

# DEFENSE FORUM



FORUM

25-27 APRIL 2017

LAUREL, MD

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# DEFENSE FORUM

## Welcome

Welcome to the AIAA Defense and Security Forum (AIAA DEFENSE Forum) at the Johns Hopkins University Applied Physics Laboratory. We are excited to have you participate this week as we seek to better understand the state of our nation's defense capabilities, postures, and systems.

This week will stimulate insightful and much needed conversations and collaboration among government leaders, civilian contractors, and academics as you tackle some of the most important questions of the day – including the threats arrayed against our nation, the future of defense acquisition, space-based defense systems, and the emerging role of UAS in defense operations. A full program of in-depth technical discussions will underscore the importance of these plenary talks, providing a great view of the state of the art in national defense strategies, systems, and technologies.

AIAA DEFENSE Forum provides opportunities to consider cutting-edge, classified, technical research presentations and insightful conversations about the strategies that bolster our nation's defensive posture, while also thinking about the systems that enable those strategies.

Everyone involved in the planning of AIAA DEFENSE Forum has worked hard to develop a robust, timely, and interesting program. We hope you take advantage of the many learning and networking opportunities throughout the week, and we thank you for being a part of this important gathering.

**AIAA DEFENSE Forum is proud to feature the following conferences:**

AIAA Missile Sciences Conference  
AIAA Strategic and Tactical Missile Systems Conference  
AIAA National Forum on Weapon System Effectiveness

# Organizing Team

## **Forum General Chair**

Kevin Massey, Raytheon Missile Systems Company

## **Forum Technical Program Chair**

Allison Cash, PeopleTec

## **Technical Program Committee**

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Alex Edsall, Draper Laboratory

Mark Friedlander, Aerojet Rocketdyne

Rick Gamble, Aerospace Testing Alliance

Zachary Hall, U.S. Army Aviation and Missile Command

Anjaney Kottapalli, Lockheed Martin Corporation

Jarret Lafleur, Sandia National Laboratories

Joseph McMorrow, Center for Countermeasures

Mark Neice, Directed Energy Professional Society

Keri Phillips, Johns Hopkins University Applied Physics Laboratory

Uday Shankar, Johns Hopkins University Applied Physics Laboratory

Tumkur Shivananda, Northrop Grumman Corporation

Bradley Steinfield, Sandia National Laboratories

Rick Tuggle, PeopleTec

Lesley Weltz, Mitre Corporation

Michael White, Johns Hopkins University Applied Physics Laboratory



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# Forum Overview

	<b>TUESDAY 25 April</b>	<b>WEDNESDAY 26 April</b>	<b>THURSDAY 27 April</b>	
0700 hrs	Networking Coffee Break	Networking Coffee Break	Networking Coffee Break	
0730 hrs				
0800 hrs	Welcome and Introductions		<b>Technical Sessions:</b> Strategic Missiles — Guidance Systems Computing Systems and Cybersecurity Estimation, Guidance, Navigation and Control	
0830 hrs	<b>Opening Plenary</b>	<b>Morning Plenary</b> <i>Counter UAS Threats and Solutions</i>		
0900 hrs	<i>Advanced Threats</i>			
0930 hrs	Networking Coffee Break	Networking Coffee Break		
1000 hrs	<b>Technical Sessions:</b> Missile Defense I - Threats, Simulation, and Testing Sea-Based Strategic Missiles - Ensuring Long-Term Sustainability & Affordability Weapon System Effectiveness M&S I System and Decision Analysis for National Security	<b>Technical Sessions:</b> Directed Energy Weapons I Land-Based Strategic Missiles - Reentry Systems and RV Test Data Analyses Weapon System Effectiveness - T&E I Innovative Concepts and Robotics	Networking Coffee Break	
1030 hrs				<b>Morning Plenary</b> <i>Acquisition</i>
1100 hrs				
1130 hrs				Networking Luncheon
1200 hrs	Networking Luncheon	Networking Luncheon		
1230 hrs			<b>Technical Sessions:</b> Land-Based Strategic Missiles - RS and RV Modeling and Simulation Tactical Missile Systems	
1300 hrs	<b>Technical Sessions:</b> Countermeasures	<b>Technical Sessions:</b> Hypersonics		
1330 hrs	Sea-Based Strategic Missiles - Enabling Technologies	Land-Based Strategic Missiles - M&S		
1400 hrs	Weapon System Effectiveness M&S II - Interceptors & Technology	Weapon System Effectiveness - T&E II		
1430 hrs	Missile Defense II: Interceptors and Technology	Directed Energy Weapons II		
1500 hrs				
1530 hrs	Networking Coffee Break	Networking Coffee Break		
1600 hrs	<b>Afternoon Plenary</b> <i>Contested Space and DoD Space Policy</i>			
1630 hrs				
1700 hrs				
1730 hrs				
1800 hrs	Welcome Reception			
1830 hrs				

# Plenary Session Speakers

Get the big picture about the defense and weapons community from the leading authorities in the field during these high-level discussions and presentations.

## Tuesday, 25 April

0800–0930 hrs

Auditorium

### Advanced Threats

**Marc Bernstein**, Associate Director, Lincoln Laboratory, Massachusetts Institute of Technology

**Keith Englander**, Director of Engineering, Missile Defense Agency

**Conrad Grant**, Chief Engineer, Johns Hopkins University Applied Physics Laboratory

1600–1730 hrs

Auditorium

### Contested Space and DoD Space Policy

Moderator: **Jandria Alexander**, Principal Director, The Aerospace Corporation

**Stephen J. Flanagan**, Senior Political Scientist, RAND Corporation

**Todd Master**, Program Manager, Tactical Technology Office, DARPA

**Jeremy Raley**, Program Manager, Tactical Technology Office, DARPA

**Audrey Schaffer**, Director, Space Strategy and Plans, Office of the Secretary of Defense

**Martin Whelan**, Corporate Director, Space Programs, Northrop Grumman Corporation

## Wednesday, 26 April

0800–0930 hrs

Auditorium

### Counter UAS

Moderator: **Kevin Massey**, Director, U.S. Business Development S & T, Raytheon Company

**Gregory Coleman**, Senior Conventional Military Strategist, United States Central Command

**Terence Haran**, Senior Research Engineer, Georgia Tech Research Institute

**David “John” Rathke**, Principal Intelligence Analyst, UAV and Special Mission Aircraft Flight, National Air and Space Intelligence Center, United States Air Force

**Andrew Roettgen**, Engineer, Technology Strategy Division, Defense Threat Reduction Agency

**Col. Douglas White**, TRADOC Capabilities Manager, Air Defense Artillery Brigade

## Thursday, 27 April

1000–1130 hrs

Auditorium

### Acquisition

**Lt. Gen. Arnold Bunch**, Military Deputy, Office of the Assistant Secretary of the Air Force for Acquisition



# Sponsors and Supporters

AIAA would like to thank the following organizations for their support of the AIAA DEFENSE Forum:

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# Networking Activities

Understanding the importance of networking with colleagues new and old, a series of activities have been planned that will help you connect with current colleagues and allow the opportunity for quality conversations.

