

JANNAF INTERAGENCY PROPULSION COMMITTEE

JOINT ARMY-NAVY-NASA-AIR FORCE



Newport News Marriott at City Center
Newport News, Virginia

4 - 7 December 2017

Meeting Invitation

48th Combustion

36th Airbreathing Propulsion

36th Exhaust Plume and Signatures

30th Propulsion Systems Hazards

Joint Subcommittee Meeting

**Programmatic and Industrial
Base Meeting**



Last updated 11/16/2017

JANNAF Meeting Invitation - December 2017

You are invited to attend the December 2017 meeting of the Joint Army-Navy-NASA-Air Force (JANNAF), which will consist of the Joint Meeting of the 48th Combustion (CS) / 36th Airbreathing Propulsion (APS) / 36th Exhaust Plume and Signatures (EPSS) / 30th Propulsion Systems Hazards (PSHS) Subcommittees, and the Programmatic and Industrial Base (PIB) Meeting. This meeting will be held **Monday through Thursday, 4 - 7 December 2017, at the Newport News Marriott at City Center in Newport News, Virginia.** Classified sessions will be held at NASA Langley Research Center in Hampton, Virginia.



The Program Chair for the meeting is **Kevin P. Ford**, Naval Air Warfare Center Weapons Division, China Lake, CA. A complete list of Program Committee Members can be found on pages 6-8.

SCOPE

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.

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

The **Combustion Subcommittee (CS)** covers analytical modeling and experimental research on chemical combustion phenomena for solid, liquid, hybrid, and airbreathing missile, space, underwater, and gun propulsion systems.

The **Airbreathing Propulsion Subcommittee (APS)** addresses technical problems and issues associated with turbojet, ramjet, scramjet, and combined- or mixed-cycle engines.

The **Exhaust Plume and Signatures Subcommittee (EPSS)** addresses the phenomena associated with the exhaust from rockets, ramjets, space, gun propulsion systems, and Electro-Optical/Infrared (EO/IR) signature community.

The **Propulsion Systems Hazards Subcommittee (PSHS)** examines potential hazards associated with missile, space, and gun propulsion systems.

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.

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Hotel Information



Sleeping rooms have been reserved with the **Newport News Marriott at City Center**, located at 740 Town Center Drive, Newport News, VA 23606. Amenities include complimentary self-parking and high speed internet access in guestrooms.

JANNAF has arranged for discounted rooms for attendees. The room rate per night for government employee attendees with a valid government employee i.d. will be at the GSA FY 2018 per diem rate, currently \$93 plus tax (currently 14%), and a \$1 per day lodging fee, for single or double occupancy. The discounted rate for all other attendees is \$107 plus tax and lodging fee.

These discounted rooms will be held for JANNAF attendees until the reservation deadline of Monday, 13 November 2017 at 11:59 p.m. EST, 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.

Note that the JANNAF discounted room rates are offered beginning Sunday, 3 December through the night of Thursday, 7 December, until sold out. Based upon availability, the hotel will honor the JANNAF discounted rates for up to two days post-meeting for those who wish to extend their stay.

Make Your Reservation Online:

Click on the appropriate reservation link ([Government](#) or [Non-government](#)) on the [Hotel Page](#) of the meeting website to make your reservation. **Using one of these links will give you direct access to the JANNAF meeting discounted room blocks.**

Changes or cancellations to your reservation can be made via www.marriott.com with your confirmation number, or by calling the number below.

For additional reservation assistance, please call (866) 329-1758. Be sure to reference either the JANNAF Govt or Industry group block (whichever is applicable to you).

Need to cancel your reservation? Be sure to do so no later than 4:00 p.m. EST 48 hours prior to your scheduled arrival date to avoid paying a cancellation penalty.

Transportation and Parking

Three airports serve the area, listed below in order by distance from the hotel:

- Newport News/Williamsburg International Airport (15 minute drive)
- Norfolk International Airport (30-60 minute drive, depending on traffic)
- Richmond International Airport (one hour drive)

The hotel does not offer airport shuttle service.

DoD employees must follow specific [travel guidelines](#) as posted on the meeting website, with respect to which of the above airports should be used, as well as restrictions regarding use of personal vehicles, taxis, or rental cars.

Ground transportation costs range from \$17 for a cab from the Newport News/Williamsburg airport, to over \$100 for a taxi or shuttle from the Richmond airport. More information can be found on the airports' websites.

For those driving personal vehicles or renting a car, the hotel is offering all JANNAF attendees complimentary self-parking.

If attending classified sessions at NASA Langley Research Center, attendees will need to drive; carpooling with other attendees is strongly encouraged due to limited parking.

Unclassified Meeting Site

Unclassified sessions will be held at the **Newport News Marriott at City Center Hotel** in Newport News, Virginia. For attendance at Unclassified sessions only, please see the Security/Attendance Requirements and Registration instructions on page 4.

