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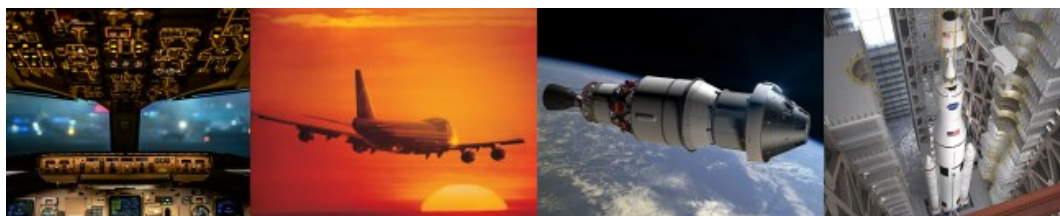
April 2016

Welcome to the latest installment of the ASEB News. This newsletter will update you on ASEB events and activities.

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Aeronautics and Space Engineering Board News



From the Chair

The 157th meeting of the Aeronautics and Space Engineering Board took place at the end of April at a pivotal juncture for the nation's aeronautics and space endeavors. The time period between our last meeting in November 2015 and now is full of successes in both public and private space and aeronautic initiatives and programs. It also comes at an interesting political juncture for the United States. More about this latter point later.

We had our usual opportunities to hear from Charlie Bolden, the NASA Administrator; Dr. Jaiwon Shin, the Aeronautics Research Mission Directorate Administrator; Bill Gerstenmaier, the Human Exploration Directorate Administrator; Dr. Pam Melroy from DARPA; and the Chief Scientists of NASA and the Air Force. In addition, to go along with our previous outreach to the "commercial Space/Aerospace industry", the board heard from Virgin Galactic.

Of particular interest was the report from Dr. Shin about the "New Horizon" vision for Aeronautics, and, the future for U.S. Aviation. The President's FY-17 budget plans reflect an increase in funding to address 'operational efficiencies' in commercial aviation; the growing integration of Unmanned Aeronautical Systems [UAS] into our airspace system; and, a significant increase in hypersonic research and development. What is even more exciting is a recognition of the

need for, and funding for "X-Planes" as a major element to support a wide variety of R&D initiatives in aeronautics.

I recently had an opportunity to discuss the New

Horizon vision for NASA Aeronautics in a visit to the Air Force's Arnold Engineering and Development Center {AEDC} in Tullahoma, Tennessee. AEDC, was established in 1951 by President Harry Truman, as a complex of wind tunnel testing facilities for aeronautics systems, and of space environment flight simulation chambers and test cells for rockets and satellites. AEDC has supported aeronautics research for both the Air Force and NASA pro-

grams—such as the hypersonic X-43 for NASA's "HYPER-X" program in the early 2000s. This unmanned experimental hypersonic aircraft design achieved a speed of Mach 9.68 during a test in 2004. Needless to say, the prospect of supporting future hypersonic activities by NASA and the Air Force has already generated interest at AEDC, and other major test organizations in the country.

Finally, the DoD, NASA, and every major organization in the government are concerned about the future of their programs in light of Presidential election, and the arrival of a new administration. While great progress has been made in our civil space programs during this current administra-

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tion, such as in firmly adopting the horizon goal of humans on Mars for Human Space Exploration, the obvious concern is whether those programs will continue to be supported by a new administration. Likewise, the same concern applies to the positive change in interest for aeronautics and aviation reflected in the renewed programs of ARMD. Therefore, a major question the ASEB will continue to address with both NASA, DoD, and others is how can the board help carry the message that our nation's space and aeronautics programs are national treasures, and should be supported and maintained.

-Lester Lyles, Chair

The views expressed here do not necessarily reflect those of the SSB or the National Academies of Sciences, Engineering, and Medicine

ASEB Calendar

May 24

NASA Aeronautics Research and Technology Roundtable Meeting, Keck Center, Washington, DC

July 21

Space Technology Industry-Government University Roundtable Meeting, Keck Center, Washington, DC

October 12-13

ASEB Fall Meeting, Beckman Center, Irvine, CA

For updates to the ASEB calendar, please see <http://www.national-academies.org/aseb>.



National Academy of Engineering

ASEB member Steve Battel was elected to the National Academy of Engineering. Mr. Battel was elected for engineering design and implementation of space flight systems.



2016 AIAA Reed Aeronautics Award

ASEB member, Earl Dowell, the William Holland Hall Professor of Mechanical Engineering at Duke University, has won the 2016 AIAA Reed Aeronautics Award in honor of his "pioneering contributions to aeroelasticity, structural dynamics, and unsteady aerodynamics, which has an enormous influence on aerospace technology." In a statement congratulating Dowell on the award, AIAA President Jim Albaugh said, "Earl Dowell's work has done much to address areas that have challenged the advance of flight," noting, "His work has allowed us to build better aircraft, find more efficient shapes for vehicles, and construct improved helicopter blades."

