AIAA

SPACE 2013

CONFERENCE & EXPOSITION

SPARKING INGENUITY AND COLLABORATION TO ENABLE MISSION SUCCESS

10–12 September 2013
San Diego Convention Center
San Diego, California

FINAL PROGRAM

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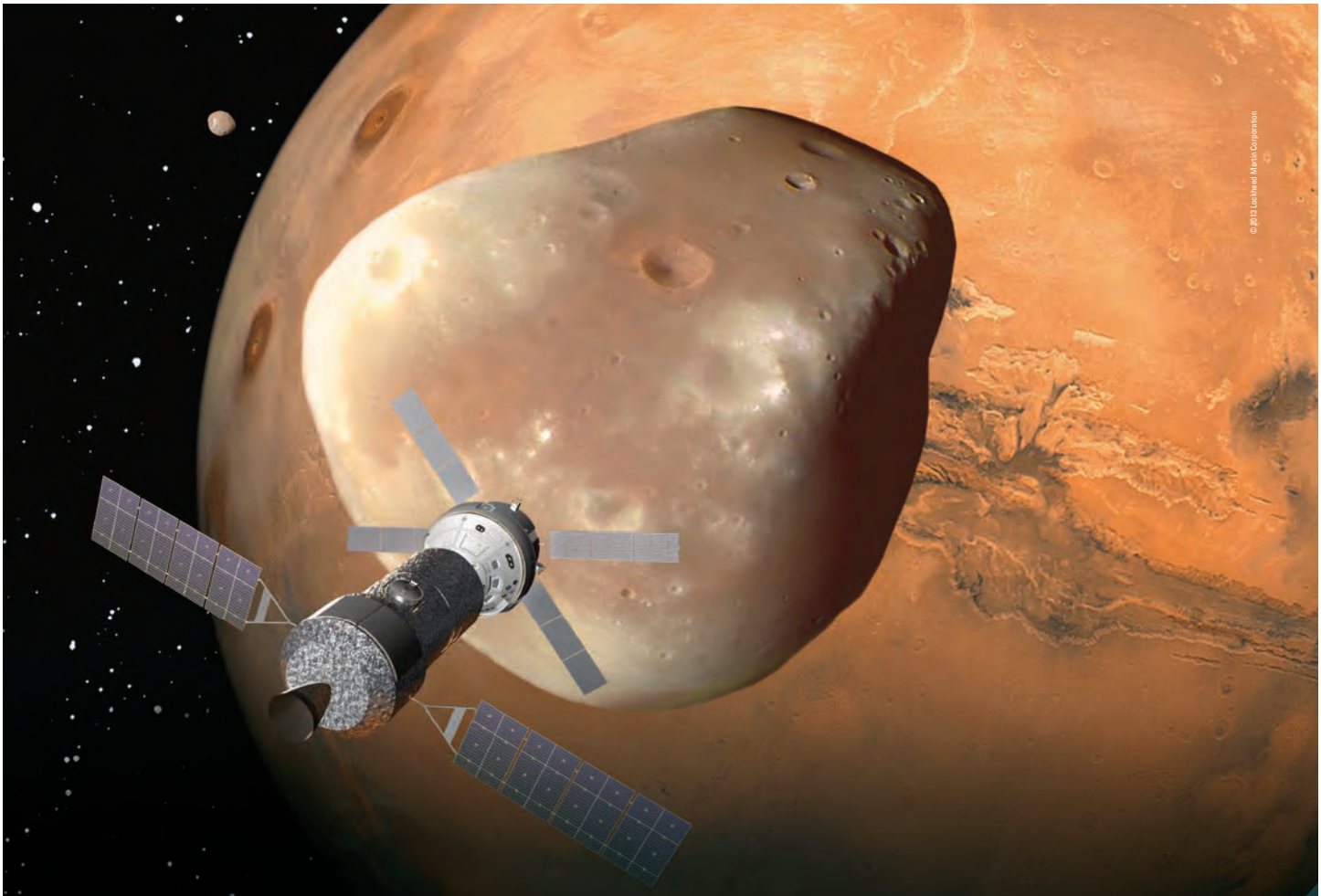

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Vice President, National Security Space, The SI Organization, Inc.

Mary Snitch
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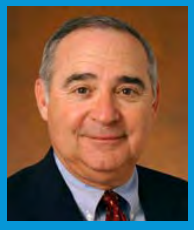

Lt Gen (Ret) Eugene L. Tattini
Deputy Director, NASA Jet Propulsion Laboratory

Gabe Watson
Vice President, GEOINT, Sensing and Science, Space Systems, Northrop Grumman Aerospace Systems

WELCOME

Dear Colleagues:

The members of the Executive Steering Committee are very excited to welcome you to the AIAA SPACE 2013 Conference & Exposition!

This year's event comes at a critical time for the space community as a number of outside forces continue to shape decisions and directions. Budgets are being squeezed, new players are emerging, business models are evolving. Now more than ever it is critical for government, industry, and academia to work together to lead the community forward in a sustainable direction, for all of us to continue our industry's legacy of innovation to solve problems and exploit emerging opportunities, and to develop the technology that will enable the next steps in our shared journey outward. It is with these factors in mind that we have developed the program for AIAA SPACE 2013.

The theme of "Sparking Ingenuity and Collaboration to Enable Mission Success" is explored through frank and forward-looking discussions designed to review the current achievements in space and highlight new initiatives and plans, while surfacing the key issues and challenges that need to be addressed in order to define clear roadmaps for future progress. The event provides the leaders from government, industry, and academia an opportunity to share ideas on how to focus the great talent and resources of the space community on the future. This work fuels the collective human drive to explore and be part of something bigger than ourselves, and brings about new technologies that make everyday living better for all of us.

As a participant in AIAA SPACE 2013, you will engage with thought leaders and decision makers to discuss the global and national outlook for human space exploration, commercial opportunities, space science, research, and technology, and the utilization of space for transportation, security, and weather monitoring. The program has been developed around three keys to the success of any space mission: Leadership, Innovation, and Technology. Challenges and opportunities will be outlined by recognized industry experts.

The themes from the plenary sessions have been integrated into panel sessions that dive deeper into the discussion, and also into the technical program, which covers many aspects of space exploration, operations, robotics and architectures, systems and engineering, and more. You will leave this year's event with the knowledge of the most current and cutting edge space technologies, as well as the contacts needed for future collaboration and partnerships.

Thank you for your participation in this year's event, and for your continued enthusiasm for space. Let the information and conversations you share this week spark the ingenuity and collaboration that is so vital for mission success.

Sincerely,
Executive Steering Committee
AIAA SPACE 2013


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NEXT GENERATION
INTO SPACE.
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Forum Overview

Tuesday, 10 September

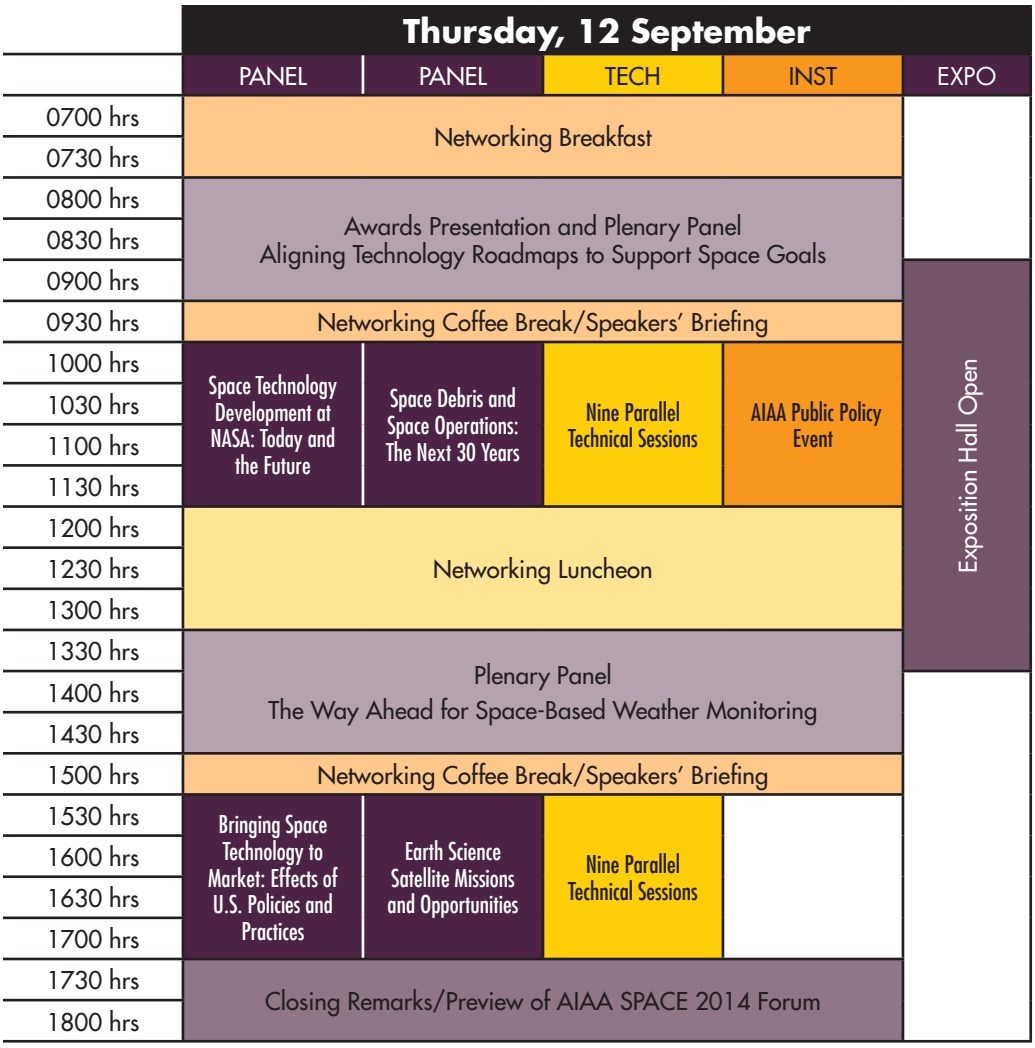
	PANEL	PANEL	PANEL	TECH	INST	EDU	EXPO
0700 hrs	Networking Breakfast						
0730 hrs							
0800 hrs	Awards Presentation and Opening Plenary Panel A Conversation with Space Executives						
0830 hrs							
0900 hrs							Exposition Hall Open
0930 hrs	Networking Coffee Break/E-Posters/Speakers' Briefing						
1000 hrs	Current Launch Vehicle Update	Mars Exploration Program: Exploration and Discovery	Enabling In-Space Infrastructure	Nine Parallel Technical Sessions	B2B Event		
1030 hrs							
1100 hrs							
1130 hrs							
1200 hrs	Networking Luncheon						
1230 hrs							
1300 hrs							
1330 hrs	Plenary Panel The Evolving Landscape of the Space Business						
1400 hrs							
1430 hrs							
1500 hrs	Networking Coffee Break/E-Posters/Speakers' Briefing						
1530 hrs	Engineering Global Space Leadership with STEM	Human Spaceflight Progress Report	NASA Space Science: The Next 30 Years	Nine Parallel Technical Sessions	Rising Leaders Forum		
1600 hrs							
1630 hrs							
1700 hrs						Engineers as Educators Train the Trainer	
1730 hrs	Opening Reception						Exposition Hall Open
1800 hrs							
1830 hrs							
1900 hrs						Engineers as Educators Workshop	
1930 hrs							
2000 hrs							
2030 hrs							
2100 hrs							
2130 hrs							

Forum Overview

Wednesday, 11 September

	PANEL	PANEL	PANEL	TECH	INST	EDU	EXPO
0700 hrs	Networking Breakfast						
0730 hrs							
0800 hrs	Awards Presentation and Plenary Panel Space Exploration for Inspiration and Profit						
0830 hrs							
0900 hrs							Exposition Hall Open
0930 hrs	Networking Coffee Break/E-Posters/Speakers' Briefing						
1000 hrs	Commercial Space Operations and Services as Stepping-Stone Enablers for Space Exploration	Designing with Operations in Mind	The Rise of Cubesats and Small Satellites: Missions and Opportunities	Nine Parallel Technical Sessions	Rising Leaders Forum	STEM K–12 Mars Rover Demo	
1030 hrs							
1100 hrs							
1130 hrs							
1200 hrs	Luncheon Panel NASA's Asteroid Redirect Mission						
1230 hrs							
1300 hrs							
1330 hrs							
1400 hrs	Networking Coffee Break/E-Posters/Speakers' Briefing						
1430 hrs	Commercial Crew and Cargo Program Status	Stimulating Innovation	Hosted and Rideshare Payloads for Reducing the Cost of Access to Space	Nine Parallel Technical Sessions	Rising Leaders Forum		
1500 hrs							
1530 hrs							
1600 hrs							
1630 hrs	Networking Happy Hour						
1700 hrs							
1730 hrs	William H. Pickering Lecture Curiosity Mars Science Laboratory						
1800 hrs							
1830 hrs							

Forum Overview



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Plenary Sessions

Leaders in the space community share their perspectives on the new challenges, future opportunities, and emerging trends in space business, exploration, and technology.

Tuesday, 10 September 2013

0800–0930 hrs **Ballroom 20A**

Opening Plenary

A Conversation with Space Executives

The space landscape is changing. New players are emerging, business models are evolving, government priorities are shifting. At the same time, a new fiscal reality is setting in globally. With these outside drivers as a backdrop, space industry leaders will discuss how space exploration, space exploitation, and space-based defense can complement one another to provide a clear path for our industry. In challenging times, what roles do ingenuity and collaboration play in enablng mission success?

Welcome Remarks: **Mike Griffin,** President, AIAA, Reston, VA

Moderator: **Lt Gen Larry D. James,** USAF (Ret), Deputy Director, NASA Jet Propulsion Laboratory, Pasadena, CA

Panelists:

Roger A. Krone, President, Network and Space Systems, Boeing Space, Defense & Security, The Boeing Company, Arlington, VA

Mark Valerio, Vice President and General Manager, Military Space, Lockheed Martin Space Systems, Lockheed Martin Corporation, Denver, CO

Gabe A. Watson, Vice President, GEOINT, Sensing, and Science, Space Systems, Northrop Grumman Aerospace Systems, Redondo Beach, CA

1330–1500 hrs **Ballroom 20A**

The Evolving Landscape of the Space Business

Budget outlooks, contracting methodologies, funding approaches, partnering philosophies, and mission architectures are altering the dynamics of how space leaders work together to achieve goals. New and novel approaches to manufacturing, testing, and operation of space systems are challenging traditional views of time to market, affordability, and risk acceptance. What is being done differently and what can we learn? Are there leadership lessons that are applicable to sustaining a space strategy?

Moderator: **Lt Gen Eugene L. Tattini,** USAF (Ret), Deputy Director, NASA Jet Propulsion Laboratory, Pasadena, CA

Panelists:

Bernie Collins, Senior Advisor, Office of the Director of National Intelligence/AT&F, Washington, DC

John Elbon, Vice President and General Manager, Space Exploration, Boeing Defense, Space, and Security, The Boeing Company, Houston, TX

William H. Gerstenmaier, Associate Administrator for Human Exploration and Operations, NASA Headquarters, Washington, DC

Lt Gen Michael A. Hamel, USAF (Ret), Senior Vice President of Corporate Strategy and Development, Orbital Sciences Corporation, Dulles, VA

Adam Harris, Vice President of Government Sales, Space Exploration Technologies Corp. (SpaceX), Hawthorne, CA

Lt Gen John T. "Tom" Sheridan, USAF (Ret), Vice President, National Security Space, The SI Organization, Inc., Alexandria, VA

Wednesday, 11 September 2013

0800–0930 hrs **Ballroom 20A**

Space Exploration for Inspiration and Profit

Debate on where to go next in space continues in the scientific community and even within and among agencies; meanwhile, the private sector has said "we're going", both for inspiration and for profit. How do we merge these approaches? Where are the synergies? How can one enable the other? How can government agencies work together with the private sector to achieve goals? How can technologies derived be leveraged for future efforts?

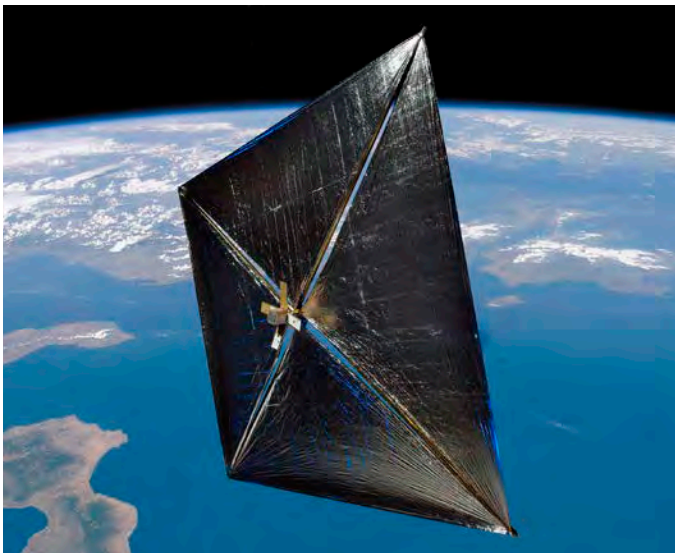
Moderator: **Bruce Pittman,** Director of Flight Projects and Chief System Engineer, NASA Space Portal, NASA Ames Research Center, Moffett Field, CA

Panelists:

Dan Dumbacher, Deputy Associate Administrator for Exploration Systems Development, NASA Headquarters, Washington, DC

Chris Lewicki, President and Chief Engineer, Planetary Resources, Inc., Seattle, WA

Robert "Bob" Richards, Co-Founder and CEO, Moon Express Inc., Moffett Field, CA



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Plenary Sessions

1200–1400 hrs **Ballroom 20A**

Luncheon Panel

NASA's Asteroid Redirect Mission

This lunchtime panel will provide an overview and status update on NASA's plan to capture a small asteroid and redirect it to cis-lunar space.

Moderator: **William H. Gerstenmaier,** Associate Administrator for Human Exploration and Operations, NASA Headquarters, Washington, DC

Panelists:

John M. Grunsfeld, Associate Administrator, Science Mission Directorate, NASA Headquarters, Washington, DC (invited)

Lindley Johnson, Near-Earth Objects Observation Program Executive, Science Mission Directorate, NASA Headquarters, Washington, DC

Brian Muirhead, Chief Engineer, Jet Propulsion Laboratory, Pasadena, CA

James Reuther, Deputy Associate Administrator for Programs, Space Technology Mission Directorate, NASA Headquarters, Washington, DC

Steve Stich, Deputy Director of Engineering, NASA Johnson Space Center, Houston, TX

Thursday, 12 September

0800–0930 hrs **Ballroom 20A**

Aligning Technology Roadmaps to Support Space Goals

This space technology plenary panel will bring together space community stakeholders for a discussion around technology roadmaps and how various initiatives across government and industry can align to support science, exploration, and defense goals. Technologies that are critical to enabling our future directions will be identified. Emerging technologies that could impact the way we approach the development and exploration of space will also be a part of the conversation

Moderator: **Carissa Christensen,** Managing Partner, The Tauri Group, Alexandria, VA

Panelists:

Michael Gazarik, Associate Administrator, Space Technology, NASA Headquarters, Washington, DC

Maj Gen Neil McCasland, USAF, Past Commander, Air Force Research Laboratory, Albuquerque, NM

Pamela Melroy, Deputy Director, Tactical Technology Office, DARPA, Arlington, VA

Kenneth Washington, Vice President, Advanced Technology Center, Lockheed Martin Space Systems Company, Lockheed Martin Corporation, Denver, CO

1330–1500 hrs **Ballroom 20A**

The Way Ahead for Space-Based Weather Monitoring

Dramatic shifts in global weather trends are increasingly common and highly visible. At the same time, our ability to monitor and predict these trends from our space-based assets is degrading. In the face of declining budgets, our capabilities are reaching the end of their useful lives. Where do we go from here?

Moderator: **Christopher J. Scolese,** Director, NASA Goddard Space Flight Center, Greenbelt, MD

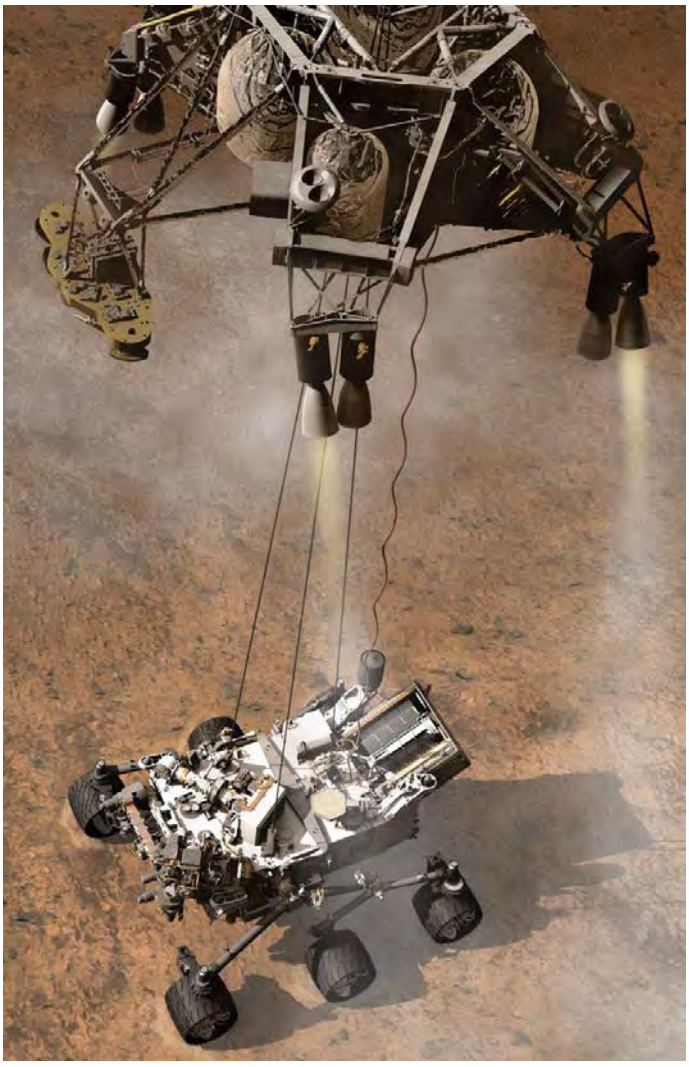
Panelists:

Jack Kaye, Associate Director for Research, Earth Science Division, NASA Headquarters, Washington, DC

Jon Kirchner, President and Chief Operating Officer, GEOOptics, Inc., Gladwyne, PA

John Murphy, National Weather Service

Clark Snodgrass, Director of GeoINT, Sensing, and Science Programs, Northrop Grumman Aerospace Systems, Redondo Beach, CA



Networking Events

As the old adage says, "It's not just what you know, it's who you know." Connect with those who may become your future colleagues and collaborators, employers or employees. Exchange ideas with the companies you want to partner with, and interact with the leaders who are shaping the future of aerospace.

Networking Breakfasts

A great way to start the day and interact with other participants, networking breakfasts will be offered on **Tuesday–Thursday, 0700–0800 hrs**, in the Ballroom 20 Lobby at the San Diego Convention Center. This event is open to all forum attendees (no tickets required).

Networking Coffee Breaks

Networking coffee breaks allow even more time for making new contacts, continuing discussions from sessions, visiting the exposition hall, or checking emails and voicemails to keep in touch with the office. Networking coffee breakswill take place in the exposition hall at the following times:

Tuesday, 10 September	0930–1000 hrs and 1500–1530 hrs
Sponsored by ULA United Launch Alliance	
Wednesday, 11 September	0930–1000 hrs and 1400–1430 hrs
Thursday, 12 September	0930–1000 hrs and 1500–1530 hrs (Ballroom 20 Foyer)

Welcome Reception

Tuesday, 10 September **1730–1900 hrs**

A welcome reception will be held on **10 September, 1730–1900 hrs**, in the exposition hall, Ballroom 20CD at the San Diego Convention Center. Take this opportunity to engage new contacts and refresh old ones. A ticket for the reception is required and included in the registration fee where indicated. Additional tickets for guests may be purchased upon registration or on site, as space is available.

Networking Luncheons

Convene with colleagues and do business with exhibitors during the networking luncheons on **Tuesday and Thursday, 10 and 12 September, 1200–1330 hrs**, in the exposition hall. Tickets are required, and are included in the registration fee where indicated. Additional tickets may be purchased upon registration or on site, as space is available.

Luncheon

Wednesday, 11 September **1200–1400 hrs**

Join speakers and participants at the luncheon on **Wednesday, 11 September, 1200–1400 hrs,** in Ballroom 20A, for a conversation on "NASA's Asteroid Redirect Mission" led by William H. Gerstenmaier, Associate Administrator for Human Exploration and Operations, NASA Headquarters, Washington, DC. A ticket for the luncheon is required, and is included in the registration fee where indicated. Additional tickets may be purchased upon registration or on site, as space is available.