Classified Meeting Site

Classified sessions will be held at **NASA Langley Research Center** in Hampton, Virginia. **Check-in at the JANNAF registration desk at the Newport News Marriott at City Center is *required* prior to attending classified sessions.** **If attending the Monday morning classified session, pick up your registration materials**, including badge and NASA visitor pass, **at the hotel on Sunday, 3 December, 5:00 p.m. - 7:00 p.m.** Please reference the detailed Security/Attendance Requirements, as well as registration instructions specific to attendance at BOTH Classified and Unclassified sessions, located on page 4.

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Security/Attendance Requirements

The overall security classification of this meeting is Secret.

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 will be permitted to attend.**

In addition, CLASSIFIED SESSION attendance is restricted to invited U.S. citizens who possess, at minimum, a SECRET U.S. Security Clearance with a need-to-know in the areas of rocket, missile, space, or gun propulsion.

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.

Registration

Registration is now open. Register by Monday, 20 November 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.

If attending **UNCLASSIFIED SESSIONS ONLY**, registration for this JANNAF meeting is a **two-part process**; to complete this process:

1. Register for the meeting via the **JANNAF Secure Portal**.
2. Pay the registration fee (Portal account **not** required).

If attending **BOTH UNCLASSIFIED AND CLASSIFIED** sessions, **complete both of the steps above, and in addition:**

- **DoD Employees ONLY:** Submit a Visit Request via JPAS. Please use **SMO Code: 0W2X85**
- **All OTHER attendees:** Complete and submit the Security Clearance Certification Form (link provided via online Registration Questionnaire)

Additional information and important links for completing your meeting registration can be found at <https://www.jannaf.org/mtgs/2017Dec/pages/registration.html>.

Register by 20 November if attending classified sessions, and/or to take advantage of the lowest fee.

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 11/20/17</i>	\$1,200.00	\$250.00
<i>11/21/17 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 "Pay Registration Fee." No login is needed.

Attendees are encouraged to complete step one of the registration process via the JANNAF Secure Portal, and submit payment, on or before Monday, 20 November 2017 to take advantage of the lowest fee, and 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 20 November 2017 will receive a full refund minus an administrative fee of \$50.00. Cancellations made after 20 November 2017 **will not be refunded**. Substitutes are welcome as long as the request for substitution is from the original attendee; the substitute meets attendance eligibility requirements; 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 to transfer or cancel your registration.

On-Site Registration / Check-in

The JANNAF Registration desk will be located on the first floor of the Newport News Marriott at City Center. Photo identification is required upon registration or check-in. The desk will be open Sunday, 3 December from 5:00 p.m. to 7:00 p.m., and Monday, 4 December through Thursday, 7 December from 7:00 a.m. to 5:00 p.m.

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Attention DoD

An approval package to certify the December 2017 JANNAF Meeting as a “government approved” conference has been submitted by Mr. Drew DeGeorge, member of the JANNAF Executive Committee from the Air Force Research Laboratory at Edwards AFB.

We anticipate timely approval of the meeting. In the meantime, **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. The hotel restaurant is Kitchen 740. Additionally, the hotel is located in City Center where many dining options can be found within a short walk. If attending classified sessions at NASA Langley Research Center, continental breakfast and breaks will be provided (see below), and there is a cafeteria on the premises offering many meal choices for lunch.

Networking Room

Mingle with other attendees in the JANNAF networking room throughout the week, where you can also check email, get a caffeine boost, and have a snack. Salon I of the Grand Ballroom will serve as the networking area at the hotel. This area will be open Monday - Thursday from 7:00 a.m. - 5:00 p.m. A light continental breakfast and mid-morning coffee break along with mid-afternoon refreshments will be served at the times stated in the program. For those attending classified sessions at NASA Langley Research Center, refreshments will be offered there during breaks as well. Please note that scheduled breaks are included in session agendas where time permits.

Networking Night

Enjoy an evening and meal with fellow JANNAF attendees on Wednesday, 6 December 2017, from 6:30 - 8:00 p.m. in Grand Ballroom II at the hotel. There is no charge for meeting attendees; however, guest tickets may be purchased on the Registration Payment site for \$40 (admission is free for children five and under). Be sure to wear your JANNAF badge to attend the event.

Reading Room

All unclassified papers presented in the technical sessions will be available to read via JANNAF touch-screen tablets in the Reading Room, located in Pearl Ballroom III. The Reading Room will be open Monday from 10:00 a.m. - 4:30 p.m., and Tuesday 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 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 in the ballroom pre-function space. 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.

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

OR

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

Upcoming JANNAF Meetings

65th JANNAF Propulsion Meeting
Programmatic and Industrial Base Meeting
12th Modeling and Simulation
10th Liquid Propulsion
9th Spacecraft Propulsion
Joint Subcommittee Meeting
21-24 May 2018
Long Beach, California

45th Structures and Mechanical Behavior
41st Propellant and Explosives Development and Characterization
32nd Rocket Nozzle Technology
30th Safety and Environmental Protection
Programmatic and Industrial Base Meeting
3-7 December 2018
Location TBA

66th JANNAF Propulsion Meeting
Programmatic and Industrial Base Meeting
49th Combustion
37th Airbreathing Propulsion
37th Exhaust Plume and Signatures
31st Propulsion Systems Hazards
Spring 2019
Location TBA

