



FALL MEETING OF THE AERONAUTICS AND SPACE ENGINEERING BOARD

164th Meeting

September 25th-27th, 2019

Beckman Center — Huntington Room

100 Academy Way, Irvine, CA

DAY 1 –SEPTEMBER 25TH

7:30 AM *Working Breakfast Available in the Beckman Dining Room*
8:30 AM *Committee Meets in Executive Session*
9:15 AM *Break*

OPEN SESSION

Zoom Remote Access Information - Day 1 Open

Link: <https://nasem.zoom.us/j/330124419>

Phone: 877-853-5257

Meeting ID: 330-124-419

Focus on Aeronautics Technology

9:30 AM	Welcome and Introductions	Alan Epstein, ASEB Chair
9:45 AM	ARMD Program and Budget Update (30 minute presentation & 15 minute discussion)	Jon Montgomery, NASA¹
10:30 AM	Update from NASA ARMD Program Director (20 minute presentation & 10 minute discussion)	Jim Kenyon, NASA
11:00 AM	Break	
11:15 AM	X-57 Program Project Manager Talk (20 minute presentation & 10 minute discussion)	Sean Clarke, NASA
11:45 AM	Working Lunch in the Beckman Dining Room (informal discussions continue over lunch)	

Focus on the Future of Aeronautics Technology

Advancing the Frontiers of Aviation Technology (2 Panels)*

12:45 PM	Advanced Low-Noise Aircraft Configurations and Their Assessment: Past, Present and Future (45 minute presentation & 15 minute discussion)	Zoltán Spakovszky, MIT
1:45 PM	Panel 1: Aircraft Noise Reduction and the Regulatory Environment (5 minute panel presentations followed by discussion)	

¹ Attendance Via Zoom

ISSUE: How can technological innovation, industry efforts, and FAA regulations further reduce the impact of aircraft noise on communities surrounding airports or on busy flight paths?

Moderator:

Alan Epstein, ASEB Chair

Panelists:

**Becky Cointin, Deputy Director, Office of
Environment and Energy, FAA**

Fay Collier, Environmentally Responsible Aviation Project, NASA

Kalena Glover, Performance Engineer, Delta Airlines

Lourdes Maurice, Consultant, DLM Global Strategies¹

**Melinda Pagliarello, Senior Director – Environmental Affairs,
Airports Council International**

3:30 PM Break

3:45 PM Panel 2: The University Leadership Initiative: Results and a Reflection on the Program

(5 minute panel presentations followed by discussion)

ISSUE: How did the ARMD-ULI facilitate the development of new technologies and innovations that benefited the aviation community? Are there any improvements that can be made to the program?

Moderator:

Eileen Collins, ASEB Member

Panelists:

Mike Benzakein, Director, Propulsion and Power Center, OSU

James Coder, Professor, U. of Tennessee-Knoxville

John Cavolowsky, NASA

Dimitris Lagoudas, Professor, Texas A&M

Yongming Liu, Professor, Arizona State

Helen Reed, Professor, Texas A&M¹

5:15 PM Observations and Closing Discussion

All

Reception and Dinner - Members, Speakers, and Invited Guests

5:30 PM Reception – Beckman Center Patio

6:00 PM Working Dinner – Beckman Center Dining Room (adjourn after)

Dinner Talk: NASA Advanced Air Vehicles Program

Dinner Speaker: Barbara Esker, NASA

Overview – A Different Perspective

*** Details of September 25th Afternoon Panels**

Focus on the Future of Aeronautics Technology

Introduction: Due to its heavy reliance on high technology, aeronautics advances only as fast as the technology that supports it progresses. In recent years, that progress has been driven by a combination of regulatory standards and industry desires for more efficient (and therefore profitable) aircraft. At this moment, new technologies are being developed that may change aeronautics dramatically, potentially energizing the aeronautics industry in the process. The two panels today and one panel tomorrow will explore these opportunities and challenges, and discuss how the United States can continue to be a dominant force in innovating, producing, and exporting aeronautics technology.

Panel 1: Aircraft Noise Reduction and the Regulatory Environment

Noise pollution from aircraft has been an issue since the advent of routine commercial aviation. Residents near airports and on busy flight paths deal with daily disruptions due to the sound of aircraft. Multiple research efforts from new aircraft bodies to novel engine design are focused on reducing the noise produced by aircraft to mitigate the effect that aircraft has on communities

¹ Attendance Via Zoom

surrounding airports and on flight paths. What are the current research efforts into aircraft noise reduction? How will the funding and regulatory environment support the development and deployment of such technologies? How can we ensure that the aviation industry minimizes the negative effects of noise on vulnerable communities?

Panel 2: The University Leadership Initiative: Results and a Reflection on the Program

The Aeronautics Research Mission Directorate (ARMD) announced in 2017 a new initiative for university partners to achieve their Strategic Implementation Plan. The goal was to foster academia-NASA partnerships, encouraging academic research into fields critical to the success of ARMD. Additionally, the products of this program would be transitioned into benefiting the aviation industry as a whole. As the program enters its third year of awards, it would benefit the program to consider the results of the first awardees of the Initiative. How did the awardees utilize the initiative to pursue new research opportunities that benefited the ARMD? How successful were the research programs funded by ULI? What new technology or innovations arose from the ULI? From the viewpoint of the first awardees, how could ARMD improve the initiative for the next round of awardees?

