



AIAA
Dayton-Cincinnati Section

*AMERICAN INSTITUTE OF
AERONAUTICS AND ASTRONAUTICS
DAYTON-CINCINNATI SECTION*



ONU Student Section
UC Student Section
UK Student Section
AFIT Student Section
Miami Univ. Student Section
UD Student Section
WSU Student Section
U. Illinois Section



Dayton Section
UD Student Section
Miami Univ. Student Section
Cedarville Student Section
WSU Student Section

Wright Brothers
Chapter



Greater Ohio Chapter



Dayton Section



Ohio Valley Section



Human Factors and
Ergonomics Society



Society for the Advancement
of Material and Process



SYMPOSIUM GUIDE

The Forty-First Annual **Dayton-Cincinnati** **Aerospace Sciences Symposium**



*Winning image from 2015
Art-In-Science competition:*

“Kokopelli Vortex”,

Submitted by:

*Muhammad Omar Memon,
University of Dayton*

*Aaron Altman,
University of Dayton*

2 March 2016

**Sinclair Conference Center
Dayton, Ohio**

www.aiaa-daycin.org/dcass

Welcome

to the
41st AIAA Dayton-Cincinnati Aerospace Sciences Symposium
(DCASS)

- - - - -

For over four decades, the AIAA Dayton-Cincinnati Aerospace Sciences Symposium has provided a unique venue for technical interchange with members of our regional aerospace community. The symposium showcases cutting-edge research with a one-day program that includes technical presentations across multiple areas of aerospace science and technology.

This year's program includes over 160 technical presentations in both morning and afternoon sessions. Our invited keynote speaker is Lt Col Tucker "Cinco" Hamilton, Experimental Fighter Test Pilot, USAF. This year's keynote presentation is entitled "Making a Difference at Mach 2."

This event has been organized by a group of dedicated volunteers who team throughout the year to make this meeting a success. This meeting would not be possible without their sustained effort. We thank the local leaders supporting DCASS as general co-chairs, and our co-sponsoring professional societies listed within this program. This meeting is also made possible by our corporate and educational sponsors shown on the back of this program. We thank them for their generous support.

Finally, we encourage folks to submit their votes for best art-in-science submissions. The best presentation and best art-in-science award winners will be recognized at the annual Dayton-Cincinnati Section Awards Banquet scheduled for May 24, 2016.

We hope you enjoy today's symposium, and we look forward to seeing you again next year!

Ryan Schmit and Markus Rumpfkeil
2016 DCASS Executive Co-Chairs

41st AIAA Dayton-Cincinnati Aerospace Sciences Symposium

Keynote Program

Welcome and Announcements:

Dr. Ryan Schmit

2016 DCASS Executive Chair

Opening Remarks:

Mr. Allen Arrington, Jr.,

Vice President, Standards, AIAA National

Keynote Address:

Making a Difference at Mach 2

Lt Col Tucker "Cinco" Hamilton

Experimental Fighter Test Pilot, USAF



Lt Col Tucker "Cinco" Hamilton started his Air Force career as an operational F-15C pilot. He supported multiple Red Flag Exercises and real world Operation Noble Eagle missions where he protected the President of the United States; at times escorting Air Force One. He then served as an Air Liaison Officer in Germany where he was the director of operations for a key command and control squadron. While serving in Germany he was hand-selected to be the initial cadre for the first MC-12 squadron in Afghanistan; heralding in the Air Force's first tactical Intelligence, Surveillance, and Reconnaissance aircraft. He served as the Chief Instructor for 200+ aircrew and accumulated over 400 combat hours directly supporting ground forces. After his time in the MC-12 he attended the USAF Test Pilot School (TPS) where he flew 30 different aircraft, wrote 38 technical reports, and took part in the first Automatic Air Collision Avoidance System testing.

After TPS graduation he became an F-15C and F-15E Instructor Experimental Test Pilot and the Technical Director for the Operational Flight Program Combined Test Force at Eglin AFB, FL. He was the lead test pilot on 11 test programs; supporting the newest software, systems, and weapons for the 450+ F-15 fleet. He's currently serving as the Developmental Test & Evaluation (DT&E) Lead for the Joint Strike Fighter, F-35; overseeing the entire DT&E effort for the U.S. Air Force, Navy, and Marines. He manages an 18 test-aircraft fleet of specially equipped F-35s across multiple operating locations with a \$3B budget. Cinco has received numerous accolades and awards, the most recent being his recognition by the U.S. Junior Chamber as a Ten Outstanding Young American.

Lt Col Hamilton has a B.S. in Aerospace Engineering from the University of Colorado (2002), an M.S. in Aerospace Engineering from the University of Tennessee (2009), and an M.S. in Flight Test Engineering from the USAF Test Pilot School (2012).

Cinco has been heavily involved with AIAA, currently chairing the K-12 STEM Committee. He also co-chairs both the STEM outreach and the Flight Officer positions in the National Capital Section. Coupled with his AIAA STEM outreach work he started a non-profit STEM outreach organization, STEM-ED, where he connects teachers to STEM volunteers. Cinco currently lives in Virginia with his wife and four young children.



2016 DAYTON-CINCINNATI SECTION AWARDS
CALL FOR NOMINATIONS

Recognize the achievements of your colleagues. The local Awards Banquet, to be held on May 24, 2016 at the Kennedy Union Ballroom, University Of Dayton, is fast approaching. Nominations are sought for several local awards. These include:

Outstanding Technical Contribution - Science Award: Presented to a Dayton-Cincinnati AIAA Section member(s) [limit of 2 people] to recognize a significant scientific achievement during the past year.

Outstanding Technical Contribution - Application Award: Presented to a Dayton-Cincinnati AIAA Section member(s) [limit of 2 people] to recognize a significant development or application achievement during the past year.

Outstanding Management Contribution Award: Presented to a Dayton-Cincinnati AIAA Section member(s) [limit of 2 people] for outstanding management contributions made during the past year.

There is no specific format required. Simply complete the attached form and E-mail the information. Award selections will be made by an expert panel of judges. Submit nominations (by E-mail) by 22 April 2016 to:

Dr. Marc Polanka

Tel: (937) 255-3636 x4714

E-mail: marc.polanka@afit.edu

NOMINATION FORM
(Nomination Package Must be Limited to 2 Pages)

CATEGORY:

Nominee:

Affiliation:

Address:

Tel:

E-mail:

Nominator:

Affiliation:

Address:

Tel:

E-mail:

Symposium Schedule At-A-Glance

Registration 7:00 AM – 2:00 PM

Corporate Exhibits 9:00 AM – 4:00 PM

Art in Science Competition 9:00 AM – 4:55 PM

First Block 8:10 AM – 9:30 AM

1 Combustion I	Room 116
2 Uncertainty Quantification	Room 119
3 Materials I	Room 120
4 Fluid Dynamics I	Room 127
5 CFD Applications I	Room 131
6 Imaging & Diagnostics I	Room 133
7 Experimental Applications I	Room 164
Empty	Room 165
8 Hypersonic Aerospace Systems I	Room 171
9 Aircraft Design	Room 262
10 Space I	Room 282