Networking Happy Hour

Wednesday, 11 September **1630–1730 hrs**

Continue discussions from the day's sessions at the Networking Happy Hour, **Wednesday, 11 September, 1630–1730 hrs**, in the Ballroom 20 Lobby. This event is followed by the William H. Pickering Lecture. A ticket for the happy hour is required and is included in the registration fee where indicated. Additional tickets may be purchased upon registration or on site, as space is available.

Educational Events

Engineers as Educators Train the Trainer Workshop

Tuesday, 10 September **1700–1800 hrs**
Room 28E

- Do you have (formal or informal) experience leading students?
- Are you enthusiastic about sharing your passion for training others with your local section?
- Do you want to connect with your local section and become a resource for STEM K–12 activities?

If you answered "yes" to any of these questions, this is the workshop for you! Your leadership and passion can be channeled to help your section inspire students and teachers in your local community.

This workshop will teach you how to train aerospace professionals to:

- Be more confident with a K–12 student audience
- Construct grade level appropriate presentations
- Use resources to make presentations exciting and engaging
- Encourage student exploration of the aerospace industry

Engineers as Educators Workshop

Tuesday, 10 September **1900–2200 hrs**
Room 28E

Do you want to share your passion for aerospace with students (in a formal or informal environment)? Are you challenged to convey the complex – and yet often brilliantly simple – nature of your job in a way that is easily understood by students and teachers of different grade levels? Are you looking for a way to become actively engaged in your community? For anyone who wants to work with K–12 students, this workshop will give you the tips and tricks to be successful – and to spark student interest to continue learning on their own. Preregistration is required.

AIAA Educator Academy: Mars Rover Demonstration

Wednesday, 11 September **1000–1330 hrs**
Room 29CD

AIAA has introduced an innovative approach to K–12 education, the AIAA Educator Academy, which features a series of three curriculum modules targeted at different grade levels: the Mars Rover Celebration; the Electric Cargo Airplane; and the Space Weather Balloon. The program allows local AIAA sections and their communities to work together to excite and inspire students as they apply math and science concepts from the classroom to real-world aerospace projects. Debuting at the SPACE 2013 Conference is a Mars Rover Celebration demonstration event for local San Diego elementary and middle school students. Stop by and see where these students' explorations of Mars will take them. Students will also be visiting the exposition hall at the conclusion of this event.

Recognition Events

Recognizing the best in the aerospace community for their outstanding achievement is one of the primary goals of AIAA. The following awards will be presented at the AIAA SPACE 2013 Conference & Exposition. Please join us in saluting the accomplishments of your peers as we celebrate aerospace ingenuity and collaboration.

AIAA Space Systems Award

Presented on Tuesday, 10 September, 0800 hrs
Ballroom 20A

Lunar CRater Observation and Sensing Satellite (LCROSS) Team

Award to be accepted by:

Anthony Colaprete, Principal Investigator, NASA Ames Research Center, Moffett Field, California

"For extraordinary achievements of LCROSS, a secondary mission that impacted the moon to obtain the first definitive signature of lunar water."

AIAA von Braun Award for Excellence in Space Program Management

Presented on Tuesday, 10 September, 0800 hrs
Ballroom 20A

Lt Gen Eugene Tattini, USAF (Ret), Deputy Director, Jet Propulsion Laboratory, Pasadena, California

"For exceptional technical management and performance to achieve space mission success and excellence, and for pioneering the development of National Security Space."

Space History, Society, and Policy Student Best Paper Competition

Presented on Tuesday, 10 September, 0930 hrs
Presentation Stage in Exposition Hall

The AIAA History, Society, and Aerospace Technology and Legal Aspects of Aeronautics and Astronautics Technical Committees are proud to sponsor a Student Best Paper Competition for technical papers submitted by students in the Space History, Society, and Policy track. Entrants are judged based on merit including: (1) relevance of the topic to the study of space history, society, or policy, (2) organization and clarity, (3) technical accuracy and appropriateness of selected analysis methods, and (4) meaningful research conclusions. In addition to a certificate, the winning paper receives a $750 award.

AIAA Space Automation and Robotics Award

Presented on Wednesday, 11 September, 0800 hrs
Ballroom 20A

Robonaut 2 Development Team

Award To Be Accepted By:

Ron Diftler, Robonaut Project Manager, NASA Johnson Space Center, Houston, Texas

"In recognition of the Robonaut 2 Development Team's pioneering technical achievement and advancement of humanoid dexterous robotics for human space exploration."

AIAA Space Operations and Support Award

Presented on Thursday, 12 September, 0800 hrs
Ballroom 20A

Orbital Express Flight Operations Team

Award accepted by:

Robert Friend, Boeing Defense Space and Security, Redondo Beach, California

Col Fred Kennedy, USAF, Robins Air Force Base, Georgia

Randy Rubens, Boeing Advanced Space Systems, Huntington Beach, California

"For recovery from a post-launch anomaly which almost resulted in loss of the mission, and then successfully completing the prime mission objective resulting in becoming the first to perform an automated rendezvous, docking and servicing mission."

AIAA Space Architecture Best Paper Certificate

Presented on Thursday, 12 September, 0800 hrs
Ballroom 20A

"Mockups 101: Code and Standard Research for Space Habitat Analogues," AIAA Paper 2012-5153, Marc Cohen, Palo Alto, California.

Special Events

Special events taking place at this year's forum highlight AIAA programs, services, and communities, and offer new perspectives on aerospace and its importance to our way of life.

Knight Cap: A View from Sacramento with California Senate Select Committee on Aerospace and Defense Chairman Steve Knight

Monday, 9 September **1900–2000 hrs**
Room 32B

An update and discussion on the latest aerospace issues pending before the California legislature and how federal legislation impact state development.

AIAA Corporate Member Business-to-Business (B2B) Networking

Tuesday, 10 September **1000–1330 hrs**
Room 29AB

Join us at the B2B networking event that will help both our prime and our small business members of the space supply chain to learn about the latest technology opportunities, to form new alliances and partnerships, and to maximize business resources. After companies outline what they are looking for in partnerships, there will be one-on-one matchmaking and detailed discussions about programs and opportunities. Registration is required for this event, and is complimentary for AIAA corporate members. There is a $200 fee for those who are not AIAA corporate members.

Panelists:

Michael Chang, Supplier Diversity/Program Deputy, Lockheed Martin Space Systems Company

Raul Alvarado, Jr., Supplier Diversity, The Boeing Company

William H. Pickering Lecture: Curiosity Mars Science Laboratory

Wednesday, 11 September **1730–1900 hrs**
Ballroom 20A

The William H. Pickering Lecture is named for the former NASA Jet Propulsion Laboratory Director to honor his initiation and leadership of America's unmanned scientific space program, from Explorer I in 1958 through the development of the Viking orbiters and Voyager outer planet and interstellar missions. The lecture is open to all attendees and the general public.

On 5 August 2012, NASA's Jet Propulsion Laboratory successfully landed the Curiosity rover on Mars, the largest rover ever sent to another planet. It was built to conduct an investigation of modern and ancient environments. Curiosity has a lifetime of at least one Mars year (~23 months), and drive capability of at least 20 km. The 155-km diameter Gale Crater was chosen as Curiosity's field site based on its regional context and strong evidence for a progression through multiple potentially habitable environments, represented by a stratigraphic record of extraordinary extent, ensuring preservation of a rich record of the environmental history of early Mars.

The landing system seemed crazy to many observers, but it was in fact the result of carefully applied engineering reason and thoughtful analysis, which Dr. Adam Steltzner will discuss. Differing touchdown systems architectures and techniques, airbags, legged landers, pallets, and sky cranes, and how they create understandable, predictable and testable systems will be discussed. Prof. John Grotzinger will highlight the recent mission results, including the discovery of an ancient habitable environment.

Welcome Remarks:
Lt Gen Eugene L. Tattini, USAF (Ret), Deputy Director, NASA Jet Propulsion Laboratory, Pasadena, CA

Speakers:
John Grotzinger, Fletcher Jones Professor of Geology and Curiosity Project Scientist, California Institute of Technology, Pasadena, CA

Adam Steltzner, Manager, Planetary Entry, Descent, and Landing and Small Body Access Office, NASA Jet Propulsion Laboratory, Pasadena, CA

AIAA's Commercial Space Group Presents: The Commercial Leverage Model and Private/Public Partnerships

Wednesday, 11 September **1900–2100 hrs**
Room 33A

Presented by: **Daniel J. Rasky,** Director, Emerging Commercial Space Office, NASA Ames Research Center, Moffett Field, CA

Over the last 20 years NASA has worked in a collaborative fashion with private industry making use of its "Other Transaction Authority" that Congress gave NASA. This new partnership model has now become known as the "Commercial Leverage Model" (CLM). Dr. Rasky will present an historic overview of how the CLM has been used to both speed up the development process while also dramatically reducing costs. Agreements with a wide variety of companies will be discussed including: SpaceHab, SpaceX, Rocketplane Kistler, Orbital Sciences, Sierra Nevada, Bigelow Aerospace, Boeing, Orbital Sciences, Blue Origin and Nanoracks. The success criteria for such agreements will be discussed as well as the applicability of the CLM to future NASA development needs will be discussed.

Special Events

AIAA San Diego Section Guest Speaker: Dale Myers

"NASA Shuttle Battle – From Start to Finish"

Wednesday, 11 September **1900–2000 hrs**
Room 32B

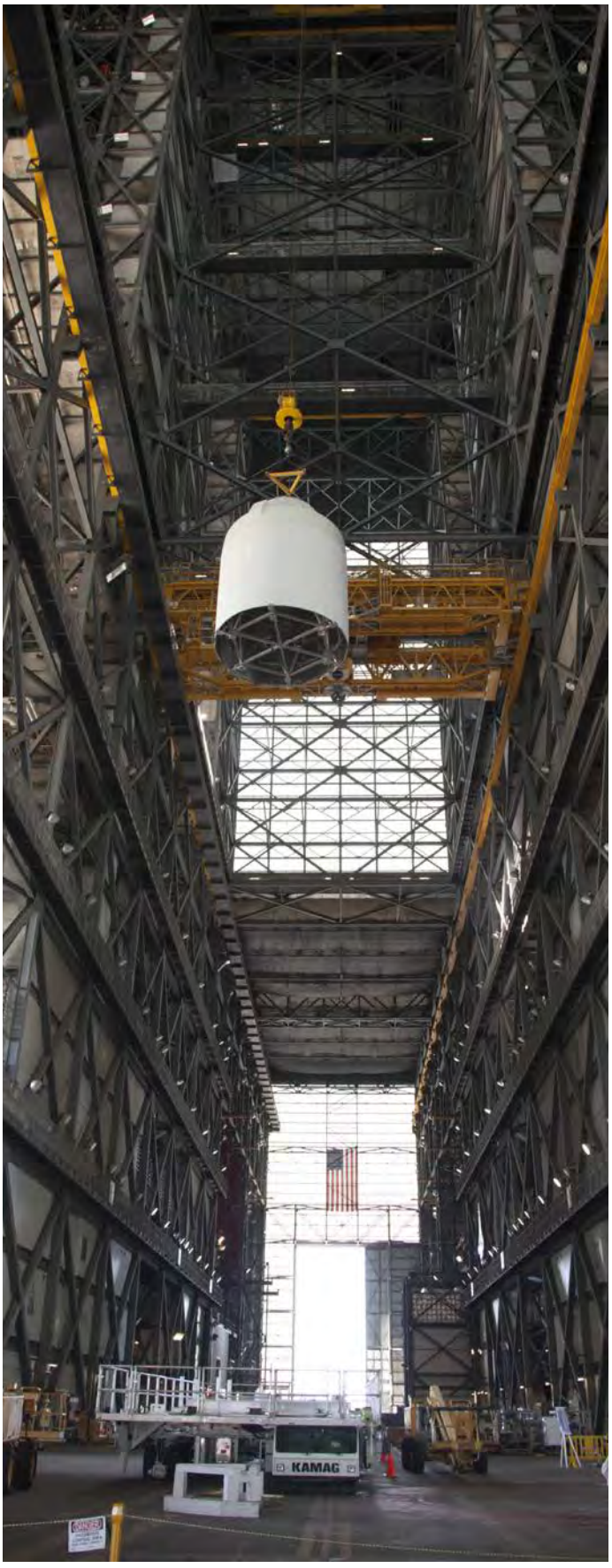
After the Pickering Lecture, the AIAA San Diego Section cordially invites all attendees to a lecture by Dale Myers, on the initiation of the NASA space shuttle program. Dale Myers is 91; and 86 years ago shook hands with his boyhood hero, Charles Lindbergh. From then on, he was hooked on a career in aerospace. In 1964, Myers began working on the Apollo program, followed by the shuttle program in 1969, soon after Apollo 11's historic moon landing. In 1970 Myers was promoted to Associate Administrator for Manned Space Flight at NASA, and was at mission control when Apollo 13 experienced a crippling explosion. On October 6, 1986, eleven months after the Challenger disaster, Myers was selected as Deputy Administrator of NASA after a "persuasive" call from President Ronald Reagan. During that time he was tasked with helping the agency recoup and continue the space shuttle program. Smithsonian historian Roger Launius credits Myers with bringing a sense of optimism to the agency following the disaster. Myers is an Honorary Fellow of AIAA, former president of the National Academy of Engineering, has earned three NASA Distinguished Service Medals, and received an honorary doctorate from Whitworth College.

NASA Reauthorization 2013: What is Happening?

Thursday, 12 September **1000–1200 hrs**
Room 29AB

Looking at historic activity and funding levels, the question is: What is a NASA Reauthorization bill's real impact and goal? Policy experts will discuss the different proposals before Congress for NASA Reauthorization 2013, the historic trends and appropriations, and expectations for future passage.

Moderator: **Jeff M. Bingham,** Senior Advisor on Space and Aeronautics, Republican Staff, Committee on Commerce, Science, and Transportation, United States Senate, Washington, DC



Special Events

AIAA's Rising Leaders in Aerospace Forum provides a forum for young aerospace leaders, age 35 and under, to learn from and engage with others.

Sponsored By

United Launch Alliance

Leadership Exchange

Tuesday, 10 September **1630–1730 hrs**
Room 29AB

An event for young aerospace professionals to meet and network with senior industry leaders.

Senior Mentors
Andy Aldrin, Director of Business Development for Human Launch Services, United Launch Alliance
Michael Griffin, AIAA President
Lt Gen (Ret) Michael Hamel, Senior Vice President, Corporate Strategy & Relations, Orbital Sciences Corporation
Lt Gen (Ret) Larry D. James, Deputy Director, NASA Jet Propulsion Laboratory
Greg Jones, Vice President, Strategy and Business Development, Orbital Sciences Corporation
Janet C. Karika, Director, Interagency Launch Programs, Jacobs NASA Launch Services Program
David King, Executive Vice President, Dynetics, Inc.
Lt Gen (Ret) Tom Sheridan, Vice President, National Security Space, SI Organization, Inc.
Lt Gen (Ret) Eugene L. Tattini, Deputy Director, NASA Jet Propulsion Laboratory

Networking Reception

Tuesday, 10 September **1830–2030 hrs**
Aqua Patio at the Hilton San Diego Bayfront

The AIAA Young Professional Committee will host a networking reception. This is a great opportunity for young professionals to meet other members and make new contacts.

YPC Young Professional Committee

University Design Competition Winners

Wednesday, 11 September **0900–1200 hrs**

Every year AIAA and the AIAA Foundation sponsor several university-level design competitions to allow students to work on systems that resemble current real-world challenges. The competitions are developed by the AIAA Student Activities Committee and various AIAA Technical Committees.

The students review the materials and objectives, design a vehicle or system, and then submit a major design report on their project. Often these projects primarily involve juniors and seniors who will be entering the workforce shortly after submitting their reports. This year's winners in the space categories will be making presentations on their projects as part of the AIAA Rising Leaders in Aerospace Forum.

AIAA Undergraduate Team Space Design Competition
Paper Title: *Conceptual Design for a Space Based Solar Power System*
School: University of Illinois at Urbana-Champaign
Authors: Cory Cameron, Philip Freidin, Brian Levine, Izan Peris Marti, Michael Reindl, Jason Swenson, John Teuber, Ernest Company Vallet
Faculty Advisor: David Carroll

AIAA Undergraduate Team Space Transportation Design Competition
Paper Title: *Ironfly EJ*
School: Embry-Riddle Aeronautical University
Authors: Timothy Grondin, Theresa Brown, Austin Coffey, Peter Edwards, Ryan May, Michael Mezzettone, Reamonn Norat, Sam Patel, Matthew Perry, Tyler Roberson
Faculty Advisor: Eric Perrell

Report from the 2nd Annual SGAC Fusion Forum

Wednesday, 11 September **1100–1130 hrs**
Room 29AB

SPACE GENERATION FUSION FORUM 2013

The Space Generation Advisory Council (SGAC) completed its second Space Generation Fusion Forum (www.spacegenerationfusionforum.org) in conjunction with the 29th Annual National Space Symposium in April in Colorado Springs. Over two days, the Space Generation Fusion Forum offered the next generation of space sector leaders from government, industry, and academia the opportunity to come together to exchange views on current and pressing space topics via interactive panels moderated by today's sector leaders. The AIAA MVP Award was presented to Lewis Groswald, who was selected from the five top participants of the Fusion Forum nominated by a panel of judges comprised of space industry leaders. He will represent SGAC and present the report of the Space Generation Fusion Forum.

Lewis Groswald, Associate Program Officer, Space Studies Board, National Research Council, Washington, DC

Navigating Through the Space Industry as a Young Professional

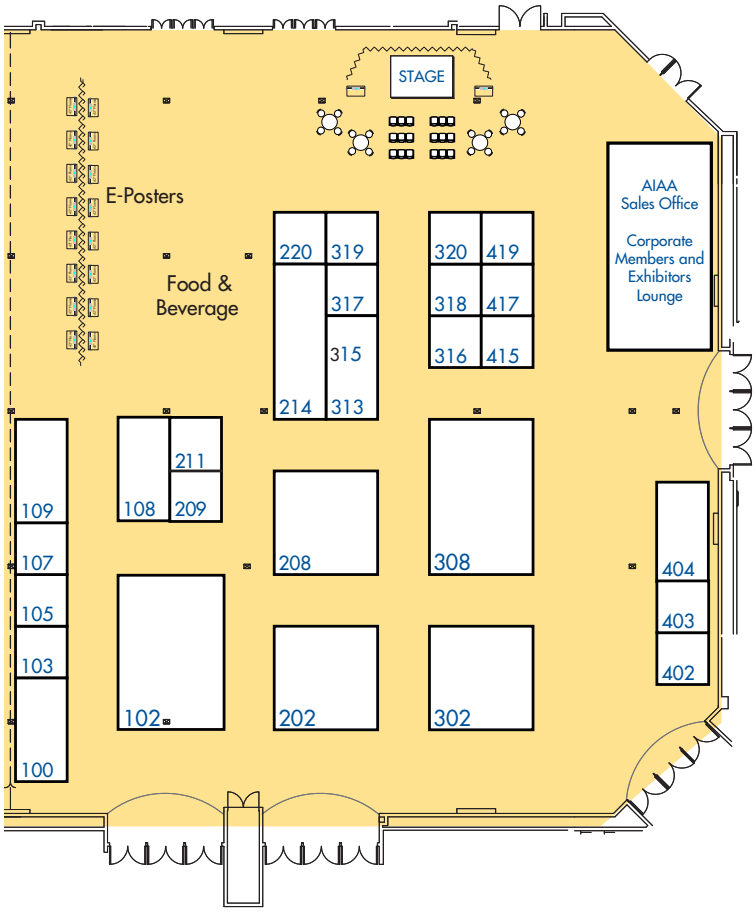
Wednesday, 11 September **1430–1630 hrs**
Room 29AB

Panelists from a variety of backgrounds will draw on their personal experience to share tips and tricks for young professionals in the space industry. This session will offer ample time for questions, discussion, and meeting other YPs who are at the conference.

Moderator: **Kate Stambaugh,** Space Systems Engineer, JHU/APL, Laurel, MD
Panelists:
Sandy Coleman, Director, NASA Exploration Program, ATK Washington Operations
Lewis Groswald, Associate Program Officer, Space Studies Board, National Research Council, Washington, DC
Paul Guthrie, Business Development Lead, The Tauri Group, Alexandria, VA
Ronald Kohl, President, R. J. Kohl & Assoc., Jefferson, MD
Zachary Krevor, Deputy, Systems Engineering and Integration, Dream Chaser Program, Sierra Nevada Corporation, Louisville, CO

Exposition Hall

The exposition hall, located in Ballroom 20CD, is the hub of business and networking activity during SPACE 2013! Networking coffee breaks, luncheons, receptions, e-poster sessions, special sessions, and exhibitor presentations are all held in the exposition hall to give attendees and exhibitors an opportunity to connect with partners, industry thought leaders, and collaborators who can help move your business forward.



Exhibitors by Booth Number

202	Aerojet Rocketdyne
108	AIAA Pubs and Service Center
320	AIAA San Diego Section
211	Airborne Systems
316	Applied Dynamics International
415	ATA Engineering
208	ATK
419	Bell's Airplanes and Rockets
214	The Boeing Company
318	California Space Enterprise Center
103	Department of Commerce
313	Desktop Aeronautics
109	Dunmore Corporation
403	IAC 2012 Toronto
105	International Space School Education Trust
102	Lockheed Martin Corporation
319	Midland Development Corporation
308/404	NASA
402	National Institute for Rocket Propulsion Systems
302	Northrop Grumman Corporation
100	Orbital Sciences Corporation
107	SEDS - USA
220	SLAC - National Accelerator Lab
209	Space Micro
317	Spectral Dynamics
417	Wyle

Exposition Hall

Exposition Hall Hours

Tuesday, 10 September	0900–1600 hrs
Welcome Reception	1730–1900 hrs
Wednesday, 11 September	0900–1600 hrs
Thursday, 12 September	0900–1400 hrs

NEW! E-Poster Sessions

AIAA has partnered with ePosterBoards LLC to bring new electronic poster sessions to this year's event! Highlighting high-quality technical information, the e-poster sessions will be held during the networking coffee breaks on Tuesday and Wednesday in the exposition hall. All e-poster final manuscripts will be included in the online conference proceedings. The e-poster session schedule is as follows:

E-Poster Session I
Tuesday, 10 September
0930–1000 hrs

E-Poster Session II
Tuesday, 10 September
1500–1530 hrs

E-Poster Session III
Wednesday, 11 September
0930–1000 hrs

E-Poster Session IV
Wednesday, 11 September
1400–1430 hrs

Networking Activities in the Exposition Hall

Networking Coffee Break
Tuesday, 10 September
0930–1000 hrs

Networking Luncheon
Tuesday, 10 September
1200–1330 hrs

Networking Coffee Break
Tuesday, 10 September
1500–1530 hrs

Welcome Reception
Tuesday, 10 September
1730–1900 hrs

Networking Coffee Break
Wednesday, 11 September
0930–1000 hrs

Networking Coffee Break
Wednesday, 11 September
1400–1430 hrs

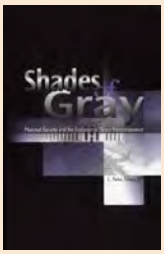
Networking Coffee Break
Thursday, 12 September
0930–1000 hrs

Networking Luncheon
Thursday, 12 September
1200–1330 hrs

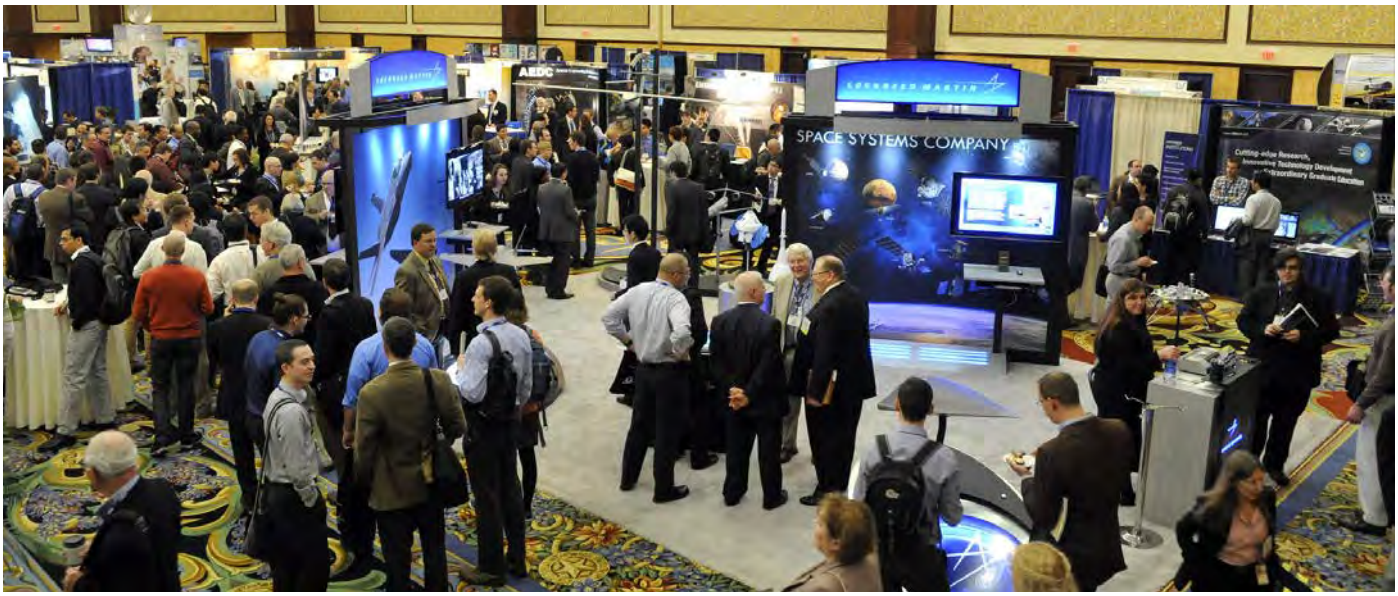
AIAA Pavilion

Stop by the AIAA Pavilion, located in the exposition hall, to browse publications and merchandise, learn about membership benefits, and meet AIAA staff.

