JANNAF INTERAGENCY PROPULSION COMMITTEE
JOINT ARMY-NAVY-NASA-AIR FORCE

MEETING INVITATION

7–17 JUNE 2021 // VIRTUAL EDITION

68th JANNAF Propulsion Meeting (JPM)
Programmatic & Industrial Base Meeting (PIB)
15th Modeling and Simulation (MSS)
12th Liquid Propulsion (LPS)
11th Spacecraft Propulsion (SPS)
JOINT SUBCOMMITTEE MEETING

Image Credit: NASA

last updated 6/4/2021

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YOU ARE INVITED TO ATTEND THE JUNE 2021 VIRTUAL MEETING OF THE JOINT ARMY-NAVY-NASA-AIR FORCE (JANNAF) INTERAGENCY PROPULSION COMMITTEE.

The virtual meeting will consist of the 68th JANNAF Propulsion Meeting, Programmatic and Industrial Base Meeting, and Joint Meeting of the 15th Modeling and Simulation, 12th Liquid Propulsion, and 11th Spacecraft Propulsion Subcommittees, to be held Monday through Friday, 7 - 11 June 2021, and Monday through Thursday, 14 - 17 June 2021.

The Program Chair for the meeting is Mr. James L. Cannon, NASA Marshall Space Flight Center, Huntsville, Alabama. A complete list of Program Committee Members can be found on pages 10-13.

The JANNAF Interagency Propulsion Committee coordinates fundamental research, exploratory development, and advanced developmental programs; standardizes procedures for nomenclature; promotes and facilitates the exchange of technical information; and accomplishes problem solving in the areas of joint agency interest on propulsion systems for missiles, rockets, boosters, spacecraft, satellites, and guns.

Johns Hopkins University Whiting School of Engineering Energetics Research Group (JHU WSE ERG) provides technical and administrative support to the JANNAF Interagency Propulsion Committee.

JHU WSE ERG - 10630 Little Patuxent Parkway, Suite 202, Columbia, MD 21044-3286
Telephone: (410) 992-7300 ● Telefax: (410) 730-4969 ● Email: info@erg.jhu.edu ● Web: www.erg.jhu.edu

MEETING SCOPE

JANNAF subcommittees focus their resources on technical issues of interest to the JANNAF agencies.

JANNAF PROPULSION MEETING

The JANNAF Propulsion Meeting (JPM) encompasses research and applications at the systems level. The JPM is held each year in conjunction with standing JANNAF subcommittee meetings on a rotating basis. The scope of the 68th JPM in 2021 spans six mission areas: Tactical Propulsion; Missile Defense/Strategic Propulsion; Propulsion Systems for Space Access; Gun and Gun-Launched Propulsion; Propulsion and Energetics Test Facilities; and Sensors for Propulsion Measurement Applications.

PROGRAMMATIC AND INDUSTRIAL BASE

The Programmatic and Industrial Base (PIB) areas of interest include integrated program plans and key decision points; industrial base assessments; risks and opportunities with respect to skills, knowledge, and experience; identification of commonality, innovative acquisition, and partnership opportunities; integrated assessments to identify rocket propulsion industrial base (RPIB) rationalization opportunities; special actions from senior agency, department, or Executive Office of the President (EOP) leadership; and information provided to decision makers for either situational awareness or policy decisions.

MODELING AND SIMULATION SUBCOMMITTEE

The Modeling and Simulation Subcommittee (MSS) provides an overarching focus on M&S across all disciplines related to JANNAF Interagency simulation-based acquisition of propulsion systems for aerospace plane, hypersonic aircraft, rocket-based space-access systems, high-speed missiles, in-space propulsion systems, and gun propulsion systems. MSS mission areas of Model-Based Engineering, Integrated Health Management, Simulation Credibility, and Modeling and Simulation of Autonomy MSS are focused on these topics, seeking to advance modeling and simulation capabilities for the propulsion community.

LIQUID PROPULSION SUBCOMMITTEE

The Liquid Propulsion Subcommittee (LPS) addresses technical problems and issues of greatest national needs associated with liquid engine systems, including liquid and gel propulsion technology topics that include the overall engine system, combustion components, and propellant feed systems.

SPACECRAFT PROPULSION SUBCOMMITTEE

The Spacecraft Propulsion Subcommittee (SPS) focuses on the full array of spacecraft propulsion technology interests including electric propulsion, chemical propulsion, micropropulsion, nuclear thermal propulsion, solar thermal propulsion, aerocapture, solar sails, tether systems, and technologies for the future.

VIRTUAL PLATFORM

Defense Collaboration Services, or DCS, is a web-based collaboration tool provided by the Defense Information Systems Agency (DISA). It meets DoD security requirements for presentation and discussion of ITAR-restricted material, and has DoD-wide approvals and authorizations for configuration and use. The tool allows for both online participation using a link to access the web interface, or dial-in participation using a phone line to listen to presentation delivery. *Dial-in participation should be used only as a last resort.* During JANNAF virtual sessions, live Q&A will be facilitated as time permits; guidance will be provided during each session.