Program Committee Members

PROGRAM CHAIR

Mr. Kevin P. Ford
Naval Air Warfare Center Weapons Division
China Lake, CA

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Mission Area I: Ignition and Combustion of Gun Propellants

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Dr. Eugene Rozumov
Army Armament Research, Development and Engineering Center / Picatinny Arsenal, NJ

Mr. Michael A. Bonanno
Naval Surface Warfare Center / Indian Head, MD

Mission Area II: Solid Propellants and Combustion

Dr. Matthew L. Gross
Naval Air Warfare Center Weapons Division / China Lake, CA

Dr. Scott A. Felt
Aerojet Rocketdyne / Rancho Cordova, CA

Mission Area III: Explosive Performance / Enhanced Blast

Dr. Brian C. Liechty
Orbital ATK / Brigham City, UT

Dr. Barrie E. Homan
Army Research Laboratory / Aberdeen Proving Ground, MD

Dr. Eric J. Welle
Air Force Research Laboratory / Eglin AFB, FL

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Mission Area IV: Airbreathing Combustion

Dr. Mark R. Gruber
Air Force Research Laboratory / Wright-Patterson AFB, OH

Mission Area V: Combustion Diagnostics

Dr. Jeffrey S. West
NASA Marshall Space Flight Center / Huntsville, AL

Mission Area VI: Liquid, Hybrid and Novel Propellants Combustion

Mr. Joel W. Robinson
NASA Marshall Space Flight Center / Huntsville, AL
Dr. A. Paul Zuttarelli
Air Force Research Laboratory / Edwards AFB, CA

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JHU WSE ERG Technical Representative

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Aerospace Technical Services / West Chester, OH

Mission Area I: Conventional Ramjet Propulsion

Dr. Trevor D. Hedman
Naval Air Warfare Center Weapons Division / China Lake, CA

Mission Area II: Scramjet Propulsion

Dr. Aaron H. Auslender
NASA Langley Research Center / Hampton, VA

Mission Area III: Scramjet Propulsion / Structures

Mr. Brett Hauber
Air Force Research Laboratory / Wright-Patterson AFB, OH

Mission Area IV: Scramjet Component / Engine Testing

Dr. Thomas A. Jackson
Air Force Research Laboratory / Wright-Patterson AFB, OH

Mission Area V: Combined / Advanced Cycle Propulsion

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

Mr. Glenn W. Liston
Air Force Research Laboratory / Arnold AFB, TN

Mission Area VI: Small / Expendable Turbopropulsion

Mr. Greg B. Bruening
Air Force Research Laboratory / Wright-Patterson AFB, OH

Mission Area VII: Fuel Technology

Mr. Richard W. Wills
Air Force Research Laboratory / Wright-Patterson AFB, OH

Mission Area VIII: Component Modeling Simulation

Dr. Mark A. Hagenmaier
Air Force Research Laboratory / Wright-Patterson AFB, OH

Dr. Richard L. Gaffney
NASA Langley Research Center / Hampton, VA

Mission Area IX: Advanced Combustion Control

Dr. Aaron H. Auslender
NASA Langley Research Center / Hampton, VA

Mr. George Kopasakis
NASA Glenn Research Center / Cleveland, OH

EXHAUST PLUME AND SIGNATURES SUBCOMMITTEE

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Army Aviation and Missile Research, Development and Engineering Center / Redstone Arsenal, AL

Technical Steering Group Deputy Chair

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Air Force Research Laboratory / Edwards AFB, CA

JHU WSE ERG Technical Representative

Mr. Nicholas S. Keim
JHU WSE Energetics Research Group / Columbia, MD

Mission Area I: Exhaust Plume Flow Field Analysis

Dr. Kevin D. Kennedy
Army Aviation and Missile Research, Development and Engineering Center / Redstone Arsenal, AL

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Mission Area II: Exhaust Plume Radiation

Mr. Jonathan Mautz
National Air and Space Intelligence Center
Wright-Patterson AFB, OH

Mission Area III: Exhaust Plume Effects

Dr. Forrest E. Lumpkin
NASA Johnson Space Center / Houston, TX

Mission Area IV: Other Exhaust Plume Related Problems

Dr. Milton E. Vaughn
Army Aviation and Missile Research, Development
and Engineering Center / Redstone Arsenal, AL

Mission Area V: Signatures and Spectral and In-band Radiometric Imaging of Targets and Scenes (SPIRITS)

Ms. Robin L. Miller
Naval Air Warfare Center Weapons Division / Point Mugu, CA

PROPULSION SYSTEMS HAZARDS SUBCOMMITTEE

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Mr. Andrew J. Taylor
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Mission Area I: Thermal Decomposition and Cookoff

Ms. Aubrey D. Farmer
Naval Air Warfare Center Weapons Division / China Lake, CA

Dr. William W. Erikson
Sandia National Laboratory / Albuquerque, NM

Mission Area II: Impact / Shock-Induced Reactions

Dr. Joel B. Stewart
Army Research Laboratory / Aberdeen Proving Ground, MD

Mission Area III: Insensitive Munitions Technology

Ms. Jamie M. Fisher
Army Aviation and Missile Research, Development
and Engineering Center / Redstone Arsenal, AL

