



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

45th Structures and Mechanical Behavior (SMBS)  
41st Propellant and Explosives Development and  
Characterization (PEDCS)  
32nd Rocket Nozzle Technology (RNTS)  
30th Safety and Environmental Protection (SEPS)  
JOINT SUBCOMMITTEE MEETING  
Programmatic and Industrial Base Meeting

**10-13**  
**December**  
**2018**

**Registration is now open!**



**Hilton Vancouver Washington**  
**Vancouver, WA**  
**(Portland metro area)**

# **Meeting Invitation**

Last updated 11/15/2018

# JANNAF Meeting Invitation - December 2018

You are invited to attend the December 2018 meeting of the Joint Army-Navy-NASA-Air Force (JANNAF) which will consist of the Joint Meeting of the Structures and Mechanical Behavior, Propellant and Explosives Development and Characterization, Rocket Nozzle Technology, and Safety and Environmental Protection Subcommittees; and the Programmatic and Industrial Base (PIB) meeting. This meeting will be held **Monday through Thursday, 10 - 13 December 2018, at the Hilton Vancouver Washington in Vancouver, WA (Portland, Oregon metropolitan area).**



The Program Chair for the meeting is **J. Robert Esslinger**, Army Aviation and Missile Research, Development and Engineering Center, Redstone Arsenal, AL. A complete list of Program Committee Members can be found on pages 6-9.

The JANNAF Interagency Propulsion Committee coordinates fundamental research, exploratory development, and advanced development 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.

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## Meeting Scope

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

### Structures and Mechanical Behavior Subcommittee

The **Structures and Mechanical Behavior Subcommittee (SMBS)** addresses the development, application, and verification of experimental, analytical, and statistical techniques required in the preliminary or detailed structural design of solid propellant rocket motors and gun ammunition, the assessment of their structural integrity, and the prediction of their service life based on structural or chemical aging mechanisms.

### Propellant and Explosives Development and Characterization Subcommittee

The scope of the **Propellant and Explosives Development and Characterization Subcommittee (PEDCS)** comprises work and issues associated with propellants, explosives, and other energetic formulations used in the development, manufacture, performance, and operation of weapons, propulsion systems, and gas generator devices. This subcommittee covers the technology areas required to develop, manufacture, and characterize propellants and ingredients. The manufacturing technologies of interest include mixing procedures, sampling and quality control, safety and handling practices, and the design and operation of mixing equipment. The characterization tests involve classical wet chemistry, instrumental analysis, chemical stability, compatibility, and calorimetric measurements.

### Rocket Nozzle Technology Subcommittee

The **Rocket Nozzle Technology Subcommittee (RNTS)** focuses on the application of advanced composite materials, including carbon-carbon, ceramic matrix, and carbon phenolic composites, and other advanced materials, as applied to solid rocket nozzles and their components, nozzle-based propulsion control systems; and related technology developments for liquid and electric propulsion.

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

The **Safety and Environmental Protection Subcommittee (SEPS)** sessions will address issues related to the safety, health and environmental impacts associated with the manufacture, storage and use of propellants, explosives and pyrotechnics. Papers addressing all health effects associated with energetic compounds, precursors, combustion products, and waste products as well as safety concerns present during their intentional use, demilitarization, and accidents will be presented. New and emerging areas of interest include additive manufacturing (3D Printing) of energetic materials, nanomaterials, and insensitive high explosive formulations.

## 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.

## Hotel Information



Sleeping rooms have been reserved with the **Hilton Vancouver Washington**, located at 301 W. 6th Street, Vancouver, WA 98660. Amenities include complimentary basic high speed internet access in guestrooms and discounted self-parking.

**The JANNAF room rate per night for all attendees will be \$109** plus state and local tax (at this time, 10.4% plus a Tourism Promotion Assessment of \$2.00 per night), for single or double occupancy. Note that this rate is **\$41 lower than** the GFY2019 GSA per diem rate!

**These discounted rooms will be held for JANNAF attendees until the deadline of Monday, 26 November at 11:59 p.m. PST**, or until they sell out, whichever comes first. Each individual is responsible for his/her own reservation.

Reservations may be made either on the Web (recommended) or by telephone (see below).

Note that the JANNAF discounted room rate is offered beginning Sunday, 9 December through the night of Thursday, 13 December, until sold out. Based upon availability, the hotel will honor the JANNAF discounted rate for up to three days pre- and post-meeting for those who wish to extend their stay.

The State of Washington will honor tax exemption for Federal employees paying for lodging charges only if the traveler presents and pays with a GSA Travel Card (blue) or GSA Integrated Card (gold), provided the sixth digit from the left on the card is 6, 7, 8, 9, or 0.

## Make Your Reservation Online

**Click on the reservation link on the [Hotel Page](#)** of the meeting website to make your reservation. Using this link will give you **direct access to the JANNAF meeting discounted room block**.

For additional reservation assistance (including changes or cancellations), please call 1-800- HILTONS (445-8667) or the hotel directly at (360) 993-4500. When calling, be sure to provide the group code of "NAS" to obtain the 2018 December JANNAF Conference discounted rate.

Need to cancel your reservation? Be sure to do so no less than 48 hours prior to arrival to avoid paying a cancellation penalty.

## Transportation and Parking

The [Portland International Airport \(PDX\)](#) is located just 12 miles from the Hilton Vancouver Washington. Sixty U.S. cities offer nonstop flights to PDX via 13 domestic airlines.

The hotel does not offer airport shuttle service. Taxis, Uber, Lyft, and rental cars are all easy ground transportation options between PDX and the hotel in Vancouver, WA. The estimated fare for one person between the airport and the hotel via Lyft and Uber is approximately \$25-30. One way cab fare is approximately \$40. Visit the [Ground Transportation](#) page on the PDX website for more information about ground transportation options.

