MEETING INVITATION

7–17 DECEMBER 2020
VIRTUAL EDITION

50th Combustion (CS)
38th Airbreathing Propulsion (APS)
38th Exhaust Plume and Signatures (EPSS)
32nd Energetic Systems Hazards (ESHS)
JOINT SUBCOMMITTEE MEETING
Programmatic & Industrial Base Meeting (PIB)

Distribution Statement A: Approved for public release; distribution is unlimited. PA Clearance Number: 20493
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The virtual meeting will consist of the Joint Meeting of the 50th Combustion, 38th Airbreathing Propulsion, 38th Exhaust Plume and Signatures, and 32nd Energetic Systems Hazards Subcommittees, and meeting of the Programmatic and Industrial Base, to be held Monday through Friday, 7 - 11 December 2020, and Monday through Thursday, 14 - 17 December 2020. This virtual meeting will include unclassified sessions only. Plans are still being evaluated for the conduct of classified sessions.

The Program Chair for the meeting is Dr. Kevin D. Kennedy, CCDC Aviation & Missile Center, Redstone Arsenal, 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.

You are invited to attend the December 2020 virtual meeting of the Joint Army-Navy-NASA-Air Force (JANNAF) Interagency Propulsion Committee.

JHU WSE ERG provides technical and administrative support to the JANNAF Interagency Propulsion Committee.

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

**COMBUSTION SUBCOMMITTEE**

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.

**AIRBREATHING PROPULSION SUBCOMMITTEE**

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

**EXHAUST PLUME AND SIGNATURES SUBCOMMITTEE**

The technologies of concern to the Exhaust Plume and Signatures Subcommittee (EPSS) involve phenomena associated with exhaust plumes from rockets, ramjets, space, and gun propulsion systems as well as wakes and hypersonic flows. These phenomena can be divided into three technical areas: plume/wake/hypersonic flowfields, plume/wake/hypersonic signatures (to include electro-optical [EO], infrared [IR], and radio frequency [RF] radiation), and a broad area incorporating other plume/wake/hypersonic effects.

In addition, the EPSS Signatures panel (formerly the Spectral and In-band Radiometric Imaging of Targets and Scenes, SPIRITS, Users Group) promotes technical interchange among members of the Electro-Optical/Infrared (EO/IR) aircraft/missile signature community from both government and industry.

**ENERGETIC SYSTEMS HAZARDS SUBCOMMITTEE**

The Energetic Systems Hazards Subcommittee (ESHS) (formerly Propulsion Systems Hazards Subcommittee, PSHS) is concerned with potential hazards associated with missile and gun systems. Included are hazard analyses for both tactical and strategic missiles, small and large caliber gun systems, solid and liquid propellant systems, hazards encountered in loading and firing operations, and key technology areas identified from hazard analyses.

**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.
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 visual 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:

<table>
<thead>
<tr>
<th>Date</th>
<th>Test Session 1</th>
<th>Test Session 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>17 Nov</td>
<td>10:00 - 11:30 a.m. EST</td>
<td>2:00 - 3:30 p.m. EST</td>
</tr>
<tr>
<td>19 Nov</td>
<td>10:00 - 11:30 a.m. EST</td>
<td>2:00 - 3:30 p.m. EST</td>
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<tr>
<td>23 Nov</td>
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<tr>
<td>24 Nov</td>
<td>10:00 - 11:30 a.m. EST</td>
<td>2:00 - 3:30 p.m. EST</td>
</tr>
<tr>
<td>2 Dec</td>
<td>10:00 - 11:30 a.m. EST</td>
<td>2:00 - 3:30 p.m. EST</td>
</tr>
<tr>
<td>3 Dec</td>
<td>10:00 - 11:30 a.m. EST</td>
<td>2:00 - 3:30 p.m. EST</td>
</tr>
</tbody>
</table>

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 organization 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 guides 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 download meeting presentations from the DCS platform.
- 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. 8 and at https://www.jannaf.org/mtgs/2020Dec/pages/registration.html.
REGISTRATION FEE

Early registration is strongly recommended. Register and pay the registration fee by Monday, 23 November at 11:59 p.m. EST to take advantage of the discounted early registration fee. The regular registration fee goes into effect on 24 November at 12:00 a.m. EST. 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.