## Coffee Breaks

Coffee breaks allow even more time for making new contacts, continuing discussions from sessions, or checking emails and voicemails to keep in touch with the office while you are at the forum. Coffee breaks will be located in the foyer:

<b>Tuesday, 25 April</b>	<b>0700, 0930, and 1530 hrs</b>
<b>Wednesday, 26 April</b>	<b>0700, 0930, and 1530 hrs</b>
<b>Thursday, 27 April</b>	<b>0700 and 0930 hrs</b>

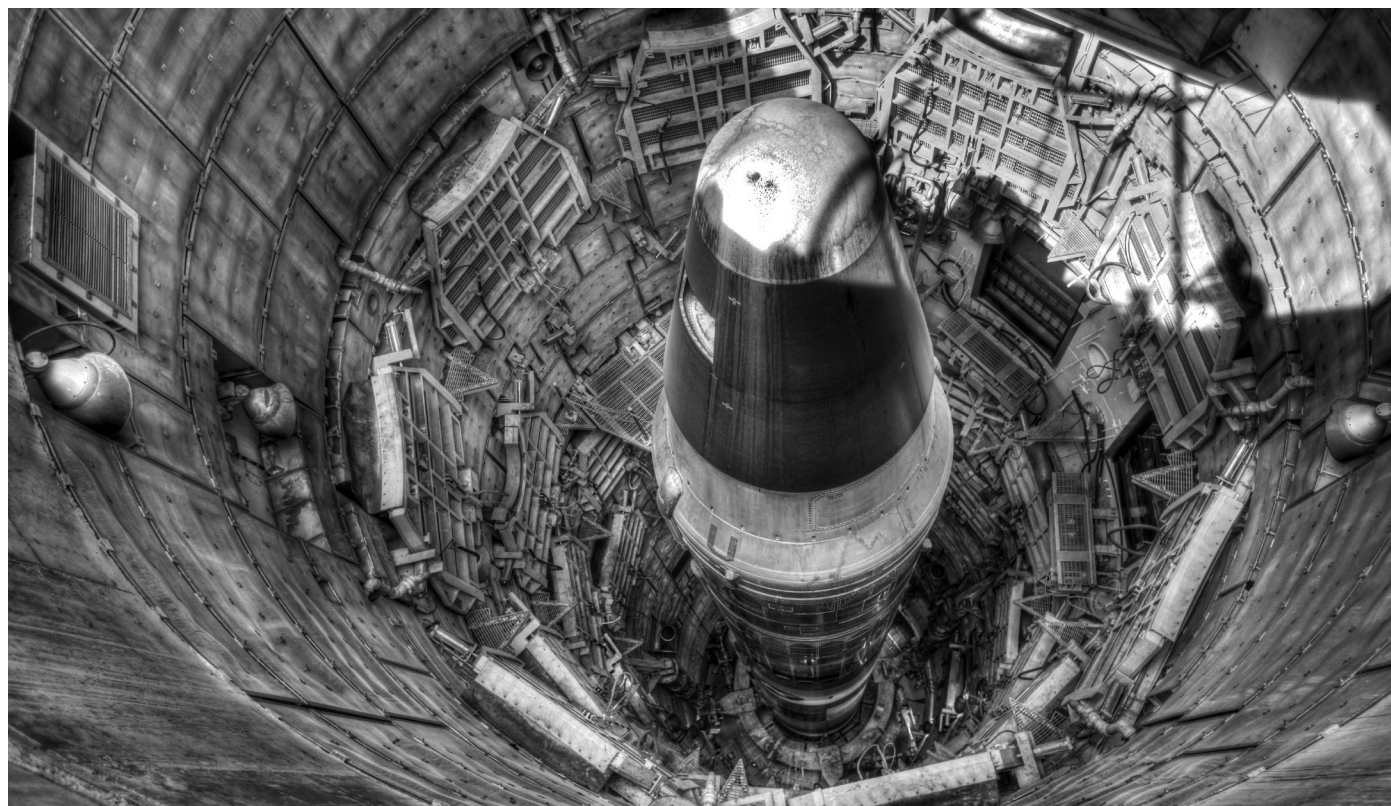
## Luncheon

Luncheons for conference attendees will be held daily in the Kossiakoff Center:

<b>Tuesday, 25 April</b>	<b>1200–1300 hrs</b>
<b>Wednesday, 26 April</b>	<b>1200–1300 hrs</b>
<b>Thursday, 27 April</b>	<b>1130–1230 hrs</b>

## Welcome Reception

A reception will be held on Tuesday, 25 April, 1730 hrs, in the Kossiakoff Center. Take this opportunity to engage new contacts and refresh old ones.



# General and Security Information

## Meeting Site

The forum is being held at the Kossiakoff Center located on the Johns Hopkins University Applied Physics Laboratory campus.

## AIAA Registration and Information Center Hours

The AIAA Registration and Information Center will be located in the foyer of the Kossiakoff Center.

<b>Tuesday, 25 April</b>	<b>0700–1830 hrs</b>
<b>Wednesday, 26 April</b>	<b>0700–1800 hrs</b>
<b>Thursday, 27 April</b>	<b>0700–1500 hrs</b>

## Parking

There is plenty of parking for forum attendees in the Kossiakoff Center parking lot on the lower level.

## Employment Opportunities

AIAA members can post and browse resumes, browse job listings, and access other online employment resources by visiting the AIAA Career Center at <http://careercenter.aiaa.org>.

## Membership

AIAA is your vital lifelong link to the collective creativity and brainpower of the aerospace profession and a champion for its achievements. Students who are not yet members may apply their registration fee toward their first year's student member dues.

## Nondiscriminatory Practices

AIAA accepts registrations irrespective of race, creed, sex, color, physical handicap, and national or ethnic origin.

Attendance at this forum is restricted to U.S. citizens who possess a final SECRET security clearance verified by the Security Office Coordinator.

## Security Badge

A security badge with photograph is required for admittance to the forum sessions. Each attendee will be required to produce a driver's license, military I.D., or company photo I.D. prior to receiving a forum badge. Badges must be worn at all times during the forum.

## Security Restrictions

Electronic devices or electronic equipment of any kind—including cell phones, radios, personal fitness devices, PDAs, laptops, tablets cameras, video/audio recording equipment, and two-way pagers and devices—are **NOT** allowed in the session rooms. One-way pagers must be placed on vibrate during the sessions.