Mr. Stephen R. Struck
Air Force Research Laboratory / Eglin AFB, FL

Mission Area IV: Gun Propellant Vulnerability

Mr. J. Kevin Boyd
Army Research Laboratory / Aberdeen Proving Ground, MD

Mission Area V: Propulsion Systems Safety and Hazard Classification

Dr. Josephine Covino
DoD Explosives Safety Board / Alexandria, VA

Mission Area VI: Energetic Liquid Hazards

Mr. Adam J. Brand
Air Force Research Laboratory / Edwards AFB, CA

PROGRAMMATIC AND INDUSTRIAL BASE

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OUSD(AT&L)/DASD, MIBP / Alexandria, VA

PIB Executive Committee Co-Chair

Mr. Michael H. Kynard
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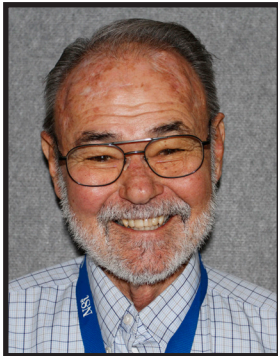
ASSISTANT SECURITY OFFICER

Tricia Reider
JHU WSE Energetics Research Group / Columbia, MD

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Program Highlights

Keynote Address



Mr. Thomas L. Boggs, currently a Scientist with Naval Systems, Incorporated in China Lake, California, has had a career spanning over 50 years in the propulsion field. He will present the keynote at this year's conference. The title of Mr. Boggs' talk is **"Fifty-four Years at China Lake—Lessons Learned."** He will address some important lessons that he has

learned during his career, which has included international, national (JANNAF in particular), Navy and China Lake activities. His recent work on hazards associated with solid propellants and explosives will also be discussed.

During the 54 years that Thom Boggs has worked as a scientist in the propulsion field, he has authored over 300 publications, edited several books, received three patents, and obtained seven secrecy order disclosures. An advocate for the "Science Based, Data Driven" research approach, Boggs has traveled across the country and around the world during his lengthy career in the field of propulsion and energetics.

A leader in the field of solid propellants, Thom is a past chairman of the JANNAF Propulsion Systems Hazards Subcommittee and the AIAA Propellants and Combustion Technical Committee. Following the massive explosions at the PEPCON plant in Henderson, Nevada, in 1988, he served as Chairman of the Tri-Service/NASA/Industry Committee on Response of Ammonium Perchlorate to Thermal and Mechanical Stimuli. Additionally, Thom has served as the Chairman of the Australia/Canada/U.K./U.S. Hazards of Energetic Materials and their Relation to Munitions Survivability organization and was the winner of the Achievement Award. Thom has also organized several JANNAF workshops.

Thom has repeatedly been acknowledged for his work and his volunteer service in the propulsion field. He received the annual Arthur S. Flemming Award, which recognizes the top 10 young men and women in Federal Service. Other awards for which he was a recipient include the Department of the Navy Meritorious Civilian Service Award, the Secretary of the Navy Career Service Award, the AIAA Wyld Propulsion

Award, which is presented for outstanding achievement in the development or application of rocket propulsion systems, and the JANNAF Executive Committee Lifetime Achievement Award.

The Keynote Address begins at 8:00 a.m. on Tuesday, 5 December in Grand Ballroom Salon II, located on the first floor of the hotel. All attendees are invited to participate. An awards presentation will immediately follow the Keynote Address.

Additional Highlights

Combustion Subcommittee (CS) highlights include:

- a session on **Monopropellant and Hypergolic Combustion**, which will emphasize advancements in ionic liquids from molecular simulations at the component level, to development and testing of thruster systems (session 1N on Monday);
- an all-day Specialist Session on **Kinetics and Related Aspects of Combustion Chemistry** (Wednesday, sessions 3C and 3T) focusing on those actively involved in the issues of chemical reaction phenomenon in the areas of modeling, diagnostics and chemical kinetics as they apply to energetic materials over a range of lifecycle conditions, and featuring the development of new diagnostics, improved computational capabilities and solid state decomposition chemistry; and
- a session on **Diagnostics and Simulations** (Thursday, session 4D) featuring presentations characterizing novel measurement systems performance and predicting properties of propellants.

The **Airbreathing Propulsion Subcommittee (APS)** will hold a total of 16 sessions running the gamut from small turbopropulsion technology (session 3R on Wednesday) to hypersonic technology applications (session 1U on Monday). Highlights include:

- an overview Specialist Session featuring updates from current **hypersonics programs** (Monday, session 1J);
- a Specialist Session on **transitioning hypersonic systems from a science and technology mindset to one of test and evaluation** (Monday evening, session 1Y);

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- **hypersonic materials development, testing, design and analysis**, offered in two sessions (Thursday, 4E and 4P);
- **High Speed Strike Weapon Technology Maturation** (Thursday, session 4F);
- advancements in **rotating detonation engine and rocket science and technology** (Tuesday, sessions 2E and 2Q); and
- **solid- and liquid-fueled ramjets** (Wednesday, session 3P).