<table>
<thead>
<tr>
<th>Payment Received</th>
<th>Regular Attendee</th>
<th>Student*</th>
</tr>
</thead>
<tbody>
<tr>
<td>on or before 11/23/20</td>
<td>$650.00</td>
<td>$125</td>
</tr>
<tr>
<td>11/24/20 or later</td>
<td>$775.00</td>
<td>$225</td>
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*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.

Cancellation policy

Please note our cancellation policy.

Written (email) cancellations submitted on or before 23 November 2020 will receive a full refund minus an administrative fee of $50.00. Cancellations made after 23 November 2020 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

50th Combustion
38th Airbreathing Propulsion
38th Exhaust Plume & Signatures
32nd Energetic Systems Hazards
Joint Subcommittee Meeting
Programmatic & Industrial Base Meeting
7 - 17 December 2020
DCS Virtual Platform

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
December 2021
Location / Format TBA

JANNAF MEETING INVITATION - DECEMBER 2020

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China Lake, CA

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Mission Area III: Scramjet Propulsion
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Mission Area II: Plume / Wake / Hypersonic Radiation and Signatures
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Mission Area IV: Other Plume / Wake / Hypersonic Related Problems
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Mission Area V: Composite Scene Signatures of Plume / Wake / Hypersonic Flowfield and Hardbody Configurations
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Mr. Robert L. Watson
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Albuquerque, NM

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DoD Explosives Safety Board
Alexandria, VA

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Security Officer
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JHU WSE Energetics Research Group
Columbia, MD

Assistant Security Officer
Tricia Frey
JHU WSE Energetics Research Group
Columbia, MD
Mr. Michael E. White, Principal Director for Hypersonics (PD,H) in the Office of the Under Secretary of Defense for Research and Engineering (OUSD R&E) in Washington, DC, will present the keynote at this year’s virtual conference. The title of Mr. White’s talk is “Delivering Transformational Warfighting Capability Based on Hypersonic Systems.” The Principal Director for Hypersonics in the Office of the Under Secretary of Defense for Research and Engineering has responsibility for the overall department vision and strategy for hypersonics relative to both offensive systems and defense against adversary hypersonic systems. This talk will describe the key elements of that DoD strategy and the progress being made to dramatically accelerate the delivery of transformational hypersonic capabilities to the warfighter.

Michael E. White is the Principal Director for Hypersonics (PD,H) in the Office of the Under Secretary of Defense for Research and Engineering (OUSD R&E). In that capacity Mr. White is responsible for leading the Nation’s vision and strategy for developing offensive and defensive warfighting capability enabled by hypersonic systems.

Before his current position, Mr. White was Head of the Air and Missile Defense Sector at the Johns Hopkins University Applied Physics Laboratory where he led over 1,100 staff members developing advanced concepts to enhance the Nation’s air and missile defense (AMD) capability for programs including AEGIS, STANDARD Missile, Ship Self Defense System, Cooperative Engagement Capability, the Surface Electronic Warfare Improvement Program, Aegis Ballistic Missile Defense and numerous other Missile Defense Agency programs.

Mr. White earned both his Bachelor of Science and Master of Science degrees in aerospace engineering from the University of Maryland. He has authored over 30 papers on hypersonic weapon system development and other defense system related topics.

