Dissipation Optimization Process in Aircraft Secondary Power Distribution Systems

Neno Novakovic, United Technology Aerospace Systems

Today’s aircraft demand many independently controlled AC and DC power sources. This creates complex requirements for power distribution units having multiple modules with different dissipation characteristics. To address this, a new concept for secondary power distribution systems has emerged based on common core software, local area network and solid state power controllers. This forms a network of independent power distribution units scattered throughout the aircraft. This decentralized concept has many benefits including wiring weight reduction, electronic load protection, software controlled circuit breaker status and indication. A power analysis algorithm determines power dissipation for each power module and distribution unit across aircraft configurations and temperature ranges.

Intellectual Property Protection at the Edge

John Wechkin & Rajiv Sarathy, Perkins Coie

Protecting intellectual property is a key element of any successful innovation program. The patent landscape is continually evolving, and has recently received a lot of attention from the press…and from the U.S. Supreme Court. Understanding these recent changes will help you maximize the value you gain from your technology innovations.

Innovating in the Workplace as a Young Professional

Kenneth LaSalle

Associate Technical Fellow, Boeing

While innovation is a challenge in any environment and at any level in an organization, some issues apply disproportionately and even uniquely to early stage professionals. Ken will discuss some of these issues and offer insights from his experience that may be useful to Rising Leaders in their own organizations.

Survival Capsule – The Alternative to Vertical and Horizontal Evacuation

Julian Sharpe, CEO, IDEA International and Survival Capsule LLC

On the December 26, 2004 a sub-oceanic mega thrust magnitude 9.0 earthquake and tsunami occurred off the coast of Sumatra in the Indian Ocean, claiming 225,000 lives. On March 11, 2011 a magnitude 9.0 earthquake shook northeastern Japan, followed by a 30 foot tsunami which claimed the lives of 20,000 people. How can we prepare for future disasters and help mitigate such disasters, whether tsunamis, earthquakes, typhoons, hurricanes, tornados and tidal surges? This presentation describes how a crazy aerospace engineer and a tsunami expert came together and took an idea through development, testing, and initial production and then eventually onto the market. An idea, that maybe one day, could help mitigate such disasters and save lives.

The Market for Air Travel: What People Pay to Fly

Dr. Roger Parker, AirMarkets Corporation

With test flights done, avionics installed, pilots trained, interiors finished and gate slots secured, the real economics work begins. Passengers get on an airliner with the goal of getting off again as soon as possible in a different place. The foundation level economic question is how much they’ll pay to do that. Roger has explored this aspect of aeronautics for 15 years, and it proves to be as challenging and intriguing as the engineering and physics of flight itself. The result of this research and development is an agent-based computer simulation of the global passenger air travel economy. This presentation shares one part of that model, the probability distribution of ticket prices as a function of city pairs, travel purposes and other identified variables. It’s a use of the methodology that gives a tractable analysis of the fundamental behavioral economics.

About Ken LaSalle

Ken is an Associate Technical Fellow (ATF) in the Boeing Commercial Airplane Weight Engineering Organization. As an ATF, Ken leads the weight control functional discipline in defining, developing and implementing standards and best practices across the weight engineering organization. Ken participates in new technology development activities through project weight estimations, proactive design influence, and promoting implementation on BCA products.

Ken began his career at Boeing in 1996 and has worked on 737 Next Generation, 777, 767-400ER, 747X new wing development and alternative wing planform optimization, Blended Wing Body, Sonic Cruiser, 7E7 and 787. At the end of 2012, Ken transitioned from 787 lead engineer to his ATF role supporting weight engineering across all Boeing Commercial Airplane programs.