ASEB Staff Members

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Celeste Naylor*
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Tanja Pilzak*
Manager, Program Operations

Andrea Rebholz
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Anesia Wilks*
Senior Project Assistant

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Senior Financial Assistant

*Staff of other NRC Boards who are shared with ASEB

Committee on NASA Space Technology Roadmaps

The Committee on NASA Space Technology Roadmaps held its second meeting on November 12-13, in Washington, D.C., its third meeting, January 11-12, 2016 in Irvine, California, and its last meeting March 21-23 in Washington, DC. The committee has drafted its report which will soon enter review. The committee is scheduled to deliver its report in summer 2016.



Above, despite being crammed into the least desirable room at Beckman, the committee still managed to work diligently during its third meeting. *Photo courtesy of Dwayne Day, ASEB Staff*



At left the committee's last meeting in March in Washington they had a bigger room, but Washington March weather. Here the committee is working on its final report, which will be delivered to NASA as soon as it emerges from review. *Photo courtesy of Dwayne Day, ASEB Staff*

Committee on NASA Technology Roadmaps Members

Todd J. Mosher, co-chair
Synconess

Liselotte J. Schioler, co-chair
National Institute of Aerospace

Arden L. Bement, Jr.
Purdue University

John C. Brock
Northrop Grumman Space Technology (retired)

James L. Burch
Southwest Research Institute

Stephen Gorevan
Honeybee Robotics, Ltd.

Charles L. Isbell, Jr.
Georgia Tech

H. Jay Melosh
Purdue University

David P. Miller
University of Oklahoma

Daniel O'Shaughnessy
The Johns Hopkins University Applied Physics Laboratory

Torrey Radcliffe
The Aerospace Corporation

John R. Rogacki
Florida Institute for Human and Machine Cognition

Julie A. Shah
MIT

Alan M. Title
Lockheed Martin Advanced Technology Center

ASEB Aeronautics Research and Technology Roundtable (ARTR)

The Aeronautics Research and Technology Roundtable will hold its next at the Keck Center on May 24, 2016. At that meeting, the Roundtable will discuss NASA's aeronautics roadmapping activities. The committee is chaired by John Tracy of Boeing.



Above, Committee chair John Tracy speaking at the July 2015 meeting of the Aeronautics Research and Technology Roundtable. Photos courtesy of Dwayne Day, ASEB Staff.



ARTR Members

John J. Tracy, Chair
The Boeing Company

Michael Bragg
University of Washington

Daniel K. Elwell
Elwell & Associates, LLC

Alan H. Epstein (NAE)
Pratt & Whitney

Mike Hirschberg
American Helicopter Society International

Bruce J. Holmes
NextGen AeroSciences, LLC

Margaret T. Jenny
RTCA, Inc.

Nicholas D. Lappos
Sikorsky Aircraft Corporation

Lourdes Maurice
Federal Aviation Administration

M. Granger Morgan
Carnegie Mellon University

Steven Pennington
U.S. Air Force

Eli Reshotko (NAE)
Case Western Reserve, Emeritus

Thomas E. Romesser (NAE)
Northrop Grumman Aerospace Systems

Jaiwon Shin
NASA

Patti Grace Smith
Patti Grace Smith Consulting, LLC

Ian A. Waitz (NAE)
MIT

Robert Walters
Virginia Tech

David W. Yoel
American Aerospace Advisors, Inc.

ASEB Space Technology Industry-Government-University Roundtable (STIGUR)

The NRC Space Technology-Industry-Government-University Roundtable was established to engage senior representatives from industry, universities, NASA, and other government agencies in discussions of critical issues related to NASA's space technology research agenda that are of shared interest.

The Roundtable held its fourth meeting March 1, 2016, in Washington, D.C., led by Chair Ray Johnson, formerly the chief technology officer of Lockheed Martin, and Stephen Jurczyk, NASA's associate administrator for the Space Technology Mission Directorate (STMD), who is also a member of the Roundtable. The March meeting included discussion of:

Development of advanced technologies that go beyond advances in "traditional" space technologies, largely focused on more affordable solutions to space missions.

Collaborative projects by NASA and other government agencies (current and future).

Joint efforts by HEOMD, SMD, STMD, and OCT to develop a Mars Technology Investment Plan.

As with all National Academies roundtables, the ASEB produced no written products as a result of the meeting; it is left to participants to make note of the key points relevant to them and their organizations. The next meeting of the Space Technology Roundtable will take place in July 2016 in Washington, D.C..

STIGUR Members

Ray O. Johnson, Chair
Lockheed Martin (retired)

Robert D. Braun
Georgia Institute of Technology

Claude Canizares
MIT

Carissa Christensen
Tauri Group Room

Raymond S. Colladay
Consultant

Douglas R. Cooke
Cooke Concepts and Solutions

Werner J.A. Dahm
Arizona State University

Antonio L. Elias
Orbital Sciences Corporation

Alec D. Gallimore
University of Michigan

Michael Gold
Bigelow Aerospace

Michael D. Griffin
Schafer Corporation

John W. Hines
Independent Consultant

Stephen G. Jurczyk
NASA

William C. Krenz
The Aerospace Corporation

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*Science and Technology Policy
Institute, IDA*