All attendees are invited to participate. The Keynote Address begins at 9:30 a.m. EST on Tuesday, 8 December. The link to Mr. White’s 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.
Combustion Subcommittee
The Combustion Subcommittee (CS) sessions will focus on research around different regimes, materials, and measurements surrounding state of art combustion sciences in the DoD and NASA. Different topics include hypersonic combustion (injection, fuels, and system design) and associated processes and modelling, interior combustion ballistics, as well as fundamental combustion research, novel green propellant chemistry, reactive materials, and metal combustion studies. Highlights include specialist sessions focusing on Enhancing Synergy between Flowfield Diagnostics and computational Modelling, in addition to several joint APS/CS sessions on Rotating Detonating Engines and Scramjets.

Airbreathing Propulsion Subcommittee
The Airbreathing Propulsion Subcommittee (APS) will discuss topics on turbopropulsion, ramjets, scramjets, pressure gain combustion, advanced materials and measurement and analysis. A strong focus will be on hypersonic vehicles, which include a hypersonic program overview, subsystem and component analysis (inlets and nozzles, isolators, fuel systems, etc.), material development and modeling techniques and tools. There will be a four day session on Aether, a turbine based combined cycle flight demonstration vehicle. Sessions on rotating detonation engines, high speed flow modeling, high speed aerodynamics, aerospace structures, and joint sessions with the Combustion Subcommittee (CS) on ignition and combustion will also be held.

Exhaust Plume and Signatures Subcommittee
The Exhaust Plume and Signatures Subcommittee (EPSS) sessions include the latest advancements in hypersonic and rocket plume, wake, and flowfield measurements, modeling, and phenomenology. Two tutorials will be provided - the first will be on chemical kinetics, held jointly with the Combustion Subcommittee; the second will be a tutorial on the Spectral and In-Band Radiometric Imagine of Targets and Scenes Model (SPIRITS) AC3. A session will also be held on the composite scene signatures. Finally, EPSS is hosting an interagency collaboration forum to facilitate identification of challenges and solutions of mutual interest across the DoD and NASA and their respective technology domains.

Energetic Systems Hazards Subcommittee
The Energetic Systems Hazards Subcommittee (ESHS), formerly the Propulsion System Hazards Subcommittee (PSHS) addresses potential hazards associated with missile, space, and gun propulsion systems by examining damage mechanisms, response to heating (cook-off), shock/impact induced reaction, as well as supporting the continued development of insensitive propellants and explosives. In addition to four technical sessions, ESHS will be holding a Panel Meeting to share current research and advances in shock and impact induced reactions.

Programmatic and Industrial Base
The Programmatic and Industrial Base is still evaluating opportunities to conduct during this meeting. This document will be updated if/when these opportunities are determined.
This year’s technical program currently consists of nearly 300 presentations in 45 technical sessions, 8 specialist sessions, and 3 workshops, plus 10 panel meetings and 3 town hall meetings. A detailed daily schedule of all sessions, specialist sessions, meetings, and networking activities is provided below and continues through page 20. Detailed agendas of the technical sessions and specialist session are listed in the Final Program beginning on page 20 (login to your JANNAF Portal account is required for access).

A Schedule Color Key has been provided on pages 17 - 20.

## TECHNICAL PROGRAM

### SCHEDULE - Monday, 7 December

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Location</th>
<th>Status</th>
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<tr>
<td>10:00 a.m. - 11:00 a.m.</td>
<td>Download DCS Session Agendas, Links/Call-in Info and Login to Session of Choice</td>
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<tr>
<td>10:00 a.m. - 24 hours/day</td>
<td>Virtual Reading Room</td>
<td></td>
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<tr>
<td>11:00 a.m. - 3:50 p.m.</td>
<td>Monday Technical Sessions, Specialist Sessions, and Town Hall Meeting</td>
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<tr>
<td>11:00 a.m. - 2:05 p.m.</td>
<td>1A APS Turbopropulsion</td>
<td>DCS “Room” 1</td>
<td>Open</td>
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<tr>
<td>11:00 a.m. - 1:35 p.m.</td>
<td>1B APS SPECIALIST SESSION: Hypersonic Program Overview</td>
<td>DCS “Room” 2</td>
<td>Open</td>
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<tr>
<td>1:30 p.m. - 3:30 p.m.</td>
<td>1C PIB SPECIALIST SESSION: Documenting Best Practices for Reusable Launch Vehicles</td>
<td>DCS “Room” 3</td>
<td>Open</td>
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<tr>
<td>11:00 a.m. - 2:05 p.m.</td>
<td>1D CS Combustion Science for Interior Ballistics</td>
<td>DCS “Room” 4</td>
<td>Open</td>
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<tr>
<td>11:00 a.m. - 2:05 p.m.</td>
<td>1D CS TOWN HALL MEETING: Guns</td>
<td>DCS “Room” 4</td>
<td>Open</td>
</tr>
<tr>
<td>11:00 a.m. - 1:35 p.m.</td>
<td>1E CS Upper Stage and Spacecraft Propulsion Component Characterization and Modeling</td>
<td>DCS “Room” 5</td>
<td>Open</td>
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</tbody>
</table>