TECHNICAL SPECIFICATIONS

Technology Requirements for web-based participation have been posted on the Virtual Platform/Technology page of the meeting website. Performance of the DCS platform can be negatively impacted by an individual's WiFi connection, security settings on their computer or network, organization IT policies, and more. For this reason, ERG has developed a detailed list of steps to optimize your experience during the virtual JANNAF meeting. *You are strongly urged to review and follow the technical guidance as far in advance of the meeting's start date as possible to ensure that your computer, network, and organizational IT policies* will allow for your seamless participation. This is important for all participants, but especially for those who have not used DCS previously. There is no need to wait until your registration is complete to review and implement these guidelines.

DCS TEST SESSIONS

To help participants identify technical issues and become familiar with the DCS platform, DCS Testing Sessions will be hosted by JHU WSE Energetics Research Group staff at the following dates and times:

Date	Test Session 1	Test Session 2
25 May	10:00 -11:30 a.m. EDT	2:00 - 3:30 p.m. EDT
26 May	10:00 -11:30 a.m. EDT	2:00 - 3:30 p.m. EDT
27 May	10:00 -11:30 a.m. EDT	2:00 - 3:30 p.m. EDT
2 June	10:00 -11:30 a.m. EDT	2:00 - 3:30 p.m. EDT
3 June	10:00 -11:30 a.m. EDT	2:00 - 3:30 p.m. EDT
4 June	10:00 -11:30 a.m. EDT	2:00 - 3:30 p.m. EDT

Links to all testing sessions will be provided once you have completed your registration form. *All participants are strongly urged to join one of these DCS test sessions* to verify the ability to log in and join the session, that your audio settings are correct, and that you are able to identify any issues early enough for your local IT staff to provide support. Neither ERG nor DISA Global Agency Support are able to assist with issues specific to your computer, network, or organizational IT policies. These matters must be addressed by the user with their local IT support.

LOGGING IN FOR SESSIONS

Attendees are asked to log in a minimum of 30 minutes prior to the start of each session you plan to attend, whether you choose to participate using the DCS website or via teleconference. This will allow the hosts of each session to confirm the identity of each attendee before allowing admission into the virtual meeting room.

The link to each day's sessions as well as the unique dial-in number for those who need it will be made available on the morning of those sessions only to attendees who have fully completed the registration process (online registration form and online registration payment are both complete). This information will be stored within a secure location in the JANNAF Portal.

VIRTUAL MEETING SECURITY GUIDELINES

As a registered attendee of this ITAR restricted meeting, you have a personal responsibility to help protect the data exchanged at this event. This includes managing your electronic devices (phones, computers, cameras, tablets, etc.), as well as your conversations and use of the DCS chat feature responsibly. Aside from security concerns, prudent and responsible use of these devices extends basic courtesy to other attendees and speakers.

Please follow these basic guidelines at this meeting:

- Use headphones when listening via computer to limit the potential for presentation eavesdropping
- Be aware of your surroundings. Be sure you are in a private location while participating in the meeting.
- Absolutely no personal videotaping, recording, or screenshots will be permitted at any time.
- Virtual participation is for registered meeting attendees only. DO NOT share meeting links or dial-in information.
- If you choose to participate via telephone and download presentation slides from the JANNAF Secure Portal, it is your responsibility to handle the files appropriately as dictated by each presentation's Distribution Statement. These files are intended only for use during their respective presentations at this meeting, and additional distribution is not permitted.
- Additional guidelines will be provided to you after registration.

SECURITY/ATTENDANCE REQUIREMENTS

THE OVERALL SECURITY CLASSIFICATION OF THIS MEETING IS UNCLASSIFIED.

To qualify to attend this meeting, all attendees must be employed by a DoD, DoE, or NASA facility, or with a DoD, DoE, or NASA contractor facility eligible for receipt of militarily-critical technical data. All attendees must also be invited U.S. citizens qualified to receive unclassified, limited-distribution information. No foreign nationals are permitted to attend.

Questions concerning attendance eligibility should be directed to the JHU WSE ERG Facility Security Team: Mary Gannaway at (410) 992-7304, ext. 211 / mgannaway@erg.jhu.edu OR Tricia Frey at (410) 992-7300, ext. 222 / tfrey@erg.jhu.edu.

REGISTRATION

Registration is now open. Complete the Registration Form at least 3 business days prior to the first day you plan to attend the meeting. If you don't currently have a JANNAF Secure Portal account and/or you have never used DCS, you are *strongly urged* to complete the registration process much sooner.

To register, you must *first* have a JANNAF Secure Portal account. Please visit the Registration page of the meeting website for additional information and important links.

Registration for this JANNAF meeting is a two-part process; to register:

1. Complete the online registration form for the meeting - *first* log in to your JANNAF Secure Portal account.
2. Pay the registration fee (Portal account NOT needed).

Additional information and important links for completing your meeting registration can be found on p. 7 and at https://www.jannaf.org/mtgs/2021June/pages/registration.html.

REGISTRATION FEE

Early registration is strongly recommended. Register *and* pay the registration fee by Monday, 24 May at 11:59 p.m. EDT to take advantage of the discounted early registration fee. The regular registration fee goes into effect on 25 May at 12:00 a.m. EDT. For details of what the registration fee includes, please go to the Registration page of the meeting website. Please reference the registration fee chart below to determine the amount applicable to your registration. The dates noted below are based on payment being *received*.