Ken received his BS in mechanical engineering from Washington State University in 1996.
**Beating the Betz Limit?**
Alexander Anderson, Founder, Odin Energy Works

This presentation describes an airborne wind turbine that—on the surface of it—appears to violate the conservation of energy by exceeding the theoretically derived Betz limit for power extraction from a stream of air by an open-rotor turbine. Analytical and computational techniques take on the unbeatable Betz limit to calculate the performance of an augmented rather than open-rotor turbine. The models are verified through comparison to the empirically derived performance of a 60 W wind tunnel test model and a full scale airborne system, which made its first flight in May 2014 at the Wild Horse Wind Facility, with grants from the Puget Sound Energy, Tacoma Power and the American Public Power Association. Actual performance is within 5% of theoretical predictions, “beating”—or more accurately, “cheating”—the Betz limit.

**Lifelong Learning through MOOC, and Introducing a New MOOC on Composites**
Professor Kuen Lin, University of Washington

A new Massive Open Online Course (MOOC) on Composite Materials Overview for Engineers has been developed by the University of Washington and will be launched on November 18, 2014. To date, over 7,000 students from 147 countries have enrolled in this course. This 8 hour class provides an introduction to composite materials from engineering design, manufacturing and repair viewpoints. The course covers six topics: introduction and application history; key differences between composites and metals; material properties; manufacturing methods; mechanics of composites; as well as design, inspection and repair. In this talk, sample videos and new teaching formats will be presented. The benefits of lifelong learning through MOOC will also be discussed.

**PelaStar Floating Offshore Wind Foundation – Engineering Challenges and Challenges for Engineers**
Jay Edgar, Glosten Pelastar

Offshore wind energy promises terawatts of renewable power, but limitations of current foundation technology strand offshore wind deployment in shallow water. PelaStar floating foundation technology opens up the currently unreachable deep water wind resource and reduces costs to the competitive levels required to support large-scale deployment. This presentation introduces the technologies behind the PelaStar floating foundation, focusing on engineering challenges—and challenges for engineers—of developing a seemingly simple concept into a commercially viable solution. We explore aero-hydro-elastic analysis methodologies used to analyze these structures, development of synthetic tendon systems, and the realities of integrating engineering solutions with financing, politics and commercial markets.

**A Practical Toolbox for Enhancing New Thinking**
Karl Rein-Weston, Boeing Associate Technical Fellow

Karl will share his experience-based insights to distill views on what innovation is at its core, and how to enhance thinking about it. The presentation begins with a challenge question, followed by methods to drive success in answering challenging questions. Discussion about these methods leads to two classes of innovation strategies. Attendees select one of these strategies for an interactive game that surfaces the influencing factors that affect solution outcomes. Such outcomes touch on why innovation is so critical and how each of us can contribute to solving major issues if we overcome the “can-we-influence-change?” hurdle. This hurdle is a key influencer of our thinking, since we naturally proceed as though we have the whole picture in mind. Three basic innovation types are introduced, and a caution raised about getting to right answers to the wrong questions. A key takeaway is that how one innovates dictates what one innovates.
Ed Wells Partnership

SPEEA-represented employees looking for innovative and effective ways to develop their career and leverage their talents should check out the Ed Wells Partnership (EWP). This joint initiative—between SPEEA and The Boeing Company—provides training and career development resources for SPEEA-represented employees to enhance their technical and professional skills. Let us help you…


Ed Wells Partnership

A Joint SPEEA/Boeing Initiative

EWP offers a wide selection of class titles in technical and professional skill areas. During 2014, we held over 500 classes, equaling 120,000 hours of training. In addition, we offer online learning and Boeing Education Network (BEN) “live” training which is available later on demand, as well as teleconferences and other career development resources.

For EWP 2015 class list, go to:  
http://edwells.web.boeing.com/Browse

Or visit us at:  
http://edwells.web.boeing.com

Guido Fetta is the Founder and Director of Cannae LLC and the inventor of the breakthrough Cannae Drive propulsion technology. This technology requires no on-board propellant. Mr. Fetta has researched and developed advanced propulsion technologies for more than 15 years. In January 2011, he led a project team that experimentally demonstrated a superconducting Cannae thruster which requires only electromagnetic energy to develop force.