Note-taking is not permitted in or around the forum sessions. Books, magazines, fliers, brochures, and other paper products will not be allowed in the session rooms.

Luggage, briefcases, and other large cases will not be allowed in the forum area. Please leave these items in your car or hotel as storage is not available at the Kossiakoff Center. Small handbags, purses, and personal possessions will be inspected upon entry into the conference area. Security spot checks may be made at any time.



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12700 Sunrise Valley Drive, Suite 200  
Reston, VA 20191-5807  
703.264.7500 or 800.639.AIAA (2422)

Fax: 703.264.7657

[custserv@aiaa.org](mailto:custserv@aiaa.org)

# Technical Sessions at a Glance

Abbreviation	Title	Date	Start Time	Location
<b>Cybersecurity, Space and Robotics</b>				
21-ADCS-1	Computing Systems and Cybersecurity	Wednesday, 27 April	0800 hrs	Room 3/4
<b>Countermeasures</b>				
6-CM-1	Countermeasures	Tuesday, 25 April	1300 hrs	Auditorium
<b>Directed Energy Weapons</b>				
12-DEW-1	Directed Energy Weapons I	Wednesday, 26 April	1000 hrs	Auditorium
16-DEW-2	Directed Energy Weapons II	Wednesday, 26 April	1300 hrs	Room 7/8
<b>Guidance, Navigation and Control</b>				
22-GNC-1	Estimation, Guidance, Navigation and Control	Thursday, 27 April	0800 hrs	Room 5/6
<b>Hypersonics</b>				
17-HYTASP-1	Hypersonics	Wednesday, 26 April	1300 hrs	Auditorium
<b>Innovative Concepts and Technologies</b>				
13-ICT-1	Innovative Concepts and Robotics	Wednesday, 26 April	1000 hrs	Room 7/8
<b>Missile Defense</b>				
2-MD-1	Missile Defense I: Threats, Simulation and Testing	Tuesday, 25 April	1000 hrs	Auditorium
7-MD-2	Missile Defense II: Interceptors and Technology	Tuesday, 25 April	1300 hrs	Room 7/8
<b>Plenary Sessions</b>				
1-PLNY-1	Advanced Threats	Tuesday, 25 April	0800 hrs	Auditorium
10-PLNY-2	Contested Space and DoD Space Policy	Tuesday, 25 April	1600 hrs	Auditorium
11-PLNY-3	Counter UAS Panel	Wednesday, 26 April	0800 hrs	Auditorium
24-PLNY-5	Acquisition	Thursday, 27 April	1000 hrs	Auditorium
<b>Strategic Missile Defense</b>				
3-SMS-1	System and Decision Analysis for National Security	Tuesday, 25 April	1000 hrs	Room 7/8
4-SMS-2	Sea-Based Strategic Missiles - Ensuring Long-Term Sustainability and Affordability	Tuesday, 25 April	1000 hrs	Room 3/4
8-SMS-3	Sea-Based Strategic Missiles - Enabling Technologies	Tuesday, 25 April	1300 hrs	Room 3/4
14-SMS-4	Land-Based Strategic Missiles - Re-Entry System and RV Test Data Analyses	Wednesday, 26 April	1000 hrs	Room 3/4
18-SMS-5	Land-Based Strategic Missiles - Modeling and Simulation	Wednesday, 26 April	1300 hrs	Room 3/4
23-SMS-6	Strategic Missiles - Guidance Systems	Thursday, 27 April	0800 hrs	Auditorium
25-SMS-7	Land-Based Strategic Missiles - RS and RV Modeling and Simulation	Thursday, 27 April	1230 hrs	Auditorium
<b>Tactical Missiles</b>				
26-TAC-1	Tactical Missile Systems	Thursday, 27 April	1230 hrs	Room 3/4
<b>Weapon Systems</b>				
5-WPNS-1	Weapon Systems Effectiveness Modeling and Simulation I	Tuesday, 25 April	1000 hrs	Room 5/6
9-WPNS-2	Weapon Systems Effectiveness Modeling and Simulation II	Tuesday, 25 April	1300 hrs	Room 5/6
15-WPNS-3	Weapon Systems Effectiveness Test and Evaluation I	Wednesday, 26 April	1000 hrs	Room 5/6
19-WPNS-4	Weapon Systems Effectiveness Test and Evaluation II	Wednesday, 26 April	1300 hrs	Room 5/6

**Tuesday**

<b>Tuesday, 25 April 2017</b>		<b>Advanced Threats</b>	<b>Auditorium</b>
1-PLNY-1 0800 - 0930 hrs	<p><b>Keith Englander</b> Director of Engineering Missile Defense Agency</p>	<p><b>Conrad Grant</b> Chief Engineer Johns Hopkins University Applied Physics Laboratory</p>	<p><b>Marc Bernstein</b> Associate Director Lincoln Laboratory, Massachusetts Institute of Technology</p>
<b>Tuesday, 25 April 2017</b>			
<b>2-MD-1</b>		<b>Missile Defense I: Threats, Simulation and Testing</b>	
Chaired by: R. GAMBLE, Aerospace Test Alliance and H. BURKE, MIT Lincoln Laboratory			
1030 hrs AIAA-Defense2017-9000 <b>Targets and Countermeasures: Recent Threat Observations</b> B. Sheeks, Lincoln Laboratory, Massachusetts Institute of Technology, Lexington, MA	1030 hrs AIAA-Defense2017-9001 <b>Reentry Vehicle Material Coatings and Their Impact to Ballistic Missile Defense</b> D. Koltenuk, Lincoln Laboratory, Massachusetts Institute of Technology, Lexington, MA	1100 hrs AIAA-Defense2017-9003 <b>Testing Interceptor and Other Imaging Sensor Systems in the AEDC Space Systems Test Facilities</b> H. Lowry, S. Steely, National Aerospace Solutions, LLC, Arnold AFB, TN	<b>Auditorium</b>
<b>Tuesday, 25 April 2017</b>			
<b>3-SMS-1</b>		<b>System and Decision Analysis for National Security</b>	
Chaired by: J. LAFLEUR, Sandia National Laboratories and B. STEINFELDT, Sandia National Laboratories			
1000 hrs AIAA-Defense2017-9004 <b>Counterforce Versus Countervalue Targeting</b> W. Kahle, J. Schwalbe, Johns Hopkins University Applied Physics Laboratory, Laurel, MD	1030 hrs AIAA-Defense2017-9005 <b>ConOps to Counter Unmanned Aircraft Systems (C-UAS) in Restricted Airspaces</b> K. Anand, Lockheed Martin Corporation, Sunnyvale, CA	1100 hrs AIAA-Defense2017-9006 <b>EXTENDED LIFECYCLE SYSTEM ENGINEERING: Principles and a strategy for an improved approach to high consequence system sustainment</b> N. Brannon, Office of the Assistant Secretary of Defense, Washington, D.C.	<b>Room 7/8</b>
<b>Tuesday, 25 April 2017</b>			
<b>4-SMS-2</b>		<b>Sea-Based Strategic Missiles - Ensuring Long-Term Sustainability and Affordability</b>	
Chaired by: M. MAGLICH, USN Strategic Systems Programs and A. EDSALL, Draper Laboratory and D. WENNER, Lockheed Martin Space Systems Company			
1000 hrs AIAA-Defense2017-9007 <b>Moderized SLBM Concept Definition Study</b> P. Bredenbaugh, J. Snyder, Lockheed Martin Space Systems Company, Sunnyvale, CA	1030 hrs AIAA-Defense2017-9008 <b>Strategic System Design for Sustainability in a Commercial World</b> J. Chard, G. Taylor, General Dynamics Corporation, Pittsfield, MA	1100 hrs AIAA-Defense2017-9009 <b>Next Generation Avionics</b> C. Lento, Draper Laboratory, Cambridge, MA	1130 hrs AIAA-Defense2017-9010 <b>OSD - Long Term Trusted Foundry Efforts</b> P. Smith, B. Hamilton, Naval Surface Warfare Center, Crane, IN
<b>Tuesday, 25 April 2017</b>			
<b>5-WPNS-1</b>		<b>Weapon Systems Effectiveness Modeling and Simulation I</b>	
Chaired by: R. ADDIS, Lawrence Livermore National Laboratory and O. YAKABOSKI, USAF AFMC			
1000 hrs AIAA-Defense2017-9011 <b>Application of a Multiple Penetrator Fast-Running Model for Predicting Complex Damage Scenes</b> D. Elliott, Army Aviation and Missile Research Development and Engineering Center, Huntsville, AL; A. Cash, D. Hyams, B. Mitchell, Peopletec, Inc., Huntsville, AL	1030 hrs AIAA-Defense2017-9085 <b>Unmanned Aerial System Predictive Radar Signature Model Development</b> K. Tamez, U.S. Army Aviation and Missile Research, Development and Engineering Center, Huntsville, AL		<b>Room 5/6</b>