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, 8 December

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Location</th>
<th>Status</th>
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<tr>
<td>8:30 a.m. - 9:30 a.m.</td>
<td>Download DCS Session Agendas, Links/Call-in Info and Login to Keynote Presentation</td>
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<tr>
<td>9:30 a.m. - 10:45 a.m.</td>
<td>KEYNOTE ADDRESS: Mr. Michael E. White, OUSD R&amp;E JANNAF Announcements and Awards</td>
<td>DCS “Room” 6</td>
<td>Open</td>
</tr>
<tr>
<td>10:30 a.m. - 11:00 a.m.</td>
<td>Login to Technical Session of Choice</td>
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<tr>
<td>11:00 a.m. - 3:05 p.m.</td>
<td>Tuesday Technical Sessions and Town Hall Meeting</td>
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<tr>
<td>11:00 a.m. - 1:35 p.m.</td>
<td>2A APS Ramjet Analysis</td>
<td>DCS “Room” 1</td>
<td>Open</td>
</tr>
<tr>
<td>11:00 a.m. - 12:35 p.m.</td>
<td>2B APS/CS Scramjets: Inlets and Nozzles</td>
<td>DCS “Room” 2</td>
<td>Open</td>
</tr>
<tr>
<td>11:00 a.m. - 2:05 p.m.</td>
<td>2C APS Advances in FTSI Simulation Capabilities for High-speed Flow Environments - I</td>
<td>DCS “Room” 3</td>
<td>Open</td>
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<tr>
<td>11:00 a.m. - 2:05 p.m.</td>
<td>2D CS/ESHS Damage Mechanisms and Effects</td>
<td>DCS “Room” 4</td>
<td>Open</td>
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<tr>
<td>11:00 a.m. - 2:05 p.m.</td>
<td>2E CS/APS Liquid Injection into Supersonic Flows</td>
<td>DCS “Room” 5</td>
<td>Open</td>
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<tr>
<td>2:05 p.m. - 3:05 p.m.</td>
<td>2E CS/APS TOWN HALL MEETING: CS/APS</td>
<td>DCS “Room” 5</td>
<td>Open</td>
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<tr>
<td>11:00 a.m. - 3:05 p.m.</td>
<td>2F EPSS Plume/Wake/Hypersonic Flowfield Measurements</td>
<td>DCS “Room” 6</td>
<td>Open</td>
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</table>