30% Off All AIAA Books at SPACE 2013



AIAA Publications is offering a special discount on all titles featured at the AIAA SPACE 2013 Conference & Exposition. Attendees can take advantage of a 30% discount off the list price of all books for sale at the AIAA Bookstore located in the AIAA Pavilion. This special offer will only be available during the forum! Also featured will be the entire 2013 AIAA Book of Month collection at their special month prices. In addition, the title *Shades of Gray*, by L. Parker Temple III, has been selected as the conference book for the AIAA SPACE 2013 Conference, and is on sale for $29.95. Take advantage of these super savings and visit the AIAA Bookstore!



Exhibitors

Aerojet 202

2001 Aerojet Road
Rancho Cordova, CA 95742
www.aerojet.com
glen.mahone@areojet.com

Aerojet is a world recognized aerospace and defense leader providing propulsion and energetic to the space, missile defense, strategic, tactical missile and armaments areas in support of domestic and international markets. GenCorp is a leading technology-based manufacturer of aerospace and defense products and systems with a real estate segment that includes activities related to the entitlement, safe, and leasing of the company's excess real estate assets.

Airborne Systems 211

3000 W. Segerstrom Avenue
Santa Ana, CA 92704
www.airborne-sys.com
kurt.hempe@airborne-sys.com

Airborne Systems, a division of HDT Global, is a world leader in the design, development, fabrication, test and integration of Entry Descent and Landing Systems (EDLS), including parachutes systems, Air Bag Landing Attenuation systems, Inflatable Aerodynamic Decelerators. We provide EDLS systems for various aircraft and spacecraft and is leading the development of new technologies including Inflatable Aerodynamic Decelerators.

Applied Dynamics International 316

3800 Stone School Road
Ann Arbor, MI 48108
www.adi.com
adinfo@adi.com

Applied Dynamics helps companies make better use of simulation assets through all stages of product development, verification testing, demonstration, training, and maintenance. Our user base includes more than 50% of the Fortune 500 aerospace and defense companies and extends into marine, power systems, oil & gas and the automotive industry.

ATA Engineering 415

11995 El Camino Real Suite #200
San Diego, CA 92130
www.ata-e.com
sales@ata-e.com

ATA Engineering, Inc (ATA) is an engineering consulting firm that provides solutions through test- and analysis-driven design by focusing on the needs of manufacturers in addressing their cost, quality, and time-to-market challenges in their mechanical and aerospace systems.

ATK 208

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Corinne, UT 84307
www.atk.com
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donald.sauvegeau@atk.com

ATK is an aerospace, defense, and commercial products company with operations in 21 states, Puerto Rico, and internationally. News and information can be found on the Internet at www.atk.com, on Facebook at www.facebook.com/atk, or on Twitter @ATK.

Bell's Airplanes and Rockets 419

914 Alfred St.
Alexandria, VA 22314
www.bellsairplanesandrockets.com
larisaomk@gmail.com

Bell's Airplanes and Rockets provides high-end scale replicas of aircraft and rockets from around the world. We are a designated retailer for Herpa, Gemini, Dragon Models, Executive Series Display Models and many more. Scales range from 1/72 to 1/1000. Order a the word's rocket systems, past and present, at the same scale to display size and power. Order all of the airlines flying Boeing 737's or Airbus 380's or any of the other airplane-- in the colors they currently use.. Build an airport to scale with vehicles, parking, terminals, trains to accessorize your display. Bell's Airplanes and Rockets.. Visualize Your Dream of Flight!

The Boeing Company 214

6861 Sperryville Lane
Moorpark, CA 93021
Kelly.George@boeing.com

Boeing is the world's largest aerospace company and innovative manufacturer of commercial jetliners and defense, space and security systems. A top U.S. exporter, Boeing products and services include commercial and military aircraft, satellites, weapons, C4ISR, electronic and defense systems, launch systems, and performance-based logistics and training.

Desktop Aeronautics 313

1900 Embarcadero Road
Suite 101
Palo Alto, CA 94303

Desktop Aeronautics provides consulting services for aerodynamic analysis and aircraft design. We work with companies of all sizes on an interim and long-term basis to supplement their technical staff with our specialized expertise. We have developed a portfolio of software applications for aircraft design and optimization. We continually enhance these tools to improve our design and advisory services. We deploy these tools in our consulting, and we license these products to clients for use in-house. The codes in our portfolio include simple software for student use, broadly applicable computational fluid dynamics tools, and customizable aircraft design suites licensed by major airframe manufacturers.

Exhibitors

Dunmore 109

145 Wharton Road
Bristol, PA 19007
www.dunmore.com

DUNMORE is a manufacturer of engineered films and tapes for aerospace, supplying multilayer insulation materials to the aerospace industry for over twenty-five years. With a highly technical product base of over 400 certified products, DUNMORE is the trusted source for engineered aerospace films and tapes. Together we're going places.

IAC 2014 Toronto 313

350 Terry Fox Drive, Suite 104
Kanata, Ontario K2K 2W5
Canada
www.iac2014.org
Geoff@iac2014.org or lynne@iac2014.org

The 2014 International Astronautical Congress – IAC 2014 – will attract over 3,000 space experts from around the world to Toronto from 29 September – 5 October. Toronto is the ideal host city-accessible, affordable, efficient, safe, exciting – a wonderful place to visit!

ISSET (International Space School Educational Trust) 105

HQ Address Carlton House
5 Herbert Terrace
Penarth
CF64 2AH
mham@isset.org

The aim of ISSET is to utilize space exploration to inspire and motivate young people through a variety of programs. ISSET seeks to instill an appreciation of what humans can achieve and to encourage young people particularly in the careers and study in STEM areas.

Lockheed Martin Corporation 415

1011 Lockheed Way
Palmdale, CA 93559
www.lockheedmartin.com
melissa.dalton@lmco.com

Lockheed Martin is a global security and aerospace company principally engaged in the design, development and integration of advanced technology systems to include cutting edge propulsion and thermal protection solutions to enable extremely high speed, precision performance.

Midland Development Corporation 319

109 Main
Midland, TX 79701
zgilbert@midlantxedc.com

The Midland Development Corporation (MDC) incentivizes qualified employers who create and retain a diversified job market in the greater Midland, Texas, region. MDC strives to efficiently cultivate Midland's economic stability, job market and the quality of life. Make Midland home to your company

NASA 308/404

300 E St. SW
Washington, D.C. 20024
www.nasa.gov

Innovate – Explore – Discover – Inspire:
NASA highlights its advanced technology development and capabilities in aeronautics, science, and human and space operations, that also have real world benefits here on Earth, today. Discover NASA's current and future missions to Mars and beyond, and learn about the Agency's contributions to the innovation economy.

National Institute for Rocket Propulsion Systems 402

Marshall Space Flight Center
Huntsville, AL 35812
emma.k.fry@nasa.gov

The National Institute for Rocket Propulsion Systems (NIRPS) serves to foster a vibrant rocket propulsion community that provides reliable and affordable propulsion systems to maintain and advance U.S. leadership in all aspects of rocket propulsion for defense, civil and commercial needs.

Northrop Grumman Corporation 302

One Space Park Dr.
Redondo Beach, CA
USA
www.northropgrumman.com

Northrop Grumman provides innovative systems, products and solutions in aerospace, electronics, information systems, and technical services to government and commercial customers worldwide. The company is a leader in missions ranging from developing nanosatellites, CubeSats and a flexible spacecraft product line to providing timely weather data and protected satellite communications for the warfighter.

Exhibitors

Orbital Sciences Corporation 100

45101 Warp Drive
Dulles, VA 20166
www.orbital.com
Contact: Ken O'Keefe
public.relations@orbital.com

Orbital Sciences Corporation is a leading supplier of reliable and cost-effective space systems. Products include space launch vehicles; missile defense interceptor and target rockets; satellites for commercial communications, science and technology and national security space applications; and human spaceflight systems, including cargo resupply services for the International Space Station.

SLAC-National Accelerator Laboratory 220

2575 Sand Hill Road
Menlo Park, CA 94025
www.slac.stanford.edu
wda@slac.stanford.edu

SLAC National Accelerator Laboratory, operated by Stanford University, has the tools and capabilities to explore frontier questions of science and to develop and engineer the advanced tools required for this exploration. SLAC capabilities include particle beam and accelerator technology, high power radio frequency sources and systems, and high precision mechanical and vacuum fabrication.

Space Micro 209

10237 Flanders Court
San Diego, CA 92121
www.spacemicro.com
sales@spacemicro.com

Space Micro supports the Space industry with affordable high performance communication products. As an engineering-driven small business, we are focused on technology development and product implementation. Our product portfolio includes Digital products, RF Products (TT&C Transponders and Mission Data Transmitters), and GN&C products (Star Trackers and Sun Sensors).

Spectral Dynamics, Inc 317

2060 Wineridge Place, Suite C
Escondido, CA 92029
www.spectraldynamics.com
dellert@sd-star.com

For 52 years Spectral Dynamics has been providing shaker control systems, data acquisition and modal analysis products, based on the correct application of science and engineering. No short cuts! We will be showing the very latest in multi-shaker, MIMO, control using our patented multi-axis testing capabilities. This includes X, Y, Z 3 DOF testing and custom shaker arrangements up to 6 DOF. Let us show you why we have installed more MIMO controllers worldwide, than anyone.

U.S. Department of Commerce 103

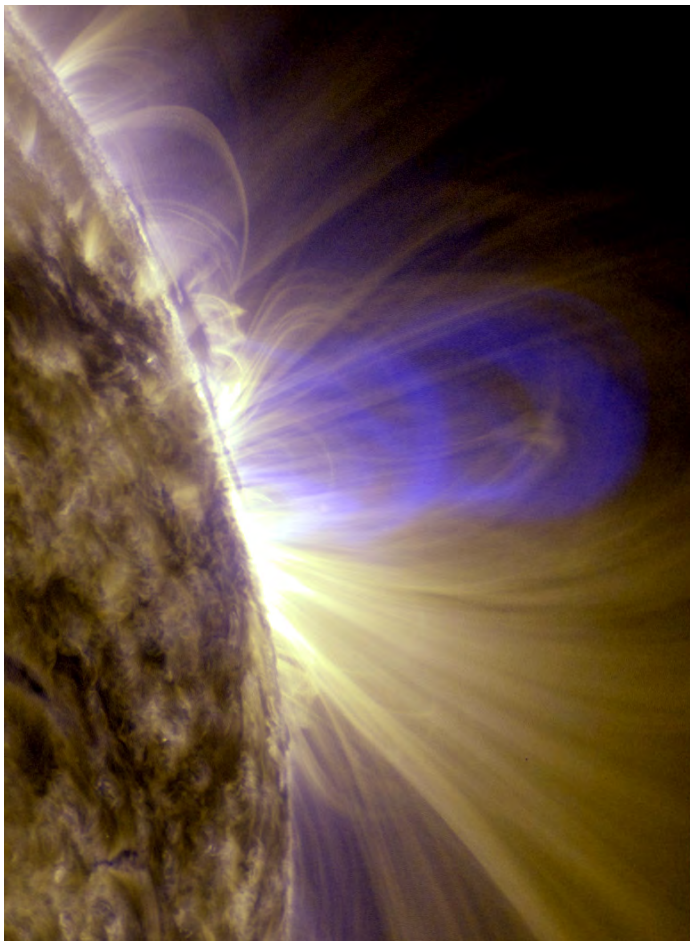
1401 Constitution Ave, NW – HCHB 1093
Washington, DC 20230
www.bis.doc.gov

The Office of Technology Evaluation is the focal point within the U.S. Department of Commerce for analyzing the capabilities of the U.S. industrial base to support the national defense by conducting surveys and assessments of defense-related technologies and industries.

Wyle 417

128 Maryland Street
El Segundo, CA 90245
www.wyle.com
burt.sanchez@wyle.com

Wyle's San Bernardino, California operations serves as a test facility for rocket engine development and qualifications services. Wyle provides high energy flow testing with steam, water, gases and cryogenic fluids using state-of-the-art data acquisition and control systems. Capabilities include: 50,000 lb. Multi-Axis Thrust Stand; Hydrocarbon and other fuels; Non-Reactives; Oxidizers; Cryogenics; Propellant Flows to Multiple Test Pads; Multiple Fluid Delivery Systems; Mil-STD-810 Testing; RTCA/DO-160D Testing; and dynamics.



Presentation Stage

The Presentation Stage provides a range of learning and networking opportunities. It offers exhibitors a chance to explain in detail how their products and services can help you achieve your goals, recognize technical excellence, as well as providing the chance to hear other interesting demonstrations and discussions. Please join us in the exposition hall for the following special presentations!

Tuesday, 10 September 2013

0930-0945 hrs

AIAA

Space History, Society, and Policy Student Best Paper Competition

Presentation of certificate

0945-1000 hrs

NASA 404

NASA's Robo-Glove

Ron Diftler, Robonaut Project Manager

The Robo-Glove was build through the continuing partnership between NASA and GM. It uses Robonaut 2 technology to increase the strength of a human's grasp. The glove would help auto workers and astronauts do their jobs better while potentially reducing the risk of repetitive stress. Robo-Glove is a spin-off of Robonaut 2: a humanoid assistant that's currently working on the ISS.

1500-1515 hrs

Applied Dynamics International 316

Applied Dynamics Overview

Alan Strech

An overview of Applied Dynamics International (ADI) and how they have helped their space-based customers succeed through the use of simulation-centric model based systems engineering tools. ADI has been involved in space programs over fifty years as they have evolved from providing analog computers to today's real-time target systems.

1515-1530 hrs

ATA Engineering 415

ATA Innovations in the Areas of Test and Analysis of Aerospace Structures

ATA Engineering, the 2012 small business winner of NASA's George M. Low award for quality and performance will present their innovations in the areas of test and analysis of aerospace systems.

Wednesday, 11 September 2013

0930-0945 hrs

IAC 2014 Toronto 403

Why Attend IAC 2014 in Toronto?

Geoffrey Languedoc

The International Astronautical Congress – one of the largest global space events with over 3,000 participants – runs from September 29 – October 5, 2014 in Toronto, Ontario. Toronto is the perfect location – easily accessible, affordable, efficient and exciting! We will explain why IAC 2014 is YOUR must-attend space conference in 2014!

0945-1000 hrs

International Space School Education Trust (ISSET) 105

Ignite their Passion!

Michelle Ham

If Space can't ignite student passion for STEM then I don't know what will. I'll tell you about some programs that combine space, leadership and teamwork to ignite their passion for STEM in a fun, hands-on innovate way.

1400-1415 hrs

DUNMORE Corporation
AIAA Corporate Member 403

The Best Dressed Spacecraft All Wear DUNMORE

Art Mallett, Jr.
Business Development Manager
Aerospace Products Group

AIAA Corporate Member DUNMORE Corporation, a manufacturer of thin film products for aerospace and other commercial sectors, will be discussing Spacecraft Thermal Control and the specialized Multi-Layer Insulation (MLI) materials used to accomplish this important function. We welcome the opportunity to discuss this and other important MLI film and tape applications with you during the conference as you visit Dunmore and Bron Aerotech at Booth 109.

General Information

Meeting Site

California's second largest city, San Diego boasts a citywide population of nearly 1.3 million residents and more than 3 million residents countywide. San Diego is renowned for its idyllic climate, 70 miles of pristine beaches, and an array of world-class attractions. Popular attractions include the world-famous San Diego Zoo, Old Town San Diego, and the Gaslamp Quarter. For more information, visit **www.sandiego.org.**

AIAA Registration and Information Center Hours

The AIAA Registration and Information Center will be located in the Ballroom 20 Lobby at the San Diego Convention Center. Hours are as follows:

Monday, 9 September	1500–1900 hrs
Tuesday, 10 September	0700–1700 hrs
Wednesday, 11 September	0700–1700 hrs
Thursday, 12 September	0700–1700 hrs

Wi-Fi Internet Access On Site

Wi-Fi access is available in meeting foyers and session rooms. Select the wireless network: **AIAA SPACE 2013.** To keep this service available and optimized for all attendees, please do not download files larger than 2MB, create multiple sessions across multiple devices, or download multiple files in one session. If you receive an error message that an AIAA server is blocking your current IP address, please inform the AIAA registration desk.

Conference Proceedings

Proceedings for the forum will be available online. The cost is included in the registration fee where indicated. Online proceedings will be available on 10 September 2013. Attendees who register in advance for the online proceedings will be provided with instructions on how to access them. Those registering on site will be provided with instructions at that time.

Author And Session Chair Information

Speakers' Briefings in Session Rooms

Authors who are presenting papers will meet with session chairs and co-chairs in their session rooms for a short briefing on the day of their sessions to exchange bios and review final details prior to the session. Briefings will meet 30 minutes prior to the start of the session. Please attend on the day of your session(s). Laptops pre-loaded with the Speakers' Briefing preparation slides will be provided in each session room. The speakers' briefing schedule is as follows:

Tuesday, 10 September 2013
Morning Sessions: 0930–1000 hrs
Afternoon Sessions: 1500–1530 hrs

Wednesday, 11 September 2013
Morning Sessions: 0930–1000 hrs
Afternoon Sessions: 1400–1430 hrs

Thursday, 13 September 2013
Morning Sessions: 0930–1000 hrs
Afternoon Sessions: 1500–1530 hrs

Session Chair Reports

All session chairs are asked to complete a session chair report to evaluate their session for future planning. AIAA has partnered with Canvas Solutions to provide an electronic Session Chair Report form. You can download the FREE mobile app in your App Store, AppWorld, or Marketplace by searching for "Canvas Solutions, Inc." The mobile app is free, so please be sure to download it. Detailed instructions will be provided in the session rooms. If you do not have a tablet or a smartphone, simply use the report form as a guide and enter your session chair report information at the session chair reporting computer station located onsite near the AIAA registration area. Report data is collected and used for future planning purposes, including session topics and room allocations. Please submit your session chair report **electronically** by **Friday, 13 September 2013.**

Audiovisual

Each session room will be preset with the following: one laptop computer, one LCD projector, one screen, one microphone and sound system (if necessitated by room size), and one laser pointer. You may also use your own computer. Any additional audiovisual equipment requested on site will be at cost to the presenter. Please note that AIAA does not provide security in the session rooms and recommends that items of value not be left unattended.

"No Paper, No Podium" and "No Podium, No Paper" Policies

If a written paper is not submitted by the final manuscript deadline, authors will not be permitted to present the paper at the forum. Also, if the paper is not presented at the forum, it will be withdrawn from the proceedings. It is the responsibility of those authors whose papers or presentations are accepted to ensure that a representative attends the conference to present the paper. These policies are intended to improve the quality of the program for attendees.

Journal Publication

Authors of appropriate papers are encouraged to submit them for possible publication in one of the Institute's archival journals: *AIAA Journal; Journal of Aircraft; Journal of Guidance, Control, and Dynamics; Journal of Propulsion and Power; Journal of Spacecraft and Rockets; Journal of Thermophysics and Heat Transfer; or Journal of Aerospace Information Systems* (formerly *Journal of Aerospace Computing, Information, and Communication)*. You may now submit your paper online at **http://mc.manuscriptcentral.com/aiaa.**

General Information

Messages and Information

Messages will be recorded and posted on a bulletin board in the registration area. It is not possible to page attendees. AIAA reserves the right to remove inappropriate notices.

Certificate of Attendance

Certificates of Attendance are available for attendees who request documentation at the conference itself. Please request your copy at the AIAA Registration and Information Center. AIAA offers this service to better serve the needs of the professional community. Claims of hours or applicability toward professional education requirements are the responsibility of the participant.

Employment Opportunities

AIAA assists members who are searching for employment by providing a bulletin board at events. This bulletin board is solely for "open position" and "available for employment" postings. Employers are encouraged to have personnel who are attending an AIAA forum bring "open position" job postings. Individual AIAA members may post "available for employment" notices. AIAA cannot assume responsibility for notices forwarded to AIAA Headquarters. AIAA reserves the right to remove inappropriate notices. AIAA members can post and browse resumes, browse job listings, and access other online employment resources by visiting the AIAA Career Center at http://careercenter.aiaa.org.

Membership

AIAA is your vital lifelong link to the collective creativity and brainpower of the aerospace profession and a champion for its achievements – and nonmembers who pay the full nonmember registration fee will receive their first year's AIAA membership at no additional cost! Students who are not yet members may apply their registration fee toward their first year's student member dues. (Free membership is not included in discounted group-rate registration.)

Young Professional Guide for Gaining Management Support

Young professionals have the unique opportunity to meet and learn from some of the most important people in the business by attending conferences and participating in AIAA activities. A detailed online guide, published by the AIAA Young Professional Committee, is available to help you gain support and financial backing from your company. The guide explains the benefits of participation, offers recommendations and provides an example letter for seeking management support and funding, and shows you how to get the most out of your participation. The online guide can be found on the AIAA website at www.aiaa.org/YPGuide.

Nondiscriminatory Practices

AIAA accepts registrations irrespective of race, creed, gender, color, sexual orientation, physical handicap, and national or ethnic origin.

Restrictions

Photography or the video or audio recording of sessions or exhibits, as well as the unauthorized sale of AIAA-copyrighted material, is prohibited.

International Traffic in Arms Regulations (ITAR)

AIAA speakers and attendees are reminded that some topics discussed at the forum could be controlled by the International Traffic in Arms Regulations (ITAR). U.S. nationals (U.S. citizens and permanent residents) are responsible for ensuring that technical data they present in open sessions to non-U.S. nationals in attendance or in conference proceedings are not export restricted by the ITAR. U.S. nationals are likewise responsible for ensuring that they do not discuss ITAR export-restricted information with non-U.S. nationals in attendance.

AIAA is the largest aerospace professional society in the world, serving a diverse range of more than 35,000 individual from 80 countries, and over 100 corporate members whose innovative, high-value profession helps make the world safer, more connected, more accessible, and more prosperous. AIAA members have produced everything from the brilliant innovations that improve daily life to the major missions that exemplify the human drive to explore and to achieve amazing things. AIAA is dedicated to igniting and celebrating aerospace ingenuity and collaboration, and conveying the importance of aerospace to our way of life, to help inspire innovation and drive technological progress in the U.S. and throughout the world.

American Institute of Aeronautics and Astronautics
1801 Alexander Bell Drive, Suite 500
Reston, VA 20191-4344
703.264.7500 or 800.639.AIAA (2422)
Fax: 703.264.7657
custserv@aiaa.org
www.aiaa.org
@aiaa

Committee Meetings

Meetings held at Hilton San Diego Bayfront unless otherwise indicated

Sunday, 8 September 2013		
1800-2200 hrs	**TAC Space and Missiles Group**	Aqua 314
Monday, 9 September 2013		
0800-1800 hrs	**Space Transportation TC**	Aqua 310
0830-1630 hrs	**Systems Engineering TC**	Cobalt 500
1300-1800 hrs	**Space Systems TC**	Aqua 313
1500-2200 hrs	**Space Colonization TC**	Cobalt 520
1700-2000 hrs	**Space Operations and Support TC**	Cobalt 505
1730-2030 hrs	**Space Automation and Robotics TC**	Cobalt 500
1800-2100 hrs	**Space Resources TC**	Aqua 311
1900-2200 hrs	**Space Logistics TC**	Cobalt 504
Tuesday, 10 September 2013		
1800-2100 hrs	**Space Tethers TC**	Cobalt 503
1830-2130 hrs	**Economics TC**	Aqua 310
1830-2200 hrs	**Small Satellite TC**	Cobalt 500
1900-2200 hrs	**Reusable Launch Vehicles PC**	Cobalt 505
1900-2200 hrs	**Space Exploration PC**	Cobalt 504
Wednesday, 11 September 2013		
1500-1600 hrs	**AIAA Public Policy Committee Space Subcommittee**	Cobalt 503
1530-1630 hrs	**SPACE 2014 Forum Executive Steering Committee**	Cobalt 504
1900–2100 hrs	**Commercial Space Group**	Convention Center Room 33A
Thursday, 12 September 2013		
0930-1230 hrs	**Corporate Membership Committee Meeting**	Cobalt 500
1530-1630 hrs	**SPACE 2014 Forum Technical Program Committee**	Cobalt 500
1630-1730 hrs	**SPACE 2014 Forum Organizing Committee**	Cobalt 500

Organizing Committee

Executive Steering Committee

Greg Jones, Vice President, Strategy and Business Development, Orbital Sciences Corporation

David King, Executive Vice President, Dynetics, Inc.