Tuesday, 25 April 2017		Countermeasures		Auditorium
Chaired by: J. MC MORROW, Center for Countermeasures (CCM) and R. GAMBLE, Aerospace Test Alliance				
1300 hrs AIAA-Defense2017-9015 <b>The Enhanced Missile Signature Model (E-MSG): Generation, Validation, and Operation to Support Missile Warning System Development and Testing</b> R. Hiers, C. Dockrey, Quamtech, Inc., Arnold AFB, TX; M. Elkins, Defense Intelligence Agency, Redstone Arsenal, AL	1400 hrs AIAA-Defense2017-9017 <b>Current and Future Threat MANPADS</b> M. Elkins, Defense Intelligence Agency, Redstone Arsenal, AL	1430 hrs AIAA-Defense2017-9018 <b>U.S. Army Aircraft Survivability Equipment</b> K. Williams, U.S. Army, Project Management Office Aircraft Survivability Equipment, Huntsville, AL		
<b>Tuesday, 25 April 2017</b>				
<b>7-MD-2</b>				
Chaired by: K. PHILLIPS, Johns Hopkins University Applied Physics Laboratory and M. WHITE, Johns Hopkins University Applied Physics Laboratory				
1300 hrs AIAA-Defense2017-9019 <b>Advanced Interceptor Trade Space for Defense against Emerging Threats</b> B. Bale, Lincoln Laboratory, Massachusetts Institute of Technology, Lexington, MA	1330 hrs AIAA-Defense2017-9020 <b>A Novel Method for Mitigating Ship Motion During Mobile Launch of Unguided Ballistic Missile Defense Targets</b> P. Kufly, M. Zachary, J. Fortier, O. Rodriguez, Johns Hopkins University Applied Physics Laboratory, Laurel, MD	1400 hrs AIAA-Defense2017-9021 <b>Wide-Angle Optical Beam Steering using Liquid Crystal Polarization Gratings</b> J. Vornehm, H. Popson, S. Berry, B. Roberts, V. Frimemeyer, Lincoln Laboratory, Massachusetts Institute of Technology, Lexington, MA; K. Gao, Kent State University, Kent, OH; et al.	1430 hrs AIAA-Defense2017-9022 <b>Advanced Optical Sensor Technology for Ballistic Missile Defense</b> D. Hunter, E. Hines, E. Stutz, K. Bihari, Lincoln Laboratory, Massachusetts Institute of Technology, Lexington, MA	1500 hrs AIAA-Defense2017-9023 <b>Radiation Hardened By Design System Architecting Strategy for Missile Defense Interceptors</b> T. Bucklew, B. McCarragher, Draper Laboratory, Cambridge, MA
<b>Tuesday, 25 April 2017</b>				
<b>8-SMS-3</b>				
Chaired by: M. MAGLICH, USN Strategic Systems Programs and A. EDSALL, Draper Laboratory and D. WEAVER, Lockheed Martin Space Systems Company				
1300 hrs AIAA-Defense2017-9024 <b>Wireless Avionic Intra-Communications (WAIC) for On-Board Avionics systems and Next-Generation Strategic Systems</b> M. Franceschini, J. Haque, Honeywell International, Inc., Phoenix, AZ	1330 hrs AIAA-Defense2017-9025 <b>Inertial Navigation with Stellar Observations for Ballistic Missile Applications</b> E. Cuij, B. Lane, V. Rizzo, R. Smith, C. Stoll, M. Weinstein, Draper Laboratory, Cambridge, MA	1400 hrs AIAA-Defense2017-9026 <b>Observational Position Differences as an Indicator of Dynamic Orbital Motion of Bright Stars</b> J. Brunson, J. VanderHeiden, D. Falset, Naval Surface Warfare Center, Dahlgren, VA	1430 hrs AIAA-Defense2017-9027 <b>Focus on Utilizing Common Parts Programs to Minimize Schedule/Cost/Technical Risks</b> P. Smith, S. Armstrong, Naval Surface Warfare Center, Crane, IN	
<b>Tuesday, 25 April 2017</b>				
<b>9-WPNS-2</b>				
Chaired by: Z. HALL, US Army AMRDEC and P. DUNN, Weidinger Associates Inc				
1300 hrs AIAA-Defense2017-9029 <b>Improved Post-Intercept Debris (PID) Radar Scene Modeling for Missile Defense Engagements</b> W. Sommers, M. Harper, G. Kruse, Peoplelec, Inc., Huntsville, AL; R. Parks, Missile Defense Agency, Huntsville, AL	1330 hrs AIAA-Defense2017-9030 <b>ParFLITES: A Parallel Software Framework for Distributed Scene Generation</b> A. Duffy, Aegis Technologies, Huntsville, AL; C. Coker, Air Force Research Laboratory, Eglin AFB, FL	1400 hrs AIAA-Defense2017-9031 <b>Numerical Analysis on the Influence of Nose Shape on Low Speed Concrete Penetration</b> O. Yakobowski, E. Piburn, U.S. Air Force, Eglin AFB, FL	1430 hrs AIAA-Defense2017-9032 <b>Application of a Fast Running Detonative Model to BMDs Engagements Involving Unitary High Explosive Targets</b> D. Hyams, A. Cash, Peoplelec, Inc., Huntsville, AL; R. Parks, Missile Defense Agency, Redstone Arsenal, AL; B. Mitchell, Peoplelec, Inc., Huntsville, AL	
<b>Tuesday, 25 April 2017</b>				
<b>10-PLNY-2</b>				
Moderator: Janina Alexander, Principal Director, Cyber Security Subdivision, The Aerospace Corporation Panelists:				
1600 - 1730 hrs		<b>Contested Space and DoD Space Policy</b>		
Stephen Flanagan Senior Political Scientist RAND Corporation		Jeremy Raley Program Manager Tactical Technology Office DARPA		
Todd Master Program Manager Tactical Technology Office DARPA		Audrey Schaffer Director Space Strategy and Plans Office of the Secretary of Defense		
Martin Whelan Corporate Director Space Programs Northrop Grumman				