At the July 2014 AIAA Joint Propulsion Conference, a team from NASA’s Johnson Space Center presented a paper* on the successful experimental demonstration of thrust in a non-superconducting Cannae prototype designed by Mr. Fetta and tested at NASA.

As an experienced business professional, Mr. Fetta has a background in sales, marketing, business development, and technology commercialization. He continues to lead development and commercialization programs for the Cannae Drive thruster technology. Mr. Fetta has a BS in Chemical Engineering from Virginia Polytechnic Institute and State University.

The Bloodhound Supersonic Car: Innovation at 1,000 mph
Tim Edwards

Head of Engineering, Atkins Aerospace Division

Bloodhound is an extraordinary automobile. Designed for a top speed of 1,050 mph, it is making an attempt on the world land speed record in Northern Cape, South Africa in 2015 and 2016. Its design speed makes it faster than a jet fighter at sea level and it is no surprise that the technologies supporting its development are closer to aerospace than automotive.

This presentation explains the mission of the Bloodhound Supersonic Car and discusses some aspects of the composite material elements behind its construction. It will also cover how designing and building a vehicle with the ambition of creating “the fastest man on earth” has involved the application of rigorous stress testing principles learnt from large aircraft development programs.

For more about the Bloodhound Supersonic Car project, see http://www.bloodhoundssc.com/

But Bloodhound’s mission is about more than just the engineering principles behind the car. We will also look at how a vehicle designed to shatter the existing land speed record of 763 mph is helping to inspire tomorrow’s engineers, including students based in Washington state, to break down barriers and challenge what is possible.

Tim Edwards is head of engineering in Atkins’ aerospace division. He has 30 years’ experience as a stress engineer, principally in the aerospace industry working for British Aerospace and Rolls Royce, but also in the rail, gas turbine and power generation sectors. He has worked in composites for 15 years and has had a leading role in the design and certification of the composite wing of the Airbus A400M military transport.
PANEL: The Emergence of Nanosatellites

Good things come in small packages; nanosatellites are no exception. This panel will discuss the burgeoning small satellite industry. Why is now the right time for nanosatellites? What breakthrough innovations are poised to change this industry? What opportunities do nanosatellites present for academia?

One thing is clear: small satellites are making a big impact. Join industry experts for an interactive discussion on the emerging nanosatellite industry.

Chris Voorhees
VP, Spacecraft Development, Planetary Resources

Robert Winglee, Ph.D.
Chair and Professor of the Department of Earth and Space Sciences, University of Washington

Tolis Dimopoulos
Sophos Law Firm, tech startup specialist

Pat Remy
Strategy consultant to large tech and startups

For more detail on panelists, see page 18

PANEL: New Business Models for Resourcing Innovation

Business value creation has its own set of technologies that, much like engineering, requires an array of disparate disciplines, each as arcane to experts in other fields as engineering is to those who have never dipped their toes in the “hard” sciences. These practices are particularly and dramatically evident in the creation of new ventures, where deep specialization and separation of disciplines into distinct and often disconnected silos is neither possible nor desirable. This panel will discuss the “nanobusiness” of startups, their creation, resourcing and operation, as viewed by those who have traveled that road from a starting point in engineering.

Tom Nugent
Co-Founder/CEO, LaserMotive

Bill Van Valkenberg
President/COO, NextGen Aerosciences

Chris Boshuizen, Ph.D.
Co-Founder and CTO, Planet Labs

Jason Andrews
President & CEO, Andrews Space, Inc. and Spaceflight, Inc.