Peter McGrath, Director, Space Exploration Business Development, The Boeing Company

Peter Montgomery, Resource Provisioning Department Director, TOSC Group, Jacobs Technology Inc.

Lt Gen (Ret) Tom Sheridan, Vice President, National Security Space, SI Organization, Inc.

Mary Snitch, Corporate Engineering and Technology, Lockheed Martin Corporation

Lt Gen (Ret) Eugene L. Tattini, Deputy Director, NASA Jet Propulsion Laboratory

Gabe Watson, Vice President GEOINT, Sensing & Science, Space Systems, Northrop Grumman Aerospace Systems

Organizing Committee

General Chair
Peter Montgomery, Resource Provisioning Department Director, TOSC Group, Jacobs Technology Inc.

Technical Program Chair
Randy Kendall, The Aerospace Corporation

Technical Program Co-Chair
John Chobany, The Aerospace Corporation

Education Chair
Steven Gorrell, Brigham Young University

International Chair
James Rendleman, USSTRATCOM JFCC SPACE

Member Engagement Chair
Kevin Burns, Northrop Grumman Corporation

Public Policy Chair
J. R. Edwards, Lockheed Martin Corporation

Recognition Chair
Jeffrey Puschell, Raytheon Company

Social Media Chair
Greg Johnston, Infotech Enterprises America

Young Professional Chairs
Zachary Krevor, Sierra Nevada Corporation

Katherine Stambaugh, Johns Hopkins University Applied Physics Laboratory

Technical Program Committee

Commercial Space Track
Lisa Matthews, Sierra Nevada Corporation

Bruce Pittman, NASA Space Portal/ NASA Ames Research Center

Intelligent Systems Track
Christopher Tschan, The Aerospace Corporation

Paul Zetocha, Air Force Research Laboratory

Nanosats and Small Sats Track
Amy Lo, Northrop Grumman Corporation

Virendra Sarohia, NASA Jet Propulsion Laboratory

Robotic Technology and Space Architecture Track
Steven Fredrickson, NASA Johnson Space Center

Shazhad Khaligh, DoD/AF/ENI

Francois Levy, Synthesis International

Gregory Scott, U.S. Naval Research Laboratory

Space and Earth Science Track
Virendra Sarohia, NASA Jet Propulsion Laboratory

Space Colonization and Space Tethers Track
Sven Bilen, The Pennsylvania State University

Anita Gale, The Boeing Company

Space Exploration Track
Chris Moore, NASA Headquarters

Surendra Sharma, NASA Ames Research Center

Space History, Society, and Policy Track
Soumyo Dutta, Georgia Institute of Technology

Cam Martin, NASA Headquarters

James Rendleman, USSTRATCOM JFCC SPACE

Space Logistics and Supportability Track
Kandyce Goodliff, NASA Headquarters

Space Operations Track
Shirley Tseng, MorganFranklin Corporation

Space Resources Track
David (Larry) Clark, Lockheed Martin Corporation

Leslie Gertsch, Missouri University of Science and Technology

Space Systems and Sensors Track
Jim Baker, Arrow Science and Technology

Amy Lo, Northrop Grumman Corporation

Space Systems Engineering and Space Economics Track
Michelle Bailey, University of Maryland University College/University of Alabama in Huntsville

Jairus Hihn, NASA Jet Propulsion Laboratory

Space Transportation and Launch Systems Track
Adam Dissel, Lockheed Martin Corporation

Barry Hellman, Air Force Research Laboratory

Miroslav Sir, The Aerospace Corporation

AIAA TAC Space and Missiles Group Director
Trevor Sorensen, University of Hawaii at Manoa

Program at a Glance

Abbreviation	Title	Start Time	Location
	Tuesday, 10 September 2013		
1-NW-1	**Tuesday Networking Breakfast**	0700 Hrs	Ballroom 20 Lobby
2-PLNRY-1	**Opening Plenary: A Conversation with Space Executives**	0800 Hrs	Ballroom 20A
3-NW-2	**Tuesday Morning Networking Coffee Break**	0930 Hrs	Ballroom 20CD
4-PSTR-1	**E-Poster Session I**	0930 Hrs	Ballroom 20CD
5-SB-1	**Tuesday Morning Speakers' Briefing in Session Rooms**	0930 Hrs	Session Rooms
6-COL-1/SR-1	**Asteroid Mining and Colonization**	1000 Hrs	Room 33A
7-CS-1	**Orbital Space Vehicle Missions**	1000 Hrs	Room 28A
8-EXPL-1	**Project Morpheus and Autonomous Precision Landing**	1000 Hrs	Room 28B
9-HS-1	**Space System Development and Societal Impact**	1000 Hrs	Room 28C
10-OPS-1	**Space Operations Best Practices I**	1000 Hrs	Room 32A
11-PANEL-1	**Current Launch Vehicle Update**	1000 Hrs	Room 30AB
12-PANEL-2	**Mars Exploration Program: Exploration and Discovery**	1000 Hrs	Room 30CD
13-PANEL-3	**Enabling In-Space Infrastructure**	1000 Hrs	Room 31AB
14-SATS-1	**Nanosat and Small Sat Missions**	1000 Hrs	Room 32B
15-SL-1	**Logistics and Supportability for Exploration**	1000 Hrs	Room 31C
16-ST-1	**Key Technical Aspects of Reusable Launch Vehicles**	1000 Hrs	Room 28D
17-AIAA-1	**AIAA Business-to-Business (B2B) Networking**	1000 Hrs	Room 29AB
18-SSEE-5	**Specialized Systems Engineering**	1000 Hrs	Room 30E
19-RSA-4	**Space Robotics Inspection and Servicing**	1000 Hrs	Room 29CD
20-NW-3	**Tuesday Networking Luncheon**	1200 Hrs	Ballroom 20CD
21-PLNRY-2	**The Evolving Landscape of the Space Business**	1330 Hrs	Ballroom 20A
22-NW-4	**Tuesday Afternoon Networking Coffee Break**	1500 Hrs	Ballroom 20CD
23-PSTR-2	**E-Poster Session II**	1500 Hrs	Ballroom 20CD
24-SB-2	**Tuesday Afternoon Speakers' Briefing in Session Rooms**	1500 Hrs	Session Rooms
25-COL-2	**Space Colonization**	1530 Hrs	Room 32B
26-CS-2	**Sub-Orbital Space Vehicle Missions**	1530 Hrs	Room 28A
27-EXPL-2	**Advanced In-Space Transportation Systems for Exploration**	1530 Hrs	Room 28B
28-HS-2	**Space History**	1530 Hrs	Room 28C
29-OPS-2	**Space Operations Modeling and Simulation**	1530 Hrs	Room 32A
30-PANEL-4	**Engineering Global Space Leadership with STEM**	1530 Hrs	Room 30AB
31-PANEL-5	**Human Spaceflight Progress Report**	1530 Hrs	Room 30CD
32-PANEL-6	**NASA Space Science: The Next 30 Years**	1530 Hrs	Room 31AB
33-RSA-1	**Modular Design and Surface Construction**	1530 Hrs	Room 29CD
34-SSEE-2	**Topics in Space Economics**	1530 Hrs	Room 30E
35-ST-2	**Space Transportation Design Methods**	1530 Hrs	Room 28D
36-SYS-1	**Space Systems Missions**	1530 Hrs	Room 31C
37-EXPL-9/RSA-5/SR-5	**Asteroid, Moon, or Mars ISRU Equipment**	1530 Hrs	Room 33A
38-AIAA-2	**Rising Leaders in Aerospace Leadership Exchange**	1630 Hrs	Room 29AB

Program at a Glance

Abbreviation	Title	Start Time	Location
	Wednesday, 11 September 2013		
41-NW-6	**Wednesday Networking Breakfast**	0700 Hrs	Ballroom 20 Lobby
42-PLNRY-3	**Space Exploration for Inspiration and Profit**	0800 Hrs	Ballroom 20A
43-NW-7	**Wednesday Morning Networking Coffee Break**	0930 Hrs	Ballroom 20CD
44-PSTR-3	**E-Poster Session III**	0930 Hrs	Ballroom 20CD
45-SB-3	**Wednesday Morning Speakers' Briefing in Session Rooms**	0930 Hrs	Session Rooms
46-AIAA-3	**Rising Leaders in Aerospace: University Design Competition Winners and Report from the 2nd Annual SGAC Fusion Forum**	1000 Hrs	Room 29AB
47-AIAA-4	**AIAA Educator Academy: Mars Rover Demonstration**	1000 Hrs	Room 29CD
48-COL-3	**Space Tether Missions and Technologies**	1000 Hrs	Room 32B
49-CS-3	**Commercial Space Science**	1000 Hrs	Room 28A
50-EXPL-3	**Life Support for Deep Space**	1000 Hrs	Room 28B
51-HS-3	**Law and Policy Foundations to System Succes**	1000 Hrs	Room 28C
52-OPS-3	**Space Operations Ground Systems Architectures**	1000 Hrs	Room 32A
53-OPS-4/RSA-2/SR-2	**Space Resources Surface Operations**	1000 Hrs	Room 33A
54-PANEL-7	**Commercial Space Operations and Services as Stepping-Stone Enablers for Space Exploration**	1000 Hrs	Room 30AB
55-SL-2	**Logistics Modeling**	1000 Hrs	Room 31C
56-SSEE-3	**Space System Architectures and Development**	1000 Hrs	Room 30E
57-ST-3	**Launch Systems**	1000 Hrs	Room 28D
58-PANEL-8	**Designing with Operations in Mind**	1000 Hrs	Room 30CD
59-PANEL-9	**The Rise of CubeSats and Small Satellites: Missions and Opportunities**	1000 Hrs	Room 31AB
60-NW-3	**Luncheon: NASA's Asteroid Redirect Mission**	1200 Hrs	Ballroom 20A
61-SB-4	**Wednesday Afternoon Speakers' Briefing in Session Rooms**	1400 Hrs	Session Rooms
62-NW-9	**Wednesday Afternoon Networking Coffee Break**	1400 Hrs	Ballroom 20CD
63-PSTR-4	**E-Poster Session IV**	1400 Hrs	Ballroom 20CD
64-SSEE-1	**Advances in Concurrent Engineering**	1430 Hrs	Room 28C
65-PANEL-12	**Stimulating Innovation: Societal Imperatives and Commercial Opportunities**	1430 Hrs	Room 30CD
66-AIAA-5	**Rising Leaders in Aerospace: Navigating Through the Space Industry as a Young Professional**	1430 Hrs	Room 29AB
67-EXPL-4	**Deep Space Habitation**	1430 Hrs	Room 28B
68-COL-4/EXPL-5/ RSA-3/SR-3	**Using Regolith for Construction**	1430 Hrs	Room 33A
69-CS-4	**Orbital Satellite Extended Missions and Life Cycle**	1430 Hrs	Room 28A
70-IS-1	**Intelligent Systems for Space: Practical Applications**	1430 Hrs	Room 32B
71-OPS-5	**Space Operations Best Practices II**	1430 Hrs	Room 32A
72-PANEL-10	**Commercial Crew and Cargo Program Status**	1430 Hrs	Room 30AB
73-PANEL-11	**Hosted and Rideshare Payloads for Reducing the Cost of Access to Space**	1430 Hrs	Room 31AB
74-SSEE-4	**Optimizing Mission Design**	1430 Hrs	Room 30E
75-ST-4	**Advanced Space Transportation Technologies**	1430 Hrs	Room 28D
76-SYS-2	**Space Systems Sensors**	1430 Hrs	Room 31C
77-NW-10	**Networking Happy Hour**	1630 Hrs	Ballroom 20 Lobby
78-LECT-1	**William H. Pickering Lecture: Curiosity Mars Science Laboratory**	1730 Hrs	Ballroom 20A
79-AIAA-6	**AIAA San Diego Section Guest Speaker: Dale Myers**	1900 Hrs	Room 32B

Program at a Glance

Abbreviation	Title	Start Time	Location
	Thursday, 12 September 2013		
80-NW-11	**Thursday Networking Breakfast**	0700 Hrs	Ballroom 20 Lobby
81-PLNRY-4	**Aligning Technology Roadmaps to Support Goals**	0800 Hrs	Ballroom 20A
82-NW-12	**Thursday Morning Networking Coffee Break**	0930 Hrs	Ballroom 20CD
83-SB-5	**Thursday Morning Speakers' Briefing in Session Rooms**	0930 Hrs	Session Rooms
84-PANEL-14	**Space Technology Development at NASA: Today and the Future**	1000 Hrs	Room 30AB
85-CS-5	**Commercializing Space Exploration**	1000 Hrs	Room 28A
86-EXPL-6/SR-4	**How Space Resources Enable Space Exploration**	1000 Hrs	Room 33A
87-EXPL-7	**Human and Robotic Mission Operations**	1000 Hrs	Room 28B
88-EXPL-8	**Human Exploration of Cis-Lunar Space**	1000 Hrs	Room 28C
89-IS-2	**Intelligent Systems for Space: Technical Developments**	1000 Hrs	Room 32B
90-SL-3	**DARPA Phoenix Program: Latest News**	1000 Hrs	Room 31C
91-SSEE-6	**Issues in Space Economics Policy**	1000 Hrs	Room 30E
92-ST-5	**Space Transportation Architectures**	1000 Hrs	Room 28D
93-SYS-3	**Space Systems Technology I**	1000 Hrs	Room 32A
94-AIAA-7	**AIAA Public Policy Event: NASA Reauthorization 2013 - What is Happening?**	1000 Hrs	Room 29AB
95-PANEL-13	**Space Debris and Space Operations: The Next 30 Years**	1000 Hrs	Room 30CD
96-NW-13	**Thursday Networking Luncheon**	1200 Hrs	Ballroom 20CD
97-PLNRY-5	**The Way Ahead for Space-Based Weather Monitoring**	1330 Hrs	Ballroom 20A
98-NW-14	**Thursday Afternoon Networking Coffee Break**	1500 Hrs	Ballroom 20 Lobby
99-SB-6	**Thursday Afternoon Speakers' Briefing in Session Rooms**	1500 Hrs	Session Rooms
100-PANEL-16	**Earth Science Satellite Missions and Opportunities**	1530 Hrs	Room 30CD
101-EXPL-10	**Coordinating Scientific and Human Exploration of Mars**	1530 Hrs	Room 28A
102-EXPL-11	**Mission Architectures**	1530 Hrs	Room 28B
103-PANEL-15	**Bringing Space Technology to Market: Effects of U.S. Policies and Practices**	1530 Hrs	Room 30AB
104-RSA-6	**Habitat Support Systems**	1530 Hrs	Room 32B
105-SATS-2	**Nanosat and Small Sat Technology**	1530 Hrs	Room 31C
106-SR-6	**Processing Space Resources**	1530 Hrs	Room 33A
107-SSEE-7	**Advances in Cost Analysis**	1530 Hrs	Room 30E
108-SSEE-8	**Risk Management**	1530 Hrs	Room 28C
109-ST-6	**Innovative Reusable Launch Vehicle Concept Design**	1530 Hrs	Room 28D
110-SYS-4	**Space Systems Technology II**	1530 Hrs	Room 32A
111-PLNRY-6	**Closing Remarks and Preview of AIAA SPACE 2014 Forum**	1730 Hrs	Ballroom 20A

Tuesday, 10 September 2013		
1-NW-1 0700 - 0800 hrs	Tuesday Networking Breakfast	Ballroom 20 Lobby

Tuesday, 10 September 2013		
2-PLNRY-1 0800 - 0930 hrs	Opening Plenary: A Conversation with Space Executives	Ballroom 20A

The space landscape is changing. New players are emerging, business models are evolving, government priorities are shifting. At the same time, a new fiscal reality is setting in globally. With these outside drivers as a backdrop, space industry leaders will discuss how space exploration, space exploitation, and space-based defense can complement one another to provide a clear path for our industry. In challenging times, what roles do ingenuity and collaboration play in enabling mission success?

Welcome Remarks
Michael D. Griffin
President, AIAA
Reston, VA

Moderator: Lt Gen Larry D. James, USAF (Ret), Deputy Director, NASA Jet Propulsion Laboratory, Pasadena, CA

Panelists:

Roger A. Krone
President, Network and Space Systems, Boeing Space, Defense & Security
The Boeing Company
Arlington, VA

Mark Valerio
Vice President and General Manager, Military Space, Lockheed Martin Space Systems
Lockheed Martin Corporation
Denver, CO

Gabe A. Watson
Vice President, GEOInt Sensing and Science, Space Systems
Northrop Grumman Aerospace Systems, Northrop Grumman Corporation
Redondo Beach, CA

Tuesday, 10 September 2013		
3-NW-2 0930 - 1000 hrs	Tuesday Morning Networking Coffee Break	Ballroom 20CD

Tuesday, 10 September 2013				
4-PSTR-1	E-Poster Session I			Ballroom 20CD
Chaired by: J. CHOBANY				
0930 hrs AIAA-2013-5301 **The Strategic Defense of Earth: A New Paradigm for Space Science** C. Jones, 21st Century Science and Technology, Washington, DC				

Tuesday, 10 September 2013		
5-SB-1 0930 - 1000 hrs	Tuesday Morning Speakers' Briefing in Session Rooms	Session Rooms

Tuesday, 10 September 2013				
6-COL-1/SR-1	Asteroid Mining and Colonization			Room 33A
Chaired by: K. ZACNY, Honeybee Robotics Spacecraft Mechanisms Corp				
1000 hrs AIAA-2013-5302 **Tethered Asteroids** J. Van Zandt, MITRE Corporation, Bedford, MA	1030 hrs AIAA-2013-5303 **Human Settlement on a Near-Earth Asteroid** E. Joyce, M. Snyder, Schuder Technologies, LLC, Bellevue, OH	1100 hrs AIAA-2013-5304 **Asteroid Mining** K. Zacny, Honeybee Robotics, Pasadena, CA; M. Cohen, Astrotecture, Moffett Field, CA; W. James, V Infinity Research LLC, Altadena, CA; B. Hilscher, Hatch Engineering, Vancouver, Canada	1130 hrs AIAA-2013-5305 **A Tool for the Automated Design and Evaluation of Habitat Interior Layouts** M. Simon, NASA Langley Research Center, Hampton, VA; A. Wilhite, Georgia Institute of Technology, Hampton, VA	

Tuesday, 10 September 2013				
7-CS-1	**Orbital Space Vehicle Missions**			**Room 28A**
Chaired by: L. MATTHEWS, Sierra Nevada Corporation				
1000 hrs AIAA-2013-5306 **Boeing CST-100 Landing and Recovery System Design and Development an Integrated Approach to Landing** J. McKinney, J. McCann, The Boeing Company, Huntington Beach, CA; T. Taylor, Cimarron, Inc., Houston, TX; T. DePauw, The Boeing Company, Huntington Beach, CA	1030 hrs AIAA-2013-5307 **The Advantages of a Hardware Based Design Methodology** Z. Krevor, R. Howard, T. Mosher, J. Curry, M. Sanchez, J. Voss, Sierra Nevada Corporation, Louisville, CO	1100 hrs AIAA-2013-5308 **Antares- A Proven Launch System for Medium Lift** J. Steinmeyer, W. Frick, M. Pieczynski, Orbital Sciences Corporation, Dulles, VA	1130 hrs AIAA-2013-5309 **Project Rhea: A Manned Reusable Spacecraft For The Scientific Observation of Mars** D. Agarwal, D. Corio, B. Massey, J. McGee, J. Ojeda, I. Root, E. Schrantz, Virginia Polytechnic Institute and State University, Blacksburg, VA	

Tuesday, 10 September 2013				
8-EXPL-1	**Project Morpheus and Autonomous Precision Landing**			**Room 28B**
Chaired by: J. WARREN, NASA Headquarters				
1000 hrs AIAA-2013-5310 **Project Morpheus: Lessons Learned in Lander Technology Development** J. Olansen, S. Munday, J. Devolites, M. Baine, NASA Johnson Space Center, Houston, TX	1030 hrs AIAA-2013-5311 **Helicopter Field Testing of NASA's Autonomous Landing and Hazard Avoidance Technology (ALHAT) System Fully Integrated with the Morpheus Vertical Test Bed Avionics** D. Rutishauser, C. Epp, E. Robertson, NASA Johnson Space Center, Houston, TX	1100 hrs AIAA-2013-5312 **Lidar Sensors for Autonomous Landing and Hazard Avoidance** F. Amzajerdian, NASA Langley Research Center, Hampton, VA; D. Pierrottet, Coherent Applications, Inc., Hampton, VA; L. Petway, G. Hines, V. Roback, R. Reisse, NASA Langley Research Center, Hampton, VA	1130 hrs AIAA-2013-5313 **Helicopter Flight Testing of a Real-Time Hazard Detection System for Safe Lunar Landing** J. Carson, N. Trawny, A. Huertas, M. Luna, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA; V. Roback, NASA Langley Research Center, Hampton, VA; A. Johnson, K. Martin, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA	

Tuesday, 10 September 2013				
9-HS-1	**Space System Development and Societal Impact**			**Room 28C**
Chaired by: S. DUTTA, Georgia Institute of Technology and J. LAFLEUR, Georgia Institute of Technology				
1000 hrs AIAA-2013-5314 **Review of Recent U.S. Human Space Exploration Plans Beyond Low Earth Orbit** P. Chai, S. Currey, C. Jones, Georgia Institute of Technology, Atlanta, GA	1030 hrs AIAA-2013-5315 **Adjusting to Reality: A Sustainable Capability-Driven Approach for NASA** M. Barton, Purdue University, West Lafayette, IN	1100 hrs AIAA-2013-5316 **Political and Technical Considerations in Developing the Space Transportation System** J. Hundley, E. Hampton, K. Baggett, B. Leahy, Zero Point Frontiers Corporation, Huntsville, AL	1130 hrs AIAA-2013-5317 **Human Space Flight in a Whole New Context for A Whole New World** W. Gerstenmaier, T. Cremins, NASA Headquarters, Washington, DC	

Tuesday, 10 September 2013				
10-OPS-1	**Space Operations Best Practices I**			**Room 32A**
Chaired by: R. HARVEY, Johns Hopkins University Applied Physics Laboratory				
1000 hrs AIAA-2013-5318 **Towards a Decision Support System for Spaceflight Operations** J. Ruszkowski, C. Hogle, NASA Johnson Space Center, Houston, TX; L. Meshkat, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA	1030 hrs AIAA-2013-5319 **A system for fault management and fault consequences analysis for NASA's Deep Space Habitat** S. Colombano, L. Spirkovska, NASA Ames Research Center, Moffett Field, CA; V. Baskaran, Stinger Ghaffarian Technologies, Inc., Moffett Field, CA; G. Aaseng, R. McCann, NASA Ames Research Center, Moffett Field, CA; J. Ossenfort, I. Smith, Stinger Ghaffarian Technologies, Inc., Moffett Field, CA; D. Iverson, M. Schwabacher, NASA Ames Research Center, Moffett Field, CA	1100 hrs AIAA-2013-5320 **Fully Autonomous Data Recovery with the NuSTAR Ground System** B. Roberts, J. Thorsness, M. Bester, University of California, Berkeley, Berkeley, CA	1130 hrs AIAA-2013-5321 **GN&C Engineering Discipline Lessons Learned from NASA's Experiences with Human Spaceflight Operations** C. Dennehy, NASA Goddard Space Flight Center, Greenbelt, MD; G. Dittemore, NASA Johnson Space Center, Houston, TX	

Tuesday, 10 September 2013		
11-PANEL-1 1000 - 1200 hrs	**Current Launch Vehicle Update**	Room 30AB

Chaired by: J. KARIKA, Jacobs Technology

Panelists will present an update of their launch vehicle programs to include recent launch history, planned manifests, and new initiatives.

Moderator: Janet Karika, Director of Interagency Launch Programs, Jacobs NASA Launch Services Program, Kennedy Space Center, FL

Panelists:

Andrew Aldrin
Director, Director, Human Launch Services
United Launch Alliance (ULA)
Centennial, CO

Adam Harris
Vice President, Government Sales
Space Exploration Technologies Corporation (SpaceX)
Hawthorne, CA

Jim Kramer
Chief Engineer and Senior Director for Mission Assurance
International Launch Services (ILS)
Reston, VA

Mark Pieczynski
Vice President, Southern California Engineering Center and Space Launch Business Development, Launch Systems Group
Orbital Sciences Corporation (OSC)
Chandler, AZ

Tuesday, 10 September 2013		
12-PANEL-2 1000 - 1200 hrs	**Mars Exploration Program: Exploration and Discovery**	Room 30CD

Chaired by: F. LI

This panel will discuss the status of several Mars missions, including the Curiosity rover, the MAVEN mission, and the status of the Mars 2020 mission; as well as the investments in new technologies that will enable Mars exploration in the future.