**Wednesday**

<b>Wednesday, 26 April 2017</b>		<b>Auditorium</b>
<b>Counter UAS Panel</b>		
<p><b>11-PLNY-3</b> 0800 - 0930 hrs</p> <p>Moderator: Kevin Massey, Director, Science and Technology, Raytheon Company</p> <p>Panelists:</p> <p><b>Terence Haran</b> Senior Research Engineer Georgia Tech Research Institute</p> <p><b>Gregory Coleman</b> Senior Conventional Military Analyst United States Central Command</p> <p><b>David "John" Rathke</b> Principal Intelligence Analyst UAV &amp; Special Mission Aircraft Flight National Air and Space Intelligence Center United States Air Force</p> <p><b>Andrew Roettgen</b> Engineer Technology Strategy Division DTRA</p> <p><b>Col. Douglas White</b> TRADOC Capabilities Manager ADA Brigade</p>		

<b>Wednesday, 26 April 2017</b>		<b>Auditorium</b>
<b>Directed Energy Weapons I</b>		
Chaired by: M. NEICE		
<p>1000 hrs AIAA-Defense2017-9033 <b>Weapon Effectiveness Measures in the Recent Army Analysis of Alternatives (AoA)</b> C. Lollar, Army Space and Missile Defense Command, Huntsville, AL</p> <p>1030 hrs AIAA-Defense2017-9086 <b>The Directed Energy Community of Interest Update - an OSD Perspective</b> S. Lekoudis, Office of the Assistant Secretary of Defense, Arlington, VA</p> <p>1100 hrs AIAA-Defense2017-9034 <b>Solid State Laser Testbed Dynamic Scoring System</b> D. Duffin, Radiance Technologies, Huntsville, AL; C. Lamar, Army Space and Missile Defense Command, Huntsville, AL</p> <p>1130 hrs AIAA-Defense2017-9083 <b>Self-Protect High Energy Laser Demonstrator (SHIELD) Advanced Technology Demonstration (ATD)</b> R. Bagnell, Air Force Research Laboratory, Kirtland AFB, NM</p>		

<b>Wednesday, 26 April 2017</b>		<b>Room 7/8</b>
<b>Innovative Concepts and Robotics</b>		
Chaired by: M. WHITE, Johns Hopkins University Applied Physics Laboratory and Z. HALL, US Army AMRDEC		
<p>1000 hrs AIAA-Defense2017-9035 <b>Multi-Mode Software defined Doppler Radar Based system for Next-Generation Strategic system</b> M. Pos, J. Haque, Honeywell International, Inc., Clearwater, FL</p> <p>1030 hrs AIAA-Defense2017-9036 <b>Low C-SWaP Multi-mode Sensor for Weapon Seekers</b> C. Rizk, Johns Hopkins University Applied Physics Laboratory, Laurel, MD</p> <p>1100 hrs AIAA-Defense2017-9037 <b>Automatic Target Recognition with Deep Neural Networks</b> J. Goodwin, A. Brewster, Lincoln Laboratory, Massachusetts Institute of Technology, Lexington, MA</p> <p>1130 hrs AIAA-Defense2017-9038 <b>Modeling Complex Interceptor Induced Damages to a UAV</b> Z. Hall, A. Owens, I. Kelly, Army Aviation and Missile Research Development and Engineering Center, Redstone Arsenal, AL; J. Grupp, Dynetics, Inc., Huntsville, AL; J. Jordan, Torch Technologies, Huntsville, AL; M. Moore, Dynetics, Inc., Huntsville, AL</p>		

<b>Wednesday, 26 April 2017</b>		<b>Room 3/4</b>
<b>Land-Based Strategic Missiles - Re-Entry System and RV Test Data Analyses</b>		
Chaired by: J. BEAN, ICBM Systems Directorate -Air Force Nuclear Weapon Center and T. SHIVANANDA, Northrop Grumman Aerospace Systems		
<p>1000 hrs AIAA-Defense2017-9039 <b>Computational Plasma and RF Attenuation Prediction Validation with New Reentry Vehicle Flight-Test Data</b> L. Arrington, T. Erwin, Lockheed Martin Corporation, King of Prussia, PA</p> <p>1030 hrs AIAA-Defense2017-9040 <b>RV Shock Test Data Filtering and Flight Data Comparison</b> C. Rockefeller, D. Hill, Lockheed Martin Corporation, King of Prussia, PA</p> <p>1100 hrs AIAA-Defense2017-9041 <b>Development of a Residual Air Balloon as an IR Countermeasure for Strategic Missile Systems</b> J. Crowley, M. Allen, P. Fate, Textron Systems, Wilmington, MA; S. Saterlie, M. Olmos, Northrop Grumman Corporation, Ogden, UT</p> <p>1130 hrs AIAA-Defense2017-9042 <b>Threat Responsive Penetration Aids Suite</b> P. Fate, R. Mills, J. Kenos, Textron Systems, Wilmington, MA; S. Saterlie, M. Olmos, Northrop Grumman Corporation, San Bernardino, UT</p>		