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Closing Plenary Session

**Surfing Aircraft Vortices for Energy:**
An overview of the DARPA/AFRL Formation Flight for Efficiency Program

David Halaas

*Guidance, Navigation & Controls Engineer, Boeing*

The Air Force Research Lab and DARPA have been investigating the challenges and opportunities associated with flying aircraft in formation for aerodynamic benefit. Under the Surfing Aircraft Vortices for Energy (SAVE) concept, aircraft are flown autonomously at longitudinal separations of 3,000 to 8,000 feet at offsets from the wake sufficient to obtain significant aerodynamic benefit. Boeing has been executing a comprehensive DARPA/AFRL program to confirm the aerodynamic benefit using flight test, assess the collateral impacts to aircraft systems and structures, measure the effects on pilot workload and quantify potential fleet wide savings. This presentation summarizes the results of this program to date.

David J Halaas is a Guidance, Navigation and Controls engineer with over 11 years of experience with the Boeing Company. He joined the Boeing Company in 2002 as a flight controls analyst and quickly gained experience with complex system integration while conducting hardware-in-the-loop testing and failure analysis of the 737NG and 777-200 automatic flight control systems. He joined Phantom Works (now Boeing Research and Technology) in 2004 to support Ground Collision Avoidance research. He was eventually reassigned to the 767 Tanker Program where he participated in the design, analysis and flight testing of the Aerial Refueling Boom control laws. David also provided support to Boeing's Vehicle Swarm Technology Lab including the design of flight control laws for small autonomous air vehicles (fixed wing and rotorcraft), design and maintenance of a large multi-vehicle simulation, and the health adaptive flight control algorithms implemented on the autonomous aircraft. Beginning in 2010, he led the development of a C-17 formation flight simulation and supported an autopilot update to support formation flight for aerodynamic benefit. This was followed by two successful C-17 flight test programs that demonstrated significant fuel burn saving. Concurrent with the C-17 simulation and flight test work, David led the development of the KC-46 Aerial Refueling Boom simulation and transitioned it to the Systems Integration Labs.

He has a BS and MS from the Department of Aeronautics and Astronautics at the University of Washington.

For more video, see [http://www.buildsomethingbetter.com/](http://www.buildsomethingbetter.com/)

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*We live at the edge of the miraculous.*

*Henry Miller*
Rising Leaders Forum Speed Mentors

Dan Brown is Head of Engineering at Atkins’ Kirkland-based aerospace office. In this role he has overall responsibility for developing and maintaining technical culture and standards across the team of 70 engineers. Dan has broad experience in the analysis and design of aircraft structures, acquired from working for a number of design service providers to OEMs. He moved to the US in 2011 to help establish Atkins’ Kirkland office. Before taking up this role he was Chief Engineer of Atkins’ aerospace office of 100 engineers in Bangalore, India, and prior to that he worked in Atkins’ Bristol, UK facility. Dan obtained a Master’s degree in Aeronautical Engineering from Bristol University, UK, and an MBA from Bradford University, UK.

Gaia Borgias Brown handles External Relations for the University of Washington. He was born in Belgium. Brown helps companies access student talent and identify potential research partners in aerodynamics, propulsion, fusion, plasma, fluids, structures and controls. Her industry network includes commercial aircraft manufacturers, Unmanned Aircraft Systems, local government officials, and international aerospace clusters. In addition to her work with UW, Brown also holds a business development position with the aerospace management and operations consultancy. Simulated Gravity, graduate studies in Mechanical Engineering at Johns Hopkins, and prior to that he worked in Atkins’ aerospace office of 100 engineers in Bangalore, India, and prior to that he worked in Atkins’ Bristol, UK facility. Dan obtained a Master’s degree in Aeronautical Engineering from Bristol University, UK, and an MBA from Bradford University, UK.

Craig Chase, Electroimpact

Craig is a Project Manager for Janicki Industries, a leader in composite tooling technology based in Sedro-Woolley, Washington. He began his career with a BS in Construction Management from the University of Washington and spent six years working as a Project Engineer/Project Manager on a wide variety of projects. He left the construction industry to work as a consultant for a large public accounting firm, providing consulting on construction costs and fixed asset management; after 7 years he decided to return to the field of project management and joined the team at Janicki Industries where he oversees customer communication, design, and fabrication of composite tooling used in the aerospace manufacturing.