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 - Wednesday, 9 December

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<td>10:00 a.m. - 11:00 a.m.</td>
<td>Download DCS Session Agendas, Links/Call-in Info and Login to Session of Choice</td>
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<td>24 hours/day</td>
<td>Virtual Reading Room</td>
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<tr>
<td>11:00 a.m. - 3:05 p.m.</td>
<td><strong>Wednesday Technical Sessions and Panel Meetings</strong></td>
</tr>
<tr>
<td>11:00 a.m. - 2:05 p.m.</td>
<td>3A APS Scramjets: Isolator Control</td>
</tr>
<tr>
<td>2:05 p.m. - 3:05 p.m.</td>
<td>3A APS <strong>PANEL MEETING:</strong> Active Combustion Control</td>
</tr>
<tr>
<td>11:00 a.m. - 2:35 p.m.</td>
<td>3B APS/CS RDE - I: Components and Fundamentals</td>
</tr>
<tr>
<td>11:00 a.m. - 2:05 p.m.</td>
<td>3C APS Advances in FTSI Simulation Capabilities for High-speed Flow Environments - II</td>
</tr>
<tr>
<td>11:00 a.m. - 12:35 p.m.</td>
<td>3D CS Metal Combustion</td>
</tr>
<tr>
<td>11:00 a.m. - 1:05 p.m.</td>
<td>3E ESHS Cook-off</td>
</tr>
<tr>
<td>1:05 p.m. - 1:25 p.m.</td>
<td>3E ESHS <strong>PANEL MEETING:</strong> Cook-off</td>
</tr>
<tr>
<td>11:00 a.m. - 3:05 p.m.</td>
<td>3F EPSS Plume/Wake/Hypersonic Flowfield Modeling</td>
</tr>
<tr>
<td>12:05 p.m. or 12:35 p.m.</td>
<td>Session Break (most sessions - see session agendas)</td>
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As Time Permits

**Networking and Open Discussion after Sessions**

| Each DCS “Room” | Open |

### SCHEDULE - Thursday, 10 December

**All Times Listed Are Eastern Standard Time**

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<td>10:00 a.m. - 11:00 a.m.</td>
<td>Download DCS Session Agendas, Links/Call-in Info and Login to Session of Choice</td>
</tr>
<tr>
<td>24 hours/day</td>
<td>Virtual Reading Room</td>
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<tr>
<td>11:00 a.m. - 3:35 p.m.</td>
<td><strong>Thursday Technical Sessions, Specialist Session, and Panel Meetings</strong></td>
</tr>
<tr>
<td>11:00 a.m. - 2:35 p.m.</td>
<td>4A APS Scramjets: Fuel Systems</td>
</tr>
<tr>
<td>2:35 p.m. - 3:35 p.m.</td>
<td>4A APS <strong>PANEL MEETING:</strong> Fuels</td>
</tr>
<tr>
<td>11:00 a.m. - 1:05 p.m.</td>
<td>4B APS RDE - II System Development, Design and Testing</td>
</tr>
<tr>
<td>11:00 a.m. - 2:05 p.m.</td>
<td>4C APS Experimental and Computational Advances in FTSI Capabilities</td>
</tr>
<tr>
<td>11:00 a.m. - 12:35 p.m.</td>
<td>4D CS/ESH5 Joint CS/ESHS Green Propellant Sensitivity Characterization</td>
</tr>
<tr>
<td>11:00 a.m. - 2:35 p.m.</td>
<td>4E ESH5 Shock / Impact-induced Reactions</td>
</tr>
<tr>
<td>1:05 p.m. - 2:05 p.m.</td>
<td>4E ESH5 <strong>PANEL MEETING:</strong> Shock / Impact-induced Reactions</td>
</tr>
<tr>
<td>11:00 a.m. - 2:10 p.m.</td>
<td>4F EPSS/CS SPECIALIST SESSION: Joint EPSS/CS Chemical Kinetics Tutorial</td>
</tr>
<tr>
<td>12:05 p.m. or 12:35 p.m.</td>
<td>Session Break (most sessions - see session agendas)</td>
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As Time Permits

**Networking and Open Discussion after Sessions**

| Each DCS “Room” | Open |

### Schedule Color Key

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<th>Type</th>
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<td>Concurrent Sessions or Panel Meetings</td>
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<tr>
<td>Networking Opportunities</td>
<td>Session Details</td>
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## SCHEDULE - Friday, 11 December