<b>Wednesday, 26 April 2017</b>		<b>Weapon Systems Effectiveness Test and Evaluation I</b>		<b>Room 5/6</b>
Chaired by: R. ADDIS, Lawrence Livermore National Laboratory and O. YAKUBOSKI, USAF AFMC				
1100 hrs AIAA-Defense2017-9043 <b>Ground Tests to Evaluate High Temperature Flow Effects on Vehicle Controls at Reentry Conditions</b> T. Wadhams, CUBRC, Buffalo, NY	1100 hrs AIAA-Defense2017-9045 <b>Creating a Novel Phased Array Radar Technology Testbed for the Nation</b> B. Baker, MIT Lincoln Laboratory, Lexington, MA	1130 hrs AIAA-Defense2017-9046 <b>Measurements in the LENS I and XX Ground Test Facilities to Evaluate the Boundary Layer Transition Characteristics of the Air Force CSM Configuration in Hypervelocity Flows</b> T. Wadhams, CUBRC, Buffalo, NY		
1130 hrs AIAA-Defense2017-9044 <b>SMDC Selected RAM Lethality Data</b> J. Willis, Modern Technology Solutions, Inc., Huntsville, AL; S. Patterson, Army Aviation and Missile Research Development and Engineering Center, Redstone Arsenal, AL; C. Lamar, Army Space and Missile Defense Command, Redstone Arsenal, AL	1400 hrs AIAA-Defense2017-9089 <b>AFSOC C-130 Laser Gunship Demonstration</b> C. Behre, Naval Surface Warfare Center, Dahlgren, VA	1430 hrs AIAA-Defense2017-9084 <b>Fiber Beam Combining HEL Technology</b> A. Benedick, Lincoln Laboratory, Massachusetts Institute of Technology, Lexington, MA		
1300 hrs AIAA-Defense2017-9087 <b>US Navy Laser Weapons system Demonstration (LWSD)</b> R. Flatley, Office of Naval Research, Arlington, VA	1400 hrs AIAA-Defense2017-9050 <b>Measurements in the LENS Hypervelocity Ground Test Facilities for Comparisons with Flight Test Data and Numerical Prediction and Design Tools</b> M. Holden, CUBRC, Buffalo, NY	1500 hrs AIAA-Defense2017-9090 <b>HPM/HPRF Payload Technologies</b> R. Hoffman, Office of Naval Research, Arlington, VA		
<b>Wednesday, 26 April 2017</b>				
<b>17-HYTASP-1</b>				
Chaired by: A. KOTTAPALLI, Lockheed Martin Corporation and M. WHITE, Johns Hopkins University Applied Physics Laboratory				
1300 hrs AIAA-Defense2017-9047 <b>Shockwave Boundary-Layer Interaction on a 7° Sharp Cone with Highly Swept Fin in Mach 6 Flow—Experiments and Simulations</b> S. Wenz, C. Ward, E. Marquart, Raytheon Company, Tucson, AZ	1330 hrs AIAA-Defense2017-9049 <b>Parametric Characterization of Hypersonic Glide Vehicles</b> M. McLaughlin, Lincoln Laboratory, Massachusetts Institute of Technology, Lexington, MA	<b>Auditorium</b>		
<b>Wednesday, 26 April 2017</b>				
<b>16-DEW-2</b>				
Chaired by: M. NEICE				
<b>Directed Energy Weapons II</b>				
1300 hrs AIAA-Defense2017-9088 <b>USMC Ground-based Air Defense Demonstration (GBAD)</b> J. Hernandez, Naval Surface Warfare Center, Dahlgren, VA	1400 hrs AIAA-Defense2017-9054 <b>Incorporating Analyses into an MBSE System Model</b> C. Phillips, M. Bott, Northrop Grumman Corporation, Ogden, UT	1430 hrs AIAA-Defense2017-9055 <b>ICBM Staging Analyses with Coupled CFD 6-DOF Capability to Predict Staging Environments Including Side Impulse and Thermal Environments</b> M. Lively, R. Hariharan, T. Shivananda, M. Olmos, Northrop Grumman Corporation, San Bernardino, CA		
1300 hrs AIAA-Defense2017-9052 <b>Probability of Damage Calculations for Optimizing System Effectiveness</b> J. Hidore, B. Lesage, Lockheed Martin Corporation, King of Prussia, PA	1400 hrs AIAA-Defense2017-9053 <b>Hot Launch Analysis for Minuteman III Using Transient, High Fidelity CFD Model With Multiple Species - Applicability for Continued MM III Modernization and Future Strategic Systems</b> R. Hariharan, M. Olmos, Northrop Grumman Corporation, San Bernardino, CA	1500 hrs AIAA-Defense2017-9056 <b>Post Boost Vehicle Modeling for Optimizing Design of MM III and other Strategic Missile Systems</b> C. Wagner, R. Feischer, Northrop Grumman Corporation, Ogden, UT; A. Hue, Northrop Grumman Corporation, San Bernardino, CA		
<b>Wednesday, 26 April 2017</b>				
<b>18-SMS-5</b>				
Chaired by: J. BEAN, ICBM Systems Directorate - Air Force Nuclear Weapon Center and T. SHIVANANDA, Northrop Grumman Aerospace Systems				
<b>Land-Based Strategic Missiles - Modeling and Simulation</b>				
1300 hrs AIAA-Defense2017-9043 <b>Ground Tests to Evaluate High Temperature Flow Effects on Vehicle Controls at Reentry Conditions</b> T. Wadhams, CUBRC, Buffalo, NY	1400 hrs AIAA-Defense2017-9054 <b>Incorporating Analyses into an MBSE System Model</b> C. Phillips, M. Bott, Northrop Grumman Corporation, Ogden, UT	1430 hrs AIAA-Defense2017-9055 <b>ICBM Staging Analyses with Coupled CFD 6-DOF Capability to Predict Staging Environments Including Side Impulse and Thermal Environments</b> M. Lively, R. Hariharan, T. Shivananda, M. Olmos, Northrop Grumman Corporation, San Bernardino, CA		
1300 hrs AIAA-Defense2017-9087 <b>US Navy Laser Weapons system Demonstration (LWSD)</b> R. Flatley, Office of Naval Research, Arlington, VA	1330 hrs AIAA-Defense2017-9049 <b>Parametric Characterization of Hypersonic Glide Vehicles</b> M. McLaughlin, Lincoln Laboratory, Massachusetts Institute of Technology, Lexington, MA	1400 hrs AIAA-Defense2017-9050 <b>Measurements in the LENS Hypervelocity Ground Test Facilities for Comparisons with Flight Test Data and Numerical Prediction and Design Tools</b> M. Holden, CUBRC, Buffalo, NY		
1300 hrs AIAA-Defense2017-9043 <b>Ground Tests to Evaluate High Temperature Flow Effects on Vehicle Controls at Reentry Conditions</b> T. Wadhams, CUBRC, Buffalo, NY	1330 hrs AIAA-Defense2017-9044 <b>SMDC Selected RAM Lethality Data</b> J. Willis, Modern Technology Solutions, Inc., Huntsville, AL; S. Patterson, Army Aviation and Missile Research Development and Engineering Center, Redstone Arsenal, AL; C. Lamar, Army Space and Missile Defense Command, Redstone Arsenal, AL	1400 hrs AIAA-Defense2017-9045 <b>Creating a Novel Phased Array Radar Technology Testbed for the Nation</b> B. Baker, MIT Lincoln Laboratory, Lexington, MA	1430 hrs AIAA-Defense2017-9046 <b>Measurements in the LENS I and XX Ground Test Facilities to Evaluate the Boundary Layer Transition Characteristics of the Air Force CSM Configuration in Hypervelocity Flows</b> T. Wadhams, CUBRC, Buffalo, NY	