Payment Received	Regular Attendee	Student*
on or before 05/24/21	$650.00	$125
05/25/21 or later	$775.00	$225

**A discounted registration fee is offered for full time students, interns, and cooperative education students.* Students must meet the security/ attendance requirements noted above and provide proof of full time student status upon request.

Registration payment will be accepted via check payable to JHU WSE Energetics Research Group, purchase order (government only), or by credit card (VISA, MasterCard, American Express) using the Registration Payment site available online. Go to the Registration page of the meeting website, and click on "Pay Registration Fee."

Payment of the registration fee may be completed as soon as permitted, but should be completed on or before Monday, 24 May 2021 to obtain the discounted early registration fee. Credit card payments made electronically via the Web will be charged immediately; a receipt will be sent to you via email.

Participation in the JANNAF virtual meeting will only be available for those whose registration is complete *(both registration form and registration payment received)*.

CANCELLATION POLICY

Please note our cancellation policy.

Written (email) cancellations submitted on or before 24 May 2021 will receive a full refund minus an administrative fee of $50.00. Cancellations made after 24 May 2021 will not be refunded. Substitutes are welcome as long as the request for substitution is from the original attendee; attendance eligibility is appropriately met by the substitute; and the original and substitute attendee are from the same organization to facilitate transfer of registration funds. Please contact Shelley Cohen via email (scohen@erg.jhu.edu) to transfer or cancel your registration.

NETWORKING

Although this virtual JANNAF meeting won't replicate the full range of networking opportunities inherent at an in-person JANNAF meeting, during the registration process, attendees have the option of sharing topics they're interested in discussing with others. This information will be included in the attendee list, accessible to registered attendees only. Attendees then may contact one another to arrange conversations at their mutual convenience. Additionally, as time permits at the end of each session, participants are welcome to continue discussion within the DCS platform.

VIRTUAL READING ROOM

Papers submitted prior to and during the meeting and presented in the technical sessions will be available to read via the JANNAF Virtual Reading Room (Distribution Statement A and C only). Presentation files will not be included. A link to the Virtual Reading Room will be provided in a secure location for registered attendees (both registration form and payment must be complete) once the meeting has begun. Reproduction of Reading Room papers is not permitted.

PROGRAM CHANGES

The Preliminary Program will be updated with any changes once per week until the Final Program is posted on the meeting website the week before the meeting. Login to your JANNAF Secure Portal account is required to access both the Preliminary and Final Programs. Note that the Preliminary and Final Programs are Distribution Statement C and are intended for use by the attendee only. Any print-outs of the program should be secured when not in your possession. Each day's agenda, incorporating all known changes for that day, will be posted each morning within the registered attendee-only secure location on the JANNAF website.

MEETING PROCEEDINGS

Proceedings from this meeting will be published by the JHU WSE Energetics Research Group. Papers submitted or presentations (if a paper is not submitted), will be provided complimentary to attendees of this meeting who have paid the full registration fee. Attendees will have access to these materials beginning approximately 12 weeks following the meeting via the JANNAF Digital Online Collection (JDOC) Database accessible through your account on the JANNAF Secure Portal. This benefit is not available for student attendees.

QUESTIONS

Questions concerning this program and/or payment of the registration fee should be directed to Shelley Cohen at (410) 992-7302, ext. 215 / scohen@erg.jhu.edu OR Gabrielle Delisle-Ballard at (410) 992-7300, ext. 208 / gdelisle@erg.jhu.edu.

Questions pertaining to registering via the JANNAF Secure Portal or accessing the online Registration Form should be directed to Mary Gannaway at (410) 992-7304, ext. 211 / mtg@jhu.edu OR Tricia Frey at (410) 992-7300, ext. 222 / tfrey@erg.jhu.edu.

WHY ATTEND A JANNAF MEETING?

Attendees of recent JANNAF meetings were surveyed to determine what they find to be the most valuable benefits of JANNAF meeting attendance. Their responses included:

- The opportunity to present limited distribution papers to a technical audience including government, industry, and academia
- The capability to engage in valuable discussion with peers
- Networking opportunities with other experts in the propulsion community outside of their usual sphere
- New members of the community have the ability to obtain priceless experience, knowledge, and community connections
- Technical interchange that allows them to stay abreast of community trends and innovations