Second Block 9:45 AM – 11:05 AM

11 Combustion II	Room 116
12 Structures	Room 119
13 Materials II	Room 120
14 Fluid Dynamics II	Room 127
15 CFD Applications II	Room 131
16 Imaging & Diagnostics II	Room 133
17 Experimental Applications II	Room 164
18 AFRL Research Collaboration Opportunities & Univ. Relations	Room 165
19 Hypersonic Aerospace Systems II	Room 171
20 Flight Dynamics	Room 262
21 Space Propulsion (Space II)	Room 282

Keynote Program in Frederick C. Smith Auditorium (Room 150) 11:20 AM – 12:30 PM

Lunch in Great Hall 12:30 PM – 1:40 PM

Third Block 1:40 PM – 3:20 PM

22 Combustion III	Room 116
23 Turbomachinery	Room 119
24 Materials III	Room 120
25 Fluid Dynamics III	Room 127
26 CFD Applications III	Room 131
27 CFD Methods	Room 133
28 Optimization	Room 164
29 Heat Transfer	Room 165
30 HIFiRE	Room 171
31 Flow Control	Room 262
32 Space III	Room 282

Fourth Block 3:35 PM – 4:55 PM

33 Combustion IV	Room 116
34 Facilities	Room 119
35 Materials and Fuels	Room 120
36 Fluid Dynamics IV	Room 127
37 CFD Applications IV	Room 131
38 AIAA Governance Changes	Room 133
Empty	Room 164
Empty	Room 165
39 Hypersonic Aerospace Systems III	Room 171
40 Space Attitude Dynamics(Space V)	Room 262
41 Space IV	Room 282

The abstracts for the talks presented today may be found on the AIAA Dayton-Cincinnati Section website: www.aiaa-daycin.org/dcass. The Executive Committee encourages the use of this website. The abstracts can be located under the "Attending" menu at the top of the Aerospace Sciences Symposium website.

Awards Information: The Dayton-Cincinnati Section of the AIAA is proud to continue its long-standing tradition of recognizing the best work presented at this symposium, as judged by the Session Chairs. This year, awards will be made in the following technical categories:

Category	Sessions	Category	Sessions
Space	10,32,41	CFD, UQ, and Optimization Methods	2,27,28
Materials and Fuels	3,13,24,35	Imaging & Diagnostics	6,16
Fluid Dynamics	4,14,25,36	Experimental Applications & Structures	7,12,17
Combustion	1,11,22,33	Aircraft Design and Flight Dynamics	9,20,40
CFD Applications	5,15,26,37	Propulsion and Heat Transfer	21,23,29
Hypersonics	8,19,30,39	Flow Control and Facilities	31,34

Session Chairs will provide scores based on the quality of the abstract, innovation and magnitude of effort, technical contribution, and presentation style. One winner will be selected for each technical category, and the presenters will be invited to the AIAA Annual Awards Banquet (free ticket!) to receive their awards!



Room	116	119	120	127	131
	SESSION 1 Combustion I	SESSION 2 Uncertainty Quantification	SESSION 3 Materials I	SESSION 4 Fluid Dynamics I	SESSION 5 CFD Applications I
Time	Chair: Marc Polanka AFIT	Chair: Markus Rumpfkeil UD	Chair: Chad Hale AFIT	Chair: Sidaard Gunasekaran UD	Chair: Donald Rizzetta AFRL
8:10	41DCASS-072 Numerical Study to Discern Influence of High Density Gradients on Turbulent Partially-Premixed Combustion Andrew Cottle - AFIT Marc D. Polanka - AFIT	41DCASS-006 Multi-Fidelity Surrogate Modeling for Efficient Uncertainty Quantification Markus Rumpfkeil - UD	41DCASS-081 Microstructural Investigation of Dynamically Failed Heat Treated 4130 Steel Luke Wuertemberger - AFIT Dr. Anthony Palazotto - AFIT	41DCASS-028 Particle Image Velocimetry using Solid Phase Carbon Dioxide Particles in Supersonic Flow Paul Gulotta - AFIT Mark F. Reeder - AFIT	41DCASS-165 Exploring Bleed Over a Supersonic Flat Plate Dayle Chang - AFRL
8:30	41DCASS-073 Temperature Characterization within a Fully Annular Ultra Compact Combustor due to Changes in the Flow Migration Nicholas Gilbert - AFIT Marc D. Polanka - AFIT Andrew E. Cottle - AFIT Larry P. Goss - ISSI	41DCASS-071 Improved Neumann Expansion Method for Stochastic Finite Element Analysis Ha-Rok Bae - WSU	41DCASS-121 High Temperature Transient Creep Analysis of Metals Sara Mirmasoudi - WSU Dr. Anthony Palazotto - AFIT Dr. Mitch Wolff - WSU	41DCASS-027 Boundary Layer Stability Analysis for Stetson's Mach 6 Blunt Cone Experiments Joseph Jewell - NRC Roger Kimmel - AFRL	41DCASS-070 Computational Fluid Dynamic Analysis of a Low Bypass Turbofan Serpentine Exhaust Nozzle Michael Anstaett - AFIT Maj Darrel Crowe, PhD - AFIT
8:50	41DCASS-103 Design and Experimentation of a Premixed Rotating Detonation Engine Ionio Andrus - AFIT Marc D. Polanka - AFIT Paul I. King - AFIT John L. Hoke - ISSI Fred R. Schauer - AFRL	41DCASS-137 Current Practices and Research in Reliability Analysis of NDE Systems Matthew Cherry - AFRL Eric Lindgren - AFRL Ramana Grandhi - WSU	41DCASS-009 Growth rate, acid functionalization, and polymer intercalation mechanisms in carbon nanotube sheet electrical behavior Jacob Singleton - AFIT Heath Misak - AFIT Shankar Mall - AFIT	41DCASS-123 Boundary Condition Effects on Supersonic Rectangular Cavities Ryan Schmit - AFRL Rudy Johnson - AFRL James Grove - AFRL	41DCASS-167 Computational Fluid Dynamics Analysis of Secondary Flows in Low Pressure Turbines Jacob Sharpe - WSU Mitch Wolff - WSU Rolf Sondergaard - AFRL
9:10		41DCASS-106 Multi-Objective Uncertainty Quantification via Stochastic Localized-Optimized Covariance Kriging Daniel Clark - WSU Ha-Rok Bae - WSU	41DCASS-136 Creep of Hi-Nicalon™ S Ceramic Fiber Tows at 700°C in Air and in Silicic Acid-Saturated Steam Matthew Piper - AFIT Marina B. Ruggles-Wrenn - AFIT	41DCASS-023 Unsteady Blade Loading of a Fan Stage in an Inlet Distortion Flow Dan Reilly - WSU Dr. David Johnston - AFRL Dr. Mitch Wolff - WSU	
9:30	Break				