<b>Wednesday, 26 April 2017</b>		<b>Weapon Systems Effectiveness Test and Evaluation II</b>		<b>Room 5/6</b>
Chaired by: P. DUNN, Weidinger Associates Inc. and R. ADDIS, Lawrence Livermore National Laboratory				
1300 hrs AIAA-Defense2017-9057 <b>Shadow UAV Wind Tunnel Testing</b> Z. Hall, M. McDaniel, A. Owens, Army Aviation and Missile Research Development and Engineering Center, Redstone Arsenal, AL	1330 hrs AIAA-Defense2017-9058 <b>Post-Flight HIFIRE-1 Ground Tests at Matching Freestream Conditions with Freestream Fluctuation Measurements for Hypersonic Flight Boundary Layer Transition Prediction</b> T. Wadhams, CUBRC, Buffalo, NY	1400 hrs AIAA-Defense2017-9059 <b>Development of a Sub-Millisecond Response Balance for Direct 6DOF Measurements on the Air Force CSM Configuration</b> Z. Carr, CUBRC, Buffalo, NY	1430 hrs AIAA-Defense2017-9061 <b>Low Cost Testing of Detection, Tracking and Terminal Guidance Components</b> B. Schmid, Army Aviation and Missile Research Development and Engineering Center, Redstone Arsenal, AL; N. Kumar, Invariant Corporation, Huntsville, AL; M. Crooks, NTA, Inc., Huntsville, AL; P. Knox, Army Aviation and Missile Research Development and Engineering Center, Redstone Arsenal, AL; S. White, Kard Technologies, Huntsville, AL; J. Sells, Army Aviation and Missile Research Development and Engineering Center, Redstone Arsenal, AL; et al.	
<b>Thursday</b>				
<b>Thursday, 27 April 2017</b>		<b>Computing Systems and Cybersecurity</b>		<b>Room 3/4</b>
Chaired by: A. CASH, People Tec				
0800 hrs AIAA-Defense2017-9062 <b>The DOVER Inherently Secure Computing Architecture</b> J. Rosenberg, C. Lockett, Draper Laboratory, Cambridge, MA	0830 hrs AIAA-Defense2017-9063 <b>Applied System Cyber Awareness on Weapon Platforms</b> T. Altrich, K. Auwae, The Boeing Company, Huntington Beach, CA	0900 hrs AIAA-Defense2017-9064 <b>Measuring Security in the Secure Computing Architecture (SCA)</b> K. Adams, Naval Surface Warfare Center, Dahlgren, VA	0930 hrs AIAA-Defense2017-9065 <b>Methods for Detecting Static and Dynamic Computer Malware</b> R. Pedersen, Lockheed Martin Corporation, Moorestown, NJ	
<b>Thursday, 27 April 2017</b>		<b>Estimation, Guidance, Navigation and Control</b>		<b>Room 5/6</b>
Chaired by: K. PHILLIPS, The Johns Hopkins University Applied Physics Laboratory				
0800 hrs AIAA-Defense2017-9067 <b>Onboard Trajectory Optimization Hardware Test</b> B. Lapsansky, J. Miller, A. Nicholl, J. Samsack, E. August, M. Patterson, Johns Hopkins University Applied Physics Laboratory, Laurel, MD	0830 hrs AIAA-Defense2017-9068 <b>Hypersonic Vehicle Onboard Trajectory Optimization</b> A. Nicholl, M. Patterson, Johns Hopkins University Applied Physics Laboratory, Laurel, MD	0900 hrs AIAA-Defense2017-9069 <b>LI Adaptive Control Augmentation of a Dynamic Inversion Autopilot for Hypersonic Vehicle Control</b> J. Parish, Sandia National Laboratories, Albuquerque, NM; T. Woodbury, Texas A&M University, College Station, TX; D. Kozlowski, T. Lavin, Sandia National Laboratories, Albuquerque, NM; J. Hurtado, Texas A&M University, College Station, TX	0930 hrs AIAA-Defense2017-9066 <b>Implementation of a High-Fidelity Actuator Model on an FPGA for Real-Time Applications</b> M. Bigelow, D. Kozlowski, S. Kowalchuk, Sandia National Laboratories, Albuquerque, NM	
<b>Thursday, 27 April 2017</b>		<b>Strategic Missiles - Guidance Systems</b>		<b>Auditorium</b>
Chaired by: J. BEAN, ICBM Systems Directorate - Air Force Nuclear Weapon Center and A. EDSALL, Draper Laboratory				
0800 hrs AIAA-Defense2017-9070 <b>The Advantages of Commonality in Strategic Missile Guidance</b> S. Forbes, A. Reinelt, Air Force Research Laboratory, Kirtland AFB, NM	0830 hrs AIAA-Defense2017-9051 <b>Vacuum Field Emission Electronics for Strategic Rad-Hard Systems</b> P. Miraglia, B. McCarragher, Draper Laboratory, Cambridge, MA	0900 hrs AIAA-Defense2017-9073 <b>Radiation Hardened Polarization Maintaining Interferometric Fiber-Optic Gyroscope Technology for Next-Generation Strategic Inertial Guidance</b> S. Forbes, Air Force Research Laboratory, Kirtland AFB, NM	0930 hrs AIAA-Defense2017-9071 <b>GPS Translator Integrated Software/Hardware-in-the-loop Dynamic Simulation for Minuteman III Operational Test Launch</b> M. Camacho, Johns Hopkins University Applied Physics Laboratory, Laurel, MD	