The APS will also co-chair a town hall meeting with the Combustion Subcommittee following a jointly-sponsored session to discuss areas of mutual interest and potential collaboration.

Program highlights of the **Exhaust Plume and Signatures Subcommittee (EPSS)** include:

- **Eight physics-based tutorials** designed to highlight and clarify the physical considerations that must be taken into account when performing plume/wake/hypersonic flowfield and signature predictions. Attendance is suggested for personnel new to the interdisciplinary field of flowfield and signature prediction, managers of such work, and established practitioners. Tutorials are being offered throughout the week (following session 1R on Monday, session 2F and following session 2R on Tuesday, and following session 4R on Thursday);
- the Monday evening **Launch Vehicle, Missile and Spacecraft Plume-Induced Environments workshop** (session 1Z), which will address plume flowfield, plume-induced thermal and aerodynamic effects, and signatures topics of interest to both NASA and the DoD. Physical phenomena, computational modeling, ground/flight testing and diagnostics will be covered; and
- **Plume/Flowfield/Hardbody Signature Prediction Capability as a National Asset workshop** (session 3U on Wednesday) will highlight the broad spectrum of user communities in the nation that have a vested interest in the continued existence and advancement of plume/wake/hypersonic flowfield and signature modeling capabilities. The needs of various communities will be presented in a classified environment to facilitate meaningful discussion, and to develop advocacy for funding the capability as a national asset.

Propulsion Systems Hazards Subcommittee (PSHS) highlights during the week include:

- presentation on the **results of the PSHS workshop on Investigation of Gap Test Modeling and Instrumentation** on Tuesday afternoon (session 2S);
- presentations on **experimental evaluation, and modeling of cook-off in propellants** on Wednesday (session 3D) and Thursday (session 4M); and
- presentations on **IM mitigation technologies** scheduled on Monday (session 1P) and Wednesday (session 3O).

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Technical Program

This year's technical program currently consists of 41 technical sessions, 11 specialist sessions, 3 workshops, and 8 tutorials encompassing nearly 300 presentations, plus 10 panel meetings, 4 town hall meetings, and 2 working group 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 in the Preliminary Program (JANNAF Portal account login required to access).

A Schedule Color Key has been provided below and on pages 11, 12, and 14 .

SCHEDULE - Sunday, 3 December				
5:00 p.m. - 7:00 p.m.	On-Site Check-In and Registration Desk Open			Grand Ballroom Foyer

SCHEDULE - Monday, 4 December				
7:00 a.m. - 5:00 p.m.	On-Site Check-In and Registration Desk Open			Grand Ballroom Foyer
7:00 a.m. - 5:00 p.m.	I.T. Office Open (for Presenters and Session Chairs needing technical assistance)			Blue Point II Open
7:00 a.m. - 10:35 a.m.	Networking Area Refreshments			Grand Ballroom I Open
8:00 a.m. - 11:35 a.m.	Monday Morning Specialist Session			
8:00 a.m. - 11:35 a.m.	IJ	APS	SPECIALIST SESSION: Hypersonic Programs Overview (U)	NASA LaRC 108 Open
10:00 a.m. - 4:30 p.m.	Reading Room			Blue Point III Open
12:45 p.m. - 1:00 p.m.	Session Chair Meeting (Monday Afternoon Sessions)			
12:05 p.m. - 1:30 p.m.	Lunch Break - <i>On Your Own</i>			
1:30 p.m. - 9:45 p.m.	Monday Afternoon Technical Sessions, Workshop, Specialist Session, Tutorials, Panel and Town Hall Meetings			
1:30 p.m. - 4:35 p.m.	IN	CS	Monopropellant and Hypergolic Combustion	Grand Ballroom III Open
4:35 p.m. - 5:35 p.m.	IN	CS	TOWN HALL MEETING: CS Liquids	Grand Ballroom III Open
1:30 p.m. - 4:35 p.m.	IO	CS	Combustion Studies	Grand Ballroom IV Open
1:30 p.m. - 5:35 p.m.	IP	PSHS	Insensitive Munitions Technology - I	Grand Ballroom V Open
5:35 p.m. - 6:20 p.m.	IP	PSHS	PANEL MEETING: Safety / Hazard Classification	Grand Ballroom V Open
1:30 p.m. - 6:00 p.m.	IQ	CS	WORKSHOP: CHEETAH Modeling for Gun Propellant Applications	Pearl Ballroom I Open
1:30 p.m. - 5:05 p.m.	IR	EPSS	Flowfield and Body Measurements	Pearl Ballroom II Open
5:15 p.m. - 5:55 p.m.	IR	EPSS	EPSS TUTORIAL I: Overall Signature Considerations	Pearl Ballroom II Open
5:55 p.m. - 6:35 p.m.	IR	EPSS	EPSS TUTORIAL II: Rocket Engine / Motor Considerations	Pearl Ballroom II Open
1:30 p.m. - 5:50 p.m.	IS	PSHS	SPECIALIST SESSION: Fire Protection	Pearl Ballroom III Open
1:30 p.m. - 5:35 p.m.	IU	APS	Hypersonic Technology Applications (U)	NASA LaRC 108 Open
3:05 p.m. - 4:05 p.m.	Networking Area Refreshments			Grand Ballroom I Open
7:30 p.m. - 9:35 p.m.	IY	APS	SPECIALIST SESSION: S&T to T&E Transition for Hypersonic Systems	Pearl Ballroom I Open
7:45 p.m. - 9:45 p.m.	IZ	EPSS	WORKSHOP: Launch Vehicle, Missile, and Spacecraft Plume-Induced Environments	Pearl Ballroom II Open