Affiliation Abbreviations

ABDA - Aerospace Business Development Associates Inc.
AFIT - Air Force Institute of Technology
AFLCM - Air Force Life Cycle Management Center
AFRL - Air Force Research Laboratory
ARSI - Aerospace Research Systems Inc
CCH - Cincinnati Childrens Hospital
CDU - Cedarville University

GHI - GoHypersonic Inc.
ISSI - Innovative Scientific Solutions Inc.
MVH - Miami Valley Hospital
NIOSH - National Institute for Occupational Safety & Health
NRC - National Research Council
NRL - Naval Research Laboratory
OAI - Ohio Aerospace Institute

41st Dayton-Cincinnati Aerospace Sciences Symposium

133	164	165	171	262	282	Room
SESSION 6 Imaging & Diagnostics I Chair: Lance Chenault <i>ABDA</i>	SESSION 7 Experimental Applications I Chair: Richard Cobb <i>AFIT</i>		SESSION 8 Hypersonic Aerospace Systems I Chair: Nicholas Bisek <i>AFRL</i>	SESSION 9 Aircraft Design Chair: Anthony Deluca <i>AFIT</i>	SESSION 10 Space I Chair: Joshua Hess <i>AFIT</i>	Time
41DCASS-102 Saturation of Electronic-Resonance-Enhanced-CARS with ns to fs excitation <i>Anil Patnaik - SE</i> <i>Sukesh Roy - SE</i> <i>James R. Gord - AFRL</i>	41DCASS-029 Force and Moment Measurements Applicable to a Flexible Weapons System <i>James Sellers - AFIT</i> <i>Dr. Mark Reeder - AFIT</i> <i>Dr. Richard Cobb - AFIT</i>		41DCASS-015 Calculation of Base State for Transition Prediction on Cones at Angle of Attack <i>Matthew Tufts - OAI</i> <i>Roger Kimmel - AFRL</i>	41DCASS-016 Effectiveness Based Design of a Tactical Tanker Aircraft <i>Andrew Petry - AFIT</i> <i>Anthony M. DeLuca - AFIT</i> <i>Edward J. Alyanak - AFRL</i>	41DCASS-044 Development of a Modularized Software Architecture to Enhance SSA with COTS Telescopes <i>Julian McCafferty - AFIT</i>	8:10
41DCASS-139 Simultaneous Single-Shot Thermometry and Minor-Species Detection via Femtosecond Fully Resonant Electronically Enhanced CARS (FREE-CARS) <i>Hans Stauffer - SE</i> <i>Jacob B. Schmidt - SE</i> <i>Sukesh Roy - SE</i> <i>Paul J. Wrzesinski - AFRL</i> <i>James R. Gord - AFRL</i>	41DCASS-138 Methods of Modeling and Environmental Test of Lithium-Ion Battery Modules in CubeSat <i>James Liu - AFIT</i>		41DCASS-011 Probabilistic Modeling of Hypersonic Flows for Gas Radiation Analysis in Remote Sensing Applications <i>Jonathan Burt - OAI</i> <i>Eswar Josyula - AFRL</i>	41DCASS-068 Framework for Multidisciplinary Sensitivity Analysis <i>Richard Snyder - AFRL</i>	41DCASS-077 Predicting Spectral Signature Intensities of Satellite Hall Effect Thruster Plumes using Small Telescopes <i>Pamela Wheeler - AFIT</i>	8:30
41DCASS-144 100 kHz Temperature Measurements in a Hydrogen-Air Rotating Detonation Engine using a Fiber-Coupled Tunable Laser System <i>Keith Rein - SE</i> <i>Sukesh Roy - SE</i> <i>Andrew Caswell - AFRL</i> <i>Frederic Schauer - AFRL</i> <i>James Gord - AFRL</i>	41DCASS-127 Effect of Surface Roughness of Electron Beam Melting Ti-6Al-4v on Ultrasonic Testing <i>Evan Hanks - AFIT</i> <i>David Liu - AFIT</i> <i>Anthony Palazotto - AFIT</i>		41DCASS-020 AFRL Ludwig Tube Initial Performance <i>Matthew Borg - AFRL</i> <i>Roger Kimmel - AFRL</i> <i>Joseph Jewell - NRC</i> <i>Brian Lam - SE</i>	41DCASS-013 Varying Reynolds Number of Biomimetic Flapping Wing By Changing Air Density and Wing Length <i>Daniel Hope - AFIT</i> <i>Dr. Anthony M. Deluca, Lt Col, USAF - AFIT</i> <i>Dr. Ryan P. OHara, Maj, USAF - AFIT</i>	41DCASS-118 Orbital Resonances in the Vinti Solution <i>Laura Duffy - AFIT</i>	8:50
41DCASS-099 Orifice Entrainment Velocity Characterization during a Ballistically Induced Hydrodynamic Ram Event <i>Andrew Lingenfelter - AFIT</i> <i>David Liu - AFLCM</i>			41DCASS-083 Development of High-Speed Schlieren System for the New AFRL Mach-6 Ludwig Tube Hypersonic Wind Tunnel <i>King Yiu Lam - SE</i> <i>Joseph S. Jewell - NRC</i> <i>Benjamin Hagen - AFRL</i> <i>Roger L. Kimmel - AFRL</i>	41DCASS-019 Aerial Re-Charging Station for Semi/Fully Autonomous, Lighter Than Air UAVs <i>Gaurang Gupta - UC</i> <i>Will Tekulve - UC</i> <i>Kyle Wilson - UC</i> <i>Kelly Cohen - UC</i>	41DCASS-183 Low Latency Weather Data from a CubeSat Constellation <i>Craig Pakish - AFIT</i>	9:10
Break						9:30

OSU - The Ohio State University
 PU - Purdue University
 SE - Spectral Energies LLC
 SRIL - Stanford Research Institute International
 UC - University of Cincinnati
 UD - University of Dayton
 UDRI - University of Dayton Research Institute

UIO - University of Iowa
 UIUC - University of Illinois at Urbana-Champaign
 UKY - University of Kentucky
 UL - University of Louisville
 UTCAS - UTC Aerospace Systems
 UTK - University of Tennessee-Knoxville
 WSU - Wright State University