For those driving personal vehicles or renting a car, the Hilton Vancouver Washington is offering JANNAF attendees staying at the hotel a discounted rate of \$6.00 per night (usually \$18) for self-parking with in/out privileges



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in the hotel's garage. Overnight guests of the hotel may charge their parking to their room. Attendees commuting or staying elsewhere should anticipate a maximum parking charge of \$12.50 per day at the Park-N-Go garage across the street from the hotel. A parking map has been provided on the Hotel page of the meeting website.

## Meeting Site

All sessions will be held at the **Hilton Vancouver Washington** in downtown Vancouver. For attendance at this meeting, please see the Security/Attendance Requirements and Registration instructions below.

## 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 Officer, Mary Gannaway, at (410) 992-7304, ext. 211 or [mtg@jhu.edu](mailto:mtg@jhu.edu).

## Registration

**Registration is now open. Register and pay the registration fee by Friday, 7 December at 11:59 p.m. EST to take advantage of the lowest fee.**

**To register, you must 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 complete this process:

1. Register for the meeting after logging in to your **JANNAF Secure Portal account**.
2. Pay the registration fee (Portal account **not** required).

**Additional information and important links** for completing your meeting registration can be found at <https://www.jannaf.org/mtgs/2018Dec/pages/registration.html>.

## Registration Fee

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*
<i>on or before 12/7/18</i>	\$1,200.00	\$250.00
<i>12/8/18 or later</i>	\$1,350.00	\$250.00

\* 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 present current student identification upon registration on-site.

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."

Attendees are encouraged to complete step one of the registration process after logging in to the JANNAF Secure Portal, and submit payment, on or before Friday, 7 December 2018 to ensure prompt registration upon arrival at the meeting. Credit card payments made electronically via the Web will be charged immediately; a receipt will be sent to you via email.

## Cancellation Policy

Please note our cancellation policy—Written (email) cancellations submitted on or before 26 November 2018 will receive a full refund minus an administrative fee of \$50.00. Cancellations made after 26 November 2018 **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 to [scohen@erg.jhu.edu](mailto:scohen@erg.jhu.edu) to transfer or cancel your registration.

## On-Site Registration / Check-in

The JANNAF Registration desk will be located on the first floor of the Hilton Vancouver Washington in the Conference Center. Photo identification is required upon registration or check-in. The desk will be open Monday, 10 December through Thursday, 13 December, from 7:00 a.m. - 5:00 p.m.

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## Attention DoD

Based on the current conference guidance, no additional approval documentation may be needed outside of what may be required in the guidance by the respective DoD organizations and agencies. This is the case for the Air Force and Navy organizations. We are working to validate this with the other organizations.

**Interested DoD attendees are strongly encouraged to obtain a JANNAF Secure Portal account now and register for the meeting** (step 1). This step does not require travel or training office authorization as it does not include a financial commitment. Payment of the registration fee may be completed as soon as permitted.

## Attire

There is no official dress code for JANNAF conferences; however, most attendees wear business or business casual attire. When packing, keep in mind that it can be difficult to regulate the temperature in meeting rooms to everyone's liking, and any changes may not be noticeable quickly, so it is best to bring a sweater or jacket and dress in layers.

## Dining

Approximately one and one-half hours for lunch has been built into the program each day. Restaurants in the hotel include Grays Restaurant and Bar (breakfast, lunch, and dinner), and Grays Coffee (breakfast through mid-morning). Additionally, the hotel is located in downtown Vancouver with several dining options within a short walk.

## Networking Room

The Heritage Ballroom Salon B on the 1st floor of the hotel will serve as the JANNAF networking area; a light continental breakfast and mid-morning coffee break along with mid-afternoon refreshments will be served at the times stated in the program. This area will be open Monday, Tuesday, and Thursday from 7:00 a.m. - 5:00 p.m., and Wednesday from 7:00 a.m. to 4:15 p.m. Please note that scheduled breaks are included in session agendas where time permits.

## Networking Night

Come enjoy an evening with fellow JANNAF attendees on Wednesday, 12 December from 6:30-8:00 p.m., in Heritage Ballroom Salons A & B at the Hilton Vancouver Washington. A cash bar reception will precede the

networking event at 6:00 p.m. **There is no charge for meeting attendees**; however, guest tickets may be purchased on the Registration Payment site for \$45 (admission is free for children five and under). Be sure to wear your JANNAF badge to attend the event.

## Reading Room

All papers presented in the technical sessions and received in time will be available to read via JANNAF touch-screen tablets in the Reading Room, located in Discovery Ballroom Salon E and open Monday through Thursday from 8:00 a.m. - 4:30 p.m. Reproduction of Reading Room papers is not permitted.

## Side Meetings

A limited number of meeting rooms of varying sizes are available for JANNAF-related side meetings. Audiovisual equipment will not be provided. Please contact Shelley Cohen at [scohen@erg.jhu.edu](mailto:scohen@erg.jhu.edu) to reserve a room as soon as possible. Requests may also be made on-site during the meeting. Rooms will be assigned first-come, first-served.

## Program Changes

Meeting programs will be distributed to attendees upon registration/check-in on-site. Note that **Final Programs are Distribution Statement C and should be secured when not in your possession**. Changes to the Final Program will be posted on touch screen monitors located on the 1st floor of the hotel conference center. Attendees should periodically check for program updates and administrative announcements and note these updates in their copy of the Final Program.

## Meeting Proceedings

Proceedings from this meeting will be published by the JHU WSE Energetics Research Group. Papers, and in limited cases, presentations will be provided complimentary to attendees of this meeting who have paid the full registration fee (early or regular). These 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.