DAY 2 – SEPTEMBER 26TH

7:00 AM **Working Breakfast Available in the Beckman Dining Room**
8:00 AM **Committee Meets in Executive Session**
8:15 AM **Break**

OPEN SESSION

Zoom Remote Access Information - Day 2 Open
 Link: <https://nasem.zoom.us/j/563641943>

Phone: 877-853-5257
 Meeting ID: 563-641-943

Focus on the Future of Aeronautics Technology

8:30 AM	Welcome and Introductions	Alan Epstein, ASEB Chair
8:35 AM	Overview of Electric Aircraft and Introduction of Topic	Valerie M. Manning, ASEB Member
8:45 AM	Overview of NASA's Electrified Aircraft Propulsion (30 minute presentation & 15 minute discussion)	James Felder, NASA
9:30 AM	Break	
9:45 AM	Panel 3: Innovations in Electric Aircraft Propulsion (5 minute panel presentations followed by discussion) ISSUE: What technical advances and research priorities are required in the near future to see the advent of practical electrically propelled commercial aircraft? Moderator: Panelists:	Valerie M. Manning, ASEB Member Yet-Ming Chiang, Professor, MIT James Felder, Aerospace Engineer, Propulsion Division, NASA Ryan Miller, Air Force Research Laboratory¹ Amanda Simpson, VP Research and Technology, Airbus America Venkat Viswanathan, Professor, Carnegie Mellon

Focus on Space Technology

11:30 AM	Update on Gateway, Human Landing System, and Space Suits (30 minute presentation & 15 minute discussion)	Marshall Smith, NASA
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¹ Attendance Via Zoom

12:15 PM	Working Lunch in the Beckman Dining Room (informal discussions continue over lunch)	
1:15 PM	NASA's Space Launch System: Enabling Artemis and Transformative Science Missions (30 minute presentation & 15 minute discussion)	John Honeycutt, NASA
2:00 PM	Update on STMD (30 minute presentation & 15 minute discussion)	Jim Reuter, NASA
2:45 PM	Break	

Focus on Space Technology Applications

3:00 PM	Panel 4: Standing on the Shoulders of Giants: Lessons Learned and Derivative Technologies from Flagship Missions (10 minute panel presentations followed by 30 minute discussion) ISSUE: What lessons have been learned from flagship missions in both space project management and advanced technology development? How can we ensure that the management strategies and the space technologies of the flagships influence both the next generation spacecraft and the private sector at large?	Moderator: <i>Pamela Melroy, ASEB Member</i> Panelists: <i>David Bearden, Senior Lead of Strategy, NASA-JPL</i> <i>Steve Justice, Director – Integrated Systems, Lockheed-Martin Skunkworks</i> <i>John Mather, Senior Project Scientist, JWST, NASA¹</i> <i>Daniel Neal, Research Fellow, Johnson & Johnson</i>
4:30 PM	Break	
4:45 PM	Meeting Attendees Group Photo	
5:00 PM	Committee Meets in Executive Session	
6:30 PM	Adjourn for the day – evening free	

* Details of September 26th Panels

Panel 3: Innovations in Electric Aircraft Propulsion

Aviation accounts for roughly 2% of the world's carbon dioxide emission, and fuel was the single largest expense for most airlines in 2018. Both of these facts have led to the industry desire for more fuel-efficient aircraft. The next step would be an aircraft with either electrically assisted propulsion or even a fully electric aircraft. The United States is not alone in its desire for aircraft of this type. Internationally, other countries have expressed a desire for an all-electric fleet servicing domestic flights within the next 20 years. What is the current state of the development of electrical aircraft in the United States? What are the next necessary technological advances to ensure the United States remains at the forefront of electric aviation technology? How do the federal government and agencies facilitate the development of electrically driven aircraft?

Panel 4: Standing on the Shoulders of Giants: Lessons Learned and Derivative Technologies from Flagship Missions

The hazardous environment of space requires a high degree of innovation, creativity, and organization to stage a successful project, especially for flagship missions. Mission planning and project management are essential to the success of these projects considering their ambitious science goals and the momentous engineering challenges. Each flagship mission improves our ability to manage and launch massive endeavors that can further our understanding of technology and science as well as capture the public imagination. However, the lessons learned in project management, mission planning, and facilitating derivative technology must be

¹ Attendance Via Zoom

acknowledged and, more importantly, implemented to ensure the success of future missions. What lessons have been learned in the course of designing and deploying these flagships from both a project management perspective and technical perspective? What project management pitfalls can be avoided in the future to ensure that future flagship projects are successful in overcoming their challenges? How have the lessons learned in both management and technology from these programs be applied to future spacecraft programs? How can the federal government and its agencies ease the technology transfer of flagship missions to American industries?

DAY 3 – SEPTEMBER 27TH

Executive Session in its entirety.