Room	116	119	120	127	131
	SESSION 11 Combustion II	SESSION 12 Structures	SESSION 13 Materials II	SESSION 14 Fluid Dynamics II	SESSION 15 CFD Applications II
Time	Chair: Brent Rankin AFRL	Chair: Harry Hilton UIUC	Chair: Anthony Palazotto AFIT	Chair: Ha-Rok Bae WSU	Chair: Mark Turner UC
9:45	<i>41DCASS-150</i> High-speed laser-based tomographic measurements for combustion applications <i>Benjamin Halls - NRC</i> <i>James R. Gord - AFRL</i> <i>Naibo Jiang - SE</i> <i>Daniel J. Thul - SE</i> Mikhail N. Slipchenko - SE Sukesh Roy - SE Terrence R. Meyer - PU	<i>41DCASS-008</i> Nonlinear Elastic and Viscoelastic 1-D Wave Propagation Modelling and Analysis <i>Harry H. Hilton - UIUC</i>	<i>41DCASS-049</i> Development of A Unified Solver for Coupled Fluid, Porous, and Material Response Problems <i>Haoyue Weng - UKY</i> <i>Huaibao Zhang - UKY</i> <i>Alexandre Martin - UKY</i>	<i>41DCASS-046</i> Flight Tests Conducted to Analyze a Store Experiencing Cavity Flow <i>Mark Reeder - AFIT</i> <i>Zachary Probst - AFIT</i> <i>Jim Grove - AFRL</i> <i>Rudy Johnson - AFRL</i>	<i>41DCASS-079</i> Evaluating the influence of vessel elasticity on hemodynamic variables in healthy and diseased aortae <i>Dhananjay Subramaniam - UC</i> <i>Dr. Ephraim J. Gutmark - UC</i> <i>Dr. Goutham Mylavarapu - CCH</i> <i>Dr. Iris Gutmark-Little - CCH</i>
10:05	<i>41DCASS-093</i> Investigation of a novel fuel injector for a dry low NOx combustor <i>Mahmoud Hamza - UC</i> <i>Umesh Bhayaraju - UC</i> <i>San-Mou Jeng - UC</i>	<i>41DCASS-061</i> Delamination prediction of uni-directional composite laminates using shell elements and a strain rate dependent micro-mechanical material model SANDEEP MEDIKONDA - UC <i>Ala Tabiei - UC</i>	<i>41DCASS-059</i> Development of a multi-species material response code <i>Ali Omidy - UKY</i> <i>Haoyue Weng - UKY</i> <i>Alexandre Martin - UKY</i>	<i>41DCASS-088</i> Roll Control Evaluation of the X-56A Flying Wing Aircraft Using Active Camber Control Compared to Conventional Ailerons Using Vortex Lattice Theory <i>Eric Yerly - AFIT</i> <i>Anthony M. DeLuca - AFIT</i> <i>James J. Joo - AFRL</i>	<i>41DCASS-010</i> The influence of the normal vascular aging and early vascular aging on hemodynamic characteristics in the circle of Willis <i>Hongtao Yu - WSU</i> <i>George P. Huang - WSU</i> <i>Zifeng Yang - WSU</i> <i>Fuyou Liang - Other</i> <i>Bryan Ludwig - MVH</i>
10:25	<i>41DCASS-143</i> Experimental Analysis of a Lean Direct Injection Combustor Concept <i>Abdelallah Ahmed - UC</i> <i>Jacob Haseman - UC</i>	<i>41DCASS-115</i> Topology Optimization of a Penetrating Warhead <i>William Graves - AFIT</i> <i>David Liu - AFIT</i> <i>Anthony N. Palazotto - AFIT</i>	<i>41DCASS-141</i> Fatigue behavior of an advanced SiC/SiC ceramic composite at 1300°C in air and in steam <i>Michael Lee - AFIT</i> <i>Marina B. Ruggles-Wrenn - AFIT</i>	<i>41DCASS-097</i> Near Surface Flow Structure with Blowing <i>Colby Borchetta - UKY</i> <i>Alexandre Martin - UKY</i> <i>Sean C.C. Bailey - UKY</i>	<i>41DCASS-066</i> Numerical Investigation of Aerodynamic Effects of a Micro Particle on a Sand Pile in a Laminar Fully Developed Flow <i>Nithin Kumar Palakurthi - UC</i> <i>Leonid A Turkevich - NIOSH</i> <i>Urmila Ghia - UC</i>
10:45	<i>41DCASS-100</i> Continued Investigation of a Rotating Detonation Engine Using Ethylene-Air Mixtures <i>Jarred Wilhite - UC</i> <i>Robert Driscoll - UC</i> <i>Andrew St. George - UC</i> <i>Vijay Anand - UC</i> <i>Ephraim J. Gutmark - UC</i>	<i>41DCASS-084</i> Vibrational Analysis of 12U Chassis <i>Daniel Miller - AFIT</i>	<i>41DCASS-098</i> The virtual crack closure-integral technique implemented in CS-FEM for fracture mechanics problems <i>Wei Zeng - UC</i> <i>Guirong Liu - UC</i>	<i>41DCASS-149</i> Noninvasive nitrogen velocimetry techniques with ultrafast lasers <i>Naibo Jiang - SE</i> <i>Daniel R. Richardson - SE</i> <i>Jason G. Mance - SE</i> <i>Hans U. Stauffer - SE</i> <i>Sukesh Roy - SE</i> <i>Benjamin R. Halls - AFRL</i> <i>James R. Gord - AFRL</i>	<i>41DCASS-158</i> A Simulation Tool for Aiding Qualification of Additively Manufactured Parts <i>Tim Vincent - UD</i>
11:05	Break				
11:20	Room 150 - Frederick Smith Auditorium Welcome & Announcements Dr. Ryan Schmit, 41 st DCASS General Chair Opening Remarks Mr. Allen Arrington, Jr., Vice President, Standards, AIAA National				
12:30	Lunch				