UPCOMING JANNAF MEETINGS

68th JANNAF Propulsion Meeting

Programmatic and Industrial Base Meeting

15th Modeling and Simulation

12th Liquid Propulsion

11th Spacecraft Propulsion

Joint Subcommittee Meeting

7 - 17 June 2021
DCS Virtual Platform

47th Structures & Mechanical Behavior

43rd Propellant & Explosives Development & Characterization

34th Rocket Nozzle Technology

32nd Safety & Environmental Protection

Joint Subcommittee Meeting

Programmatic & Industrial Base Meeting

6 - 16 December 2021
DCS Virtual Platform

69th JANNAF Propulsion Meeting

Programmatic and Industrial Base Meeting

51st Combustion

39th Airbreathing Propulsion

39th Exhaust Plume & Signatures

33rd Energetic Systems Hazards

Joint Subcommittee Meeting

Spring 2022
Location / Format TBA

PROGRAM COMMITTEE MEMBERS

Program Chair

Mr. James L. Cannon
NASA Marshall Space Flight Center
Huntsville, AL

JANNAF Propulsion Meeting

JANNAF Propulsion Meeting Program Committee Chair

Dr. David R. Gonzalez
Office of Naval Research
Arlington, VA

JANNAF Propulsion Meeting Program Committee Deputy Chair

Mr. Bruce R. Askins
NASA Marshall Space Flight Center
Huntsville, AL

JANNAF Propulsion Meeting Program Committee

Mr. Paul J. Conroy
DEVCOM Army Research Laboratory
Aberdeen Proving Ground, MD

Lt. Col. William Evans
Air Force Research Laboratory
Edwards AFB, CA

Mr. Christopher G. Murawski
Air Force Research Laboratory
Wright-Patterson AFB, OH

Ms. Megan L. Rex
Naval Air Warfare Center - Weapons Division
China Lake, CA

Dr. Jeremy R. Rice
DEVCOM Aviation & Missile Center
Redstone Arsenal, AL

Dr. Charles J. Trefny
NASA Glenn Research Center
Cleveland, OH

Mission Area I: Tactical Propulsion

Dr. Jeremy R. Rice
DEVCOM Aviation & Missile Center
Redstone Arsenal, AL

Dr. David R. Gonzalez
Office of Naval Research
Arlington, VA

Mission Area II: Missile Defense / Strategic Propulsion

Dr. Robert J. Jensen
Sierra Lobo, Incorporated
Edwards AFB, CA

Ms. Megan L. Rex
Naval Air Warfare Center - Weapons Division
China Lake, CA

Mission Area III: Propulsion Systems for Space Access

Mr. Bruce R. Askins
NASA Marshall Space Flight Center
Huntsville, AL

Mission Area IV: Gun and Gun-Launched Propulsion

Mr. Edward G. Tersine
Naval Surface Warfare Center-Indian Head Division
Indian Head, MD