David J Halas is a Guidance, Navigation and Controls engineer with over 11 years of experience with the Boeing Company. He joined Boeing in 2002 as a flight controls analyst, with experience in complex system integration with hardware-in-the-loop testing and failure analysis of the 737NG and 777-200 automatic flight control systems. He joined Phantom Works (now Boeing Research and Technology) in 2004 to support Ground Collision Avoidance research. He was assigned to the 767 Tanker Program where he participated in the design, analysis and flight testing of the Aerial Refueling Boom control laws. In 2010, he led the development of a C-17 formation flight simulation and supported an autopilot update to support formation flight for aerodynamic benefit. He has a BS and MS in Aeronautics and Astronautics from the University of Washington.

Ben Hempstead is a Mechanical Engineer Lead and Chief of Staff at Electroimpact, Inc. He has a broad range of experience in aerospace machine tool and fixture design, manufacture, and project management. He also has experience with the business requirements for these projects. As Chief of Staff, he promotes and maintains Electroimpact corporate culture, conducts the raise review process, and provides progressive discipline where needed. He seeks to get paid to build cool stuff and have fun while earning money and expanding the market share for his employer. Specialties include: Engineering management, CAD and ANSYS experience, ability to fabricate/machine physical prototypes, and good customer relations.

Paul Vijgen is an Associate Technical Fellow in Flight Sciences (Aerodynamic Configurations) at Boeing in Seattle. His tasks include developing and maintaining flow-control drag-reduction technologies. He was member of the 787 Aerodynamics design team since start of 7E7 and focused development of the 787 Trailing-Edge Variable Camber system. Paul graduated with an MS in Aerospace Engineering from Delft University of Technology in The Netherlands (1983). While at NASA Langley, he obtained a Doctor of Engineering degree from the University of Kansas. At NASA, he worked on sheared wing tips and flight testing of flow control. He has several patents and co-authored technical papers. Paul is an Associate Fellow of the AIAA and Associate Member of the RAeS. He is the 2014-2015 vice-chair-elect of the AIAA Pacific Northwest Section.

Chris Voorhees is Vice President of Spacecraft Development at Planetary Resources, leading the technical team in implementing detailed design, development, integration and operation of the company’s spacecraft line of products. He has played an integral role in both the Mars Exploration Rover and Mars Science Laboratory projects. He served as Chief Engineer for mechanical assembly, integration and testing for NASA’s $2.5 billion Mars Science Laboratory (MSL). He was also responsible for the integrated system design of the MSL rover’s mechanical and structural subsystems. Chris received NASA’s Exceptional Achievement Medal for the design and development of the Mars Exploration Rover’s mobility system. He graduated summa cum laude from Rensselaer Polytechnic Institute with a BS degree in Mechanical Engineering.

Dr. Erika Wagner serves as Business Development Manager for Blue Origin, LLC, a developer of vehicles and technologies to enable human space transportation. Prior to joining Blue Origin, Dr. Wagner worked with the X PRIZE Foundation as Senior Director of Exploration Prize Development and founding Executive Director of the X PRIZE Lab@MIT. Previously, she was MIT’s McGraw- Smith Science Director and Executive Director of the Mars Gravity Biosatellite Program, a multi-university spacecraft development initiative to investigate the physiological effects of reduced gravity. Dr. Wagner’s interdisciplinary academic background includes a bachelor’s in Biomedical Engineering from Vanderbilt University, a master’s in Aeronautics & Astronautics from MIT, and a PhD in Bioastronautics from the Harvard/MIT Division of Health Sciences and Technology.