133	164	165	171	262	282	Room
SESSION 16 Imaging and Diagnostics II Chair: Anil Patnaik <i>SE</i>	SESSION 17 Experimental Applications II Chair: Aaron Altman <i>UD</i>	SESSION 18 Research Collaboration Opportunities and University Relations at AFRL Chair: Jose Camberos <i>AFRL</i>	SESSION 19 Hypersonic Aerospace Systems II Chair: James Rutledge <i>AFIT</i>	SESSION 20 Flight Dynamics Chair: Donald Kunz <i>AFIT</i>	SESSION 21 Space Propulsion (Space II) Chair: Carl Hartsfield <i>AFIT</i>	Time
41DCASS-050 Internal Combustion Engine In-Cylinder Gas Temperature Measurements Using Fourier Transform Infrared Spectroscopy <i>Matthew Deutsch - AFIT Marc D. Polanka - AFIT Joseph K. Ausserer - AFIT Paul J. Litke - AFRL Andrew W. Caswell - AFRL Keith D. Grinstead, Jr. - UDRI Keith D. Rein - SE</i>	41DCASS-132 SIERRA Project <i>Jeffrey Bennett - ARSI Dr. Kelly Cohen - UC</i>	Opportunities for collaboration with AFRL will be presented, from the perspective of academic funding needs for faculty, fellowship and scholarship opportunities for students, and on-site visiting scholar programs across many levels.	41DCASS-007 Aerodynamic Database Generation for a Hypersonic Vehicle using Variable-Fidelity Kriging and Control Elevon Deflection as an Independent Variable <i>James Tancred - UD Markus Rumpfkeil - UD</i>	41DCASS-033 Evaluation of UAV Flying Qualities using JSBSim <i>Joshua Kim - AFIT Dr. Donald Kunz - AFIT</i>	41DCASS-026 Performance Testing of Various Nozzle Designs for Water Electrolysis Thruster <i>Yuen Jing Liu - AFIT David Liu - AFIT Carl Hartsfield - AFIT</i>	9:45
41DCASS-175 High-Speed, Burst-Mode PIV for Space-Time Correlations in Turbulent Jets <i>Joseph Miller - AFRL James R. Gord - AFRL Naibo Jiang - SE Sukesh Roy - SE Terrence R. Meyer - PU</i>	41DCASS-087 Acoustic Field of a Rectangular Supersonic Jet Exhausting Over a Flat Surface <i>Pablo Mora - UC Florian Baier - UC Ephraim Gutmark - UC Kailas Kailasanath - NRL</i>		41DCASS-014 Hypersonic Experimental Aero-thermal Capability Study through Multilevel Fidelity Computational Fluid Dynamics <i>Denton Sagerman - UD Barry Hellman - AFRL James Tancred - AFRL Markus Rumpfkeil - UD</i>	41DCASS-043 Developing UAV Flying Qualities Requirements Using JSBSim Physics-Based Modeling <i>Nicholas Higgins - AFIT Donald L. Kunz - AFIT</i>	41DCASS-048 Empirical Determination of Performance Characteristics for 1cm Micro Radio-Frequency Ion Propulsion System <i>Connor Muilenburg - AFIT David Liu - AFIT Carl Hartsfield - AFIT</i>	10:05
41DCASS-122 Time resolved tomographic PIV measurements in a K-9 larynx <i>Alexandra Maddox - UC Ephraim Gutmark - UC Liran Oren - UC</i>	41DCASS-129 Impact of Scale on the Acoustics from a Conical C-D Nozzle Interacting with a Flat Surface <i>Florian Baier - UC Pablo Mora - UC Ephraim Gutmark - UC Kazhikathra Kailasanath - NRL</i>		41DCASS-035 Development and Verification of Thermo-Mechanical Solver in Re-entry Ablation Problem <i>RUI FU - UKY Jonathan F. Wenk - UKY Alexandre Martin - UKY</i>	41DCASS-179 Preliminary Investigation of Formation Flying Uncertainty Metrics <i>Rick Graves - OAI</i>	41DCASS-110 Time-Resolved Measurement of Plasma Characteristics in a Hall Thruster Plume <i>David Cunningham - AFIT</i>	10:25
41DCASS-153 Laser-Induced Breakdown Spectroscopy for Fuel/Air Ratio Measurements in High-pressure Hydrocarbon Flames <i>Paul Hsu - SE Naibo Jiang - SE Jason Mance - SE Mikhail Slipchenko - SE Sukesh Roy - SE Yue Wu - UTK Mark Gragston - UTK</i>			41DCASS-147 Rapid Design Cycles with Path Dependent Hypersonic Loads <i>Zach Gaston - GHI Adam Culler - GHI Lance Jacobsen - GHI</i>	41DCASS-191 Analysis of a Near Real-Time Optimal Attitude Control for Satellite Simulators <i>Ryan Patrick - AFIT</i>	41DCASS-131 Design of an Inertial Electrostatic Confinement Plasma Generator <i>Troy D. Soileau, Jr. - UKY Connor Johnstone - UKY Kenneth Freeman - UKY Joshua Little - UKY Kody Grilz - UKY Brett Emerson - UKY Michael Winter - UKY</i>	10:45
Break						11:05
Room 150 - Frederick Smith Auditorium Keynote Address Making a difference at Mach 2 Lt Col Tucker "Cinco" Hamilton, Experimental Fighter Test Pilot, USAF						11:20
Lunch						12:30

Room	116	119	120	127	131
	SESSION 22 Combustion III Chair: Joshua S. Heyne UD	SESSION 23 Turbomachinery Chair: Michael List AFRL	SESSION 24 Materials III Chair: Marina Ruggles-Wrenn AFIT	SESSION 25 Fluid Dynamics III Chair: Richard Snyder AFRL	SESSION 26 CFD Applications III Chair: Jose Camberos AFRL
Time					
13:40	41DCASS-117 Hollow Rotating Detonation Combustor Operation with Ethylene-Air Mixtures Vijay Anand - UC Andrew St. George - UC Ephraim Gutmark - UC	41DCASS-017 Exploration Vorticity Dynamics Method for Advanced Axial Fan / Compressor Aerodynamic Design and Flow Mechanism Analysis Huanlong Chen - UC Mark G. Turner - UC	41DCASS-040 Microstructural Characterization and Process Mapping in Beam-Based Additive Manufacturing of IN625 Luke Sheridan - WSU Dr. Nathan Klingbeil - WSU Dr. Joy Gockel - WSU Nathan Levkulich - WSU	41DCASS-031 Unsteady Evolution of the Tip Vortex on Stationary and Oscillating NACA0012 Wings Daniel Garmann - AFRL	41DCASS-005 Variable-Fidelity Surrogate Modeling and Optimization of Vehicle Aerodynamic Performance Dean Bryson - UD Markus Rumpfkeil - UD
14:00	41DCASS-142 The Effect of Cheverons on the Primary Swirler on the Combustion Dynamics Using a Counter-Rotating Radial-Radial Swirler Sheng-Chieh Lin - UC Xionghui Wang - UC Wessam Estefanos - UC San-Mou Jeng - UC	41DCASS-024 Investigation of Secondary Loss Production Mechanisms Through a Low Pressure Turbine Cascade Philip Bear - WSU Mitch Wolff - WSU Christopher Marks - AFRL Rolf Sondergaard - AFRL	41DCASS-041 Microstructural Characterization and Process Mapping in Beam-Based Additive Manufacturing of IN718 Luke Sheridan - WSU Nathan Levkulich - WSU Dr. Nathan Klingbeil - WSU Dr. Joy Gockel - WSU	41DCASS-053 Self-Sustained Aeroelastic Oscillations of an Airfoil at Transitional Reynolds Numbers Caleb Barnes - AFRL Miguel Visbal - AFRL	41DCASS-162 A Combined Virtual Boundary and Level-Set Method for Continuum Aeroelastic Sensitivity Analysis Koorosh Gobal - WSU Dr. Ramana V. Grandhi - WSU
14:20	41DCASS-155 Characterization of a Methane-Air Microflame with Seed Particles Zhaojin Diao - UKY Michael Winter - UKY	41DCASS-045 Demonstration of Modeling and Optimization Capability for Cavity Flows in an Axial Compressor Syed Moez Hussain Mahmood - UC Mark G. Turner - UC	41DCASS-047 Feasibility of Attaining Fully Equiaxed Microstructure through Process Parameter Control in Additive Manufacturing of Ti-6Al-4V Sarah Kuntz - WSU Dr. Nathan Klingbeil - WSU	41DCASS-120 Evolution of wing-tip vortex structure in turbulence Hari Ghimire - UKY Sean C.C. Bailey - UKY	41DCASS-178 Detached-Eddy Simulations of Supersonic Weapons Bay Dynamics Rick Graves - OAI Ryan Schmit - AFRL Rudy Johnson - AFRL Charles Tyler - AFRL
14:40	41DCASS-160 Modeling of Chemiluminescent Species in Hydrogen-Air and Methane-Air Flames Siamak Mahmoudi - UKY José Graña-Otero - UKY	41DCASS-171 Unsteady Flow Physics in the Trailing Edge Region of a Transonic Turbine Cascade Natalia Posada - WSU Dr. John Clark - AFRL Dr. Andrew Lethander - AFRL Dr. Mitch Wolff - WSU	41DCASS-055 Tailoring Process Parameters to Achieve High Density in Laser Powder Bed Additive Manufacturing of Ti-6Al-4V Components Nathan Levkulich - WSU Dr. Greg Loughnane - WSU Dr. Nathan Klingbeil - WSU Dr. Joy Gockel - WSU Luke Sheridan - WSU	41DCASS-080 Wingtip Vortex Behavior in the Vicinity of the Maximum Lift to Drag Ratio Lift Condition Muhammad Omar Memon - UD Aaron Altman - UD	41DCASS-125 A general permeability model for incompressible flow through porous media Tingting Tang - UKY J. M. McDonough - UKY
15:00	41DCASS-146 A study of the relation between unsteady fuel-air mixing and NOx emissions from lean premixed combustion Wessam Estefanos - UC San-Mou Jeng - UC	41DCASS-056 T-Blade3: A Simple and Robust Blade Design Tool for Complex Energy Conversion Devices Kiran Siddappaji - UC Dr. Mark G. Turner - UC Dr. Ahmed Nemnem - UC Syed Moez Hussain Mahmood - UC	41DCASS-124 Effects of Additive Manufacturing Methods on the Dynamic Properties of 15-5PH Stainless Steel Allison Dempsey - AFIT David Liu - AFIT Anthony Palazotto - AFIT Rachel Abrahams - AFRL	41DCASS-130 The Effect of a Locally Oscillating Wall on a Turbulent Boundary Layer Sabah Alhamdi - UKY Sean C.C. Bailey - UKY	41DCASS-169 Creating User-Friendly Masks for Simulink Models Samuel Tilmann - WSU Rory Roberts - WSU Mitch Wolff - WSU
15:20	Break				