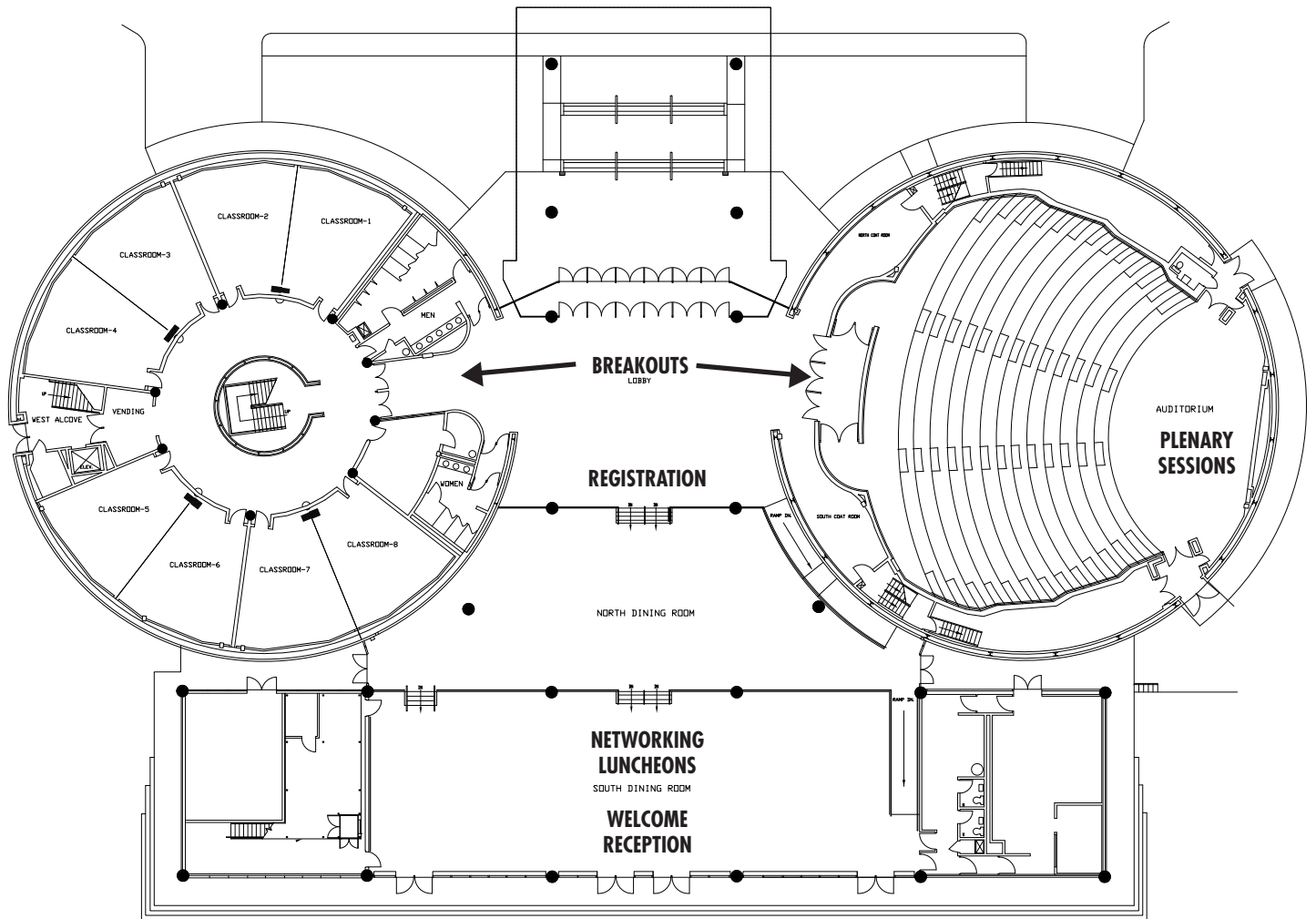


Thursday, 27 April 2017		Acquisition		Auditorium	
24-PLNY-5 1000 - 1130 hrs		<p style="text-align: center;"><b>Lt. Gen. Arnold Bunch</b> Military Deputy Office of the Assistant Secretary of the Air Force for Acquisition</p>			
<b>Thursday, 27 April 2017</b>					
<b>Land-Based Strategic Missiles - RS and RV Modeling and Simulation</b>					
Chaired by: J. BEAN, ICBM Systems Directorate - Air Force Nuclear Weapon Center and T. SHIVANANDA, Northrop Grumman Aerospace Systems					
1230 hrs	1300 hrs	1330 hrs	1400 hrs	1430 hrs	
AIAA-Defense2017-9074 <b>RV Finite Element Model Validation Status</b> D. Hill, E. Leung, C. Rockeeller, K. O'Hara, T. Birzer, Lockheed Martin Corporation, King of Prussia, PA	AIAA-Defense2017-9075 <b>Multidisciplinary Assessment of Shroud Rocket Nozzle Cover Misalignment</b> D. Vracek, J. Daywitz, G. Strickland, K. O'Hara, M. Hamigan, Lockheed Martin Corporation, King of Prussia, PA	AIAA-Defense2017-9076 <b>Method for Missile System Test &amp; Evaluation for Replacement Components</b> D. Hammel, M. Kiester, D. Turner, Lockheed Martin Corporation, King of Prussia, PA	AIAA-Defense2017-9077 <b>Modeling the Effects of Endoatmospheric Hostile Environments on Ballistic Reentry Vehicles</b> D. Leary, J. Duffy, E. Gonsthor, M. Noorani, L. Arrington, Lockheed Martin Corporation, King of Prussia, PA		Auditorium
<b>Thursday, 27 April 2017</b>					
<b>Tactical Missile Systems</b>					
Chaired by: M. FRIEDLANDER, Aerojet Rocketdyne and J. ESSLINGER, AIRDEC					
1230 hrs	1300 hrs	1330 hrs	1400 hrs	1430 hrs	
AIAA-Defense2017-9079 <b>Capabilities of Aerojet Rocketdyne's Aerothermal Test Facility in Virginia for Ramjet and Scramjet Engine Ground Testing</b> C. Rock, T. Smith, Aerojet Rocketdyne, Culpeper, VA	AIAA-Defense2017-9080 <b>Use of an Operational Effectiveness Analysis Simulation Tool to Shape the Development of a Tactical Missile Science and Technology Program</b> D. Flagg, C. Derrick, Army Aviation and Missile Research Development and Engineering Center, Redstone Arsenal, AL	AIAA-Defense2017-9081 <b>Validation of Multi-Physics Code, Velodyne, against Flight Test Data for Lethality and Post Intercept Debris</b> A. Alghoso, D. McCullough, Covid Technologies, Inc., Alexandria, VA; S. Hummel, A. Lloyd, S. Neal, M. Stamps, Covid Technologies, Inc., Mooresville, NC, et al.	AIAA-Defense2017-9082 <b>Towards Consistent Environment Modeling for Missile Defense Agency Simulations</b> M. Vaughn, U.S. Army Aviation and Missile Research, Development and Engineering Center, Huntsville, AL	AIAA-Defense2017-9012 <b>Aero-structural modeling of a Damaged Composite wing</b> A. Owens, Z. Hall, M. Deerman, Army Aviation and Missile Research Development and Engineering Center, Redstone Arsenal, AL; J. Grupp, Dynetics, Inc., Huntsville, AL; J. Jordan, Torch Technologies, Huntsville, AL	Room 3/4

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# DEFENSE



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