Rising Leaders Forum Speed Mentors

Julian Sharpe is CEO and President of IDEA International and Survival Capsule LLC. Having graduated from Loughborough University of Technology, UK in 1985 with a degree in Aeronautical Engineering and Design, he joined British Aerospace, Hatfield, and worked as a Stress Analyst on the A330/340 wings. He then moved to Westland Helicopters and worked EH101 which is where his long contracting career began. In 2007, he completed his last contract at Boeing, Everett and opened IDEA International (Innovative Design Engineering and Analysis). IDEA has supported Boeing, Airbus, Gulfstream, Sikorsky, Mitsubishi, EMFCO, TELAIR, Moog, Nabtesco, Aero Design, Bucher Leichtbau AG, AAR Cargo, Valiant Machine and others.

Jason Slagle is Director of Propulsion for the Boeing 787 Dreamliner with overall responsibility for the integrity of engines, nacelles, engine build up systems, pylons/landing structures and systems and propulsion system functionality. He is also responsible for management and direction of the overall Propulsion Life Cycle Product Team. Previously, he was Director & Chief Engineer of Engines and Fuels in Boeing Commercial Airplanes. Prior to Boeing, Jason held multiple leadership roles at General Electric Aviation, Lockheed Martin Aerostuctures and Cessna. He has a BS in Aerospace Engineering from Penn State, graduate studies in Mechanical Engineering at Johns Hopkins, and a Master’s in Management and Engineering from MIT.

Paul Vigen is an Associate Technical Fellow in Flight Sciences (Aerodynamic Configurations) at Boeing Commercial in Seattle. His tasks include developing and maintaining flow-control drag-reduction technologies. He was member of the 787 Aerodynamics design team since start of 7E7 and focused development of the 787 Trailing-Edge Variable Camber system. Paul graduated with an MS in Aerospace Engineering from Delft University of Technology in The Netherlands (1983). While at NASA Langley, he obtained a Doctor of Engineering degree from the University of Kansas. At NASA, he worked on sheared wing tips and flight testing of flow control. He has several patents and co-authored technical papers. Paul is an Associate Fellow of the AIAA and Associate Member of the RAeS. He is the 2014-2015 vice-chair-elect of the AIAA Pacific Northwest Section.

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Rising Leaders Forum Speed Mentors

Julian Sharpe, IDEA Inc.
Jason Andrews
President and CEO, Andrews Space, Inc. and SpaceFlight, Inc.

Andrews Space is a best value integrator of aerospace systems and developer of advanced spacecraft products and components. In 2010, Mr. Andrews founded SpaceFlight Inc. to provide routine, low-cost access to space for small and secondary payloads. SpaceFlight offers small spacecraft and secondary payload flight to low earth, geosynchronous and low lunar orbit. Prior to co-founding Andrews Space and SpaceFlight, he worked at Kistler Aerospace. He holds a BS degree in Aerospace Engineering from the University of Washington and a “40 Under 40” honor by the Puget Sound Business Journal in 2006.

Chris Boshuizen, Ph.D.
Co-Founder and CTO, Planet Labs

Chris Boshuizen is Co-Founder and CTO of Planet Labs. He is responsible for the system architecture and oversees the engineering teams. Prior to Planet Labs, Dr. Boshuizen was a Space Mission Architect at NASA Ames Research, where he co-created the PhoneSat Project, the cheapest and fastest built spacecraft at NASA, and led multiple partnership projects between NASA and private space companies. Prior to NASA, he was appointed interim executive director of Singularity University, coordinated the founding of the University and raised over $2.5 million in initial funding from Silicon Valley sources. In 2014, Dr. Boshuizen was awarded the Advance Global Award as Expatriate Australian of the Year. Dr. Boshuizen received his and BS and Ph.D. in Physics from the University of Sydney.

Robert Winglee, Ph.D.
University of Washington

Professor Robert Winglee is the Chair and Professor of the Department of Earth and Space Sciences at the University of Washington and the Director of the Washington NASA Space Grant Consortium. He has extensive experience, and nearly 150 publications, in space plasma physics and engineering, particularly in relation to the space environments around the planets and advanced space propulsion systems. His research was featured on the Discovery Channel Science of Star Wars in 2005 and Mars Rising in 2007. He is a Fellow of NASA’s Innovative Advanced Concepts and is presently developing a sample return system from small solar system objects. He was the recipient of the 2001 DISCOVER Magazine Award for Technological Innovation.