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<tbody>
<tr>
<td>11:00 a.m. - 3:35 p.m.</td>
<td><strong>Friday Technical Sessions, Workshop, and Panel Meeting</strong></td>
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<tr>
<td>11:00 a.m. - 12:35 p.m.</td>
<td>5A APS/CS Scramjets: Tools, Analysis and Application</td>
<td>Open</td>
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<tr>
<td>11:00 a.m. - 12:05 p.m.</td>
<td>5B APS Advanced Airbreathing System Designs and Methods</td>
<td>Open</td>
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<tr>
<td>11:00 a.m. - 3:35 p.m.</td>
<td>5C APS Ramjet Fuels and Design</td>
<td>Open</td>
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<tr>
<td>11:00 a.m. - 3:15 p.m.</td>
<td>5D APS WORKSHOP: FTSI Investigation of Compliant Structural Components in High-speed Flow Environments</td>
<td>Open</td>
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<tr>
<td>11:00 a.m. - 2:05 p.m.</td>
<td>5E ESHS Insensitive Munitions Technology</td>
<td>Open</td>
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<tr>
<td>2:05 p.m. - 3:05 p.m.</td>
<td>5E ESHS PANEL MEETING: Insensitive Munitions</td>
<td>Open</td>
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<tr>
<td>11:00 a.m. - 12:35 p.m.</td>
<td>5F CS Electric-Solid DACS and AF-M315E Compatibility</td>
<td>Restricted</td>
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<tr>
<td>12:05 p.m. or 12:35 p.m.</td>
<td>Session Break (most sessions - see session agendas)</td>
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<tr>
<td>As Time Permits</td>
<td>Networking and Open Discussion after Sessions</td>
<td>Each DCS “Room”</td>
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## SCHEDULE - Monday, 14 December

**All Times Listed Are Eastern Standard Time**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
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<tbody>
<tr>
<td>11:00 a.m. - 3:35 p.m.</td>
<td><strong>Monday Technical Sessions, Specialist Sessions, Panel Meeting, and Town Hall Meeting</strong></td>
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<tr>
<td>11:00 a.m. - 3:35 p.m.</td>
<td>6A APS Aether - TBCC Flight Demonstration Vehicle Concept - I (Overview and Propulsion)</td>
<td>Open</td>
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</tr>
<tr>
<td>11:00 a.m. - 2:35 p.m.</td>
<td>6B APS Advanced Design, Analysis, and Testing of Extreme Environment Structures</td>
<td>Open</td>
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<tr>
<td>11:00 a.m. - 12:40 p.m.</td>
<td>6C APS SPECIALIST SESSION: ATTAM PGC Activities</td>
<td>Open</td>
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<tr>
<td>11:00 a.m. - 12:05 p.m.</td>
<td>6D CS Reactive Materials</td>
<td>Open</td>
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<tr>
<td>12:35 p.m. - 1:05 p.m.</td>
<td>6D CS PANEL MEETING: Reactive Materials</td>
<td>Open</td>
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<tr>
<td>1:05 p.m. - 1:35 p.m.</td>
<td>6D CS TOWN HALL MEETING: Enhanced Blast</td>
<td>Open</td>
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</tr>
<tr>
<td>11:00 a.m. - 3:05 p.m.</td>
<td>6E CS/APS Ignition, Flameholding, and Alternate Fuels</td>
<td>Open</td>
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<tr>
<td>11:00 a.m. - 1:05 p.m.</td>
<td>6F EPSS Part 1 Comparisons against Measurement</td>
<td>Open</td>
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<tr>
<td>1:35 p.m. - 3:35 p.m.</td>
<td>6F EPSS Part 2 SPECIALIST SESSION: Hypersonic Signature Observations and Phenomenology Tutorial</td>
<td>Open</td>
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<tr>
<td>12:05 p.m. or 12:35 p.m.</td>
<td>Session Break (most sessions - see session agendas)</td>
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<td>As Time Permits</td>
<td>Networking and Open Discussion after Sessions</td>
<td>Each DCS “Room”</td>
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### Schedule Color Key