133	164	165	171	262	282	Room
SESSION 27 CFD Methods Chair: Yongsheng Lian <i>UL</i>	SESSION 28 Optimization Chair: Jacob Freeman <i>AFIT</i>	SESSION 29 Heat Transfer Chair: David Munday <i>UC</i>	SESSION 30 HIFiRE Chair: Douglas Dolvin <i>AFRL</i>	SESSION 31 Flow Control Chair: Michael OI <i>AFRL</i>	SESSION 32 Space III Chair: Eric Swenson <i>AFIT</i>	Time
41DCASS-030 Multiphase Flow Simulation Using the Moment of Fluid Method <i>Yongsheng Lian - UL</i>	41DCASS-022 Finding Pursuit-Evasion Game Equilibrium Solutions Using Direct Orthogonal Collocation <i>Ryan Carr - AFIT Richard Cobb - AFIT</i>	41DCASS-021 Thermal Modeling of an Aircraft with High Energy Cryogenic Cooled Electronics Using Tip to Tail Modeling and Optimization <i>Sean Nuzum - WSU Adam Donovan - WSU Rory Roberts - WSU Mitch Wolff - WSU</i>	41DCASS-004 High-Fidelity Simulations of the HIFiRE-6 Flow Path <i>Nicholas Bisek - AFRL</i>	41DCASS-002 Control Strategies for a Laminar-Flow Compatible High-Lift Wing Configuration <i>Donald Rizzetta - AFRL Miguel Visbal - AFRL</i>	41DCASS-133 Analysis of Software Defined Radios to Collect GPS Data from Terrestrial Transmitters <i>Jonathan Fullenkamp - AFIT</i>	13:40
41DCASS-037 Turbulent Flow Field Prediction Using Numerical Gradient Data-driven Adaptive k-omega Model <i>Zhiyong Li - UKY Huaibao Zhang - UKY Jesse B. Hoagg - UKY Sean C.C. Bailey - UKY Alexandre Martin - UKY</i>	41DCASS-034 Optimized Cooperative Control for Combat Survivability Using Unmanned Defensive Wingman <i>Jason Torf - AFIT Ryan Carr - AFIT Dr. Richard Cobb - AFIT</i>	41DCASS-074 Scaling Film Cooling Performance from Ambient to Near Engine Temperatures <i>Robert Ashby - AFIT Marc D. Polanka - AFIT James L. Rutledge - AFIT Connor J. Wiese - AFIT</i>	41DCASS-168 Development of the HIFiRE Flight 6 Aerodynamic Database Model <i>Matthew Bartkowicz - GHI Lance Jacobsen - GHI Christian Haag - GHI Zane Nitzkorski - GHI</i>	41DCASS-012 Post-Stall Performance Improvement through Bio-inspired Passive Covert Feathers <i>Aaron Altman - UD Guillaume Allemand - UD</i>	41DCASS-173 Satellite Quantum Key Distribution Modeling Toolkit Development and the Impact of Channel Effects on Satellite-based Raw Key Generation Rates <i>Jonathan Denton - AFIT</i>	14:00
41DCASS-039 A fully-implicit, Giles-type nonreflecting boundary condition in a DG/Chimera turbomachinery solver <i>Nathan Wukie - UC Paul D. Orkwis - UC</i>	41DCASS-105 Multi-Fidelity Design Optimization: Trust Region Centric Low-Fidelity Correction Methodology <i>Christopher Fischer - WSU Ramana V. Grandhi - WSU</i>	41DCASS-113 Comparison of Adiabatic Effectiveness Measurements Obtained from Pressure Sensitive Paint and Infrared Thermography Techniques <i>Connor Wiese - AFIT James L. Rutledge - AFIT Marcus D. Polanka - AFIT Robert W. Ashby - AFIT</i>	41DCASS-163 Development of the HIFiRE Flight 6 Aerodatabase Uncertainty Model <i>Lance Jacobsen - GHI Matt Bartkowicz - GHI Christian Haag - GHI Zane Nitzkorski - GHI</i>	41DCASS-018 Flow Response to Nanosecond Pulse Excitation over a Thin Airfoil <i>Ata Esfahani - OSU Achal Singhal - OSU Mo Samimy - OSU</i>	41DCASS-060 Development of a High Altitude Balloon Educational Program for a Student-Driven Organization <i>Adam Herrmann - UC Tyler Parcell - UC McKenzie Kinzbach - UC Michael Gyurgyak - UC Robert Imhoff - UC</i>	14:20
41DCASS-057 Modeling and Analysis of Permeability in Carbon Fibrous Materials <i>Olivia Schroeder - UKY Francesco Panerai - UKY Jason White - SRII Alexandre Martin - UKY Olivia Schroeder - UKY</i>	41DCASS-134 The Loyal Wingman Optimal Control Problem in a Static Threat Environment <i>Clay Humphreys - AFIT Richard G. Cobb - AFIT David R. Jacques - AFIT Jonah A. Reeger - AFIT</i>	41DCASS-063 Dependence of Film Cooling Effectiveness on 3D Printed Cooling Holes <i>Paul Aghasi - UC Ephraim Gutmark - UC David Munday - UC</i>	41DCASS-076 Simultaneous Infrared and Pressure Measurements of Crossflow Instability Modes for HIFiRE-5 <i>Matthew Borg - AFRL Roger L. Kimmel - AFRL</i>	41DCASS-054 Goal-Driven Flow Visualization <i>Christopher Koehler - UTCAS Ryan Durscher - AFRL Philip Beran - AFRL</i>	41DCASS-069 Versatile 3D Optical Measurement System for Satellite Deployables <i>Tyler Dicks - CDU Jordan Bellanti - CDU</i>	14:40
41DCASS-174 Supersonic Corner Flow Predictions using the Quadratic Constitutive Relation <i>Tim Leger - OAI Nicholas Bisek - AFRL</i>	41DCASS-172 A Cellworks Optimization Method for Air Vehicle Design <i>Hao Li - WSU Dr. Ramana Grandhi -</i>	41DCASS-170 Measurement of Spectral, Directional Emittance for Various Materials at Elevated Temperatures <i>Bradley Butler - UKY Robert Bickel - UKY Hai Fu - UKY Dr. Dusan Sekulic - UKY Dr. Michael Winter - UKY</i>	41DCASS-156 HIFiRE-6 Leading Edge Design and Experimental Evaluation <i>Adam Culler - GHI Zach Gaston - GHI Lance Jacobsen - GHI</i>	41DCASS-058 Airfoil Flow Control via Fast-Flap Actuation <i>Michael OI - AFRL Albert Medina - AFRL Kenneth Granlund - AFRL</i>	41DCASS-082 Space Object Self-Tracker On-Board Orbit Determination Analysis <i>Stacie Flamos - AFIT</i>	15:00
Break						15:20