Moderator: Fuk Li, Director, Mars Exploration Directorate, NASA Jet Propulsion Laboratory, Pasadena, CA

Panelists:

Joseph Grebowsky
MAVEN Project Scientist, Planetary Magnetospheres Division,
NASA Goddard Space Flight Center
Greenbelt, MD

James Reuther
Deputy Associate Administrator for Programs
Space Technology Mission Directorate, NASA Headquarters
Washington, DC

Jennifer Trosper
Deputy Project Manager, Mars Science Laboratory
NASA Jet Propulsion Laboratory
Pasadena, CA

Matthew Wallace
Mars 2020 Deputy Project Manager
NASA Jet Propulsion Laboratory
Pasadena, CA

Tuesday, 10 September 2013		
13-PANEL-3 1000 - 1200 hrs	**Enabling In-Space Infrastructure**	Room 31AB

Chaired by: C. MOORE, NASA Headquarters

This panel will discuss benefits, strategies, and technologies for enabling key elements of in-space infrastructure, such as spaceports, propellant depots, communications networks, and satellite servicing to support exploration and expand our economic sphere beyond Earth.

Moderator: Christopher Moore, NASA Headquarters, Washington, DC

Panelists:

James Schier
Program Executive for Space Communications,
NASA Headquarters
Washington, DC

Harley Thronson
Senior Scientist for Advanced Concepts
NASA Goddard Space Flight Center
Greenbelt, MD

Ronald Ticker
Program Executive for Satellite Servicing
NASA Headquarters
Washington, DC

Alan Wilhite
Langley Professor of Aerospace Engineering
National Institute of Aerospace and Georgia Institute of Technology
Yorktown, VA

Tuesday, 10 September 2013				
14-SATS-1	**Nanosat and Small Sat Missions**			**Room 32B**
Chaired by: A. SANTANGELO				
1000 hrs AIAA-2013-5322 **Architecting Disaggregated Space Weather Solutions Using Nanosatellites** J. Lam, P. La Tour, J. Kim, Space and Missile Systems Center, El Segundo, CA	1030 hrs AIAA-2013-5323 **INSPIRE: Interplanetary NanoSpacecraft Pathfinder in Relevant Environment** A. Klesh, J. Baker, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA; J. Bellardo, California Polytechnic State University, San Luis Obispo, CA; J. Castillo-Rogez, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA; J. Cutler, University of Michigan, Ann Arbor, Ann Arbor, MI; L. Halatek, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA; E. Lightsey, University of Texas, Austin, Austin, TX; N. Murphy, C. Raymond, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA	1100 hrs AIAA-2013-5324 **Rollable Nano-etched Diffractive Low-Concentration PV Sheets for Powering LEO Cube-Satellites** A. Ishihara, Carnegie Mellon University, Moffett Field, CA	1130 hrs AIAA-2013-5325 **EyasSat-cubed: a Low-cost On-ramp for Nanosatellite Programs** D. Barnhart, U.S. Air Force Academy, Colorado Springs, CO; J. Sellers, Teaching Science & Technology, Inc., Manitou Springs, CO	

Tuesday, 10 September 2013				
15-SL-1	**Logistics and Supportability for Exploration**			**Room 31C**
Chaired by: T. BACHMAN, LMI and P. PACELEY, Draper Laboratory				
1000 hrs AIAA-2013-5326 **Trash-to-Gas: Using Waste Products to Minimize Logistical Mass During Long Duration Space Missions** P. Hintze, A. Caraccio, S. Anthony, NASA Kennedy Space Center, Cape Canaveral, FL; R. DeVor, J. Captain, QinetiQ, Kennedy Space Center, FL; A. Tsoras, University of Kentucky, Lexington, KY; M. Nur, University of Rochester, Rochester, NY	1030 hrs AIAA-2013-5327 **Maintenance and Recycling in Space: Functional Dependency Analysis of On-Orbit Servicing Satellites Team for Modular Spacecraft** C. Guariniello, D. DeLaurentis, Purdue University, West Lafayette, IN	1100 hrs AIAA-2013-5328 **Assessment of Maintainability for Future Human Asteroid and Mars Missions** C. Stromgren, M. Terry, B. Mattfeld, Binera, Inc., Silver Springs, MD; W. Cirillo, K. Goodliff, NASA Langley Research Center, Hampton, VA; H. Shyface, Analytical Mechanics Associates, Inc., Hampton, VA; A. Maxwell, Georgia Institute of Technology, Hampton, VA	1130 hrs AIAA-2013-5329 **Electrospray Propulsion Systems for Small Satellites and Satlets** D. Spence, E. Ehrbar, N. Rosenbald, N. Demmons, T. Roy, S. Hoffman, W. Williams, M. Tsay, J. Zwahlen, K. Hohman, V. Hruby, Busek Company, Inc., Natick, MA; C. Tocci, ALFA, LLC, Halifax, MA	

Tuesday, 10 September 2013				
16-ST-1	**Key Technical Aspects of Reusable Launch Vehicles**			**Room 28D**
Chaired by: A. DISSEL, Lockheed Martin Space Systems and B. HELLMAN, Air Force Reseach Laboratory				
1000 hrs AIAA-2013-5330 **Rarefied Aerothermodynamics Technology Development for Future High-Altitude High-Speed Transport (EU-FAST20XX)** R. Votta, M. Marini, G. Ranuzzi, Italian Aerospace Research Center (CIRA), Capua, Italy; T. Schlegat, K. Hannemann, German Aerospace Center (DLR), Göttingen, Germany; M. Sippel, German Aerospace Center (DLR), Bremen, Germany	1030 hrs AIAA-2013-5331 **Numerical and Experimental Analyses on Re-entry Vehicle Control Surfaces** M. Di Clemente, E. Trifoni, M. Marini, Italian Aerospace Research Center (CIRA), Capua, Italy	1100 hrs AIAA-2013-5332 **Adaptive Sampling to Improve Aerodynamic Predictions for Reusable Rocket-Powered Vehicles** D. Crowley, S. Edwards, D. Mavris, Georgia Institute of Technology, Atlanta, GA; B. Hellman, Air Force Research Laboratory, Wright-Patterson AFB, OH	1130 hrs AIAA-2013-5333 **The Application of a Hybrid Probabilistic Method for Design Margin Estimation to the FAST Reference Flight System** B. Robertson, D. Mavris, Georgia Institute of Technology, Atlanta, GA; J. Zweber, Air Force Research Laboratory, Wright-Patterson AFB, OH	

Tuesday, 10 September 2013		
17-AIAA-1 **1000 - 1330 hrs**	**AIAA Business-to-Business (B2B) Networking**	**Room 29AB**
Join us at the B2B event that will help both our prime and our small business members of the space supply chain to learn about the latest technology opportunities, to form new alliances and partnerships, and to maximize business resources. After companies outline what they are looking for in partnerships, there will be one-on-one matchmaking and detailed discussions about programs and opportunities. Registration is required for this event, and is complimentary for AIAA corporate members. There is a $200 fee for those who are not AIAA corporate members.		

Tuesday, 10 September 2013				
18-SSEE-5	**Specialized Systems Engineering**			**Room 30E**
Chaired by: E. NICHOLS, Orbital Sciences Corporation				
1000 hrs AIAA-2013-5334 **Aerospace Program Performance Change Distributions** E. Conrow, Management and Technology Associates, Redondo Beach, CA	1030 hrs AIAA-2013-5335 **2013 U.S. Propulsion Industrial Base Health Metrics Survey Preliminary Results** R. Doreswamy, E. Fry, NASA Marshall Space Flight Center, Huntsville, AL	1100 hrs AIAA-2013-5336 **Development of a Management Support Framework for Space Based Systems of Systems Programs** A. Aliakbargolkar, Skolkovo Institute of Science and Technology, Moscow, Russia; G. Filippazzo, ESA, Frascati, Italy	1130 hrs AIAA-2013-5337 **Planetary Lander Testbed for Technology Demonstration** R. Frampton, J. Ball, The Boeing Company, Huntington Beach, CA; D. Masten, Masten Space Systems, Mojave, CA; P. Ferguson, K. Oittinen, The Boeing Company, Huntington Beach, CA; C. Ake, Masten Space Systems, Mojave, CA	

Tuesday, 10 September 2013				
19-RSA-4	**Space Robotics Inspection and Servicing**			**Room 29CD**
Chaired by: S. FREDRICKSON, NASA-Johnson Space Center				
1000 hrs AIAA-2013-5338 **Smart SPHERES: a Telerobotic Free-Flyer for Intravehicular Activities in Space** M. Micire, T. Fong, NASA Ames Research Center, Moffett Field, CA; T. Morse, E. Park, C. Provencher, Stinger Ghaffarian Technologies, Inc., Moffett Field, CA; E. Smith, Universities Space Research Association, Moffett Field, CA; V. To, Stinger Ghaffarian Technologies, Inc., Moffett Field, CA; R. Torres, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA; D. Wheeler, Stinger Ghaffarian Technologies, Inc., Moffett Field, CA; D. Mittman, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA	1030 hrs AIAA-2013-5339 **Robotic Servicing Technology Development** J. Pellegrino, B. Roberts, NASA Goddard Space Flight Center, Greenbelt, MD	1100 hrs AIAA-2013-5340 **Robonaut 2 on the International Space Station: Status Update and Preparations for IVA Mobility** T. Ahlstrom, NASA Johnson Space Center, Houston, TX; A. Curtis, Oceaneering International, Inc., Houston, TX; M. Diftler, R. Berka, NASA Johnson Space Center, Houston, TX; C. Joyce, Oceaneering International, Inc., Houston, TX; J. Badger, S. Yayathi, NASA Johnson Space Center, Houston, TX	1130 hrs AIAA-2013-5341 **Phoenix Program Status - 2013** D. Barnhart, Defense Advanced Research Projects Agency, Arlington, VA; B. Sullivan, Space Systems Integration, LLC, Arlington, VA; R. Hunter, NASA Ames Research Center, Moffett Field, CA; J. Bruhn, XPD Analytics, Stafford, VA; E. Fowler, ManTech, Arlington, VA; L. Hoag, KTSi, Arlington, VA; S. Chappie, G. Henshaw, B. Kelm, T. Kennedy, M. Mook, K. Vincent, Naval Research Laboratory, Washington, DC	

Tuesday, 10 September 2013		
20-NW-3 **1200 - 1330 hrs**	**Tuesday Networking Luncheon**	**Ballroom 20CD**

Tuesday, 10 September 2013		
21-PLNRY-2 **1330 - 1500 hrs**	**The Evolving Landscape of the Space Business**	**Ballroom 20A**

Budget outlooks, contracting methodologies, funding approaches, partnering philosophies, and mission architectures are altering the dynamics of how space leaders work together to achieve goals. New and novel approaches to manufacturing, testing, and operation of space systems are challenging traditional views of time to market, affordability, and risk acceptance. What is being done differently and what can we learn? Are there leadership lessons that are applicable to sustaining a space strategy?

Moderator: Lt Gen Eugene L. Tattini, USAF (Ret), Deputy Director, NASA Jet Propulsion Laboratory, Pasadena, CA

Panelists:

Bernie Collins
Senior Advisor, Office of the Director of National Intelligence/AT&F
Washington, DC

John Elbon
Vice President and General Manager, Space Exploration, Boeing Defense, Space, and Security
The Boeing Company
Houston, TX

Lt Gen Michael A. Hamel, USAF (Ret)
Senior Vice President of Corporate Strategy and Development
Orbital Sciences Corporation
Dulles, VA

Adam Harris
Vice President of Government Sales, Space Exploration Technologies Corportion (SpaceX)
Hawthorne, CA

William H. Gerstenmaier
Associate Administrator for Human Exploration and Operations
NASA Headquarters
Washington, DC

Lt Gen John T. (Tom) Sheridan, USAF (Ret)
Vice President, National Security Space
The SI Organization, Inc.
Alexandria, VA

Tuesday, 10 September 2013		
22-NW-4 **1500 - 1530 hrs**	**Tuesday Afternoon Networking Coffee Break**	**Ballroom 20CD**

Tuesday, 10 September 2013				
23-PSTR-2	**E-Poster Session II**			**Ballroom 20CD**
Chaired by: J. CHOBANY				
1500 hrs AIAA-2013-5342 **The Case for Small and Medium Lift Capabilities** J. Steinmeyer, W. Frick, M. Pieczynski, Orbital Sciences Corporation, Dulles, VA	1500 hrs AIAA-2013-5343 **Point to point sub-orbital transportation as rapid response after asteroids impact** H. Chang, University of Tokyo, Tokyo, Japan	1500 hrs AIAA-2013-5474 **Mapping a mission profile for the exploration of Europa's ocean** D. Allen, M. Jones, C. Woolsey, Virginia Polytechnic Institute and State University, Blacksburg, VA; W. Moore, Hampton University, Hampton, VA; L. McCue, Virginia Polytechnic Institute and State University, Blacksburg, VA		

Tuesday, 10 September 2013		
24-SB-2 **1500 - 1530 hrs**	**Tuesday Afternoon Speakers' Briefing in Session Rooms**	**Session Rooms**

Tuesday, 10 September 2013				
25-COL-2	**Space Colonization**			**Room 32B**
Chaired by: A. GALE, Boeing Defense, Space & Security				
1530 hrs AIAA-2013-5344 **A Comparison Of A Solar Power Satellite Concept To A Concentrating Solar Power System** D. Smitherman, NASA Marshall Space Flight Center, Huntsville, AL	1600 hrs AIAA-2013-5345 **Space Colonization and Its Limitations** S. Riaz, Mississippi State University, Mississippi State, MS	1630 hrs AIAA-2013-5346 **3D Printing of Food for Space Missions** M. Terfansky, M. Thangavelu, University of Southern California, Los Angeles, CA	1700 hrs AIAA-2013-5347 **Understanding the Biological Significance of Cosmic Radiation and Electromagnetic Factors for Human Space Colonization** C. Jones, 21st Century Science and Technology, Washington, DC	

Tuesday, 10 September 2013				
26-CS-2	**Sub-Orbital Space Vehicle Missions**			**Room 28A**
Chaired by: J. KELLY, NASA Dryden Flight Research Center				
1530 hrs AIAA-2013-5348 **Training for Commercial Space Flight** B. Henwood, Environmental Tectonics Corporation, Southampton, PA	1600 hrs AIAA-2013-5349 **Profile of Individuals Interested in Commercial Human Spaceflight** C. Christensen, P. Guthrie, E. Hinds, S. Johnson, Tauri Group, Alexandria, VA	1630 hrs AIAA-2013-5350 **Suborbital Flights for Space Science** S. Arnold, K. Lindstrom, Johns Hopkins University Applied Physics Laboratory, Laurel, MD	1700 hrs AIAA-2013-5351 **Applying Game Theory to Commercial Human Suborbital Training** B. Henwood, Environmental Tectonics Corporation, Southampton, PA	

Tuesday, 10 September 2013				
27-EXPL-2	**Advanced In-Space Transportation Systems for Exploration**			**Room 28B**
Chaired by: J. WARREN, NASA Headquarters				
1530 hrs AIAA-2013-5352 **Solar Electric Propulsion (SEP) Benefits for Near Term NASA Exploration** L. DeMaster-Smith, S. Kimbrel, S. Overton, C. Carpenter, R. Myers, D. King, Aerojet, Redmond, WA	1600 hrs AIAA-2013-5353 **Progress in Nuclear Cryogenic Propulsion Stage Technologies and Qualification Strategies** M. Houts, T. Kim, W. Emrich, R. Hickman, J. Broadway, H. Gerrish, NASA Marshall Space Flight Center, Huntsville, AL; S. Borowski, NASA Glenn Research Center, Cleveland, OH; J. George, NASA Johnson Space Center, Houston, TX; R. Bechtel, Department of Energy, Germantown, MD	1630 hrs AIAA-2013-5354 **Nuclear Thermal Propulsion (NTP): A Proven, Growth Technology for 'Fast Transit' Human Missions to Mars** S. Borowski, D. McCurdy, T. Packard, NASA Glenn Research Center, Cleveland, OH	1700 hrs AIAA-2013-5355 **Conceptual Common Modular Design for Crew and Cargo Landers and Deep Space Vehicles for Human Exploration of the Solar System** M. Benton, The Boeing Company, El Segundo, CA	

Tuesday, 10 September 2013				
28-HS-2	**Space History**			**Room 28C**
Chaired by: C. MARTIN, NASA-Dryden Flight Research Center				
1530 hrs AIAA-2013-5356 **Merging Space Industry Analysis with Graphic Design and Fine Art** P. Smith, Tauri Group, Alexandria, VA	1600 hrs AIAA-2013-5357 **Using Requirements-Induced Complexity to Anticipate Development and Integration Problems: Analysis of Past Missions** A. Salado, R. Nilchiani, Stevens Institute of Technology, Hoboken, NJ	1630 hrs AIAA-2013-5358 **Morpheus 1.5a Lander Failure Investigation Results** J. Devolites, J. Olansen, S. Munday, NASA Johnson Space Center, Houston, TX	1700 hrs AIAA-2013-5359 **Start-up and Scale-up of a Novel Form of Colony Governance** P. Schubert, Indiana University-Purdue University Indianapolis, Indianapolis, IN	

Tuesday, 10 September 2013				
29-OPS-2	**Space Operations Modeling and Simulation**			**Room 32A**
Chaired by: D. LAVALLEE, JHU/Applied Physics Laboratory				
1530 hrs AIAA-2013-5360 **Keeping ESA's Operational Spacecraft Simulators Young** M. Pantoquilho, P. Margarido, ESA, Darmstadt, Germany	1600 hrs AIAA-2013-5361 **Rotary Decelerators for Spacecraft: Historical Review and Simulation Results** R. Diaz-Silva, University of California, Davis, Davis, CA; D. Arellano, Advanced Rotorcraft Technology, Inc., Sunnyvale, CA; M. Sarigulklijn, N. Sarigul-Klijn, University of California, Davis, Davis, CA	1630 hrs AIAA-2013-5362 **Modeling to Improve the Risk Reduction Process for Command File Errors** L. Bryant, L. Meshkat, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA	1700 hrs AIAA-2013-5363 **Galileo Constellation Operations, Training and Simulations** M. Ambrosini, German Aerospace Center (DLR), Oberpfaffenhofen, Germany	

Tuesday, 10 September 2013		
30-PANEL-4 **1530 - 1730 hrs**	**Engineering Global Space Leadership with STEM**	**Room 30AB**

Chaired by: J. RENDLEMAN, Joint Functional Component Command for Space

The panel will discuss how to energize the workforce pipeline to prepare the next generation of space leaders.

Moderator: Michael Heil, President and CEO, Ohio Aerospace Institute, Cleveland, OH

Panelists:

Brad Botwin
Director, Industrial Studies
U.S. Department of Commerce
Washington, DC

David Hayhurst
Dean, College of Engineering
San Diego State University
San Diego, CA

Kathy Hedges
President and CEO
Program Management & Controls, LLC
Rancho Santa Fe, CA

Rebecca Smith
Director of Community Engagement
The Eastridge Group of Staffing Companies
San Diego, CA

Tuesday, 10 September 2013		
31-PANEL-5 **1530 - 1730 hrs**	**Human Spaceflight Progress Report**	**Room 30CD**

Chaired by: D. SAUVAGEAU, ATK Mission Systems

The international community is currently making significant progress toward human exploration beyond Low Earth Orbit (LEO). NASA is developing the Orion space capsule and the Space Launch System (SLS) to send astronauts beyond LEO. Russia, Japan, and China are also pursuing major human exploration initiatives. The International Space Station continues to expand the significance of its contributions. The International Space Exploration Coordination Group is developing an internationally endorsed plan for human exploration beyond LEO. This panel will provide a status as to progress being made toward sending humans beyond LEO.

Moderator: Donald Sauvageau, ATK, Brigham City, UT

Panelists:

Mark Geyer
Manager, Multipurpose Crew Vehicle Program
NASA Johnson Space Center
Houston, TX

Kathleen C. Laurini
Senior Advisor, Exploration and Space Operations
NASA Johnson Space Center
Houston, TX

Todd May
SLS Program Manager
NASA Marshall Space Flight Center
Huntsville, AL

Sam Scimemi
Director, International Space Station
NASA Headquarters
Washington, DC

Michael T. Suffredini
ISS Program Manager
NASA Johnson Space Center
Houston, TX (invited)

Tuesday, 10 September 2013				
32-PANEL-6 **1530 - 1730 hrs**	**NASA Space Science: The Next 30 Years**			**Room 31AB**
Chaired by: D. MCCLEESE				
This panel will discuss: What are the challenges in space science? What is the science community's vision for research in astrophysics, exoplanets, planetary science, and solar and space physics? What opportunities might there be for international cooperation? How do we advocate and align the new technology investments to enable space science? Moderator: Daniel McCleese, Chief Scientist, NASA Jet Propulsion Laboratory, Pasadena, CA Panelists: **John Grunsfeld** Associate Administrator, Science Mission Directorate,NASA Headquarters Washington, DC (invited) **Heather Knutson** Assistant Professor of Planetary Science California Institute of Technology Pasadena, CA **Jonathan Lunine** Professor in the Physical Sciences, and Director Center for Radiophysics and Space Research Cornell University **Jason Rhodes** Research Scientist, NASA Jet Propulsion Laboratory Pasadena, CA **Thomas Zurbuchen** Professor, Space Science and Aerospace Engineering, and Associate Dean for Entrepreneurship University of Michigan				

Tuesday, 10 September 2013				
33-RSA-1	**Modular Design and Surface Construction**			**Room 29CD**
Chaired by: S. KHALIGH, Laser Sculpture				
1530 hrs AIAA-2013-5364 **Flexible Lunar/Extraterrestrial Exploration Transportation System (FLEETS)** J. Burr, D. Carter, J. Cummings, M. Cunningham, R. Foust, C. O'Hare, S. Wingate, University of Maryland, College Park, MD	1600 hrs AIAA-2013-5365 **A System Study for Evolving Propulsion Systems on Piloted and Cargo Mars Missions** G. Rios-Georgio, Orbital Sciences Corporation, Dulles, VA	1630 hrs AIAA-2013-5366 **Mars Biosignature-Detection Capabilities: A Method for Objective Comparison of In Situ Measurements and Sample Return** C. Weisbin, W. Lincoln, D. Papanastassiou, M. Coleman, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA	1700 hrs AIAA-2013-5367 **Welding and Testing of Propulsion Subsystem of PMM-Based Satellite Qualification Model** D. Zandonadi, M. Kakizaki, National Institute for Space Research (INPE), São José dos Campos, Brazil; J. Goncalves, Fibraforte, São José dos Campos, Brazil	

Tuesday, 10 September 2013				
34-SSEE-2	**Topics in Space Economics**			**Room 30E**
Chaired by: G. FINGER, Reynolds Smith & Hills				
1530 hrs AIAA-2013-5368 **Affordable Space Systems** H. Apgar, MCR, LLC, El Segundo, CA	1600 hrs AIAA-2013-5369 **Evidence for Predictive Trends in TRL Transition Metrics** J. Hay, Tauri Group, Alexandria, VA; J. Reeves, NASA Langley Research Center, Hampton, VA; E. Gresham, Tauri Group, Alexandria, VA; J. Williams-Byrd, NASA Langley Research Center, Hampton, VA; E. Hinds, Tauri Group, Alexandria, VA	1630 hrs AIAA-2013-5370 **Findings and Considerations from the NASA Explanation of Change Study** B. Bitten, D. Emmons, The Aerospace Corporation, Los Angeles, CA	1700 hrs AIAA-2013-5371 **Architecting Cellularized Space Systems using Model-Based Design Exploration** A. Kerzhner, M. Ingham, M. Khan, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA; J. Ramirez, J. De Luis, J. Hollman, Aurora Flight Sciences, Cambridge, MA; S. Arestie, D. Sternberg, Massachusetts Institute of Technology, Cambridge, MA	

Tuesday, 10 September 2013				
35-ST-2	**Space Transportation Design Methods**			**Room 28D**
Chaired by: C. PLAISTED, a.i. Solutions, Inc				
1530 hrs AIAA-2013-5372 **NASA Advanced Concepts Office, Earth-To-Orbit Team Design Process and Tools** E. Waters, J. Garcia, CFD Research Corporation (CFDRC), Huntsville, AL; G. Threet, A. Philips, NASA Marshall Space Flight Center, Huntsville, AL	1600 hrs AIAA-2013-5373 **A Multidisciplinary Approach to the Heavy Lift System Architecture Study** V. Hutchinson, K. Bocam, T. Herrmann, R. Thompson, D. Nelson, Orbital Sciences Corporation, Dulles, VA	1630 hrs AIAA-2013-5374 **High-Fidelity Performance Database Characterization for a Staged Launch Vehicle Using Response Surface Methodology** J. Fuller, Orbital Sciences Corporation, Dulles, VA	1700 hrs AIAA-2013-5375 **Vehicle Architecture Study Using the Aerojet Rocketdyne Bantam Rocket Engine Family** M. Long, C. Joyner, T. Kokan, Pratt & Whitney, West Palm Beach, FL	

Tuesday, 10 September 2013				
36-SYS-1	**Space Systems Missions**			**Room 31C**
Chaired by: D. KWON, Orbital Sciences Corporation				
1530 hrs AIAA-2013-5376 **NASA Innovative Advanced Concepts** R. Turner, Analytic Services, Inc., Arlington, VA; J. Falker, J. Derleth, NASA Headquarters, Washington, DC; K. Reilly, Dell, Inc., Washington, DC, DC	1630 hrs AIAA-2013-5379 **Athena Rideshare™ Missions: Dramatically Reducing the Cost of Space Access** G. Kehrl, Lockheed Martin Corporation, Denver, CO; M. Steele, ATK, Magna, UT			

Tuesday, 10 September 2013				
37-EXPL-9/RSA-5/SR-5	**Asteroid, Moon, or Mars ISRU Equipment**			**Room 33A**
Chaired by: D. CLARK, Lockheed Martin Space Systems				
1530 hrs AIAA-2013-5380 **Near Earth Asteroid (NEA) as an Alternative Manned Interplanetary Spaceship** H. Chang, University of Tokyo, Tokyo, Japan; C. Wang, National Taipei University of Technology, Taipei, Taiwan	1600 hrs AIAA-2013-5381 **Human Inter-Space Vehicles and Astronaut Survivability** W. Strobl, Self, Carlsbad, CA; J. Mildice, R. Hora, Earth Space Applications, Inc., Poway, CA	1630 hrs AIAA-2013-5382 **ATHLETE: Trading Complexity for Mass in Roving Vehicles** B. Wilcox, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA	1700 hrs AIAA-2013-5383 **Helicopter Flight Test of a Compact, Real-Time 3-D Flash Lidar for Imaging Hazardous Terrain during Planetary Landing** V. Roback, NASA Langley Research Center, Hampton, VA; A. Bulyshev, Analytical Mechanics Associates, Inc., Hampton, VA; F. Amzajerdian, P. Brewster, B. Barnes, K. Kempton, R. Reisse, NASA Langley Research Center, Hampton, VA	

Tuesday, 10 September 2013				
38-AIAA-2 **1630 - 1730 hrs**	**Rising Leaders in Aerospace Leadership Exchange**			**Room 29AB**
An event for young aerospace professionals, 35 and under, to meet and network with senior industry leaders. Senior mentors include: **Andy Aldrin** Director of Business Development for Human Launch Services United Launch Alliance **Michael Griffin** AIAA President **Lt Gen Michael Hamel, USAF (Ret)** Senior Vice President, Corporate Strategy and Relations Orbital Sciences Corporation **Janet C. Karika** Director, Interagency Launch Programs Jacobs NASA Launch Services Program **David King** Executive Vice President, Dynetics, Inc. **Greg Jones** Vice President, Strategy and Business Development Orbital Sciences Corporation **Lt Gen Eugene L. Tattini, USAF (Ret)** Deputy Director, NASA Jet Propulsion Laboratory **Lt Gen Larry D. James, USAF (Ret)** Deputy Director, NASA Jet Propulsion Laboratory **Lt Gen Tom Sheridan, USAF (Ret)** Vice President, National Security Space, SI Organization, Inc.				