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The Boeing Company

Roger M. Myers
Aerojet Rocketdyne

Russell E. Partch
U.S. Air Force

Marcia Smith
*Space and Technology Policy
Group, LLC*

John C. Sommerer
Talitha Ventures

Alfred Tadros
Space Systems/Loral

Laurence R. Young
MIT



At left is the newest aircraft to be displayed at the Smithsonian's Steven F. Udvar-Hazy Museum near Washington Dulles International Airport. This Sikorsky HH-52A Seaguard participated in a dramatic rescue of 22 sailors from burning ships outside Galveston, Texas in 1979. *Photo courtesy of Dwayne Day, ASEB Staff.*

Committee on Biological and Physical Sciences in Space Members

Elizabeth Cantwell, Co-chair
Arizona State University

Robert J. Ferl, Co-chair
University of Florida

Kenneth M. Baldwin
University of California, Irvine

Robert L. Byer
Stanford University

Ofofike (DK) A. Ezekoye
The University of Texas at Austin

Mohammad Kassemi
Case Western Reserve University

Ronald G. Larson
University of Michigan

Richard E. Lenski
Michigan State University

James A. Pawelczyk
The Pennsylvania State University

Marylyn D. Ritchie
The Pennsylvania State University

Pol D. Spanos
Rice University

Krystyn J. Van Vliet
MIT

Peter W. Voorhees
Northwestern University

Erika Wagner
Blue Origin, LLC

Eugenia Y-H Wang
University of Louisville

Space Studies Board/ASEB Standing Committee on Biological and Physical Sciences in Space

The Committee on Biological and Physical Sciences in Space (CBPSS) held a meeting October 27-29, 2015 at the Beckman Center in Irvine, CA. The committee also held a meeting March 29-31 at the NAS Building in Washington, DC as part of "Space Science Week," an annual Space Studies Board sponsored series of meetings and lectures. The committee's meeting included a symposium on research in commercial low Earth orbit and featured speakers from industry, NASA, and CASIS, which is seeking research customers for the International Space Station. A providers panel featured industry representatives such as Bigelow Aerospace, Sierra Nevada, Orbital ATK, and NanoRacks. A customers panel featured representatives from Eli Lilly, Merck, ACME Advanced Materials, Inc., LaunchPad Medical, and Purdue University. The committee also heard about NASA planning for commercial LEO from Sam Scimemi, NASA headquarters, and economic considerations for LEO research platform markets from Ioana Cozmuta, NASA Ames Research Center.

More information about the committee and its membership can be found at http://sites.nationalacademies.org/SSB/SSB_145312.

ASEB Committee on Propulsion and Energy Systems to Reduce Commercial Aviation Carbon Emissions (Low Carbon Aviation Committee)

The purpose of this study is to examine options for reducing life-cycle carbon emissions from commercial aviation globally even if air traffic grows as expected. The recommended research agenda will consist of a prioritized set of research projects of importance to the national and international commercial aeronautics community, and it will focus on advances in technologies and capabilities that can only be achieved through substantial research and technology development. The study is focused on propulsion and energy systems research; it will not develop recommendations for research in other areas such as airframe designs or air traffic management systems. The committee is led by Dr. Karen A. Thole, Pennsylvania State University, and Dr. Woodrow Whitlow, Jr., Cleveland State University. The committee held a meeting November 10-11, 2015 in Washington, and its final meeting January 7-8 in Irvine. The focus of these two meetings was on low carbon technologies related to combustion engines, electric propulsion systems, and drop-in biofuels. The committee's final report is currently in review and scheduled for delivery in early summer 2016.

Low Carbon Aviation Committee Members

Karen A. Thole, Co-chair
Pennsylvania State University

Woodrow Whitlow, Co-chair
Cleveland State University

Meyer J. Benzakein,
The Ohio State University

R. Stephen Berry
University of Chicago Gordon Center for Integrative Studies Department of Chemistry and James Franck Institute

Marty K. Bradley
Boeing Commercial Airplanes

Steven J. Csonka
Commercial Aviation Alternative Fuels Initiative

David J.H. Eames
Rolls-Royce North America

Daniel K. Elwell
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Zia Haq
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Purdue University

James F. Miller
Argonne National Laboratory

John G. Nairus
AFRL/RQQ

Stephen M. Ruffin
Georgia Institute of Technology

Hratch G. Semerjian
National Institute of Standards and Technology

Subhash C. Singhal
Pacific Northwest National Laboratory

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About the ASEB...

The ASEB was established in 1967 "to focus talents and energies of the engineering community on significant aerospace policies and programs." In undertaking its responsibility, the ASEB oversees ad hoc committees that recommend priorities and procedures for achieving aerospace engineering objectives, and offers a way to bring engineering and other related expertise to bear on aerospace issues of national importance. Among these issues are: research and development aspects of the Next Generation Air Transportation System (NextGen); NASA's aeronautics research program; national aeronautics R&D policy and its implementation; space policy and programs, with a focus on human spaceflight and space operations; commercial space activities; and other aerospace engineering topics.



Washington's cherry blossoms bloomed early this year, in March. It then got cold again. *Photo courtesy of Dwayne Day, ASEB Staff.*