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## Questions

Questions concerning this program and/or payment of the registration fee should be directed to Shelley Cohen at (410) 992-7302, ext. 215 or email: [scohen@erg.jhu.edu](mailto:scohen@erg.jhu.edu).

Questions pertaining to registering via the JANNAF Secure Portal should be directed to:

Mary Gannaway: Call (410) 992-7304, ext. 211 or email [mtg@jhu.edu](mailto:mtg@jhu.edu)

OR

Tricia Reider: Call (410) 992-7300, ext. 222 or email [treider@erg.jhu.edu](mailto:treider@erg.jhu.edu)

## Upcoming JANNAF Meetings

66th JANNAF Propulsion Meeting  
Programmatic and Industrial Base Meeting  
49th Combustion

37th Airbreathing Propulsion  
37th Exhaust Plume and Signatures  
31st Propulsion Systems Hazards  
Joint Subcommittee Meeting

*Spring 2019*

*Location TBD*

13th Modeling and Simulation  
11th Liquid Propulsion  
10th Spacecraft Propulsion  
Joint Subcommittee Meeting  
Programmatic and Industrial Base Meeting

*December 2019*

*Location TBD*

## Program Committee Members

### PROGRAM CHAIR

J. Robert Esslinger, Jr.  
Army Aviation and Missile Research, Development  
and Engineering Center  
Redstone Arsenal, AL

### STRUCTURES AND MECHANICAL BEHAVIOR SUBCOMMITTEE

#### Technical Steering Group Chair

Dr. Jeremy R. Rice  
Army Aviation and Missile Research, Development  
and Engineering Center / Redstone Arsenal, AL

#### JANNAF Executive Committee Liaison

Dr. Jay S. Lilly  
Army Aviation and Missile Research, Development  
and Engineering Center / Redstone Arsenal, AL

#### JHU WSE ERG Technical Representatives

Mr. David Owen  
JHU WSE Energetics Research Group / Columbia, MD

#### Mission Area I: Service Life / Missile Sustainment

Vacant

#### Mission Area II: Materials Properties and Characterization

Dr. Soe T. (Tom) Bhe  
Aerojet Rocketdyne / Rancho Cordova, CA

Mr. David J. Braithwaite  
Northrop Grumman Corporation / Brigham City, UT

#### Mission Area III: Structural Analysis and Design

Dr. Brian C. Liechty  
Northrop Grumman Corporation / Brigham City, UT

#### Mission Area IV: Experimental Structural and Mechanical Analysis and Test Methods

Mr. Vincent McDonald  
Naval Surface Warfare Center / Indian Head, MD

#### Mission Area V: Nondestructive Evaluation

Mr. Scott H. McClain  
Army Armament Research, Development and Engineering Center  
Picatinny Arsenal, NJ

#### Mission Area VI: Damage Tolerance / Fracture / Failure [Joint Mission Area with RNTS]

Mr. David M. McCutcheon  
NASA Marshall Space Flight Center / Huntsville, AL

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## **PROPELLANT AND EXPLOSIVES DEVELOPMENT AND CHARACTERIZATION SUBCOMMITTEE**

### **Technical Steering Group Co-Chair**

Dr. Mark H. Mason, Jr.  
Naval Air Warfare Center Weapons Division / China Lake, CA

### **Technical Steering Group Deputy Chair**

Mr. Chuck Davis  
NASA / Kennedy Space Center, FL

### **JANNAF Executive Committee Liaison**

Mr. Frank C. Tse  
Naval Surface Warfare Center / Indian Head, MD

### **JHU WSE ERG Technical Representative**

Mr. William A. Bagley  
JHU WSE Energetics Research Group / Columbia, MD

### **Mission Area I: Liquid Propellants**

Dr. Benjamin Greene  
Jacobs Technology, Incorporated / Las Cruces, NM

### **Mission Area II: Explosive Development and Characterization**

Dr. Mark H. Mason, Jr.  
Naval Air Warfare Center Weapons Division / China Lake, CA

### **Mission Area III: Propellant and Explosives Process Engineering**

Dr. Jamie B. Neidert  
Army Aviation and Missile Research, Development and Engineering Center / Redstone Arsenal, AL

Mr. Richard S. Muscato  
Naval Surface Warfare Center / Indian Head, MD

Mr. Charles R. Painter  
Naval Surface Warfare Center / Indian Head, MD

### **Mission Area IV: Energetic Materials Characterization and Raw Material Obsolescence**

Mr. Christopher A. Marshall  
Army Aviation and Missile Research, Development and Engineering Center / Redstone Arsenal, AL

### **Mission Area V: Solid Propellant Ingredients and Formulations**

Dr. Gregory W. Drake  
Army Aviation and Missile Research, Development and Engineering Center / Redstone Arsenal, AL

Dr. Nirupam J. Trivedi  
Army Research Laboratory / Aberdeen Proving Ground, MD

### **Mission Area VI: Propellant and Explosive Surveillance and Aging**

Dr. Kerry A. Clark  
Naval Surface Warfare Center-IHEODTD / Indian Head, MD

### **Mission Area VII: Gun Propulsion**

Dr. Kirstin F. Warner  
DoD Explosives Safety Board / Alexandria, VA

Ms. Christine D. Knott  
Naval Surface Warfare Center-IHEODTD / Indian Head, MD

### **Mission Area VIII: Green Energetic Materials (GEM) Joint PEDCS - SEPS Mission Area**

Mr. Noah Lieb  
Jensen Hughes / Baltimore, MD

Dr. Jesse J. Sabatini  
Army Research Laboratory / Aberdeen Proving Ground, MD

Dr. Sara K. Pliskin  
Naval Surface Warfare Center / Crane, IN

## **ROCKET NOZZLE TECHNOLOGY SUBCOMMITTEE**

### **Technical Steering Group Chair**

Mr. J. Robert Esslinger, Jr.  
Army Aviation and Missile Research, Development and Engineering Center / Redstone Arsenal, AL