Tuesday, 10 September 2013		
39-NW-5 **1730 - 1900 hrs**	**Opening Reception**	**Ballroom 20CD**

Tuesday, 10 September 2013		
40-AIAA-8 **1830 - 2030 hrs**	**Rising Leaders in Aerospace Networking Reception**	**Aqua Patio at the Hilton San Diego Bayfront**
The AIAA Young Professional Committee is hosting a networking reception. This is a great opportunity for young aerospace professionals to meet other members and make new contacts.		

Wednesday, 11 September 2013		
41-NW-6 0700 - 0800 hrs	Wednesday Networking Breakfast	Ballroom 20 Lobby

Wednesday, 11 September 2013		
42-PLNRY-3 0800 - 0930 hrs	Space Exploration for Inspiration and Profit	Ballroom 20A

Debate on where to go next in space continues in the scientific community and even within and among agencies; meanwhile, the private sector has said "we're going", both for inspiration and for profit. How do we merge these approaches? Where are the synergies? How can one enable the other? How can government agencies work together with the private sector to achieve goals? How can technologies derived be leveraged for future efforts?

Moderator: Bruce Pittman, Director of Flight Projects and Chief System Engineer, NASA Space Portal, NASA Ames Research Center, Moffett Field, CA

Panelists:

Dan Dumbacher
Deputy Associate Administrator for Exploration Systems Development NASA Headquarters
Washington, DC

Chris Lewicki
President and Chief Engineer, Planetary Resources, Inc.
Seattle, WA

Robert (Bob) Richards
Co-Founder and CEO, Moon Express Inc.
Moffett Field, CA

Wednesday, 11 September 2013		
43-NW-7 0930 - 1000 hrs	Wednesday Morning Networking Coffee Break	Ballroom 20CD

Wednesday, 11 September 2013				
44-PSTR-3	E-Poster Session III			Ballroom 20CD
Chaired by: J. CHOBANY				
0930 hrs AIAA-2013-5384 **Current and Near-Future Space Launch Vehicles for Manned Trans-Planetary Space Exploration: Phobos-Deimos Mission Architecture Case Study** A. Jain, N. Trost, University of Houston, Houston, TX				

Wednesday, 11 September 2013		
45-SB-3 0930 - 1000 hrs	Wednesday Morning Speakers' Briefing in Session Rooms	Session Rooms

Wednesday, 11 September 2013		
46-AIAA-3 **1000 - 1200 hrs**	**Rising Leaders in Aerospace: University Design Competition Winners and Report from the 2nd Annual SGAC Fusion Forum**	**Room 29AB**

Chaired by: Z. KREVOR, Sierra Nevada Corporation

1000-1100 hrs University Design Competition Winners

Every year AIAA and the AIAA Foundation sponsor several university-level design competitions to allow students to work on systems that resemble current real-world challenges. The competitions are developed by the AIAA Student Activities Committee and various AIAA Technical Committees. The students review the materials and objectives, design a vehicle or system, and then submit a major design report on their project. Often these projects primarily involve juniors and seniors who will be entering the workforce shortly after submitting their reports. This year's winners in the space categories will be making presentations on their projects as part of the AIAA Rising Leaders in Aerospace Forum.

AIAA Undergraduate Team Space Design Competition
AIAA-2013-5386
Paper Title: Conceptual Design for a Space Based Solar Power System
School: University of Illinois at Urbana-Champaign
Authors: Cory Cameron, Philip Freidin, Brian Levine, Izan Peris Marti, Michael Reindl, Jason Swenson, John Teuber, Ernest Company Vallet
Faculty Advisor: David Carroll

AIAA Undergraduate Team Space Transportation Design Competition
AIAA-2013-5387
Paper Title: Ironfly EJ
School: Embry-Riddle Aeronautical University
Authors: Timothy Grondin, Theresa Brown, Austin Coffey, Peter Edwards, Ryan May, Michael Mezzettone, Reamonn Norat, Sam Patel, Matthew Perry, Tyler Roberson
Faculty Advisor: Eric Perrell

1100-1130 hrs Report from the 2nd Annual SGAC Fusion Forum

The Space Generation Advisory Council (SGAC) completed its second Space Generation Fusion Forum (www.spacegenerationfusionforum.org) in conjunction with the 29th Annual National Space Symposium in April in Colorado Springs. Over two days, the Space Generation Fusion Forum offered the next generation of space sector leaders from government, industry, and academia the opportunity to come together to exchange views on current and pressing space topics via interactive panels moderated by today's sector leaders. The AIAA MVP Award was presented to Lewis Groswald, who was selected from the five top participants of the Fusion Forum nominated by a panel of judges comprised of space industry leaders. He will represent SGAC and present the report of the Space Generation Fusion Forum.

Lewis Groswald
Associate Program Officer, Space Studies Board, National Research Council, Washington, DC

Wednesday, 11 September 2013		
47-AIAA-4 **1000 - 1200 hrs**	**AIAA Educator Academy: Mars Rover Demonstration**	**Room 29CD**

AIAA has introduced an innovative approach to K-12 education, the AIAA Educator Academy, which features a series of three curriculum modules targeted at different grade levels: the Mars Rover Celebration; the Electric Cargo Airplane; and the Space Weather Balloon. The program allows local AIAA sections and their communities to work together to excite and inspire students as they apply math and science concepts from the classroom to real-world aerospace projects. Debuting at the SPACE 2013 Conference is a Mars Rover Celebration demonstration event for local San Diego elementary and middle school students. Stop by and see where these students' explorations of Mars will take them. Students will also be visiting the exposition hall at the conclusion of this event.

Wednesday, 11 September 2013				
48-COL-3	**Space Tether Missions and Technologies**			**Room 32B**
Chaired by: S. BILEN, The Pennsylvania State University				
1000 hrs AIAA-2013-5388 **Optimal Control of Self-Deorbit Nano-Satellite Using Electrodynamic Tethers** R. Zhong, Z. Zhu, York University, Toronto, Canada	1030 hrs AIAA-2013-5389 **Electrodynamic Tether Systems on Small-Scale Spacecraft Using Dual-Purpose Materials for the Plasma-Spacecraft Interface** J. McTernan, S. Bilen, Pennsylvania State University, University Park, PA	1100 hrs AIAA-2013-5390 **Analysis of passive system to damp the libration of electrodynamic tethers for deorbiting** R. Mantellato, M. Pertile, G. Colombatti, E. Lorenzini, University of Padova, Padova, Italy	1130 hrs AIAA-2013-5391 **Investigating Miniature Electrodynamic Tethers and Interaction with the Low Earth Orbit Plasma** I. Bell, University of Michigan, Ann Arbor, Ann Arbor, MI; J. McTernan, Pennsylvania State University, University Park, PA; B. Gilchrist, University of Michigan, Ann Arbor, Ann Arbor, MI; S. Bilen, Pennsylvania State University, University Park, PA	

Wednesday, 11 September 2013				
49-CS-3	**Commercial Space Science**			**Room 28A**
Chaired by: B. HARRIS, CASIS [Center for Advancement of Science in Space]				
1000 hrs AIAA-2013-5392 **ISS Utilization and Advancing Research in Space** B. Harris, Center for Advancement of Science in Space (CASIS), Melbourne, FL	1030 hrs AIAA-2013-5393 **Innovative Approaches to Technology Transfer and Commercialization at the NASA Johnson Space Center** D. Leestma, K. Krishen, NASA Johnson Space Center, Houston, TX; C. Shepherd, Jacobs, Houston, TX	1100 hrs AIAA-2013-5394 **Surrogate Astronaut Robotic Avatars: Co-Robotics for Safe, Economic Space Operations** M. Thangavelu, A. Chau, University of Southern California, Los Angeles, CA	1130 hrs AIAA-2013-5395 **Space Solar Power Satellite Systems as a Service Provider of Electrical Power for Lunar Industries** C. Bergsrud, S. Noghanian, J. Straub, University of North Dakota, Grand Forks, Grand Forks, ND	

Wednesday, 11 September 2013				
50-EXPL-3	**Life Support for Deep Space**			**Room 28B**
Chaired by: J. JOSHI, NASA Headquarters				
1000 hrs AIAA-2013-5396 **The Next Generation of ECLSS: Life Support Outside the Earth-Moon System** J. Leidich, T. MacCallum, B. Finger, Paragon Space Development Corporation, Tucson, AZ	1030 hrs AIAA-2013-5397 **Vapor Compression and Thermoelectric Heat Pumps for the Cascade Distillation Subsystem: Design and Experiment** E. Ungar, L. Erickson, NASA Johnson Space Center, Houston, TX	1100 hrs AIAA-2013-5398 **Greenhouse Modules and Regenerative Life-Support Systems for Space** L. Poulet, P. Zabel, D. Schubert, V. Maiwald, German Aerospace Center (DLR), Bremen, Germany; C. Lasseur, C. Paillé, ESA, Noordwijk, The Netherlands; D. Quantius, C. Zeidler, German Aerospace Center (DLR), Bremen, Germany	1130 hrs AIAA-2013-5399 **Solar Food Production and Life Support in Space Exploration** T. Nakamura, Physical Sciences, Inc., Pleasanton, CA; O. Monje, QinetiQ, Kennedy Space Center, FL; B. Bugbee, Utah State University, Logan, UT	

Wednesday, 11 September 2013				
51-HS-3	**Law and Policy Foundations to System Succes**			**Room 28C**
Chaired by: J. RENDLEMAN, Joint Functional Component Command for Space				
1000 hrs AIAA-2013-5400 **ULA SmallSat / Hosted Rideshare Missions Accommodations** G. Szatkowski, United Launch Alliance, Denver, CO; D. Czajkowski, Space Micro, Inc., San Diego, CA	1030 hrs AIAA-2013-5401 **Cyber operations to defend space systems?** J. Rendleman, Rendleman & Associates, Colorado Springs, CO; R. Ryals, USfalcon, Colorado Springs, CO	1100 hrs AIAA-2013-5402 **Analysis of Technology Transfer within Satellite Programs in Developing Countries using Systems Architecture** D. Wood, Johns Hopkins University Applied Physics Laboratory, Laurel, MD	1130 hrs AIAA-2013-5403 **A Curriculum-Integrated Small Spacecraft Program for Interdisciplinary Education** A. Nervold, J. Straub, J. Berk, University of North Dakota, Grand Forks, Grand Forks, ND	

Wednesday, 11 September 2013				
52-OPS-3	**Space Operations Ground Systems Architectures**			**Room 32A**
Chaired by: D. LAVALLEE, JHU/Applied Physics Laboratory				
1000 hrs AIAA-2013-5404 **Development of Hybrid Product Breakdown Structure for NASA Ground Systems** M. Monaghan, SAIC, Kennedy Space Center, FL; R. Henry, NASA Kennedy Space Center, Cape Canaveral, FL	1030 hrs AIAA-2013-5405 **NuSTAR Ground Systems Approach - Lessons Learned** M. Bester, B. Roberts, M. Lewis, W. Marchant, University of California, Berkeley, Berkeley, CA	1100 hrs AIAA-2013-5406 **Suomi National Polar-orbiting Partnership (Suomi NPP) Ground System Performance** K. Grant, C. Bergeron, Raytheon Company, Aurora, CO	1130 hrs AIAA-2013-5407 **Space Mission Resilience** M. Berkowitz, Lockheed Martin Corporation, Herndon, VA	

Wednesday, 11 September 2013				
53-OPS-4/RSA-2/SR-2	**Space Resources Surface Operations**			**Room 33A**
Chaired by: D. CLARK, Lockheed Martin Space Systems				
1000 hrs AIAA-2013-5408 **Operations Toolset for Future Integrated Human, Robot and Automated Missions** P. Steele, ESA, Darmstadt, Germany	1030 hrs AIAA-2013-5409 **Gravity Independent Climbing Robot: Technology Demonstration and Mission Scenario Development** A. Parness, M. Frost, B. Kennedy, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA	1100 hrs AIAA-2013-5410 **Sample Acquisition and Caching Architectures for the Mars 2020 Rover Mission** K. Zacny, P. Chu, G. Paulsen, J. Spring, M. Hedlund, B. Mellerowicz, A. Garcia, S. Indyk, J. Craft, Honeybee Robotics, Pasadena, CA	1130 hrs AIAA-2013-5411 **Guidance Navigation and Control Technology Assessment for Future Planetary Science Missions** P. Beauchamp, J. Cutts, L. Wood, L. Cangahuala, J. Riedel, M. Aung, R. Volpe, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA	

Wednesday, 11 September 2013		
54-PANEL-7 **1000 - 1200 hrs**	**Commercial Space Operations and Services as Stepping-Stone Enablers for Space Exploration**	**Room 30AB**

Chaired by: J. DOUGLAS

This panel will explore how current and emerging commercial space operations and services can become stepping-stone enablers for space exploration. The NASA-enabled commercial cargo and crew services for the International Space Station is already helping to create new (commercial) means of accessing the Low Earth Orbit, while other established and emerging commercial space operations and services as satellite communications, space tourism, satellite servicing, etc., continue to flourish or are being developed for near term applications. All these can be a good basis for enabling an extended or new cis-lunar operational infrastructure for space exploration, which in turn will help further spur the space industrial revolution.

Moderator: Dan King, Director, MDA Inc., Brampton, Ontario, Canada

Panelists:

Bryan Benedict
Product Line Manager, Civil Hosted Payloads,
Intelsat General Corporation
Rancho Palos Verdes, CA

Scott Burleigh
Principal Engineer
NASA Jet Propulsion Laboratory
Pasadena, CA

William Pomerantz
Vice President
Special Projects, Virgin Galactic
Pasadena, CA

Frank Taylor
Director of Technology, Space Exploration Systems
Space Systems Group, Sierra Nevada Corporation
Louisville, CO

Wednesday, 11 September 2013				
55-SL-2	**Logistics Modeling**			**Room 31C**

Chaired by: K. GOODLIFF, NASA Langley Research Center and P. PACELEY, Draper Laboratory

1000 hrs AIAA-2013-5412 **Extending Systems-Based Sparing Capabilities to NASA's Critical Ground Systems** T. Bachman, J. Castilho, D. Peterson, R. Kline, LMI, McLean, VA	1030 hrs AIAA-2013-5413 **Improved Concurrent Optimization Formulation of Crewed Space Habitats and Their Supporting Logistics Systems** K. Ho, J. Green, O. De Weck, Massachusetts Institute of Technology, Cambridge, MA	1100 hrs AIAA-2013-5414 **A Generalized Multi-Commodity Network Flow Model for Space Exploration Logistics** T. Ishimatsu, O. De Weck, J. Hoffman, Massachusetts Institute of Technology, Cambridge, MA; Y. Ohkami, Keio University, Yokohama, Japan; R. Shishko, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA	1130 hrs AIAA-2013-5415 **Space Solar Power as an Enabler for a Human Mission to Mars** C. Bergsrud, S. Noghanian, J. Straub, University of North Dakota, Grand Forks, Grand Forks, ND	

Wednesday, 11 September 2013				
56-SSEE-3	**Space System Architectures and Development**			**Room 30E**

Chaired by: M. BAILEY

1000 hrs AIAA-2013-5416 **Fractionated Space Systems: Decoupling Conflicting Requirements and Isolating Requirement Change Propagation** A. Salado, R. Nilchiani, Stevens Institute of Technology, Hoboken, NJ	1030 hrs AIAA-2013-5417 **Architecting Federated Satellite Systems for Successful Commercial Implementation** A. Aliakbargolkar, Skolkovo Institute of Science and Technology, Moscow, Russia	1100 hrs AIAA-2013-5418 **Quantification of the Influence between Satellite Design Parameters for the Support of System Design Decisions** T. Nemetzade, Astrium, Munich, Germany; R. Förstner, University of the German Federal Armed Forces, Neubiberg, Germany	1130 hrs AIAA-2013-5419 **The Business Case of Geo Satellite Servicing, Repair, and Inspection** B. Naasz, NASA Goddard Space Flight Center, Greenbelt, MD; F. Culbertson, III, Arctic Slope Research Corporation (ASRC), Greenbelt, MD; J. Pellegrino, ATK, Beltsville, MD; B. Reed, NASA Goddard Space Flight Center, Greenbelt, MD	

Wednesday, 11 September 2013				
57-ST-3	**Launch Systems**			**Room 28D**

Chaired by: M. SIR, The Aerospace Corporation

1000 hrs AIAA-2013-5420 **The National Institute for Rocket Propulsion Systems: A Status Report** L. Thomas, NASA Marshall Space Flight Center, Huntsville, AL	1030 hrs AIAA-2013-5421 **Gateway Space Exploration Missions Enabled by the Space Launch System** B. Donahue, The Boeing Company, Huntsville, AL	1100 hrs AIAA-2013-5422 **Air Launch: Examining Performance Potential of Various Configurations and Growth Options** E. Waters, CFD Research Corporation (CFDRC), Huntsville, AL; D. Creech, TriVector Services, Inc., Huntsville, AL; A. Philips, NASA Marshall Space Flight Center, Huntsville, AL	1130 hrs AIAA-2013-5423 **Atlas V Commercial Crew Human Space Flight Capability Development** M. Holguin, United Launch Alliance, Denver, CO	

Wednesday, 11 September 2013		
58-PANEL-8 1000 - 1200 hrs	Designing with Operations in Mind	Room 30CD

Chaired by: J. SHANNON

This panel will bring together operators and designers to discuss past operational/integration challenges that can inform future design efforts, with a focus on lessons learned from ISS operation.

Moderator: John P. Shannon, Program Manager, International Space Station, Boeing Space Exploration, The Boeing Company, Houston, TX

Panelists:

Frank Culbertson
Orbital Sciences Corporation, Dulles, VA

Michael Lopez-Alegria
President, Commercial Spaceflight Federation

Sandra H. Magnus
Executive Director, AIAA, Reston, VA

Garrett Reisman
Space Exploration Technologies Corporation (SpaceX)

Wednesday, 11 September 2013		
59-PANEL-9 1000 - 1200 hrs	The Rise of CubeSats and Small Satellites: Missions and Opportunities	Room 31AB

Chaired by: J. CRUSAN

Moderator: Jason Crusan, Director, Advanced Exploration Systems Division, Human Exploration and Operations Mission Directorate, NASA Headquarters, Washington, DC

Panelists:

Jordi Puig-Suari
Professor, Aerospace Engineering, Cal Poly
San Luis Obispo, CA

Robbie Schingler
Co-Founder, Planet Labs Inc.

Garrett L. Skrobot
ELaNa Project/Mission Manager, NASA Kennedy Space Center
Kennedy Space Center, FL

Bruce Yost
Program Manager, Small Spacecraft Technology Program
NASA Ames Research Center, Moffett Field, CA

Wednesday, 11 September 2013		
60-NW-3 1200 - 1400 hrs	Luncheon: NASA's Asteroid Redirect Mission	Ballroom 20A

This lunchtime panel will provide an overview and status update on NASA's plan to capture a small asteroid and redirect to cis-lunar space.

Moderator: William H. Gerstenmaier, Associate Administrator for Human Exploration and Operations, NASA Headquarters, Washington, DC

Panelists:

John M. Grunsfeld
Associate Administrator, Science Mission Directorate
NASA Headquarters, Washington, DC (invited)

Lindley Johnson
Near-Earth Objects Observation Program Executive
Science Mission Directorate, NASA Headquarters
Washington, DC

Brian Muirhead
Chief Engineer, Jet Propulsion Laboratory
Pasadena, CA

James Reuther
Deputy Associate Administrator for Programs, Space Technology Mission Directorate, NASA Headquarters, Washington, DC

Steve Stich
Deputy Director of Engineering
NASA Johnson Space Center, Houston, TX

Wednesday, 11 September 2013		
61-SB-4 1400 - 1430 hrs	Wednesday Afternoon Speakers' Briefing in Session Rooms	Session Rooms

Wednesday, 11 September 2013		
62-NW-9 1400 - 1430 hrs	Wednesday Afternoon Networking Coffee Break	Ballroom 20CD

Wednesday, 11 September 2013				
63-PSTR-4	**E-Poster Session IV**			**Ballroom 20CD**
Chaired by: J. CHOBANY				
1400 hrs AIAA-2013-5424 **Astrosociology and Japanese Youth: A Report on the "Constructing the Future Society" series of courses and symposium at Meiji University** R. Rivera Rusca, Meiji University, Tokyo, Japan	1400 hrs AIAA-2013-5425 **Lunar Capture Trajectories in the Four-Body Problem** K. Onozaki, H. Yoshimura, Waseda University, Shinjuku, Japan	1400 hrs AIAA-2013-5426 **Space Coordinate Systems** W. McGee, D. Ducharme, Raytheon Company, El Segundo, CA	1400 hrs AIAA-2013-5427 **Developing Commercial Crew Transportation Capability through Technological Milestone Targets** R. Freeman, Northcentral University, Prescott Valley, AZ	1400 hrs AIAA-2013-5428 **Testing an ontology for sustainable human presence in space** N. Brackley, Missouri University of Science and Technology, Rolla, MO

Wednesday, 11 September 2013				
64-SSEE-1	**Advances in Concurrent Engineering**			**Room 28C**
Chaired by: M. BANDECCHI, European Space Agency (ESA) -ESTEC and J. HIHN, Jet Propulsion Laboratory				
1430 hrs AIAA-2013-5429 **A Continuous Verification Process in Concurrent Engineering** V. Schaus, P. Fischer, D. Lüdtke, M. Tiede, A. Gerndt, German Aerospace Center (DLR), Braunschweig, Germany	1500 hrs AIAA-2013-5430 **Launch Vehicle Design applying Concurrent Engineering** A. Braukhane, E. Dumont, A. Koch, German Aerospace Center (DLR), Bremen, Germany; H. Journier, ESA/ESTEC, Noordwijk, The Netherlands	1530 hrs AIAA-2013-5431 **Exploring Mission Concepts with the JPL Innovation Foundry A-Team** J. Ziemer, J. Ervin, J. Lang, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA	1600 hrs AIAA-2013-5432 **Estimation Model of Spacecraft Parameters and Cost Based on a Statistical Analysis of COMPASS System Designs** S. Oleson, NASA Glenn Research Center, Cleveland, OH; M. Gerberich, Ohio State University, Columbus, OH	

Wednesday, 11 September 2013		
65-PANEL-12 **1430 - 1630 hrs**	**Stimulating Innovation: Societal Imperatives and Commercial Opportunities**	**Room 30CD**

Technology and capabilities developed for space exploration, both manned and unmanned, eventually finds many uses in the greater society. Transfer of knowledge and products from the space sector to more general uses is easy to evaluate using a historical lens. It is much harder to visualize and understand what current impacts space exploration is having as well as predicting what future benefits will be realized based on the current environment. What is a constant, however, is the fact that there will be a continuing leveraging of space technology for the greater good. The panel will discuss the impacts that space technology has had on society and ways that it will continue to do so. The discussions will encompass current research and attempts to transfer space-derived knowledge and technology as well as forecasting future outcomes.