Tolis Dimopoulos
Sophos Law Firm

Tolis Dimopoulos founded Sophos Law in 2007 to create a modern law firm that reinvents the attorney-client relationship with the client experience at its core. He provides strategic legal and business counsel to technology entrepreneurs, startups and emerging growth companies, serving as general counsel to advise on entity formation, equity allocations, securities compliance, financing, strategic partnerships and intellectual property. He is the organizer of the Seattle League of Extraordinary Entrepreneurs, where he runs events focused on providing early stage financing information to startups and entrepreneurs. He has a JD from the University of Richmond, an MBA from George Washington University and a BS in Aeronautical & Astronautical Engineering from Purdue.

Bill Van Valkenberg
President/COO, NextGen Aeronosciences

As a general business and securities lawyer in several law firms and as a business owner and manager, Bill Van Valkenberg has more than 30 years’ experience building and advising companies through rapidly changing business environments, complex restructurings and capital markets transactions. He is accomplished in structuring and negotiating business transactions, has strong securities and corporate governance expertise, a solid background in mergers and acquisitions and partnering transactions, and hands-on experience with regulated industries. Bill was the Chief Legal Officer of DayJet Corporation, an on-demand regional air carrier. He has a JD from the University of Utah and a BA in Economics from the University of Washington.
Session Presenters

Neno Novakovic is a Senior Systems Engineer at United Technology Aerospace Systems, and has more than 20 years’ experience in aircraft systems design, integration, testing, and certification. In his early career, working for the Department of Defense in former Yugoslavia, he was a part of the R&D team developing turbojet engine control and health monitoring systems. Moving to Canada, he transitioned to landing gear systems design and integration. As Landing Gear Systems Lead on the Boeing 787 program, he co-authored the landing gear systems lightning compliance for the 787-8 program. In the recent years, his focus is on aircraft electrical power systems and power optimization, and has contributed to several U.S. patents and technical articles. His technical articles have been published in SAE Aerospace journals and conferences.

Julian Sharpe is CEO and President of IDEA International and Survival Capsule LLC. Having graduated from Loughborough University of Technology, UK in 1985 with a degree in Aeronautical Engineering and Design, he joined British Aerospace, Hatfield, and worked as a Stress Analyst on the A330/340 wings. He then moved to Westland Helicopters and worked EH101 which is where his long contracting career began. In 2007, he completed his last contract at Boeing, Everett and opened IDEA International (Innovative Design Engineering and Analysis). IDEA has supported Boeing, Airbus, Gulfstream, Sikorsky, Mitsubishi, EMFCO, TELAIR, Moog, Nábteco, Aero Design, Bucher Leichtbau AG, AAR Cargo, Valmainte and others.

Founder and part owner of Odin Energy Works LLC, Alexander Anderson holds two pending patents in tethered airborne electric generation and meteorological systems. His current fields of research are unconventional renewable technologies and innovative solutions for STEM education. Class valedictorian of St. Martin’s University at age 18, Anderson received an AIAA scholarship during his undergraduate education. His A-PEGASUS-I airborne wind turbine first flew in May 2014 at Puget Sound Energy’s Wild Horse Wind Facility and received grants from Puget Sound Energy, Tacoma Power and the American Public Power Association. Anderson is currently the principal investigator of an international engineering and humanitarian project in Papua New Guinea led by WASRAG, a division of Rotary International.