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

JANNAF Meeting Invitation - December 2017

SCHEDULE - Tuesday, 5 December

7:00 a.m. - 5:00 p.m.	On-Site Check-In and Registration Desk Open			Grand Ballroom Foyer	
7:00 a.m. - 5:00 p.m.	I.T. Office Open (for Presenters and Session Chairs needing technical assistance)			Blue Point II	Open
7:00 a.m. - 8:00 a.m.	Networking Area Refreshments			Grand Ballroom I	Open
7:15 a.m. - 7:30 a.m.	Session Chair Meeting (Tuesday Sessions)			Blue Point III	Closed
8:00 a.m. - 10:00 a.m.	KEYNOTE ADDRESS: "Fifty-four Years at China Lake—Lessons Learned" Mr. Thomas L. Boggs, Naval Systems, Incorporated <i>Awards and Announcements</i>			Grand Ballroom II	Open
8:00 a.m. - 4:30 p.m.	Reading Room			Blue Point III	Open
9:30 a.m. - 10:00 a.m.	Networking Area Refreshments			Grand Ballroom I	Open
10:00 a.m. - 6:00 p.m.	JANNAF Technical Executive Committee Meeting			Board Room	Closed
10:00 a.m. - 12:05 p.m.	Tuesday Morning Technical Sessions, Tutorials, Panel Meeting				
10:00 a.m. - 11:35 a.m.	2B	CS	Gun Primer / Igniter Design and Modeling	Grand Ballroom III	Open
10:00 a.m. - 11:05 p.m.	2C	APS	Combustion Control and Actuators	Grand Ballroom IV	Open
11:05 a.m. - 12:05 p.m.	2C	APS	PANEL MEETING: Advanced Combustion Control	Grand Ballroom IV	Open
10:00 a.m. - 12:05 p.m.	2D	APS	Scramjet Mixing and Combustion Systems	Grand Ballroom V	Open
10:00 a.m. - 12:05 p.m.	2E	APS	Advancements in Rotating Detonation Rocket S&T	Pearl Ballroom I	Open
10:00 a.m. - 10:40 a.m.	2F	EPSS	EPSS TUTORIAL III: Continuum Nozzle and Plume Considerations	Pearl Ballroom II	Open
10:40 a.m. - 11:20 a.m.	2F	EPSS	EPSS TUTORIAL IV: Rarefied Flow Considerations	Pearl Ballroom II	Open
11:20 a.m. - 12:00 p.m.	2F	EPSS	EPSS TUTORIAL V: Radiative Transfer Considerations	Pearl Ballroom II	Open
10:00 a.m. - 12:05 p.m.	2G	PSHS	Explosive Sensitivity	Pearl Ballroom III	Open
12:05 p.m. - 1:30 p.m.	Lunch Break - <i>On Your Own</i>				
1:30 p.m. - 6:55 p.m.	Tuesday Afternoon Technical Sessions, Specialist Session, Tutorial, and Panel Meetings				
1:30 p.m. - 5:35 p.m.	2M	APS	Scramjet and Inlet Design, Test, and Analysis	Grand Ballroom II	Open
5:35 p.m. - 6:35 p.m.	2M	APS	PANEL MEETING: Engine Testing and Validation	Grand Ballroom II	Open
1:30 p.m. - 4:35 p.m.	2N	CS	Closed Bomb and Simulators for Gun Propellants	Grand Ballroom III	Open
1:30 p.m. - 4:35 p.m.	2O	CS	Composite Propellant Modeling and Simulation	Grand Ballroom IV	Open
1:30 p.m. - 3:35 p.m.	2P	JPM	SPECIALIST SESSION: HME in a DIY World	Grand Ballroom V	Open
1:30 p.m. - 4:35 p.m.	2Q	APS	Advancements in Rotating Detonation Engine S&T	Pearl Ballroom I	Open
1:30 p.m. - 6:05 p.m.	2R	EPSS	Computational Models and Methods	Pearl Ballroom II	Open
6:15 p.m. - 6:55 p.m.	2R	EPSS	EPSS TUTORIAL VI: Environment Effects	Pearl Ballroom II	Open
1:30 p.m. - 4:35 p.m.	2S	PSHS	Gap Testing: Applications and Materials	Pearl Ballroom III	Open
1:30 p.m. - 3:05 p.m.	2T	PSHS	Energetic Liquid Hazards	Blue Point I	Open
3:05 p.m. - 3:35 p.m.	2T	PSHS	PANEL MEETING: Energetic Liquid Hazards	Blue Point I	Open
3:05 p.m. - 4:05 p.m.	Networking Area Refreshments			Grand Ballroom I	Open
7:30 p.m. - 9:00 p.m.	APS Inflow Profile Effects Working Group Meeting			Grand Ballroom V	Closed