Moderator: Michael D. Griffin, President, AIAA, Reston, VA

Panelists:

Tim Budzik
Managing Director, Houston Technology Center, Houston, TX

William C. Martel
Associate Professor of International Security Studies, The Fletcher School, Tufts University, Medford, MA

Cheryl Nickerson
Professor, The Biodesign Institute, Infectious Diseases and Vaccinology, Arizona State University, Tempe, AZ

Wednesday, 11 September 2013		
66-AIAA-5 **1430 - 1630 hrs**	**Rising Leaders in Aerospace: Navigating Through the Space Industry as a Young Professional**	**Room 29AB**

Panelists from a variety of backgrounds will draw on their personal experience to share tips and tricks for young professionals in the space industry. This session will offer ample time for questions, discussion, and meeting other YPs who are at the conference.

Moderator: Katherine Stambaugh, Space Systems Applications, Johns Hopkins Applied Physics Laboratory, Laurel, MD

Panelists:

Sandy Coleman
Director, NASA Exploration Program, ATK Washington Operations

Lewis Groswald
Associate Program Officer, Space Studies Board National Research Council, Washington, DC

Paul Guthrie
Business Development Lead, The Tauri Group Alexandria, VA

Ronald Kohl
President, R. J. Kohl & Assoc., Jefferson, MD

Zachary Krevor
Deputy, Systems Engineering and Integration, Dream Chaser Program, Sierra Nevada Corporation, Louisville, CO

Wednesday, 11 September 2013				
67-EXPL-4	**Deep Space Habitation**			**Room 28B**
Chaired by: J. JOSHI, NASA Headquarters				
1430 hrs AIAA-2013-5433 **Internal Layout for a Cis-Lunar Habitat** B. Griffin, Gray Research, Inc., Huntsville, AL; D. Smitherman, NASA Marshall Space Flight Center, Huntsville, AL; S. Howe, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA	1500 hrs AIAA-2013-5434 **Crew Health for Space Vehicles in a Mars Mission** J. Silva, Georgia Institute of Technology, Atlanta, GA; J. Silva, Embry-Riddle Aeronautical University, Daytona, FL	1530 hrs AIAA-2013-5435 **RadWorks Storm Shelter Design for Solar Particle Event Shielding** M. Simon, J. Cerro, M. Clowdsley, NASA Langley Research Center, Hampton, VA	1600 hrs AIAA-2013-5436 **NASA Habitat Demonstration Unit (HDU) Deep Space Habitat Analog** S. Howe, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA; K. Kennedy, NASA Johnson Space Center, Houston, TX; T. Gill, NASA Kennedy Space Center, Cape Canaveral, FL; R. Smith, NASA Langley Research Center, Hampton, VA; P. George, NASA Glenn Research Center, Cleveland, OH	

Wednesday, 11 September 2013				
68-COL-4/EXPL-5/RSA-3/SR-3	**Using Regolith for Construction**			**Room 33A**
Chaired by: K. ZACNY, Honeybee Robotics Spacecraft Mechanisms Corp				
1430 hrs AIAA-2013-5437 **Faxing Structures to the Moon: Freeform Additive Construction System (FACS)** S. Howe, B. Wilcox, C. McQuin, J. Townsend, R. Rieber, M. Barmatz, J. Leichty, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA	1500 hrs AIAA-2013-5438 **Advances in Contour Crafting Technology for Extraterrestrial Settlement Infrastructure Buildup** B. Khoshnevis, M. Thangavelu, X. Yuan, J. Zhang, University of Southern California, Los Angeles, CA	1530 hrs AIAA-2013-5439 **The Effects of Microgravity on Extrusion Based Additive Manufacturing** M. Snyder, J. Dunn, E. Gonzalez, Made In Space, Moffett Field, CA	1600 hrs AIAA-2013-5440 **Developing Structural Materials Using Lunar Soils** Y. Qiao, University of California, San Diego, La Jolla, CA	

Wednesday, 11 September 2013				
69-CS-4	**Orbital Satellite Extended Missions and Life Cycle**			**Room 28A**
Chaired by: M. DICKEY, Sierra Nevada Corporation				
1430 hrs AIAA-2013-5441 **Implementation and Continued Development of High Performance Green Propulsion in the U.S** A. Dinardi, SSC Group, Washington, DC; S. Beckel, ATK, Elkton, MD; J. Dyer, Skybox Imaging, Mountain View, CA	1500 hrs AIAA-2013-5442 **Long Term Radiation Belt Remediation** J. Davis, M. Thangavelu, University of Southern California, Los Angeles, CA	1530 hrs AIAA-2013-5443 **Leveraging Commercial Satellite Constellation Production to Reduce Mission Cost: Advantages and Challenges** P. Remias, D. Goldstein, H. Curtis, G. Hegemann, Sierra Nevada Corporation, Louisville, CO	1600 hrs AIAA-2013-5444 **Rationale for Need of In-Orbit Servicing Capabilities for GEO Spacecraft** B. Benedict, Intelsat General Corporation, Bethesda, MD	

Wednesday, 11 September 2013				
70-IS-1	**Intelligent Systems for Space: Practical Applications**			**Room 32B**
Chaired by: C. TSCHAN, The Aerospace Corporation and P. ZETOCHA				
1430 hrs AIAA-2013-5445 **Intelligent RF-IR Data Fusion for Space Objects using Artificial Intelligence Techniques** D. Stottler, Stottler Henke Associates, Inc., San Mateo, CA	1500 hrs AIAA-2013-5446 **Goal-Driven Automated Dynamic Retraining for Space Weather Abnormality Detection** C. Bowman, Data Fusion & Neural Networks, Broomfield, CO; C. Tschan, The Aerospace Corporation, Colorado Springs, CO	1530 hrs AIAA-2013-5447 **Combined Sensor/Interceptor Scheduling for Ballistic Missile Defense based on AI Techniques** D. Stottler, Stottler Henke Associates, Inc., San Mateo, CA	1600 hrs AIAA-2013-5448 **Fielding Artificial Intelligence techniques for radar image processing and extracted object behavior analysis on High Performance Computing (HPC) hardware** D. Stottler, Stottler Henke Associates, Inc., San Mateo, CA	

Wednesday, 11 September 2013				
71-OPS-5	**Space Operations Best Practices II**			**Room 32A**
Chaired by: R. HARVEY, Johns Hopkins University Applied Physics Laboratory				
1430 hrs AIAA-2013-5449 **System Engineering Competencies for Space System Program Managers** A. Hoheb, The Aerospace Corporation, El Segundo, CA	1500 hrs AIAA-2013-5450 **Van Allen Probes Low Cost Mission Operations Concept and Lessons Learned** R. Harvey, J. Eichstedt, Johns Hopkins University Applied Physics Laboratory, Laurel, MD	1530 hrs AIAA-2013-5451 **Global Last-Line of Defense System (GOLD)** J. Marcy, Raytheon Company, Tucson, AZ; M. Thangavelu, University of Southern California, Los Angeles, CA	1600 hrs AIAA-2013-5452 **Implementation of Thermal Gauging Method for Orbital STARBusTM Satellite** B. Yendler, S. Chernikov, YSPM, LLC, Saratoga, CA; J. Molinsky, D. Guadagnoli, Orbital Sciences Corporation, Dulles, VA	

Wednesday, 11 September 2013				
72-PANEL-10 **1430 - 1630 hrs**	**Commercial Crew and Cargo Program Status**			**Room 30AB**
Chaired by: E. MANGO				

A progress report, including completed and upcoming development milestones and certification efforts, for missions carrying NASA astronauts to the International Space Station.

Moderator: Gregory B. Harland, Public Affairs Officer, NASA Kennedy Space Center, Kennedy Space Center, FL

Panelists:

Frank Culbertson
Executive Vice President and General Manager
Advanced Programs Group, Orbital Sciences Corporation
Dulles, VA

John Mulholland
Vice President and Program Manager, Commercial Programs
Boeing Space Exploration, The Boeing Company,
Houston, TX

Nicholas Patrick
Human Integration Architect, Blue Origin LLC
Kent, WA

Garrett Reisman
Dragon Rider Project Manager
Space Exploration Technologies Corporation (SpaceX)
Hawthorne, CA

Mark Sirangelo
Corporate Vice President and Head of Space Systems
Sierra Nevada Corporation
Louisville, CO

Wednesday, 11 September 2013				
73-PANEL-11 **1430 - 1630 hrs**	**Hosted and Rideshare Payloads for Reducing the Cost of Access to Space**			**Room 31AB**
Chaired by: J. BAKER				

The rapid growth of the small satellite market (cubesats and nanosats) has accentuated the need for low cost access to space for a multitude of space technology payloads. This panel will examine the past, present and future rideshare and hosted payload methodologies employed to bring down the cost of access to space for smaller space payloads.

Moderator: Jim Baker, Chief Executive Officer, Arrow Science and Technology, Houston, TX

Panelists:

Doug Holker
Associate Principal Director, Developmental Planning and Projects
The Aerospace Corporation, El Segundo, CA

Robert Plunkett
Payload Integration Manager, MEI Technologies, Houston, TX

Matt Steele
Director of Business Development and Strategy, ATK Aerospace Systems, Magna, UT

Wednesday, 11 September 2013				
74-SSEE-4	**Optimizing Mission Design**			**Room 30E**
Chaired by: D. DRESS, NASA Langley Research Center				
1430 hrs AIAA-2013-5453 **Ensuring Competency Optimization from a Systems Thinking Perspective** A. Polite-Wilson, The Aerospace Corporation, El Segundo, CA	1500 hrs AIAA-2013-5454 **Space Mission Concept Development using Concept Maturity Levels** R. Wessen, C. Borden, J. Ziemer, R. Moeller, J. Ervin, J. Lang, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA	1530 hrs AIAA-2013-5455 **The Tailoring of Traditional Systems Engineering for the Morpheus Project** J. Devolites, J. Hart, NASA Johnson Space Center, Houston, TX	1600 hrs AIAA-2013-5456 **Investigation into System Functionality and Decomposition as an Extension to Previous Mars Exploration Studies** E. Dahan, Z. Herman, C. Procaccino, T. Wang, S. Bandyopadhyay, D. Ahern, S. D'Urso, University of Illinois, Urbana-Champaign, Urbana, IL	

Wednesday, 11 September 2013				
75-ST-4	**Advanced Space Transportation Technologies**			**Room 28D**
Chaired by: J. KNAUF, Scitor Corporation				
1430 hrs AIAA-2013-5457 **Marshall Enriched Storable Oxidizer** J. Herdy, D. Yanez, Qualis Corporation, Huntsville, AL	1500 hrs AIAA-2013-5458 **Cryogenic Propellant Storage and Transfer Technology Maturation: Establishing a Foundation for a Technology Demonstration Mission** M. Doherty, M. Meyer, S. Motil, C. Ginty, NASA Glenn Research Center, Cleveland, OH	1530 hrs AIAA-2013-5459 **Bantam Family of Aerojet Rocketdyne Commercial Rocket Engines** D. Levack, W. Sack, Pratt & Whitney, Canoga Park, CA		

Wednesday, 11 September 2013				
76-SYS-2	**Space Systems Sensors**			**Room 31C**
Chaired by: J. BLOOMER, Raytheon Space & Airborne Systems				
1430 hrs AIAA-2013-5461 **VIIRS Improvements over MODIS** K. Grant, Raytheon Company, Aurora, CO; J. Puschell, Raytheon Company, El Segundo, CA; S. Miller, Raytheon Company, Aurora, CO	1500 hrs AIAA-2013-5462 **Evaluation of Hyperspectral Snapshot Imagers onboard Nanosatellite Clusters for Multi-Angular Remote Sensing** S. Nag, K. Cahoy, O. De Weck, Massachusetts Institute of Technology, Cambridge, MA; C. Gatebe, B. Pasquale, G. Georgiev, T. Hewagama, S. Aslam, NASA Goddard Space Flight Center, Greenbelt, MD	1530 hrs AIAA-2013-5463 **An Echo State Network for Ionospheric Disturbances Behavior Modeling on Spaceborne Interferometric Synthetic Aperture Radar** B. Massinas, A. Doulamis, N. Doulamis, D. Paradissis, National Technical University of Athens, Athens, Greece	1600 hrs AIAA-2013-5464 **The ESA STE-QUEST Mission Study - Space Mission Design to Test Einstein's Equivalence Principle** M. Gehler, L. Cacciapuoti, A. Heske, R. Biesbroek, P. Waller, E. Wille, ESA, Noordwijk, The Netherlands	

Wednesday, 11 September 2013		
77-NW-10 **1630 - 1730 hrs**	**Networking Happy Hour**	**Ballroom 20 Lobby**

Wednesday, 11 September 2013		
78-LECT-1 **1730 - 1900 hrs**	**William H. Pickering Lecture: Curiosity Mars Science Laboratory**	**Ballroom 20A**

Welcome Remarks
Lt Gen Eugene L. Tattini, USAF (Ret)
Deputy Director, NASA Jet Propulsion Laboratory, Pasadena, CA

Speakers:

John Grotzinger
Fletcher Jones Professor of Geology and Curiosity Project Scientist,
California Institute of Technology, Pasadena, CA

Adam Steltzner
Manager, Planetary Entry, Descent, and Landing and Small Body Access Office
NASA Jet Propulsion Laboratory, Pasadena, CA

Wednesday, 11 September 2013		
79-AIAA-6 **1900 - 2000 hrs**	**AIAA San Diego Section Guest Speaker: Dale Myers**	**Room 32B**

NASA Shuttle Battle - From Start to Finish

After the Pickering Lecture, the AIAA San Diego Section cordially invites all attendees to a lecture by Dale Myers, on the initiation of the NASA space shuttle program. Dale Myers is 91; and 86 years ago shook hands with his boyhood hero, Charles Lindbergh. From then on, he was hooked on a career in aerospace. In 1964, Myers began working on the Apollo program, followed by the shuttle program in 1969, soon after Apollo 11's historic moon landing. In 1970 Myers was promoted to Associate Administrator for Manned Space Flight at NASA, and was at mission control when Apollo 13 experienced a crippling explosion. On October 6, 1986, eleven months after the Challenger disaster, Myers was selected as Deputy Administrator of NASA after a "persuasive" call from President Ronald Reagan. During that time he was tasked with helping the agency recoup and continue the space shuttle program. Smithsonian historian Roger Launius credits Myers with bringing a sense of optimism to the agency following the disaster. Myers is an Honorary Fellow of the AIAA, former president of the National Academy of Engineering, has earned three NASA Distinguished Service Medals, and received an honorary doctorate from Whitworth College.

Thursday, 12 September 2013

80-NW-11 0700 - 0800 hrs	Thursday Networking Breakfast	Ballroom 20 Lobby

Thursday, 12 September 2013

81-PLNRY-4 0800 - 0930 hrs	Aligning Technology Roadmaps to Support Goals	Ballroom 20A

This space technology plenary panel will bring together space community stakeholders for a discussion around technology roadmaps and how various initiatives across government and industry can align to support science, exploration, and defense goals. Technologies that are critical to enabling our future directions will be identified. Emerging technologies that could impact the way we approach the development and exploration of space will also be a part of the conversation.

Moderator: Carissa Christensen, Managing Partner, The Tauri Group, Alexandria, VA

Panelists:

Michael Gazarik
Associate Administrator, Space Technology, NASA Headquarters
Washington, DC

Maj Gen Neil McCasland, USAF
Past Commander, Air Force Research Laboratory
Albuquerque, NM

Pamela Melroy
Deputy Director, Tactical Technology Office, DARPA
Arlington, VA

Kenneth Washington
Vice President, Advanced Technology Center, Lockheed Martin Space Systems Company, Lockheed Martin Corporation
Denver, CO

Thursday, 12 September 2013

82-NW-12 0930 - 1000 hrs	Thursday Morning Networking Coffee Break	Ballroom 20CD

Thursday, 12 September 2013

83-SB-5 0930 - 1000 hrs	Thursday Morning Speakers' Briefing in Session Rooms	Session Rooms

Thursday, 12 September 2013

84-PANEL-14 1000 - 1200 hrs	Space Technology Development at NASA: Today and the Future	Room 30AB

This panel will examine the space technology requirements for current and future human and robotic exploration missions - with special emphasis on future asteroid and Mars exploration technology needs.

Moderator: Mason Peck, Chief Technologist, NASA Headquarters, Washington, DC

Panelists:

Jason Crusan
Director, Advanced Exploration Systems, Human Exploration and Operations Mission Directorate, NASA Headquarters, Washington, DC

Michele Manuel
Assistant Professor, Department of Materials Science and Engineering, University of Florida
Gainesville, FL

Roger Myers
Executive Director, Advanced In-Space Systems
Aerojet-Rocketdyne
Redmond, WA

James Reuther
Deputy Associate Administrator for Programs, Space Technology Mission Directorate, NASA Headquarters
Washington, DC

Tim Van Sant
Chief Technologist, Science Mission Directorate
NASA Headquarters
Washington, DC

Thursday, 12 September 2013				
85-CS-5	**Commercializing Space Exploration**			**Room 28A**
Chaired by: R. PITTMAN, NASA Space Portal				
1000 hrs AIAA-2013-5465 **The Nuclear Thermal Propulsion Stage (NTPS): A Key Space Asset for Human Exploration and Commercial Missions to the Moon** S. Borowski, D. McCurdy, L. Burke, NASA Glenn Research Center, Cleveland, OH	1030 hrs AIAA-2013-5466 **Definition and Analysis of the International Commercial Spaceflight Industry, 2006-2012** P. Guthrie, C. Christensen, S. Fye, Tauri Group, Alexandria, VA	1100 hrs AIAA-2013-5467 **Low Earth Orbit (LEO) Infrastructure: Services, Stakeholders and Challenges for Economic Development** R. Kohl, R. J. Kohl & Associates, Inc., Jefferson, MD	1130 hrs AIAA-2013-5468 **LEAPFROG Generation-X: Exploring Modularized Martian Robotic Exploration through Crowdsourcing the Open-Source Community** M. Ortega, A. Thakur, E. Aldana, M. Jacobs, P. Kranenburg, G. Meine, A. Coco, A. Ybarra, A. Coria, A. Armour, C. Vogt, C. Gomez, D. Pinzon, D. Monga, H. Sharifazadeh, M. Lam, N. Brito, S. McKie, S. Vierma, University of Southern California, Los Angeles, CA	

Thursday, 12 September 2013				
86-EXPL-6/SR-4	**How Space Resources Enable Space Exploration**			**Room 33A**
Chaired by: L. GERTSCH, Missouri University of Science and Technology				
1000 hrs AIAA-2013-5469 **A detailed analysis of the lunar and Phobos nodes within the OASIS spaceports network** L. Poulet, M. Labriet, C. Singh Derewa, International Space University, Strasbourg, France	1030 hrs AIAA-2013-5470 **A Multicriteria Optimisation Design of SPSE for Adaptive LEO Satellites Missions Using the PSI Method** S. Ekpo, Manchester Metropolitan University, Manchester, United Kingdom	1100 hrs AIAA-2013-5471 **The missing step to building a lunar spaceport** M. Labriet, L. Poulet, International Space University, Strasbourg, France	1130 hrs AIAA-2013-5472 **Parametric Optimization and Prediction Software for Excavation and Prospecting Tasks** K. Zacny, P. Chu, G. Paulsen, J. Spring, M. Hedlund, J. Craft, Honeybee Robotics, Pasadena, CA; P. van Susante, Michigan Technological University, Houghton, MI; R. Mueller, G. Galloway, J. Mantovani, NASA Kennedy Space Center, Cape Canaveral, FL	

Thursday, 12 September 2013				
87-EXPL-7	**Human and Robotic Mission Operations**			**Room 28B**
Chaired by: S. SHARMA, NASA				
1000 hrs AIAA-2013-5473 **Promoting Crew Autonomous Procedures and the International Space Station as a Testbed for Human Space Exploration** Y. Lee, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA; S. Beisert, F. Moreno, M. Rodriggs, NASA Johnson Space Center, Houston, TX; D. Eagles, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA	1030 hrs AIAA-2013-5385 **Mitigating the Effects of the Space Radiation Environment: A Novel Approach of Using Graded-Z Materials** W. Atwell, The Boeing Company, Houston, TX; K. Rojdev, NASA Johnson Space Center, Houston, TX; S. Aghara, S. Sriprisan, University of Massachusetts, Lowell, Lowell, MA	1030 hrs AIAA-2013-5475 **Surface Telerobotics: Development and Testing of a Crew Controlled Planetary Rover System** M. Bualat, T. Fong, M. Allan, X. Bouyssounouse, T. Cohen, L. Fluckiger, R. Gogna, L. Kobayashi, G. Lee, S. Lee, C. Provencher, E. Smith, V. To, H. Utz, D. Wheeler, NASA Ames Research Center, Moffett Field, CA; E. Pacis, Space and Naval Warfare Systems Center, San Diego, CA; D. Schreckenghost, TRACLabs, Inc., Houston, TX		

Thursday, 12 September 2013				
88-EXPL-8	**Human Exploration of Cis-Lunar Space**			**Room 28C**
Chaired by: C. MOORE, NASA Headquarters				
1000 hrs AIAA-2013-5476 **Orion Program Status** P. Marshall, S. Norris, Lockheed Martin Corporation, Littleton, CO	1030 hrs AIAA-2013-5477 **The Multi-purpose Crew Vehicle European Service Module: a European Contribution to Human Exploration** P. Berthe, ESA, Noordwijk, The Netherlands; K. Schubert, J. Grantier, NASA Glenn Research Center, Cleveland, OH; K. Pietsch, Astrium, Bremen, Germany; P. Angelillo, Astrium, Les Mureaux, France; L. Price, Lockheed Martin Corporation, Houston, TX	1100 hrs AIAA-2013-5478 **Trajectory Design Considerations for Human Missions to Explore the Lunar Farside From the Earth-Moon Lagrange Point EM-L2** W. Pratt, C. Buxton, S. Hall, J. Hopkins, A. Scott, Lockheed Martin Corporation, Littleton, CO	1130 hrs AIAA-2013-5479 **Lunar Lander Designs for Crewed Surface Sortie Missions in a Cost-Constrained Environment** M. Schaffer, SpaceWorks Enterprises, Inc., Washington, DC; E. Buchen, B. St Germain, SpaceWorks Enterprises, Inc., Atlanta, GA	

Thursday, 12 September 2013				
89-IS-2	**Intelligent Systems for Space: Technical Developments**			**Room 32B**
Chaired by: C. TSCHAN, The Aerospace Corporation and P. ZETOCHA				
1000 hrs AIAA-2013-5480 **Algorithm Development Library for Environmental Satellite Missions** K. Grant, S. Miller, Raytheon Company, Aurora, CO; M. Jamilkowski, Raytheon Company, Greenbelt, MD	1030 hrs AIAA-2013-5481 **Understanding and Managing Information Flows** J. Herdy, Qualis Corporation, Huntsville, AL; D. Yanez, ESI Group, St. Louis, MO	1100 hrs AIAA-2013-5482 **A Visual Integrated Development Environment for Automated Planning Domain Models** J. Ong, Stottler Henke Associates, Inc., San Mateo, CA; D. Smith, NASA Ames Research Center, Moffett Field, CA; E. Remolina, Stottler Henke Associates, Inc., San Mateo, CA; M. Boddy, Adventium Labs, Minneapolis, CA	1130 hrs AIAA-2013-5483 **How Intelligent is your Satellite or Ground System?** C. Tschan, The Aerospace Corporation, Colorado Springs, CO	