Mission Area V: Propulsion and Energetics Test Facilities

Mr. Michael D. Owen
NASA White Sands Test Facility
Las Cruces, NM

Ms. Julie A. Carlile
Air Force Research Laboratory
Edwards AFB, CA

Mission Area VI: Sensors for Propulsion Measurement Applications

Dr. Gary W. Hunter
NASA Glenn Research Center
Cleveland, OH

JANNAF Executive Committee Liaison

Mr. Drew O. DeGeorge
Air Force Research Laboratory
Edwards AFB, OH

JHU WSE ERG Technical Representative

Mr. Nick Keim
JHU WSE Energetics Research Group
Columbia, MD

Programmatic and Industrial Base

PIB Executive Committee Co-Chairs

Dr. Christine M. Michienzi
OUSD (A&S) Industrial Policy
Alexandria, VA

Dr. Thomas M. Brown
NASA Marshall Space Flight Center
Huntsville, AL

JHU WSE ERG Technical Representative

Mr. Kirk V. Sharp
JHU WSE Energetics Research Group
Long Beach, MS

Modeling and Simulation Subcommittee

Technical Steering Group Chair

Dr. Michael D. Watson
NASA Marshall Space Flight Center
Huntsville, AL

JANNAF Executive Committee Liaison

Dr. Daniel J. Dorney
NASA Marshall Space Flight Center
Huntsville, AL

JHU WSE ERG Technical Representative

Mr. Alex Bishop
JHU WSE Energetics Research Group
Columbia, MD

Mission Area I: Model-Based Engineering

Mr. Adrian M. Blot
DEVCOM Armaments Center
Picatinny Arsenal, NJ

Dr. Eric C. Sholes
DEVCOM Aviation & Missile Center
Redstone Arsenal, AL

Mission Area II: Integrated Health Management

Mr. James T. Singleton
Air Force Research Laboratory
Edwards AFB, CA

Mission Area III: Simulation Credibility: Verification, Validation, and Risk

Dr. Robert Baurle
NASA Langley Research Center
Hampton, VA

Dr. Dean R. Eklund
Air Force Research Laboratory
Wright-Patterson AFB, OH

Mission Area IV: Modeling and Simulation of System Autonomy

Dr. Michael D. Watson
NASA Marshall Space Flight Center
Huntsville, AL

Dr. David R. Gonzalez
Office of Naval Research
Arlington, VA

Liquid Propulsion Subcommittee

Technical Steering Group Co-Chairs

Mr. James L. Cannon
NASA Marshall Space Flight Center
Huntsville, AL

Dr. Daniel L. Brown
Air Force Research Laboratory
Edwards AFB, CA

JANNAF Executive Committee Liaison

Dr. Daniel J. Dorney
NASA Marshall Space Flight Center
Huntsville, AL

JHU WSE ERG Technical Representative

Mr. Benjamin Hill-Lam
JHU WSE Energetics Research Group
Columbia, MD

Mission Area I: Liquid Engine Systems

Mr. John W. Peugeot
NASA Marshall Space Flight Center
Huntsville, AL

Mr. Nils M. Sedano
Air Force Research Laboratory
Edwards AFB, CA

Mission Area II: Liquid Combustion Subsystems and Components

Dr. Christopher S. Protz
NASA Marshall Space Flight Center
Huntsville, AL

Dr. Levon Gevorkyan
The Aerospace Corporation
El Segundo, CA

Mission Area III: Liquid Propulsion Feed and Pressurization Systems

Mr. James L. Cannon
NASA Marshall Space Flight Center
Huntsville, AL

Mr. Alan M. Sutton
Air Force Research Laboratory
Edwards AFB, CA

Mission Area IV: Advanced Materials for Liquid Propulsion Applications

Mr. Clyde "Chip" Jones
NASA Marshall Space Flight Center
Huntsville, AL

Mr. Jamie B. Malak
Air Force Research Laboratory
Edwards AFB, CA

Spacecraft Propulsion Subcommittee

Technical Steering Group Chair

Dr. William A. Hargus, Jr.
Air Force Research Laboratory
Edwards AFB, CA

Technical Steering Group Deputy Chair

Dr. Hani Kamhawi
NASA Glenn Research Center
Cleveland, OH

JANNAF Executive Committee Liaison

Dr. Dhanireddy R. Reddy
NASA Glenn Research Center
Cleveland, OH

JHU WSE ERG Technical Representative

Mr. Alex Bishop
JHU WSE Energetics Research Group
Columbia, MD

Mission Area I: Chemical Propulsion

Mr. A. Paul Zuttarelli
Air Force Research Laboratory
Edwards AFB, CA

Dr. Eric H. Cardiff
NASA Goddards Space Flight Center
Greenbelt, MD

Mrs. Corinne Sedano
Air Force Research Laboratory
Edwards AFB, CA

Mission Area II: Electric Propulsion

Dr. Hani Kamhawi
NASA Glenn Research Center
Cleveland, OH

Dr. Robert B. Lobbia
Jet Propulsion Laboratory
Pasadena, CA

Dr. Justin Koo
Air Force Research Laboratory
Edwards AFB, CA

Mission Area III: Cube / Nano Satellite Propulsion

Dr. Colleen M. Marrese-Reading
Jet Propulsion Laboratory
Pasadena, CA

Mr. Khary I. Parker
NASA Goddard Space Flight Center
Greenbelt, MD

Dr. William A. Hargus, Jr.
Air Force Research Laboratory
Edwards AFB, CA

Mission Area IV: Future Technologies

Dr. George J. Williams, Jr.
NASA Glenn Research Center
Cleveland, OH

Dr. Kurt A. Polzin
NASA Marshall Space Flight Center
Huntsville, AL

JANNAF Meeting Manager

Shelley S. Cohen
JHU WSE Energetics Research Group
Columbia, MD

Meetings and Communications Assistant

Gabrielle Delisle-Ballard
JHU WSE Energetics Research Group
Columbia, MD

Security Officer

Mary T. Gannaway
JHU WSE Energetics Research Group
Columbia, MD

Assistant Security Officer

Tricia Frey
JHU WSE Energetics Research Group
Columbia, MD

UPDATED KEYNOTE ADDRESS

MS. LAKIESHA HAWKINS

Deputy Manager,
Human Landing System Program Office

NASA Marshall Space Flight Center

Huntsville, AL

Ms. Lakiesha Hawkins, Deputy Manager, Human Landing System Program Office at NASA Marshall Space Flight Center in Huntsville, AL, is presenting the keynote at this year's virtual conference. The title of Ms. Hawkins' talk is, "Human Landing System Program: Overview and Status." On March 26, 2019, NASA was charged with landing the first woman and the next man on the South Pole of the Moon by 2024, followed by a sustained presence on and around the Moon by 2028. NASA's Human Landing System (HLS) Program is responsible for the transportation in deep space to carry humans to and from the surface of the Moon, as part of NASA's Artemis lunar exploration program.

Ms. Hawkins' presentation will provide an overview of NASA's Artemis lunar exploration program and a current status of the Human Landing System program.

In her new role as Deputy Manager of the HLS Program Office, Ms. Hawkins will assist the HLS Program Manager in leading the development of an integrated human lunar landing system, including elements such as the descent element, ascent element, and transfer vehicle for the Artemis program. Before becoming the Deputy, Hawkins was manager of the HLS Program Office's Program Planning and Control Office, and was responsible for leadership of the budget, risk, schedule, governance, cyber security, and audit aspects of lander development efforts. From 2018 to 2019, she was deputy manager of the Habitation Systems Development Office, providing program and project leadership for the Gateway Habitation Element. In 2017, she was chief of the Avionics Systems Integration Branch, where she managed systems engineers leading avionics software and hardware integration for the Space Launch System.

Hawkins holds a bachelor's degree in mechanical engineering from Florida Agricultural and Mechanical University in Tallahassee and a master's degree in engineering management from the University of South Florida in Tampa. She was awarded a NASA Outstanding Leadership Medal in 2017 and was honored as a Distinguished Alumni by the Florida A&M University-Florida State University College of Engineering Department of Mechanical Engineering in 2018.

All attendees are invited to participate. **The Keynote Address begins at 9:30 a.m. EDT on Tuesday, 8 June.** The link to Ms. Hawkins' presentation will be made available that morning to all registered attendees. Plan on logging in at least 30 minutes prior to the scheduled start time. An awards presentation will immediately follow the Keynote Address.