Room	116	119	120	127	131
	SESSION 33 Combustion IV	SESSION 34 Facilities	SESSION 35 Materials and Fuels	SESSION 36 Fluid Dynamics IV	SESSION 37 CFD Applications IV
Time	Chair: David Munday <i>UC</i>	Chair: Carl Tilman <i>AFRL</i>	Chair: Paul Litke <i>AFRL</i>	Chair: Richard Wills <i>AFRL</i>	Chair: Darrell Crowe <i>AFIT</i>
15:35	<i>41DCASS-075</i> Design and Testing of a Low Flow, High-Temperature Can Combustor for a Brayton Cycle Wave Rotor <i>Michael McClearn - AFIT</i> <i>Marc D. Polanka - AFIT</i> <i>Kevin P. Lapp - AFIT</i>	<i>41DCASS-107</i> Design, Development and Validation of UC Film Cooling Research Facility <i>Mouleeswaran</i> <i>Kandampalayam</i> <i>Kandasamy P - UC</i> <i>Ephraim Gutmark - UC</i> <i>David Munday - UC</i>	<i>41DCASS-104</i> Integrated Magnetic Components for RF Applications <i>Sheena Hussaini - WSU</i> <i>Dr. Robert C. Fitch - AFRL</i> <i>Dr. Yan Zhuang - WSU</i>	<i>41DCASS-065</i> Theoretical Analysis of Shrouded Horizontal Axis Wind Turbines <i>Tariq Khamlaj - UD</i> <i>Prof. Markus Rumpfkeil - UD</i>	<i>41DCASS-032</i> Calculation of Water Collection Efficiency of SLDs Using a Multiphase Flow Solver <i>Yisen Guo - UL</i> <i>Yongsheng Lian - Other</i>
15:55	<i>41DCASS-003</i> Alternating Flow Patterns in Multi-Nozzle Combustors <i>Brian Dolan - UC</i> <i>Rodrigo Villalva Gomez - UC</i> <i>Ephraim Gutmark - UC</i>	<i>41DCASS-154</i> Hypersonic Wind Tunnel Ceramic Core Storage Heater Design <i>Adam Katterheinrich - GHI</i> <i>Lance Jacobsen - GHI</i>	<i>41DCASS-085</i> Performance Comparison of Multiple Ionic Liquid Monopropellants Using the Busek BGT-X5 Green Monopropellant Thruster <i>Blake Morgan - AFIT</i> <i>David Liu - AFIT</i> <i>Carl Hartsfield - AFIT</i> <i>Marcus Young - AFRL</i>	<i>41DCASS-151</i> The physics of discharging bottles <i>Miguel Angel Gomez-Lopez - UKY</i> <i>Jose Graña-Otero - UKY</i>	<i>41DCASS-109</i> Sizing the Thermal Protection System on the Kentucky Re-Entry Universal Payload System <i>Troy D. Soileau, Jr. - UKY</i> <i>Justin Cooper - UKY</i> <i>Huaibao Zhang - UKY</i> <i>Haoyue Weng - UKY</i> <i>Alexandre Martin - UKY</i>
16:15	<i>41DCASS-145</i> Experimental study of combustion dynamics of swirl-stabilized liquid-fueled combustion <i>Xionghui Wang - UC</i> <i>Michael Denton - UC</i> <i>San-Mou Jeng - UC</i>	<i>41DCASS-159</i> University of Kentucky Plasma Research Facilities <i>Helmut Koch - UKY</i> <i>Bradley Butler - UKY</i> <i>Dr. Michael Winter - UKY</i>	<i>41DCASS-095</i> Mapping of Fuel Anti-Knock Requirements for Small Remotely Piloted Aircraft Engines <i>Joseph Ausserer - AFIT</i> <i>Marc D. Polanka - AFIT</i> <i>Matthew J. Deutsch - AFIT</i> <i>Paul J. Litke - AFRL</i> <i>Jacob Baranski - ISSI</i>	<i>41DCASS-101</i> Relationship Between The Wingtip Vortex, The Free Shear Layer and Aerodynamic Efficiency <i>Sidaard Gunasekaran - UD</i> <i>Dr. Aaron Altman - UD</i>	<i>41DCASS-180</i> Design and Analysis of a High-Speed Reference Concept <i>Rick Graves - OAI</i> <i>Charles Tyler - AFRL</i> <i>John Benek - AFRL</i>
16:35	<i>41DCASS-094</i> Study of Development of a Novel Phase Airblast Injector for Gas Turbine Combustors <i>Jianing Li - UC</i> <i>Umesh Bhayaraju - UC</i> <i>San-Mou Jeng - UC</i>	<i>41DCASS-092</i> Heat Transfer Analysis of a Heated Pebble Bed System for Rotating Detonation Engine Development <i>Joshua Shepard - AFIT</i> <i>Marc D. Polanka - AFIT</i> <i>Andrew G. Naples - ISSI</i> <i>John L. Hoke - ISSI</i>	<i>41DCASS-177</i> Emissions Studies of Fuel Surrogates Using a Well Stirred Reactor <i>Robert Stachler - UD</i> <i>Dr. Joshua S. Heyne - UD</i> <i>Dr. Scott D. Stouffer - UDRI</i> <i>Dr. Joseph D. Miller - AFRL</i> <i>Dr. W. Mel Roquemore - AFRL</i>	<i>41DCASS-166</i> Acetone PLIF for the Investigation of Mixing in a Non-Premixed Rotating Detonation Engine <i>Chris Fugger - SE</i> <i>Daniel R. Richardson - SE</i> <i>Brent A. Rankin - AFRL</i> <i>Kevin Cho - AFRL</i> <i>Andrew W. Caswell - AFRL</i> <i>James R. Gord - AFRL</i> <i>Frederick R. Schauer - AFRL</i> <i>John L. Hoke - ISSI</i>	<i>41DCASS-096</i> Liquid Fuel Film Cooling: A CFD Analysis with Hydrocarbon Fuel <i>Jacob Bills - AFIT</i> <i>Darrell S. Crowe - AFIT</i> <i>James L. Rutledge - AFIT</i> <i>Edward B. Coy - AFRL</i>
16:55	Adjourn				