### **JANNAF Executive Committee Liaison**

Dr. Jay S. Lilly  
Army Aviation and Missile Research, Development and Engineering Center / Redstone Arsenal, AL

### **JHU WSE ERG Technical Representative**

Mr. David Owen  
JHU WSE Energetics Research Group / Columbia, MD

### **Mission Area I: Nozzle Thermal, Structural, Fluids Analysis and Modeling**

Dr. Heath T. Martin  
NASA Marshall Space Flight Center / Huntsville, AL

### **Mission Area II: Nozzle Design, Test and Evaluation**

Mr. Clyde E. Carr, Jr.  
Northrop Grumman Corporation / Elkton, MD

### **Mission Area III: Thrust Control**

Mr. J. Robert Esslinger, Jr.  
Army Aviation and Missile Research, Development and Engineering Center / Redstone Arsenal, AL

### **Mission Area IV: Innovative Nozzle Materials and Manufacturing**

Ms. Amanda B. Napier  
Army Aviation and Missile Research, Development and Engineering Center / Redstone Arsenal, AL

Mr. Timothy W. Lawrence  
NASA Marshall Space Flight Center / Huntsville, AL



# JANNAF Meeting Invitation - December 2018

## Program Committee Members - continued

### **Mission Area V: Damage Tolerance / Fracture / Failure [Joint Mission Area with SMBS]**

Mr. David M. McCutcheon  
NASA Marshall Space Flight Center / Huntsville, AL

### **SAFETY AND ENVIRONMENTAL PROTECTION SUBCOMMITTEE**

#### **Technical Steering Group Chair**

Dr. Sara K. Pliskin  
Naval Surface Warfare Center / Crane, IN

#### **JANNAF Executive Committee Liaison**

Dr. Rose A. Pesce-Rodriguez  
Army Research Laboratory / Aberdeen Proving Ground, MD

#### **JHU WSE ERG Technical Representatives**

Mr. William A. Bagley  
JHU WSE Energetics Research Group / Columbia, MD

#### **Mission Area I: Toxicology**

Dr. David R. Mattie  
Air Force Research Laboratory, 711HPW / Wright-Patterson AFB, OH  
Dr. Mark S. Johnson  
Army Public Health Center / Aberdeen Proving Ground, MD

#### **Mission Area II: Atmospheric Dispersion Modeling and Hazards Assessment**

Mr. Daniel E. Strub  
30th Space Wing / Vandenberg AFB, CA

#### **Mission Area III: Instrumentation**

Dr. Karen L. Mumy  
Naval Medical Research Unit - Dayton / Wright-Patterson AFB, OH

#### **Mission Area IV: Environmental**

Dr. William S. Eck  
Army Public Health Center / Aberdeen Proving Ground, MD  
Dr. Karen L. Mumy  
Naval Medical Research Unit - Dayton / Wright-Patterson AFB, OH

#### **Mission Area V: Industrial Hygiene**

Ms. Lindsey Kneten  
Army Public Health Center / Aberdeen Proving Ground, MD

#### **Mission Area VI: Range Safety and Explosives Safety**

Mr. Daniel E. Strub  
30th Space Wing / Vandenberg AFB, CA

### **Mission Area VII: Green Energetic Materials (GEM) Joint PEDCS - SEPS Mission Area**

Mr. Noah Lieb  
Jensen Hughes / Baltimore, MD

Dr. Jesse J. Sabatini  
Army Research Laboratory / Aberdeen Proving Ground, MD

Dr. Sara K. Pliskin  
Naval Surface Warfare Center / Crane, IN

### **Mission Area VIII: Demilitarization, Reclamation, and Reuse Technologies**

Dr. Jeffrey L. Lee  
Army Aviation and Missile Research, Development  
and Engineering Center / Redstone Arsenal, AL  
Mr. Gary Mescavage  
Army Armament Research, Development and Engineering Center  
Picatinny Arsenal, NJ  
Ms. Pamela L. Sheehan  
Army Armament Research, Development and Engineering Center  
Picatinny Arsenal, NJ

Dr. Jeanne Hartzell  
Naval Ordnance Safety and Security Activity / Indian Head, MD

### **Mission Area IX: Review of Accidents and Incidents**

Mr. Daniel E. Strub  
30th Space Wing / Vandenberg AFB, CA

### **PROGRAMMATIC AND INDUSTRIAL BASE**

#### **PIB Executive Committee Co-Chair**

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

#### **PIB Executive Committee Co-Chair**

Mr. Robert H. Champion  
NASA Marshall Space Flight Center / Huntsville, AL

#### **JHU WSE ERG Technical Representative**

Kirk V. Sharp  
JHU WSE Energetics Research Group / Columbia, MD



# JANNAF Meeting Invitation - December 2018

## JANNAF MEETING MANAGER

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

## COMMUNICATIONS AND MEETINGS ASSISTANT / MEETING PROCEEDINGS EDITOR

Kathryn Cochran  
JHU WSE Energetics Research Group / Columbia, MD

## SECURITY OFFICER

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

## ASSISTANT SECURITY OFFICER

Tricia Reider  
JHU WSE Energetics Research Group / Columbia, MD

## Program Highlights

### Keynote Address



**Mr. Robert M. Lightfoot, Jr.**, President of LSINC Corporation in Huntsville, AL, will present the keynote at this year's conference. The title of Mr. Lightfoot's address is "**Risk Leadership**". As new systems and technologies are developed, engineers are challenged to assess the risks associated with fielding something new. This takes more

than "risk management", it takes "risk leadership". This speech will highlight the similarities and differences between a risk "management" and risk "leadership" approach.