- **Meeting Services**
- **Networking Opportunities**
- **Closed Meetings**
- **Concurrent Sessions or Panel Meetings**
- **Session Details**
- **Panel Meetings**
# Schedule - Tuesday, 15 December

**All Times Listed Are Eastern Standard Time**

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<td>10:00 a.m. - 11:00 a.m.</td>
<td>Download DCS Session Agendas, Links/Call-in Info and Login to Session of Choice</td>
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<tr>
<td>24 hours/day</td>
<td>Virtual Reading Room</td>
</tr>
<tr>
<td><strong>11:00 a.m. - 3:35 p.m.</strong></td>
<td><strong>Tuesday Technical Sessions, Workshop, and Specialist Session</strong></td>
</tr>
<tr>
<td>11:00 a.m. - 2:35 p.m.</td>
<td>7A APS Aether - TBCC Flight Demonstration Vehicle Concept - II (Propulsion and Configuration Performance)  DCS “Room” 1 Open</td>
</tr>
<tr>
<td>11:00 a.m. - 3:35 p.m.</td>
<td>7B CS/ESHS Reactive Material and Fragmentation Testing  DCS “Room” 2 Restricted</td>
</tr>
<tr>
<td>11:00 a.m. - 1:35 p.m.</td>
<td>7C APS Experimental Techniques for Extreme Environment Structural Testing  DCS “Room” 3 Open</td>
</tr>
<tr>
<td>1:35 p.m. - 3:05 p.m.</td>
<td>7C APS Advances in High-speed Flight Technology  DCS “Room” 3 Open</td>
</tr>
<tr>
<td>11:00 a.m. - 2:15 p.m.</td>
<td>7D APS WORKSHOP: Equivalent Available Pressure Measurement Technique  DCS “Room” 4 Open</td>
</tr>
<tr>
<td>11:00 a.m. - 1:35 p.m.</td>
<td>7E CS Non-Intrusive Diagnostics in Combusting and Non-combusting Flow  DCS “Room” 5 Open</td>
</tr>
<tr>
<td>11:00 a.m. - 1:05 p.m.</td>
<td>7F EPSS Plume/Wake/Hypersonic Flowfield Topics  DCS “Room” 6 Open</td>
</tr>
<tr>
<td>1:35 p.m. - 3:35 p.m.</td>
<td>7F EPSS SPECIALIST SESSION: SPIRITS AC3 Tutorial  DCS “Room” 6 Open</td>
</tr>
<tr>
<td>12:05 p.m. or 12:35 p.m.</td>
<td>Session Break (most sessions - see session agendas)</td>
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<tr>
<td>As Time Permits</td>
<td>Networking and Open Discussion after Sessions  Each DCS “Room” Open</td>
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# Schedule - Wednesday, 16 December

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<td>10:00 a.m. - 11:00 a.m.</td>
<td>Download DCS Session Agendas, Links/Call-in Info and Login to Session of Choice</td>
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<td>Virtual Reading Room</td>
</tr>
<tr>
<td><strong>11:00 a.m. - 3:05 p.m.</strong></td>
<td><strong>Wednesday Technical Sessions, Specialist Session, and Panel Meeting</strong></td>
</tr>
<tr>
<td>11:00 a.m. - 2:05 p.m.</td>
<td>8A APS Aether - TBCC Flight Demonstration Vehicle Concept - III (Structures, Thermal and Ground Tests)  DCS “Room” 1 Open</td>
</tr>
<tr>
<td>11:00 a.m. - 2:35 p.m.</td>
<td>8B APS Characterization and Development of High-temperature Material Systems - I  DCS “Room” 2 Open</td>
</tr>
<tr>
<td>11:00 a.m. - 2:35 p.m.</td>
<td>8C APS Advances in High-speed Aerothermoelastic Experiments of Aerospace Structures  DCS “Room” 3 Open</td>
</tr>
<tr>
<td>11:00 a.m. - 2:05 p.m.</td>
<td>8D CS SPECIALIST SESSION: Enhancing Synergy between Flowfield Diagnostics and Computational Modeling  DCS “Room” 4 Open</td>
</tr>
<tr>
<td>2:05 p.m. - 3:05 p.m.</td>
<td>8D CS PANEL MEETING: Flow Field Diagnostics  DCS “Room” 4 Open</td>
</tr>
<tr>
<td>11:00 a.m. - 2:35 p.m.</td>
<td>8E CS Propellant Combustion - Experimental and M&amp;S  DCS “Room” 5 Open</td>
</tr>
<tr>
<td>11:00 a.m. - 3:05 p.m.</td>
<td>8F EPSS Composite Scene Signatures  DCS “Room” 6 Open</td>
</tr>
<tr>
<td>12:05 p.m. or 12:35 p.m.</td>
<td>Session Break (most sessions - see session agendas)</td>
</tr>
<tr>
<td>As Time Permits</td>
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**Schedule Color Key**