Schedule Color Key

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

JANNAF Meeting Invitation - December 2017

SCHEDULE - Wednesday, 6 December

7:00 a.m. - 5:00 p.m.	On-Site Check-In and Registration Desk Open			Grand Ballroom Foyer	
7:00 a.m. - 5:00 p.m.	I.T. Office Open (for Presenters and Session Chairs needing technical assistance)			Blue Point II	Open
7:00 a.m. - 8:00 a.m.	Networking Area Refreshments			Grand Ballroom I	Open
7:15 a.m. - 7:30 a.m.	Session Chair Meeting (Wednesday Sessions)			Blue Point III	Closed
8:00 a.m. - 4:30 p.m.	Reading Room			Blue Point III	Open
8:00 a.m. - 12:35 p.m.	Wednesday Morning Technical Sessions, and Specialist Sessions, and Town Hall Meetings				
8:00 a.m. - 11:35 a.m.	3A	CS	Explosive Performance – Air Blast	Grand Ballroom II	Open
11:35 a.m. - 12:35 p.m.	3A	CS	<i>TOWN HALL MEETING</i> : Explosives and Enhanced Blast	Grand Ballroom II	Open
8:00 a.m. - 10:35 a.m.	3B	CS	Gun Interior Ballistics Modeling	Grand Ballroom III	Open
10:35 a.m. - 11:35 a.m.	3B	CS	<i>TOWN HALL MEETING</i> : Guns	Grand Ballroom III	Open
8:00 a.m. - 12:35 p.m.	3C	CS	<i>SPECIALIST SESSION</i> : Kinetics and Related Aspects of Combustion Chemistry – I	Grand Ballroom IV	Open
8:00 a.m. - 11:35 a.m.	3D	PSHS	Cook-off – I	Grand Ballroom V	Open
8:00 a.m. - 12:05 p.m.	3E	APS	Scramjet Propulsion	Pearl Ballroom I	Open
8:00 a.m. - 11:05 a.m.	3F	APS	<i>SPECIALIST SESSION</i> : Pressure Gain Combustion	Pearl Ballroom II	Open
8:00 a.m. - 12:05 p.m.	3G	PIB	<i>SPECIALIST SESSION</i> : Thrust Vector Control (TVC)	Pearl Ballroom III	Open
8:00 a.m. - 12:05 p.m.	3J	EPSS	Composite Flowfield / Hardbody Signatures (U)	NASA LaRC 108	Open
9:35 a.m. - 10:35 a.m.	Networking Area Refreshments			Grand Ballroom I	Open
12:05 p.m. - 1:25 p.m.	APS Technical Steering Group Meeting			Boardroom	Closed
12:05 p.m. - 1:30 p.m.	Lunch Break - <i>On Your Own</i>				
1:15 p.m. - 6:05 p.m.	Wednesday Afternoon Technical Sessions, Workshop, Specialist Sessions, and Panel Meetings				
1:30 p.m. - 4:35 p.m.	3M	CS/PSHS	Gun Propellant Characterization	Grand Ballroom II	Open
1:30 p.m. - 4:35 p.m.	3N	CS	Explosives	Grand Ballroom III	Open
1:30 p.m. - 4:35 p.m.	3O	PSHS	Insensitive Munitions Technology – II	Grand Ballroom IV	Open
4:35 p.m. - 5:35 p.m.	3O	PSHS	<i>PANEL MEETING</i> : Inensitive Munitions Technology	Grand Ballroom IV	Open
1:30 p.m. - 5:35 p.m.	3P	APS	Solid and Liquid Fueled Ramjets	Grand Ballroom V	Open
1:30 p.m. - 5:35 p.m.	3Q	APS	Scramjet Components and Advanced Analysis	Pearl Ballroom I	Open
5:35 p.m. - 6:05 p.m.	3Q	APS	<i>PANEL MEETING</i> : Component Level Modeling and Simulation	Pearl Ballroom I	Open
1:30 p.m. - 4:35 p.m.	3R	APS	Small Turbopropulsion Technology	Pearl Ballroom II	Open
1:30 p.m. - 5:05 p.m.	3T	CS	<i>SPECIALIST SESSION</i> : Kinetics and Related Aspects of Combustion Chemistry – II	Pearl Ballroom III	Open
5:05 p.m. - 5:35 p.m.	3T	CS	<i>PANEL MEETING</i> : Kinetics	Pearl Ballroom III	Open
1:15 p.m. - 5:35 p.m.	3U	EPSS	<i>WORKSHOP</i> : Plume/Flowfield/Hardbody Signature Prediction Capability as a National Asset (U)	NASA LaRC 108	Open
2:00 p.m. - 5:30 p.m.	APS Pressure Gain Combustion Working Group Meeting			Boardroom	Closed
3:05 p.m. - 4:05 p.m.	Networking Area Refreshments			Grand Ballroom I	Open
6:00 p.m. - 8:00 p.m.	Networking Night - Dinner and Cash Bar <i>JANNAF Badge or Guest Ticket required</i>			Grand Ballroom II	Open