In his role as President of LSINC Corporation, Mr. Lightfoot is responsible for leading innovative strategy assurance and product development to help clients achieve mission success. His extensive knowledge in managing a federal agency through times of significant change allows him to develop strategies and eliminate barriers that can impact necessary change for any organization.

Lightfoot is the former Acting Administrator of the National Aeronautics & Space Administration (NASA). His permanent position at NASA Headquarters was Associate Administrator, the agency's highest-ranking civil service position. He previously was director of NASA's Marshall Space Flight Center in Huntsville, AL, one of NASA's largest

field installations, which plays a critical role in NASA's space operations, exploration and science missions. He spent much of his Marshall career in rocket engine testing and the space shuttle propulsion office. He also served as director of the Propulsion Test Directorate at NASA's Stennis Space Center in Mississippi. After Stennis, two years were spent at NASA Headquarters focused on strategies for the shuttle return to flight following the Columbia tragedy.

Lightfoot received a bachelor's degree in mechanical engineering from the University of Alabama where he is a Distinguished Departmental Fellow for the Department of Mechanical Engineering, a College of Engineering fellow, and served on the Mechanical Engineering Advisory Board. He was inducted into the State of Alabama Engineering Hall of Fame in 2010. He received numerous awards during his NASA career, including the Presidential Rank Award for Distinguished Executives, the highest honors attainable for federal government work, in 2006, 2010 and 2016.

All attendees are invited to participate. **The Keynote Address begins at 8:00 a.m. on Tuesday, 11 December, in Discovery Ballroom A-C** on the first floor of the hotel. An awards presentation will immediately follow the Keynote Address.

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## Additional Program Highlights

### Structures and Mechanical Behavior Subcommittee

The SMBS will offer a Specialist Session on **Non-Destructive Evaluation Needs and Capabilities for Solid Rocket Motors** on Tuesday in two parts (sessions 2H and 2T). A meeting of the Non-Destructive Evaluation Panel will follow at 5:35 p.m. that day.

On Wednesday afternoon, Thomas Williams, Northrop Grumman Corporation, and Stephen Cash, QuantiTech, Incorporated, will present a Specialist Session on **Solid Rocket Motor Lessons Learned** (session 3S).

The SMBS will also offer a workshop jointly with RNTS on Thursday afternoon entitled, **Verification, Validation, and Uncertainty Quantification** (session 4Q). Participants will work in conjunction with the Modeling and Simulation Subcommittee's Verification, Validation, and Uncertainty Quantification Team to define approaches for Verification, Validation and Uncertainty Quantification that can be used in the propulsion analytical community with an emphasis on Rocket Nozzle Technology and Structures and Mechanical Behavior.

### Propellant and Explosives Development and Characterization Subcommittee

With more than 20 technical sessions and multiple Specialist Sessions, the PEDCS will offer a very full and diverse program on topics such as a Specialist Session on **CL-20 Efforts - Past, Present, Future Formulations**, offered jointly with the PIB on Monday (sessions 1D and 1P). This Specialist Session looks to educate and assess past and present efforts to solve the economical issues, and engage in future efforts. By bringing the community (OSD, DoD/DoE Laboratories, Program Managers, and Industry) together, the goal is to solve these critical technical, economical, and logistical challenges, in order to equip our warfighters with the best and state of the art technology.

On Thursday, there will be a PEDCS Specialist Session entitled, **AOP-7 US National Section Test Methodology Review** (sessions 4D and 4P). The purpose of this specialist session is to have the community present on state of the art test methods for energetic material characterization and qualification in order to update the *AOP-7 Manual of Data Requirements and Tests for the Qualification of Explosive Materials for Military*. The goal is to remove the US National section from the manual in its entirety and have a technical

discussion with the community to determine which tests should be removed, updated, and any new methods that should be added.

Other PEDCS program highlights include a two-part Specialist Session on **Small Scale Sensitivity Testing (Impact, Friction, ESD)** on Wednesday (sessions 3D and 3P), and four sessions on the topic of **Propellant and Explosives Process Engineering** (sessions 3B and 3N on Wednesday, and 4A and 4M on Thursday).

### Rocket Nozzle Technology Subcommittee

In addition to the joint workshop with SMBS on **Verification, Validation, and Uncertainty Quantification** on Wednesday (session 4Q), RNTS is offering a Workshop jointly with the PIB on Wednesday entitled, **Subscale Testing of Rocket Motor Insulation Candidates for Dechlorane Obsolescence** (session 3Q). The purpose of this workshop is to assess how well the small scale testing used to evaluate rocket motor insulation formulations correlates to sub-scale and full-scale motor testing and to establish best practices for test standardization. This workshop will provide valuable information about the small scale testing currently being performed on replacement insulation candidates and guidance for future test efforts.

### Safety and Environmental Protection Subcommittee

The SEPS will offer a session jointly with the PEDCS on **Green Energetic Materials** on Wednesday morning (session 3F), followed immediately by a meeting of the Green Energetic Materials Panel.

Other SEPS program highlights include a session on **Demilitarization** on Tuesday afternoon (2M), a two-part session on **Regulations and New Materials** on Wednesday (3H and 3T), and a **Toxicology** session on Thursday afternoon (4N).

### Programmatic and Industrial Base

The PIB will hold two Specialist Sessions on Thursday. In the morning (session 4C), the topic will be **Reducing Obsolescence and Foreign Dependency Issues for Critical Chemicals**. The afternoon session (4O) will feature a panel discussion on **Removing Barriers and Impediments to Enable Mitigations for Critical Chemicals**.