PROGRAM HIGHLIGHTS

JANNAF Propulsion Meeting

The JPM will hold four sessions: High Speed Propulsion Technologies (1D), Future Space Access (2D), Tactical Solid Rocket Motor Developments (3D), and Gun and Gun-Launched Propulsion (6D). The JPM sessions will complement the subcommittee sessions with content on novel and cutting edge technologies, research, and systems.

Programmatic and Industrial Base

JANNAF provides a forum for discussion of propulsion issues, challenges, and opportunities across the Military Departments, Defense Agencies and NASA. JANNAF subcommittees focus their resources on technical issues of interest to the JANNAF agencies. The topic of reusability practices for rocket propulsion systems is featured in a session (5D) sponsored by the Large Liquid Propulsion Working Group. Included in the discussions are papers on Propulsion Systems, Safety and Mission Assurance practices, thrust vector control and associated systems, and primary structural considerations.

Modeling and Simulation Subcommittee

The updated MSS meeting rotation will allow the subcommittee to return to meeting with LPS and SPS this year. There will be many sessions overlapping with these subcommittees topics, including the GFSSP code demonstration (7A), and analyses of supersonic space system components (8A). MSS will also be holding a plenary (2A) with invited speaker Dr. Venkateswaran Sankaran, Chief Scientist of AFOSR. Dr. Sankaran will be providing his insight on the M&S community and action plan, across all aspects of modeling and simulation.

Liquid Propulsion Subcommittee

The 12th Liquid Propulsion Subcommittee sessions will cover a wide variety of overarching topics, including liquid engine systems' analysis, combustion subsystems and components, propellant feed and pressurization systems, as well as advanced materials research and development within these applications. Specific topics of interest covered in the LPS sessions include propellant characterization and performance, additive manufacturing usage in rocket engine systems, and research into rotating detonation rocket engines.

Highlights this meeting include a brand new panel dedicated to the emerging field of rotating detonation rocket engines that will meet for the first time after a full session of RDRE papers (4C) on Thursday, June 10th. The Rotating Detonation Rocket Engine Panel will address the technology development requirements for RDRE design, manufacture, modeling, and experimental testing. One of its initial areas of focus will be the establishment of a minimum set of JANNAF accepted test and performance prediction metrics and figures of merit for rotating detonation rocket engines.

Another announcement from the LPS community comes from the Combustion Stability Panel (2C), who are nearing the final stages of the update to the CPIA-655 Combustion Stability Guidelines document. They have completed an external review of the guidelines to provide an independent review of the document with a wide range of expertise and strong experience base. Reviewers included engineers in various capacities: systems-level, combustion device, stability, technical advisors, management, and "greybeards". The document is currently in the disposition stage, after which it will be submitted for publication by JHU-ERG on the JANNAF Digital Online Collection (JDOC).

Spacecraft Propulsion Subcommittee

Multiple workshops will be held during this virtual meeting. The workshop identifying the status of hydrazine and MMH (1B) will focus primarily on the impact of green monopropellants effect on the procurement and quality of the hydrazine and MMH that is purchased. This workshop will examine the industrial base through NASA's, the Air Force's and DLA's perspective. The fifth EPOSE workshop (6B) will be held, papers will continue to expand on the testing of electric propulsion in space and examine facility interactions with ground testing. Lastly, a workshop discussing ground testing for nuclear thermal and electric propulsion will be held (9B).

TECHNICAL PROGRAM

This year's technical program currently consists of more than 150 presentations in 24 technical sessions, 3 specialist sessions, and 4 workshops, plus 7 panel meetings. A detailed daily schedule of all sessions, specialist sessions, meetings, and networking activities is provided below and continues through page 19. Detailed agendas of the technical sessions, workshops, and specialist sessions, if known, are listed in the Preliminary Program beginning on page 20 (login to your JANNAF Portal account is required for access).

A Schedule Color Key has been provided on pages 16, 18, and 19.

SCHEDULE - Monday, 7 June All Times Listed Are Eastern Daylight Time					
10:00 a.m. - 11:00 a.m.	Download DCS Session Agendas, Links/Call-in Info and Login to Session of Choice				
10:00 a.m. - 24 hours/day	Virtual Reading Room				
11:00 a.m. - 2:30 p.m.	**Monday Workshop and Technical Sessions**				
11:00 a.m. - 2:30 p.m.	1B	SPS	*WORKSHOP:* Status of Hydrazine and MMH	DCS "Room" 2	Open
11:00 a.m. - 2:05 p.m.	1C	LPS	Advancements in Liquid Engine Systems	DCS "Room" 3	Open
11:30 a.m. - 12:35 p.m.	1D	JPM	High-Speed Propulsion Technologies	DCS "Room" 4	Open
12:05 p.m.	Session Break (most sessions - see session agendas)				
As Time Permits	Networking and Open Discussion after Sessions			Each DCS "Room"	Open