JANNAF Meeting Invitation - December 2017

SCHEDULE - Thursday, 7 December

7:00 a.m. - 5:00 p.m.	On-Site Check-In and Registration Desk Open			Grand Ballroom Foyer	
7:00 a.m. - 5:00 p.m.	I.T. Office Open (for Presenters and Session Chairs needing technical assistance)			Blue Point II	Open
7:00 a.m. - 8:00 a.m.	Networking Area Refreshments			Grand Ballroom I	Open
7:15 a.m. - 7:30 a.m.	Session Chair Meeting (Thursday Sessions)			Blue Point III	Closed
8:00 a.m. - 4:30 p.m.	Reading Room			Blue Point III	Open
8:00 a.m. - 12:05 p.m.	Thursday Morning Technical Sessions, and Specialist Sessions				
8:00 a.m. - 12:05 p.m.	4A	PSHS	Fragment Impact of Energetics	Grand Ballroom II	Open
8:00 a.m. - 11:35 a.m.	4B	CS	Reactive Materials – I	Grand Ballroom III	Open
8:00 a.m. - 11:05 a.m.	4C	CS/APS	Scramjet Cold-start	Grand Ballroom IV	Open
8:00 a.m. - 12:05 p.m.	4D	CS	Diagnostics and Simulations	Grand Ballroom V	Open
8:00 a.m. - 11:35 a.m.	4E	APS	Hypersonic Materials Development and Testing	Pearl Ballroom I	Open
8:00 a.m. - 12:05 p.m.	4F	APS	High Speed Strike Weapon Technology Maturation	Pearl Ballroom II	Open
8:00 a.m. - 10:05 a.m.	4G	PIB	SPECIALIST SESSION: Initial Results from Department of Commerce Rocket Propulsion Industrial Base Survey – I (U.S. Government Only)	Pearl Ballroom III	US Govt Only
10:35 a.m. - 12:05 p.m.	4G	PIB	SPECIALIST SESSION: Initial Results from Department of Commerce Rocket Propulsion Industrial Base Survey – II	Pearl Ballroom III	Open
8:00 a.m. - 12:05 p.m.	4H	EPSS	Facilitating Technologies	Blue Point I	Open
10:05 a.m. - 10:35 a.m.	Networking Area Refreshments			Grand Ballroom I	Open
12:00 p.m. - 1:30 p.m.	CS Technical Steering Group Meeting			Boardroom	Closed
12:05 p.m. - 1:30 p.m.	Lunch Break - <i>On Your Own</i>				
1:30 p.m. - 6:05 p.m.	Thursday Afternoon Technical Sessions, Specialist Session, Tutorials, Panel and Town Hall Meetings				
1:30 p.m. - 4:35 p.m.	4M	PSHS	Cook-off – II / Hazards Classification	Grand Ballroom II	Open
4:35 p.m. - 5:05 p.m.	4M	PSHS	PANEL MEETING: Cook-off	Grand Ballroom II	Open
1:30 p.m. - 3:05 p.m.	4N	CS	Reactive Materials – II	Grand Ballroom III	Open
3:05 p.m. - 3:35 p.m.	4N	CS	PANEL MEETING: Reactive Materials	Grand Ballroom III	Open
1:30 p.m. - 5:05 p.m.	4O	CS/APS	Liquid Fuel Injection in Scramjets	Grand Ballroom IV	Open
5:05 p.m. - 6:05 p.m.	4O	CS/APS	TOWN HALL MEETING: Joint CS / APS	Grand Ballroom IV	Open
1:30 p.m. - 5:35 p.m.	4P	APS	Hypersonic Materials Design and Analysis	Grand Ballroom V	Open
1:30 p.m. - 4:50 p.m.	4Q	PSHS	Impact-induced Reactions	Pearl Ballroom I	Open
4:50 p.m. - 5:35 p.m.	4Q	PSHS	PANEL MEETING: Shock / Impact-induced Reactions	Pearl Ballroom I	Open
1:30 p.m. - 4:35 p.m.	4R	EPSS	Additional Considerations for Signatures	Pearl Ballroom II	Open
4:45 p.m. - 5:25 p.m.	4R	EPSS	EPSS TUTORIAL VII: Thoughts on EO / IR Hardbody Signature Considerations	Pearl Ballroom II	Open
5:25 p.m. - 6:05 p.m.	4R	EPSS	EPSS TUTORIAL VIII: Composite EO / IR Plume / Hardbody Signatures	Pearl Ballroom II	Open
1:30 p.m. - 5:05 p.m.	4S	PIB	SPECIALIST SESSION: Launch Vehicle Reusability - Design, Test and Refurbishment Approaches to Achieving System Reliability	Pearl Ballroom III	Open
3:05 p.m. - 4:05 p.m.	Networking Area Refreshments			Grand Ballroom I	Open
5:30 p.m. - 7:30 p.m.	PSHS Technical Steering Group Meeting			Blue Point I	Closed
6:00 p.m. - 8:00 p.m.	EPSS Technical Steering Group Meeting			Boardroom	Closed

Schedule Color Key

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