Thursday, 12 September 2013				
90-SL-3	**DARPA Phoenix Program: Latest News**			**Room 31C**
Chaired by: K. GOODLIFF, NASA Langley Research Center and T. BACHMAN, LMI				
1000 hrs AIAA-2013-5484 **DARPA Phoenix Payload Orbital Delivery System (PODs): "FedEx to GEO"** B. Sullivan, Space Systems Integration, LLC, Chantilly, VA; D. Barnhart, Defense Advanced Research Projects Agency, Arlington, VA; L. Hill, Space Systems Integration, LLC, Chantilly, VA; P. Oppenheimer, Naval Research Laboratory, Washington, DC; B. Benedict, Intelsat General Corporation, Rancho Palos Verdes, CA; G. Van Ommering, L. Chappell, Space Systems/Loral, Palo Alto, CA; J. Ratti, MDA, Brampton, Canada; P. Will, Self, Torrance, CA	1030 hrs AIAA-2013-5485 **Satlets - The Building Blocks of Future Satellites - And Which Mold Do You Use ?** T. Jaeger, W. Mirczak, NovaWurks, Los Alamitos, CA	1100 hrs AIAA-2013-5486 **The Market for Satellite Cellularization: A historical view of the impact of the satlet morphology on the space industry** L. Hill, Space Systems Integration, LLC, Arlington, VA; D. Barnhart, Defense Advanced Research Projects Agency, Arlington, VA; E. Fowler, ManTech, Arlington, VA; R. Hunter, NASA Ames Research Center, Moffett Field, CA; L. Hoag, KTSi, Arlington, VA; B. Sullivan, Space Systems Integration, LLC, Arlington, VA; P. Will, University of Southern California, Los Angeles, CA	1130 hrs AIAA-2013-5487 **Utilizing Cubesat Architecture and Innovative Low-Complexity Devices to Repurpose Decommissioned Apertures for RF Communications** L. Johnson, J. Hollman, J. McClellan, Aurora Flight Sciences, Cambridge, MA; P. Fisher, Massachusetts Institute of Technology, Cambridge, MA	

Thursday, 12 September 2013				
91-SSEE-6	**Issues in Space Economics Policy**			**Room 30E**
Chaired by: M. DITTMAR, Dittmar Associates, Inc.				
1000 hrs AIAA-2013-5488 **Exploring the current and future knowledge areas and skill sets within the U.S. Commercial Space Industry** S. McMullen, K. Witcher, Embry-Riddle Aeronautical University, Daytona Beach, FL; M. McMullen, Northcentral University, Prescott Valley, AZ; B. Fiske, Embry-Riddle Aeronautical University, Daytona Beach, FL	1030 hrs AIAA-2013-5489 **Modeling Operations Costs for Human Exploration Architectures** R. Shishko, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA	1100 hrs AIAA-2013-5490 **U. S. Government versus Commercial Acquisitions** R. Leamon, Y. Lazear, RYL Analytics and Consulting, Morro Bay, CA	1130 hrs AIAA-2013-5491 **Innovative Models For Private Financing of Space Science Missions White Paper** J. Nosanov, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA; M. Potter, International Institute of Space Commerce, Douglas, United Kingdom; N. Patton, C. Stott, International Space University, Strasbourg, France	

Thursday, 12 September 2013				
92-ST-5	**Space Transportation Architectures**			**Room 28D**
Chaired by: M. SIR, The Aerospace Corporation and K. BOCAM, Orbital Sciences Corporation				
1000 hrs AIAA-2013-5492 **A Combined Solar Electric and Storable Chemical Propulsion Vehicle for Piloted Mars Missions** S. Oleson, NASA Glenn Research Center, Cleveland, OH; B. Drake, NASA Johnson Space Center, Houston, TX; C. Mercer, NASA Glenn Research Center, Cleveland, OH	1030 hrs AIAA-2013-5493 **Understanding the Lunar System Architecture Design Space** D. Arney, A. Wilhite, Georgia Institute of Technology, Hampton, VA; D. Reeves, NASA Langley Research Center, Hampton, VA	1100 hrs AIAA-2013-5494 **RS-34 (Peacekeeper Post Boost Propulsion System) Orbital Debris Application Concept Study** E. Esther, C. Burnside, NASA Marshall Space Flight Center, Huntsville, AL	1130 hrs AIAA-2013-5495 **Techniques for Integrated Thermal-Structural Design of an Orbital Propellant Depot** A. Noevere, A. Wilhite, Georgia Institute of Technology, Atlanta, GA	

Thursday, 12 September 2013				
93-SYS-3	**Space Systems Technology I**			**Room 32A**
Chaired by: S. KHALIGH, Laser Sculpture				
1000 hrs AIAA-2013-5496 **Autonomous Navigation System Performance in the Earth-Moon System** J. Christian, West Virginia University, Morgantown, WV	1030 hrs AIAA-2013-5497 **Integration of Inflatables and LASER** K. Tanaka, Institute for Applied Optics, Tokyo, Japan	1100 hrs AIAA-2013-5498 **Alphasat TDP1 Laser Communication Terminal: paving the way for the European Data Relay Satellite System** D. Troendle, G. Muehlnikel, F. Heine, H. Kaempfner, TESAT Spacecom, Backnang, Germany; S. Philipp-May, R. Meyer, German Aerospace Center (DLR), Bonn, Germany; F. Garat, ESA, Noordwijk, The Netherlands	1130 hrs AIAA-2013-5499 **Joint Polar Satellite System (JPSS) Common Ground System (CGS) Multimission Support** M. Jamilkowski, Raytheon Company, Greenbelt, MD; S. Miller, K. Grant, Raytheon Company, Aurora, CO	

Thursday, 12 September 2013		
94-AIAA-7 **1000 - 1200 hrs**	**AIAA Public Policy Event: NASA Reauthorization 2013 - What is Happening?**	**Room 29AB**

Looking at historic activity and funding levels, the question is: What is a NASA Reauthorization bill's real impact and goal? Listen to expert discussion of the different proposals before Congress for NASA Reauthorization 2013, the historic trends and appropriations, and expectations for future passage.

Jeff M. Bingham
Senior Advisor on Space and Aeronautics, Republican Staff, Committee on Commerce, Science, and Transportation, United States Senate, Washington, DC (invited)

Thursday, 12 September 2013		
95-PANEL-13 **1000 - 1200 hrs**	**Space Debris and Space Operations: The Next 30 Years**	**Room 30CD**

This panel will discuss where we're going with regard to the near-space environment, services to commercial and foreign operators, related standards, and active debris removal during that time period. The objective will be to see how current projections for the orbital environment might affect space operations and related services, standards, and policies, and what we should be doing related to debris removal in this time frame to support a stable future environment.

Moderator: William Ailor, Principal Engineer, Center for Orbital and Reentry Debris Studies, The Aerospace Corporation, El Segundo, CA

Panelists:

Jim Armor
Vice President, Strategy and Business Development
Space Systems, ATK, Beltsville, MD

Bryan Benedict
Product Line Manager, Civil Hosted Payloads
Intelsat General, Rancho Palos Verdes, CA

J.-C. Liou
Chief Technologist, Astromaterials Research and Exploration Science Directorate
NASA Johnson Space Center, Houston, TX

Glenn Peterson
Senior Engineering Specialist, The Aerospace Corporation, Los Angeles, CA

Frederick A. Slane
Executive Director, Space Infrastructure Foundation, Colorado Springs, CO

Thursday, 12 September 2013		
96-NW-13 **1200 - 1330 hrs**	**Thursday Networking Luncheon**	**Ballroom 20CD**

Thursday, 12 September 2013		
97-PLNRY-5 **1330 - 1500 hrs**	**The Way Ahead for Space-Based Weather Monitoring**	**Ballroom 20A**

Dramatic shifts in global weather trends are increasingly common and highly visible. At the same time, our ability to monitor and predict these trends from our space-based assets is degrading. In the face of declining budgets, our capabilities are reaching the end of their useful lives. Where do we go from here?

Moderator: Christopher J. Scolese, Director, NASA Goddard Space Flight Center, Greenbelt, MD

Panelists:

Jack Kaye
Associate Director for Research, Earth Science Division Science Mission Directorate
NASA Headquarters
Washington, DC

Jon Kirchner
President and Chief Operating Officer
GEOOptics, Inc.
Gladwyne, PA

John Murphy
Director, Office of Science and Technology
National Weather Service (NOAA)
Silver Spring, MD

Clark Snodgrass
Director of GeoInt, Sensing, and Science Programs
Northrop Grumman Aerospace Systems, Northrop Grumman Corporation Redondo Beach, CA

Thursday, 12 September 2013		
98-NW-14 1500 - 1530 hrs	Thursday Afternoon Networking Coffee Break	Ballroom 20 Lobby

Thursday, 12 September 2013		
99-SB-6 1500 - 1530 hrs	Thursday Afternoon Speakers' Briefing in Session Rooms	Session Rooms

Thursday, 12 September 2013		
100-PANEL-16 1530 - 1730 hrs	Earth Science Satellite Missions and Opportunities	Room 30CD

Chaired by: J. KAYE

This panel will discuss: What are the current and future remote sensing activities/opportunities of various federal agencies? What enabling technologies are critical to the future satellite missions?

Moderator: Jack Kaye, Associate Director for Research, Earth Science Division, NASA Headquarters, Washington, DC

Panelists:

Tom Cecere
Land Remote Sensing Program Office, U.S. Geological Survey

George Komar
Associate Director, Earth Science Technology Office (ESTO)
NASA Headquarters, Washington, DC

Chris Scolese
Director, NASA Goddard Space Science Center
Greenbelt, MD

Marcus Watkins
Director, Joint Agency Satellite Division (JASD), Earth Science Division
NASA Headquarters, Washington, DC

Thursday, 12 September 2013				
101-EXPL-10	Coordinating Scientific and Human Exploration of Mars			Room 28A
Chaired by: M. GATES, NASA HQ				
1530 hrs AIAA-2013-5500 **Intersections and Opportunities in Human Exploration, Science and Technology Identified in the Mars Program Planning Group** M. Gates, R. Lillard, G. Tahu, M. Wargo, NASA Headquarters, Washington, DC; J. Baker, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA; B. Drake, NASA Johnson Space Center, Houston, TX	1600 hrs AIAA-2013-5501 **Preparing for Humans at Mars, MPPG updates to Strategic Knowledge Gaps and Collaboration with Science Missions** J. Baker, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA; M. Wargo, NASA Headquarters, Washington, DC; D. Beaty, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA	1630 hrs AIAA-2013-5502 **Technology Needs to Support Future Mars Exploration** E. Nilsen, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA; R. Lillard, NASA Headquarters, Washington, DC; J. Baker, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA	1700 hrs AIAA-2013-5503 **Mangalyaan - Overview and Technical Architecture of India's First Interplanetary Mission to Mars** V. Sundararajan, Aerospace In India, Research Triangle Park, NC	

Thursday, 12 September 2013				
102-EXPL-11	Mission Architectures			Room 28B
Chaired by: S. SHARMA, NASA				
1530 hrs AIAA-2013-5504 **ISECG Global Exploration Roadmap: A Stepwise Approach to Deep Space Exploration** R. Martinez, NASA Johnson Space Center, Houston, TX; K. Goodliff, NASA Langley Research Center, Hampton, VA; R. Whitley, NASA Johnson Space Center, Houston, TX	1600 hrs AIAA-2013-5505 **GER Technology Development Map—a coordinated analysis of technology development interests** C. Lange, Canadian Space Agency, Saint-Hubert, Canada; A. Bergamasco, ESA, Noordwijk, The Netherlands; J. Hill, German Aerospace Center (DLR), Bonn, Germany; S. Stilson, NASA Headquarters, Washington, DC; H. Ueno, Japan Aerospace Exploration Agency (JAXA), Tsukuba, Japan; S. Vangen, NASA Kennedy Space Center, Cape Canaveral, FL	1630 hrs AIAA-2013-5506 **Developing a Modular Affordable Evolvable Architecture for Sustainable Human Lunar Exploration** D. Akin, University of Maryland, College Park, MD	1700 hrs AIAA-2013-5507 **A Lean, Fast Mars Round-trip Mission Architecture: Using Current Technologies for a Human Mission in the 2030s** L. Bailey, NASA Johnson Space Center, Houston, TX; D. Folta, B. Barbee, F. Vaughn, B. Campbell, H. Thronson, J. Englander, T. Lin, NASA Goddard Space Flight Center, Greenbelt, MD	

Thursday, 12 September 2013		
103-PANEL-15 1530 - 1730 hrs	Bringing Space Technology to Market: Effects of U.S. Policies and Practices	Room 30AB

Chaired by: K. KRISHEN, NASA-Johnson Space Center and C. SHEPHERD, Jacobs Engineering Group, Inc.

This panel explores the effects of federal policies and recent innovative space technology transfer practices on the success of technology transfer. Technologies developed for the challenging space environment often have great potential to be adapted into new commercial products/markets. This panel will discuss the challenges and opportunities posed by U.S. policies in regard to space technology transfer.

Moderator: Kumar Krishen, ST/Senior Scientist/Lead Technologist, Technology Transfer and Commercialization Office, NASA Johnson Space Center, Houston, TX

Panelists:

Daniel Broderick
Manager, Office of Technology Transfer, Commercial Programs Office
NASA Jet Propulsion Laboratory, Pasadena, CA

David C. Leestma
Manager, Technology Transfer and Commercialization Office
NASA Johnson Space Center, Houston, TX

Andrew Nelson
Chief Operating Officer, XCOR Aerospace, Mojave, CA

Bob Prochnow
Director, Gulf Coast RCIC and Bay Area RCIC, Texas Emerging Technology Fund, and Chief Information Officer
Houston Technology Center, Houston, TX

Thursday, 12 September 2013				
104-RSA-6	Habitat Support Systems			Room 32B

Chaired by: S. KHALIGH, Laser Sculpture

1530 hrs	1600 hrs	1630 hrs	1700 hrs	
AIAA-2013-5508	AIAA-2013-5509	AIAA-2013-5510	AIAA-2013-5511	
Virtual Construction of Space Habitats: Connecting Building Information Models (BIM) and SysML	**SpiderFab: An Architecture for Self-Fabricating Space Systems**	**X1: A Robotic Exoskeleton for In-Space Countermeasures and Dynamometry**	**Designing a Zero Gravity Toilet for Disabled Space Tourists**	
R. Polit Casillas, S. Howe, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA	R. Hoyt, Tethers Unlimited, Inc., Bothell, WA	R. Rea, C. Beck, R. Rovekamp, Oceaneering International, Inc., Houston, TX; P. Neuhaus, Institute for Human & Machine Cognition (IHMC), Pensacola, FL; M. Diftler, NASA Johnson Space Center, Houston, TX	H. Chang, University of Tokyo, Tokyo, Japan; C. Wang, National Taipei University of Technology, Taipei, Taiwan	

Thursday, 12 September 2013				
105-SATS-2	Nanosat and Small Sat Technology			Room 31C

Chaired by: J. BAKER, Arrow Science and Technology

1530 hrs	1600 hrs	1630 hrs	1700 hrs	
AIAA-2013-5512	AIAA-2013-5513	AIAA-2013-5514	AIAA-2013-5515	
An Open Source Space Hypervisor For Small Satellites	**Nanosat Launch Vehicles: A Global Perspective and Business Case**	**Dynamics and Control of a Disordered System In Space**	**The Tremendous Advantages of FANTM-RiDE™-Enabled Dedicated Rideshare vs. Hosted Payloads**	
A. Santangelo, sci_Zone, Rio Rancho, NM	M. Bille, T. Hunsaker, Booz Allen Hamilton, Colorado Springs, CO	M. Quadrelli, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA	D. Lim, TriSept Corporation, Chantilly, VA	

Thursday, 12 September 2013				
106-SR-6	Processing Space Resources			Room 33A

Chaired by: J. RICHARD

1530 hrs	1600 hrs	1630 hrs	1700 hrs	
AIAA-2013-5516	AIAA-2013-5517	AIAA-2013-5518	AIAA-2013-5519	
Advanced Water Purification System for In Situ Resource Utilization	**Robotic and Human-Assisted Lunar Sample Return**	**The conceptual design of lunar cave outpost**	**A Retrospective Analysis of Technology Forecasting**	
S. Anthony, NASA Kennedy Space Center, Cape Canaveral, FL; S. Jolley, J. Captain, QinetiQ, Kennedy Space Center, FL	H. Shyface, Analytical Mechanics Associates, Inc., Hampton, VA; J. Antol, M. Bobskill, D. Reeves, NASA Langley Research Center, Hampton, VA; D. Arney, Georgia Institute of Technology, Hampton, VA	S. Rahimi Motem, P. Heidari, Self, Tehran, Iran	S. Charbonneau, S. Fye, J. Hay, C. Mullins, Tauri Group, Alexandria, VA	

Thursday, 12 September 2013				
107-SSEE-7	**Advances in Cost Analysis**			**Room 30E**
Chaired by: S. STUKES, Jet Propulsion Laboratory				
1530 hrs AIAA-2013-5520 **Using System Complexity to Increase Cost Estimate Accuracy in Government Procurements** P. Malone, MCR, LLC, El Segundo, CA	1600 hrs AIAA-2013-5521 **Cost Modeling Considerations & Challenges of the SpaceLiner - An Advanced Hypersonic, Suborbital Spaceplane** O. Trivailo, German Aerospace Center (DLR), Bremen, Germany; A. Lentsch, Orbspace Space Engineering, Podersdorf/See, Austria; M. Sippel, German Aerospace Center (DLR), Bremen, Germany; A. Sekercioglu, Monash University, Melbourne, Australia	1630 hrs AIAA-2013-5522 **A manpower cost model to support contract negotiation of space projects** G. Cifani, P. Martino, ESA, Noordwijk, The Netherlands	1700 hrs AIAA-2013-5523 **TCASE: Technology Cost and Schedule Estimating Tool** M. Schaffer, J. Depasquale, SpaceWorks Enterprises, Inc., Washington, DC; J. Reeves, NASA Langley Research Center, Hampton, VA	

Thursday, 12 September 2013				
108-SSEE-8	**Risk Management**			**Room 28C**
Chaired by: J. DAHLGREN, MITRE Corporation				
1530 hrs AIAA-2013-5524 **Understanding the Results of an Integrated Cost/ Schedule Risk Analysis** J. Johnson, NASA Headquarters, Washington, DC; D. Elliott, Tecolote Research, Inc., Los Angeles, CA	1600 hrs AIAA-2013-5525 **Complex Project Interface and Technology Risk Assessment utilizing DSM Methods for Indian Space Exploration Missions** V. Sundararajan, Aerospace In India, Research Triangle Park, NC	1630 hrs AIAA-2013-5526 **Lithium Ion Battery Fault Management on the Van Allen Probes** E. Smith, M. Butler, K. Fretz, B. Wilhelm, Johns Hopkins University Applied Physics Laboratory, Laurel, MD	1700 hrs AIAA-2013-5527 **Verification & Validation by Risk Class: Understanding how Risk Classes affect the V&V process** B. Solish, B. Cooke, N. Cox, P. Kahn, P. Peddada, R. Prakash, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA	

Thursday, 12 September 2013				
109-ST-6	**Innovative Reusable Launch Vehicle Concept Design**			**Room 28D**
Chaired by: A. DISSEL, Lockheed Martin Space Systems and B. HELLMAN, Air Force Reseach Laboratory				
1530 hrs AIAA-2013-5528 **Preliminary MIPCC Enhanced F-4 and F-15 Performance Characteristics for a First Stage Reusable Launch Vehicle** K. Kloesel, C. Clark, NASA Dryden Flight Research Center, Edwards, CA	1600 hrs AIAA-2013-5529 **Small Launch Vehicle Concept Development for Affordable Multi-Stage Inline Configurations** B. Beers, E. Waters, A. Philips, G. Threet, NASA Marshall Space Flight Center, Huntsville, AL	1630 hrs AIAA-2013-5530 **Centaur Capability to Support Varying Mission Requirements** L. Pollard, P. Wilson, United Launch Alliance, Centennial, CO	1700 hrs AIAA-2013-5531 **Aircraft Dynamic Modes of a Winged Reusable Rocket Plane** B. Hellman, B. Pleiman, Air Force Research Laboratory, Wright-Patterson AFB, OH; M. Street, XCOR Aerospace, Mojave, CA	

Thursday, 12 September 2013				
110-SYS-4	**Space Systems Technology II**			**Room 32A**
Chaired by: A. LO, Northrop Grumman Aerospace Systems				
1530 hrs AIAA-2013-5532 **Spacecraft Health and Forensics from Video Telemetry** T. Nye, Self, Palos Verdes Estates, CA	1600 hrs AIAA-2013-5533 **ON-OFF Adhesive Grippers for Earth-Orbit** A. Parness, B. Kennedy, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA	1630 hrs AIAA-2013-5534 **Joint Polar Satellite System (JPSS) Common Ground System (CGS) Overview and Evolution** S. Miller, Raytheon Company, Aurora, CO; M. Jamilkowski, Raytheon Company, Greenbelt, MD; K. Grant, Raytheon Company, Aurora, CO	1700 hrs AIAA-2013-5535 **On the Phoenix ADCS-M^{3}D Architecture** L. Singh, M. Fritz, S. Bhatt, Draper Laboratory, Cambridge, MA; N. Bedrossian, Halliburton, Houston, TX; T. Henderson, B. Moran, Draper Laboratory, Cambridge, MA	

Thursday, 12 September 2013		
111-PLNRY-6 **1730 - 1830 hrs**	**Closing Remarks and Preview of AIAA SPACE 2014 Forum**	**Ballroom 20A**

Author/Session Chair Index

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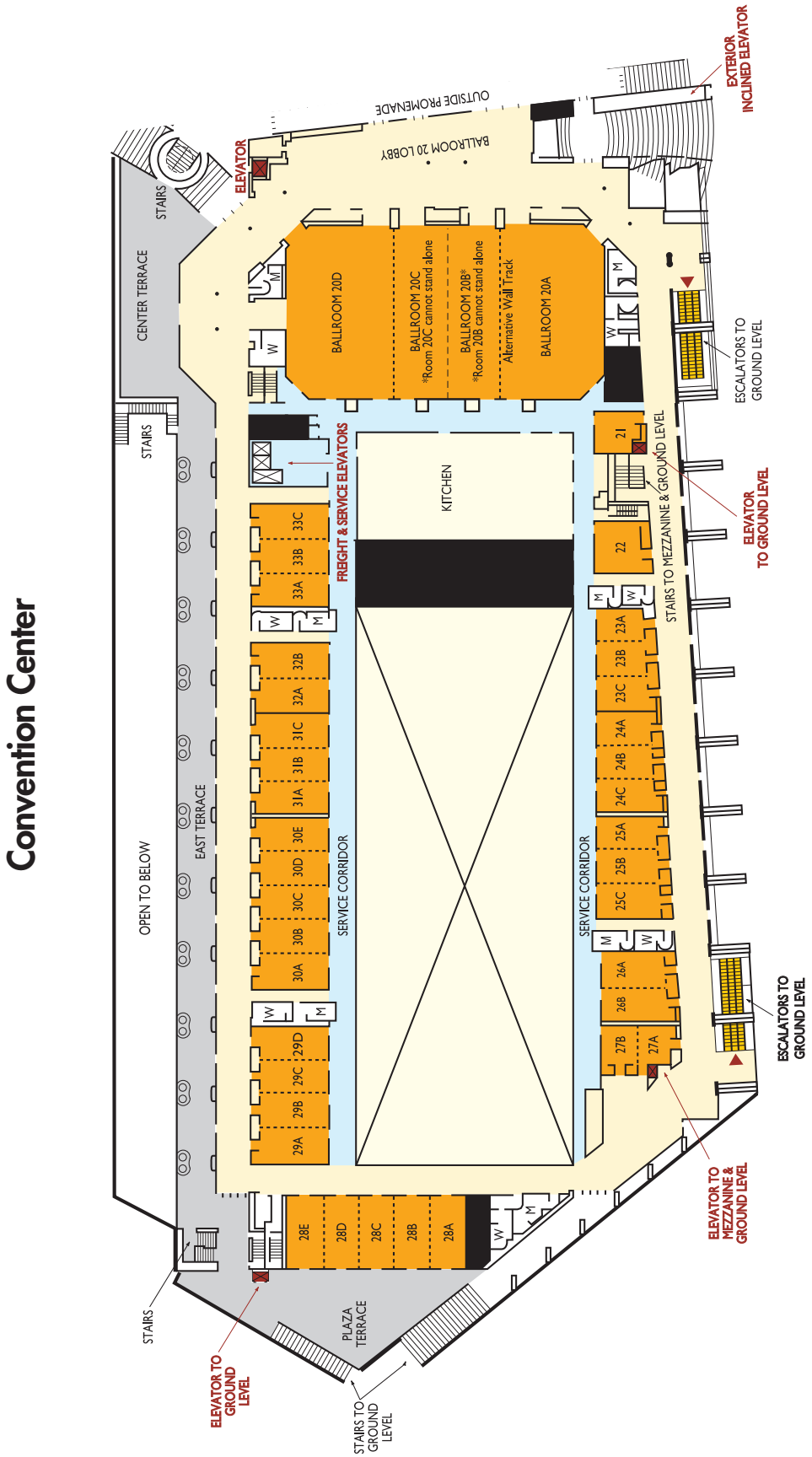
Venue Map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