SCHEDULE - Tuesday, 8 June All Times Listed Are Eastern Daylight Time					
8:30 a.m. - 9:30 a.m.	Download DCS Session Agendas, Links/Call-in Info and Login to Keynote Presentation				
24 hours/day	Virtual Reading Room				
9:30 a.m. - 10:45 a.m.	*KEYNOTE ADDRESS:* Ms. Lakiesha Hawkins, NASA Marshall Space Flight Center *JANNAF Announcements and Awards*			DCS "Room" 5	Open
10:30 a.m. - 11:00 a.m.	Login to Technical Session of Choice				
11:00 a.m. - 2:35 p.m.	**Tuesday Specialist Session, Technical Sessions, and Panel Meeting**				
11:00 a.m. - 12:00 p.m.	2A	MSS	MSS Plenary	DCS "Room" 1	Open
11:00 a.m. - 12:35 p.m.	2B	SPS	Advanced Propulsion	DCS "Room" 2	Open
11:00 a.m. - 1:35 p.m.	2C	LPS	Propellant Characterization and Performance	DCS "Room" 3	Open
1:35 p.m. - 2:35 p.m.	2C	LPS	*PANEL MEETING:* Combustion Stability	DCS "Room" 3	Open
11:00 a.m. - 1:35 p.m.	2D	JPM	Future Space Access	DCS "Room" 4	Open
12:05 p.m.	Session Break (most sessions - see session agendas)				
As Time Permits	Networking and Open Discussion after Sessions			Each DCS "Room"	Open

Schedule Color Key			
	Meeting Services		Concurrent Sessions or Panel Meetings
	Networking Opportunities		Session Details
	Closed Meetings		Panel Meetings

SCHEDULE - Wednesday, 9 June All Times Listed Are Eastern Daylight Time					
10:00 a.m. - 11:00 a.m.	Download DCS Session Agendas, Links/Call-in Info and Login to Session of Choice				
24 hours/day	Virtual Reading Room				
11:00 a.m. - 3:30 p.m.	**Wednesday Workshop and Technical Sessions**				
11:00 a.m. - 3:30 p.m.	3A	SPS	*WORKSHOP:* Discernment of a Joint Approach to Identify and Select Advanced Concepts for Transformative Impact	DCS "Room" 1	Open
11:00 a.m. - 2:05 p.m.	3B	SPS	Spacecraft Liquid Chemical Propulsion Analysis	DCS "Room" 2	Open
11:00 a.m. - 2:05 p.m.	3C	LPS	Advanced Engine Component Simulation and Testing	DCS "Room" 3	Open
11:00 a.m. - 12:35 p.m.	3D	JPM	Tactical Solid Rocket Motor Developments	DCS "Room" 4	Open
12:05 p.m. or 12:35 p.m.	Session Break (most sessions - see session agendas)				
As Time Permits	Networking and Open Discussion after Sessions			Each DCS "Room"	Open

SCHEDULE - Thursday, 10 June All Times Listed Are Eastern Daylight Time					
10:00 a.m. - 11:00 a.m.	Download DCS Session Agendas, Links/Call-in Info and Login to Session of Choice				
24 hours/day	Virtual Reading Room				
11:00 a.m. - 4:35 p.m.	**Thursday Technical Sessions, Specialist Session, and Panel Meetings**				
11:00 a.m. - 3:30 p.m.	4A	MSS	*SPECIALIST SESSION:* Primer for Uncertainty Quantification Using the Probability Box Approach	DCS "Room" 1	Open
3:30 p.m. - 4:00 p.m.	4A	MSS	*PANEL MEETING:* Simulation Credibility - Uncertainty, Verification, Validation and Risk	DCS "Room" 1	Open
11:00 a.m. - 3:05 p.m.	4B	SPS	Electric Propulsion Activities	DCS "Room" 2	Open
3:05 p.m. - 4:35 p.m.	4B	SPS	*PANEL MEETING:* Electric Propulsion	DCS "Room" 2	Open
11:00 a.m. - 3:05 p.m.	4C	LPS	Rotating Detonation Engines	DCS "Room" 3	Open
3:05 p.m. - 3:50 p.m.	4C	LPS	*PANEL MEETING:* Rotating Detonation Rocket Engine	DCS "Room" 3	Open
12:35 p.m.	Session Break (most sessions - see session agendas)				
As Time Permits	Networking and Open Discussion after Sessions			Each DCS "Room"	Open

SCHEDULE - Friday, 11 June All Times Listed Are Eastern Daylight Time					
10:00 a.m. - 11:00 a.m.	Download DCS Session Agendas, Links/Call-in Info and Login to Session of Choice				
24 hours/day	Virtual Reading Room				
11:00 a.m. - 3:15 p.m.	**Friday Technical Sessions**				
11:00 a.m. - 12:05 p.m.	5A Part 1	MSS	Simulation Credibility: Model Validation	DCS "Room" 1	Open
12:30 p.m. - 2:05 p.m.	5A Part 2	MSS	Investigations into Reactive Flow and Thermal Systems	DCS "Room" 1	Open
11:00 a.m. - 2:35 p.m.	5B	SPS	Cube / Nano Satellite Propulsion	DCS "Room" 2	Open
11:00 a.m. - 2:05 p.m.	5C	LPS	Additively Manufactured Component Development and Test	DCS "Room" 3	Open
11:00 a.m. - 3:15 p.m.	5D	PIB	Launch Vehicle Reusability	DCS "Room" 4	Open
12:05 p.m. or 12:35 p.m.	Session Break (most sessions - see session agendas)				
As Time Permits	Networking and Open Discussion after Sessions			Each DCS "Room"	Open