# JANNAF Meeting Invitation - December 2018

## Program Highlights - continued

In addition, the PIB is jointly offering a two-part Specialist Session with PEDCS on Monday entitled, **CL-20 Efforts - Past, Present, Future Formulations** (sessions 1D and 1P). Also, along with the RNTS, the PIB is jointly offering a Wednesday Workshop entitled, **Subscale Testing of Rocket Motor Insulation Candidates for Dechlorane Obsolescence** (session 3Q).

been used successfully in the propulsion and energetics community for programs to improve performance and improve insensitive munitions response. The workshop will introduce the newest generation of JANNAF participants to the GOTChA Process, and serve as a refresher for those who have used it previously (session 1E).

## JANNAF Propulsion Meeting

On Monday morning, former JANNAF Technical Executive Committee Chair, Stuart Blashill, will present **An Introduction to the GOTChA Process**, which has

## Technical Program

This year's technical program currently consists of 33 technical sessions with more than 200 presentations, plus 11 specialist sessions, 3 workshops, and 11 panel meetings. A detailed daily schedule of all sessions, workshops, meetings and networking activities is provided below and continues through page 14. Detailed agendas of the technical sessions, specialist sessions, and workshops are listed in the Program Section of the Preliminary Program beginning on page 15; you must have a JANNAF Secure Portal Account to access the Preliminary Program.

**A Schedule Color Key has been provided on pages 12, 13 and 14.**

SCHEDULE - Monday, 10 December					
7:00 a.m. - 5:00 p.m.	On-Site Check-In and Registration Desk Open				
7:00 a.m. - 5:00 p.m.	I.T. Office Open (for Presenters and Session Chairs needing technical assistance)			Alder	Open
7:00 a.m. - 10:00 a.m.	Networking Area Refreshments			Heritage B	Open
7:15 a.m. - 7:30 a.m.	Session Chair Meeting (Monday Sessions)			Discovery E	Closed
8:00 a.m. - 4:30 p.m.	Reading Room			Discovery E	Open
<b>8:00 a.m. - 12:05 p.m.</b>	<b>Monday Morning Technical Session, Workshop, and Specialist Session</b>				
8:00 a.m. - 12:00 p.m.	ID	PEDCS/PIB	<i>SPECIALIST SESSION: CL-20 Efforts – Past, Present, Future Formulations – I</i>	Heritage A	Open
8:00 a.m. - 12:00 p.m.	IE	JPM	<i>WORKSHOP: An Introduction to the GOTChA Process</i>	Heritage C	Open
10:00 a.m. - 12:05 p.m.	IB	PEDCS	Detonation Physics - I	Discovery C	Open
12:00 p.m. - 12:30 p.m.	PIB Update for TSG Chairs			Boardroom	Closed
12:00 p.m. - 1:30 p.m.	Lunch Break - <i>On Your Own</i>				
<b>1:30 p.m. - 5:05 p.m.</b>	<b>Monday Afternoon Technical Sessions, Specialist Session, and Panel Meeting</b>				
1:30 p.m. - 5:05 p.m.	IM	PEDCS	Composite Propellants	Heritage E	Open
1:30 p.m. - 5:05 p.m.	IN	PEDCS	Explosive Ingredients	Discovery C	Open
1:30 p.m. - 5:00 p.m.	IP	PEDCS/PIB	<i>SPECIALIST SESSION: CL-20 Efforts – Past, Present, Future Formulations - II</i>	Heritage A	Open*
1:30 p.m. - 4:35 p.m.	IQ	SMBS	Materials Characterization	Heritage C	Open
4:35 p.m. - 5:05 p.m.	IQ	SMBS	<i>PANEL MEETING: Joint Service Life and Materials Characterization</i>	Heritage C	Open
3:00 p.m. - 4:05 p.m.	Networking Area Refreshments			Heritage B	Open

\* Although session 1P is an open session, the final presentation in the session (at 4:00 p.m.) is for DoD attendees only.