Jay Edgar is president of Glosten, a Seattle-based marine consultancy founded in 1958. Jay has been with Glosten for 27 years, where he has led the development of specialized marine platforms ranging from research vessels, tugs, and barges to floating golf greens, cable-laying equipment and specialized sensor platforms. As president of the 75 person multi-disciplinary firm, Jay oversees the day-to-day operations of the growing consultancy as well as the financing and strategic development of the firm’s PelaStar business unit, a spinoff from their Marine Environmental and Renewable Energy Practice. This unique practice leverages Glosten’s broad expertise in the practical application of advanced analysis and technologies to develop and integrate green solutions in the marine community.

Tom Nugent is President and co-founder of LaserMotive, focused on commercializing wireless power. Previously, he was a project scientist at Intellectual Ventures Labs, a multidisciplinary early-stage R&D lab. He also served as Chief Innovation Director for LiiPort Inc., a pioneer in the development of the modern space elevator concept. Tom has been involved in liquid-fueled rocket engine development and testing through the MIT Rocket Team, and advanced fusion propulsion research at the Jet Propulsion Laboratory. He holds a BS in Physics from University of Illinois at Urbana-Champaign, and an MS in Materials Science and Engineering from MIT.

Session Presenters

John is a patent attorney focused on strategic patent preparation, prosecution and related counsel over a range of technologies, concentrated in aerospace, semiconductors, cleantech, medical devices and other mechanical technologies. Previously, John was an engineer at Boeing Military Airplane Company.

Dr. Parker is principal researcher for AirMarkets Corporation, in association with NextGen Aerosciences, focused on applied research in air transportation system management and passenger behavior, to bring advanced revenue and market estimation tools to industry at all levels, from equipment manufacturing to airport management. 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 methodologies. He has taught market research methods at the graduate level and consulted with air travel industry organizations. He has published over three dozen papers in the field, and presented numerous advanced topical workshops.

Rajiv Sarathy is a patent attorney with an MBA and 13 years software industry experience, including 9 years as a software development engineer and manager at Microsoft. His practice focuses on IP matters including securing, prosecuting and defending patents. He is an instrument-rated private pilot.

Dr. Lin is a Professor in the William E. Boeing Department of Aeronautics and Astronautics at the University of Washington. He received his Master’s and Ph.D. degrees from MIT, specializing in aircraft structures and composite materials. He has over 40 years of R&D experience in advanced composite materials and structures. He has concentrated his teaching on composite materials, aircraft structures and finite element methods. He received Professor of Year Awards three times. In partnership with Boeing, he developed the award-winning UW-Boeing Certificate Program in Aircraft Composite Structural Analysis and Design. Recently, he developed a new MOOC on composites, launching November 18, 2014, for which more than 7,000 students from 147 counties have enrolled.

Karl is an AIAA Associate Fellow, a Boeing Associate Technical Fellow, a Licensed Professional Aerospace Engineer, and holds three patents. Some of his roles at Boeing have included Airspace and Operational Efficiency program manager, representative on the SESAR Industrial Support team in Europe under EADS, 787 structural window program manager, Renton Program Management Office (the Boeing 737 and 757 avionics program manager), Commercial Airplane standards manager, Boeing V22 Osprey flight controls consulting engineer, 747 autoflight control systems design engineer and control systems flight/simulator test engineer. He has MIT Sloan Executive Certificate in Management & Leadership and Strategy & Innovation, an MS in Aeronautics and Astronautics from the University of Washington, and a BTech/Isc from Loughborough University, UK.

Dr. Holmes has more than 40 years’ experience in industry and NASA. He has entrepreneurial experience in air transportation innovations (DayJet Corporation) and in complexity science tools (NextGen Aerosciences). He has demonstrated leadership in national air transportation system strategies, large scale public-private partnerships in strategic aeronautics technology development, state level air transportation strategies and national airspace modernization. He currently serves on Boards of Directors and as advisor to investment bankers, industry, states, universities and the Federal government in technology system thinking. Dr. Holmes is a Fellow of the AIAA, author of more than 90 technical papers and holds numerous patents on aeronautical technologies.

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Both the man of science and the man of action live always at the edge of mystery, surrounded by it.

J. Robert Oppenheimer