SCHEDULE - Monday, 14 June All Times Listed Are Eastern Daylight Time					
10:00 a.m. - 11:00 a.m.	Download DCS Session Agendas, Links/Call-in Info and Login to Session of Choice				
24 hours/day	Virtual Reading Room				
11:00 a.m. - 3:35 p.m.	**Monday Technical Sessions, Panel Meeting, and Workshop**				
11:00 a.m. - 1:35 p.m.	6A	MSS	Modeling and Simulation of System Autonomy and Control	DCS "Room" 1	Open
1:35 p.m. - 2:35 p.m.	6A	MSS	*PANEL MEETING:* Modeling and Simulation of System Autonomy	DCS "Room" 1	Open
11:00 a.m. - 3:35 p.m.	6B	SPS	*WORKSHOP:* Electric Propulsion Operation in the Space Environment and Facility Interactions (EPOSE V)	DCS "Room" 2	Open
11:00 a.m. - 2:05 p.m.	6C	LPS	Engine Component Modeling and Test	DCS "Room" 3	Open
11:00 a.m. - 3:05 p.m.	6D	JPM	Gun and Gun-Launched Propulsion	DCS "Room" 4	Open
12:05 p.m. or 12:35 p.m.	Session Break (most sessions - see session agendas)				
As Time Permits	Networking and Open Discussion after Sessions			Each DCS "Room"	Open

SCHEDULE - Tuesday, 15 June All Times Listed Are Eastern Daylight Time					
10:00 a.m. - 11:00 a.m.	Download DCS Session Agendas, Links/Call-in Info and Login to Session of Choice				
24 hours/day	Virtual Reading Room				
11:00 a.m. 3:05 p.m.	**Tuesday Specialist Session, Technical Sessions, and Panel Meeting**				
11:00 a.m. - 2:30 p.m.	7A	MSS	*SPECIALIST SESSION:* MSS Tool Demonstrations	DCS "Room" 1	Open
11:00 a.m. - 2:05 p.m.	7B	SPS	Nuclear Propulsion - I	DCS "Room" 2	Open
11:00 a.m. - 1:35 p.m.	7C	LPS	Liquid Propellant Feed and Pressurization Systems	DCS "Room" 3	Open
1:35 p.m. - 2:35 p.m.	7C	LPS	*PANEL MEETING:* Turbomachinery	DCS "Room" 3	Open
11:00 a.m. - 3:05 p.m.	7D	LPS	Advanced Materials and Processes for Liquid Propulsion Systems - I	DCS "Room" 4	Open
12:35 p.m.	Session Break (most sessions - see session agendas)				
As Time Permits	Networking and Open Discussion after Sessions			Each DCS "Room"	Open

Schedule Color Key			
	Meeting Services		Concurrent Sessions or Panel Meetings
	Networking Opportunities		Session Details
	Closed Meetings		Panel Meetings

SCHEDULE - Wednesday, 16 June
All Times Listed Are Eastern Daylight Time

10:00 a.m. - 11:00 a.m.	Download DCS Session Agendas, Links/Call-in Info and Login to Session of Choice				
24 hours/day	Virtual Reading Room				
11:00 a.m. - 2:50 p.m.	**Wednesday Technical Sessions and Panel Meeting**				
11:00 a.m. - 12:05 p.m.	8A	MSS	Fluid Analyses of Supersonic and Space System Components	DCS "Room" 1	Open
11:00 a.m. - 2:35 p.m.	8B	SPS	Nuclear Propulsion - II	DCS "Room" 2	Open
11:00 a.m. - 2:05 p.m.	8C	LPS	Advanced Materials and Processes for Liquid Propulsion Systems - II	DCS "Room" 3	Open
2:05 p.m. - 2:50 p.m.	8C	LPS	*PANEL MEETING:* Advanced Materials and Processes for Liquid Propulsion Systems	DCS "Room" 3	Open
12:05 p.m. or 12:35 p.m.	Session Break (most sessions - see session agendas)				
As Time Permits	Networking and Open Discussion after Sessions			Each DCS "Room"	Open

SCHEDULE - Thursday, 17 June
All Times Listed Are Eastern Daylight Time

10:00 a.m. - 11:00 a.m.	Download DCS Session Agenda, Link/Call-in Info and Login to Session				
12:00 a.m. - 3:05 p.m.	Virtual Reading Room				
11:00 a.m. - 3:20 p.m.	**Thursday Workshop**				
11:00 a.m. - 3:20 p.m.	9B	SPS	*WORKSHOP:* Flight Qualification Requirements for NTP- and NEP-Powered Human Mars Missions	DCS "Room" 2	Open
12:05 p.m. or 12:35 p.m.	Session Break				
As Time Permits	Networking and Open Discussion after Session			Each DCS "Room"	Open

Schedule Color Key

	Meeting Services		Concurrent Sessions or Panel Meetings
	Networking Opportunities		Session Details
	Closed Meetings		Panel Meetings