# JANNAF Meeting Invitation - December 2018

## SCHEDULE - Tuesday, 11 December

7:00 a.m. - 5:00 p.m.	On-Site Check-In and Registration Desk Open				
7:00 a.m. - 5:00 p.m.	I.T. Office Open (for Presenters and Session Chairs needing technical assistance)			Alder	Open
7:00 a.m. - 8:00 a.m.	Networking Area Refreshments			Heritage B	Open
7:15 a.m. - 7:30 a.m.	Session Chair Meeting (Tuesday Sessions)			Discovery E	Closed
8:00 a.m. - 10:00 a.m.	KEYNOTE ADDRESS: "Risk Leadership" Mr. Robert M. Lightfoot, Jr., LSINC Corporation <i>Awards and Announcements</i>			Discovery A-C	Open
8:00 a.m. - 4:30 p.m.	Reading Room			Discovery E	Open
9:30 a.m. - 10:00 a.m.	Networking Area Refreshments			Heritage B	Open
10:00 a.m. - 6:00 p.m.	JANNAF Technical Executive Committee Meeting			Boardroom	Closed
<b>10:00 a.m. - 12:05 p.m.</b>	<b>Tuesday Morning Technical Sessions and Specialist Session</b>				
10:00 a.m. - 12:05 p.m.	2C	PEDCS	Liquid Propellants - I	Discovery C	Open
10:00 a.m. - 11:35 a.m.	2E	SMBS	Structural Analysis and Design - I	Heritage C	Open
10:00 a.m. - 11:35 a.m.	2F	PEDCS	Composite Propellant Ingredients	Heritage D	Open
10:00 a.m. - 12:05 p.m.	2G	RNTS	Nozzle Thermal, Structural, Fluids Analysis and Modeling - I	Heritage E	Open
10:00 a.m. - 12:05 p.m.	2H	SMBS	SPECIALIST SESSION: Non-Destructive Evaluation Needs and Capabilities for Solid Rocket Motors - I	Heritage F	Open
12:05 p.m. - 1:30 p.m.	Lunch Break - <i>On Your Own</i>				
<b>1:30 p.m. - 6:05 p.m.</b>	<b>Tuesday Afternoon Technical Sessions, Specialist Session, and Panel Meetings</b>				
1:30 p.m. - 5:05 p.m.	2M	SEPS	Demilitarization	Discovery A	Open
1:30 p.m. - 4:35 p.m.	2N	PEDCS	Gun Propulsion	Discovery B	Open
1:30 p.m. - 3:35 p.m.	2O	PEDCS	Liquid Propellants - II	Discovery C	Open
4:05 p.m. - 5:05 p.m.	2O	PEDCS	PANEL MEETING: Liquid Propellants	Discovery C	Open
1:30 p.m. - 3:35 p.m.	2P	PEDCS	Detonation Physics - II	Heritage A	Open
1:30 p.m. - 3:35 p.m.	2Q	SMBS	Structural Analysis and Design - II	Heritage C	Open
4:05 p.m. - 4:35 p.m.	2Q	SMBS	PANEL MEETING: Structural Analysis and Design	Heritage C	Open
1:30 p.m. - 5:35 p.m.	2R	PEDCS	Novel Energetic Materials	Heritage D	Open
5:35 p.m. - 6:05 p.m.	2R	PEDCS	PANEL MEETING: Future Directions Towards Novel Energetics	Heritage D	Open
1:30 p.m. - 3:35 p.m.	2S	RNTS	Nozzle Thermal, Structural, Fluids Analysis and Modeling - II	Heritage E	Open
4:05 p.m. - 4:35 p.m.	2S	RNTS	PANEL MEETING: Nozzle Analysis and Modeling	Heritage E	Open
1:30 p.m. - 5:05 p.m.	2T	SMBS	SPECIALIST SESSION: Non-Destructive Evaluation Needs and Capabilities for Solid Rocket Motors - II	Heritage F	Open
5:05 p.m. - 5:35 p.m.	2T	SMBS	PANEL MEETING: Non-destructive Evaluation	Heritage F	Open
3:05 p.m. - 4:05 p.m.	Networking Area Refreshments			Heritage B	Open

### Schedule Color Key

Meeting Services	Concurrent Sessions or Panel Meetings
Networking Opportunities	Session Details
Closed Meetings	Panel, Town Hall, & Working Group Meetings



# JANNAF Meeting Invitation - December 2018

## SCHEDULE - Wednesday, 12 December

7:00 a.m. - 5:00 p.m.	On-Site Check-In and Registration Desk Open				
7:00 a.m. - 5:00 p.m.	I.T. Office Open (for Presenters and Session Chairs needing technical assistance)			Alder	Open
7:00 a.m. - 8:00 a.m.	Networking Area Refreshments			Heritage B	Open
7:15 a.m. - 7:30 a.m.	Session Chair Meeting (Wednesday Sessions)			Discovery E	Closed
8:00 a.m. - 4:30 p.m.	Reading Room			Discovery E	Open
<b>8:00 a.m. - 12:05 p.m.</b>	<b>Wednesday Morning Technical Sessions, Specialist Session, and Panel Meetings</b>				
8:00 a.m. - 11:35 a.m.	3A	PEDCS	Detonation Physics - III	Discovery A	Open
8:00 a.m. - 12:05 p.m.	3B	PEDCS	Propellant and Explosives Process Engineering - I: Micro-Fluidic Reactors	Discovery B	Open
8:00 a.m. - 10:05 a.m.	3C	PEDCS	Explosive Formulations - I	Discovery C	Open
8:00 a.m. - 12:00 p.m.	3D	PEDCS	<i>SPECIALIST SESSION</i> : Small Scale Sensitivity Testing (Impact, Friction, ESD) - I	Heritage A	Open
8:00 a.m. - 10:05 a.m.	3E	RNTS	Innovative Nozzle Materials	Heritage C	Open
8:00 a.m. - 11:35 a.m.	3F	PEDCS/SEPS	Green Energetic Materials	Heritage D	Open
11:35 a.m. - 12:00 p.m.	3F	PEDCS/SEPS	<i>PANEL MEETING</i> : Green Energetics Materials	Heritage D	Open
8:00 a.m. - 9:05 a.m.	3G	SMBS	Experimental Structural Analysis and Testing	Heritage E	Open
9:05 a.m. - 9:35 a.m.	3G	SMBS	<i>PANEL MEETING</i> : Experimental Structural Analysis and Testing	Heritage E	Open
8:00 a.m. - 11:05 a.m.	3H	SEPS	Regulations and New Materials - I	Heritage F	Open
9:30 a.m. - 10:35 a.m.	Networking Area Refreshments			Heritage B	Open
12:00 p.m. - 1:30 p.m.	Lunch Break - <i>On Your Own</i>				
12:00 p.m. - 1:00 p.m.	RNTS Technical Steering Group Meeting			Boardroom	Closed
12:00 p.m. - 1:30 p.m.	PIB Executive Committee Meeting			Cedar	Closed
<b>1:30 p.m. - 5:35 p.m.</b>	<b>Wednesday Afternoon Technical Sessions, Specialist Sessions, and Workshop</b>				
1:30 p.m. - 5:35 p.m.	3N	PEDCS	Propellant and Explosives Process Engineering - II: Chemical Scale-Up	Discovery B	Open
1:30 p.m. - 5:05 p.m.	3O	PEDCS	Explosive Formulations - II	Discovery C	Open
1:30 p.m. - 4:30 p.m.	3P	PEDCS	<i>SPECIALIST SESSION</i> : Small Scale Sensitivity Testing (Impact, Friction, ESD) - II	Heritage A	Open
1:30 p.m. - 5:30 p.m.	3Q	RNTS/ PIB	<i>WORKSHOP</i> : Subscale Testing of Rocket Motor Insulation Candidates for Dechlorane Obsolescence	Heritage C	Open
1:30 p.m. - 5:35 p.m.	3R	PEDCS	Energetic Materials Characterization and Raw Material Obsolescence	Heritage D	Open
1:30 p.m. - 4:35 p.m.	3S	SMBS	<i>SPECIALIST SESSION</i> : Solid Rocket Motor Lessons Learned	Heritage E	Open
1:30 p.m. - 4:35 p.m.	3T	SEPS	Regulations and New Materials - II	Heritage F	Open
3:00 p.m. - 4:05 p.m.	Networking Area Refreshments			Heritage B	Open
6:00 p.m. - 8:00 p.m.	Networking Night - Dinner and Cash Bar <i>JANNAF Badge or Guest Ticket required</i>			Heritage A & B	Open