- **Meeting Services**
- **Concurrent Sessions or Panel Meetings**
- **Networking Opportunities**
- **Session Details**
- **Closed Meetings**
- **Panel Meetings**
**JANNAF MEETING INVITATION - DECEMBER 2020**

### SCHEDULE - Thursday, 17 December

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<td>Virtual Reading Room</td>
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<tr>
<td><strong>11:00 a.m. 3:50 p.m.</strong></td>
<td><strong>Thursday Technical Sessions, Specialist Session, Workshop, and Panel Meetings</strong></td>
</tr>
<tr>
<td>11:00 a.m. - 2:35 p.m.</td>
<td><strong>9A</strong> APS Aether - TBCC Flight Demonstration Vehicle Concept - IV (Related Work)  <strong>DCS “Room” 1</strong> Open</td>
</tr>
<tr>
<td>11:00 a.m. - 12:35 p.m.</td>
<td><strong>9B</strong> APS Characterization and Development of High-temperature Material Systems - II <strong>DCS “Room” 2</strong> Open</td>
</tr>
<tr>
<td>1:05 p.m. - 2:05 p.m.</td>
<td><strong>9B</strong> APS <strong>PANEL MEETING:</strong> Manufacturability/Suitability for Integration of Advanced Material Systems onto High-speed Systems <strong>DCS “Room” 2</strong> Open</td>
</tr>
<tr>
<td>11:00 a.m. - 3:55 p.m.</td>
<td><strong>9C</strong> EPSS <strong>SPECIALIST SESSION:</strong> Interagency Collaboration Forum <strong>DCS “Room” 3</strong> Open</td>
</tr>
<tr>
<td>11:00 a.m. - 1:35 p.m.</td>
<td><strong>9D</strong> CS Boost and Upper Stage Propulsion Modeling and Analysis <strong>DCS “Room” 4</strong> Open</td>
</tr>
<tr>
<td>11:00 a.m. - 2:05 p.m.</td>
<td><strong>9E</strong> CS Metal in Propellant Combustion <strong>DCS “Room” 5</strong> Open</td>
</tr>
<tr>
<td>11:00 a.m. - 3:05 p.m.</td>
<td><strong>9F</strong> APS <strong>WORKSHOP:</strong> Medium Scale Critical Components (MSCC) Program <strong>DCS “Room” 6</strong> Open</td>
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<tr>
<td>3:05 p.m. - 3:50 p.m.</td>
<td><strong>9F</strong> APS <strong>PANEL MEETING:</strong> Engine Test and Evaluation <strong>DCS “Room” 6</strong> Open</td>
</tr>
<tr>
<td>12:05 p.m. or 12:35 p.m.</td>
<td>Session Break (most sessions - see session agendas)</td>
</tr>
<tr>
<td>12:05 p.m. or 12:35 p.m.</td>
<td>Networking and Open Discussion after Sessions <strong>Each DCS “Room”</strong> Open</td>
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