### Schedule Color Key

	Meeting Services		Concurrent Sessions or Panel Meetings
	Networking Opportunities		Session Details
	Closed Meetings		Panel, Town Hall, & Working Group Meetings

# JANNAF Meeting Invitation - December 2018

## SCHEDULE - Thursday, 13 December

7:00 a.m. - 5:00 p.m.	On-Site Check-In and Registration Desk Open			
7:00 a.m. - 5:00 p.m.	I.T. Office Open (for Presenters and Session Chairs needing technical assistance)		Alder	Open
7:00 a.m. - 8:00 a.m.	Networking Area Refreshments		Heritage B	Open
7:15 a.m. - 7:30 a.m.	Session Chair Meeting (Thursday Sessions)		Discovery E	Closed
8:00 a.m. - 4:30 p.m.	Reading Room		Discovery E	Open
<b>8:00 a.m. - 12:05 p.m.</b>	<b>Thursday Morning Technical Sessions and Specialist Sessions</b>			
8:00 a.m. - 12:05 p.m.	4A	PEDCS	Propellant and Explosives Process Engineering - III: Resonant Acoustic Mixing (RAM)	Discovery A Open
8:00 a.m. - 10:05 a.m.	4B	PEDCS	Surveillance and Aging	Discovery B Open
8:00 a.m. - 11:45 a.m.	4C	PIB	<i>SPECIALIST SESSION</i> : Reducing Obsolescence and Foreign Dependency Issues for Critical Chemicals	Discovery C Open
8:00 a.m. - 12:05 p.m.	4D	PEDCS	<i>SPECIALIST SESSION</i> : AOP-7 US National Section Test Methodology Review - I	Heritage A Open
8:00 a.m. - 11:05 a.m.	4E	RNTS	Design, Test, Evaluation	Heritage C Open
11:05 a.m. - 11:25 a.m.	4E	RNTS	<i>PANEL MEETING</i> : Rocket Nozzle Design, Test, and Evaluation	Heritage C Open
8:00 a.m. - 10:05 a.m.	4F	PEDCS	Minimum Signature Propellants - I	Heritage D Open
9:35 a.m. - 10:35 a.m.	Networking Area Refreshments		Heritage B	Open
12:00 p.m. - 1:30 p.m.	Lunch Break - <i>On Your Own</i>			
12:00 p.m. - 1:00 p.m.	SMBS Technical Steering Group Meeting		Boardroom	Closed
12:00 p.m. - 1:30 p.m.	SEPS Technical Steering Group Meeting		Birch	Closed
<b>1:30 p.m. - 6:35 p.m.</b>	<b>Thursday Afternoon Technical Sessions, Workshop, Specialist Sessions, and Panel Meetings</b>			
1:30 p.m. - 5:05 p.m.	4M	PEDCS	Propellant and Explosives Process Engineering - IV	Discovery A Open
5:05 p.m. - 6:05 p.m.	4M	PEDCS	<i>PANEL MEETING</i> : Propellant and Explosives Process Engineering	Discovery A Open
1:30 p.m. - 5:35 p.m.	4N	SEPS	Toxicology	Discovery B Open
5:35 p.m. - 6:35 p.m.	4N	SEPS	<i>PANEL MEETING</i> : Occupational Health & Toxicology	Discovery B Open
1:30 p.m. - 5:00 p.m.	4O	PIB	<i>SPECIALIST SESSION</i> : Panel Discussion: Removing Barriers and Impediments to Enable Mitigations for Critical Chemicals	Discovery C Open
1:30 p.m. - 5:00 p.m.	4P	PEDCS	<i>SPECIALIST SESSION</i> : AOP-7 US National Section Test Methodology Review - II	Heritage A Open*
1:30 p.m. - 5:30 p.m.	4Q	RNTS/SMBS	<i>WORKSHOP</i> : Verification, Validation, and Uncertainty Quantification	Heritage C Open
1:30 p.m. - 4:35 p.m.	4R	PEDCS	Minimum Signature Propellants - II	Heritage D Open
3:00 p.m. - 4:05 p.m.	Networking Area Refreshments		Heritage B	Open
6:00 p.m. - 8:00 p.m.	PEDCS Technical Steering Group Meeting		Discovery D	Closed

\* Although session 4P is an open session, the final two presentations in the session (starting at 4:00 p.m.) are for DoD attendees only.

### Schedule Color Key

Meeting Services	Concurrent Sessions or Panel Meetings
Networking Opportunities	Session Details
Closed Meetings	Panel, Town Hall, & Working Group Meetings