Affiliation Abbreviations

ABDA - Aerospace Business Development Associates Inc.
 AFIT - Air Force Institute of Technology
 AFLCM - Air Force Life Cycle Management Center
 AFRL - Air Force Research Laboratory
 ARSI - Aerospace Research Systems Inc
 CCH - Cincinnati Childrens Hospital
 CDU - Cedarville University

GHI - GoHypersonic Inc.
 ISSI - Innovative Scientific Solutions Inc.
 MVH - Miami Valley Hospital
 NIOSH - National Institute for Occupational Safety & Health
 NRC - National Research Council
 NRL - Naval Research Laboratory
 OAI - Ohio Aerospace Institute

133	164	165	171	262	282	Room
SESSION 38 AIAA Governance Changes Chair: Allen Arrington <i>AIAA National</i>			SESSION 37 Hypersonic Aerospace Systems III Chair: Carl Hartsfield <i>AFIT</i>	SESSION 38 Space Attitude Dynamics (Space V) Chair: Eric Swenson <i>AFIT</i>	SESSION 39 Space IV Chair: Richard Cobb <i>AFIT</i>	Time
Mr. Allen Arrington, Jr., Vice President, Standards, will be coming from AIAA National to discuss AIAA Governance changes. This special session will be a 30 minute talk followed by Q&A.			41DCASS-038 Impact of spallation phenomenon on a hypersonic flow-field environment <i>Raghava S. C. Davuluri - UKY</i> <i>Huaibao Zhang - UKY</i> <i>Dr. Kaveh A. Tagavi - UKY</i> <i>Dr. Alexandre Martin - UKY</i>	41DCASS-148 Characterization of AFIT's 6U Attitude Determination and Control System in Earth's Ambient Magnetic Field <i>Eric Bassett - AFIT</i>	41DCASS-064 Minimum-Fuel Trajectory Design in Multiple Dynamical Environments Utilizing Direct Transcription Methods and Particle Swarm Optimization <i>Alfredo Zurita - AFIT</i> <i>Christopher D. Geisel - AFIT</i>	15:35
			41DCASS-161 Investigation of Topology Optimization for Geometrically Nonlinear Structures <i>David Neiferd - WSU</i> <i>Dr. Ramana V. Grandhi - WSU</i>	41DCASS-090 Alternate Numerical Solutions to Wahba's Problem for Satellite Attitude Determination <i>Joshuah Hess - AFIT</i> <i>Dr. Eric D. Swenson - AFIT</i>	41DCASS-089 Military Applications of High-Altitude Satellite Orbits in a Multi-Body Dynamical Environment Using Numerical Methods and Dynamical Systems Theory <i>Meredith Wilmer - AFIT</i> <i>Christopher D. Geisel - AFIT</i>	15:55
			41DCASS-114 Computational Study of Non-Equilibrium Effects on Hypersonic Boundary-Layer Stability <i>Xiaowen Wang - AFRL</i> <i>Eswar Josyula - AFRL</i>	41DCASS-112 Run Time Assurance Architecture and Formal Methods Analysis Applied to a 6U CubeSat Attitude Control Subsystem <i>Kerianne Gross - AFRL</i>	41DCASS-111 A Logic-based Mission Modeling Tool for Designing CubeSats <i>Joshua Loudermilk - AFIT</i> <i>Dr. Richard Cobb - AFIT</i> <i>Dr. Brad Ayres - AFIT</i>	16:15
				41DCASS-128 Pointing Analysis and Design Drivers for Low Earth Orbit Satellite Quantum Key Distribution <i>Jeremiah Specht - AFIT</i>	41DCASS-182 Space Debris Removal: A Look at Now and Tomorrow <i>Krista Roth - AFIT</i> <i>Dr Eric Swenson - AFIT</i>	16:35
Adjourn						16:55

OSU - The Ohio State University
 PU - Purdue University
 SE - Spectral Energies LLC
 SRIL - Stanford Research Institute International
 UC - University of Cincinnati
 UD - University of Dayton
 UDRI - University of Dayton Research Institute

UIO - University of Iowa
 UIUC - University of Illinois at Urbana-Champaign
 UKY - University of Kentucky
 UL - University of Louisville
 UTCAS - UTC Aerospace Systems
 UTK - University of Tennessee-Knoxville
 WSU - Wright State University

ORGANIZING COMMITTEE CHAIRS

Committee	Chair	Deputy
Executive	Ryan Schmit	Markus Rumpfkeil
Technical Program	Markus Rumpfkeil	Carl Hartsfield
Registration	Christian Schmiedel	Tim Leger
Venue/Gift	Beth Huelskamp	Eric Swenson
Keynote	Lance Chenault	James Rutledge
Website	Tim Leger	
Publications	Travis Michalak	Mitch Wolff
Art in Science	Levi Elston	Nitin Bhagat
Exhibits and Displays	Nicholas Niedbalski	
Corporate Sponsors	Cindy Obringer	Sivaram Gogineni
Government Approval	Joe Miller	Marc Polanka

CORPORATE AND EDUCATIONAL SPONSORS

Sponsor	Contact	Email
<u>Platinum Level</u>		
<u>Gold Level</u>		
Cradle North America Inc.	Ms. Elysia Pritchett	info@cradle-cfd.com
Innovative Scientific Solutions, Inc.	Dr. Jim Crafton	jwcrafton@innssi.com
Motion Engineering Co., Inc.	Mr. John Huhn	jh@highspeedimaging.com
Rolls-Royce Corporation	Mr. Dan Jensen	Daniel.T.Jensen@rolls-royce.com
<u>Silver Level</u>		
Bastech, Inc.	Mr. Wes Brown	wesb@bastech.com
Ohio Aerospace Institute	Mr. John French	JohnFrench@oai.org
Spectral Energies, LLC	Dr. Sivaram P. Gogineni	goginesp@gmail.com

GENERAL CO-CHAIRS

Col Joel Luker, Director, Aerospace Systems Directorate, Air Force Research Laboratory
Dr. Teik Lim, Dean, College of Engineering and Applied Science, University of Cincinnati
Dr. Adedeji B. Badiru, Dean of the Graduate School of Engineering and Management, AFIT
Dr. Eddy Rojas, Dean of the School of Engineering, University of Dayton
Dr. Nathan Klingbeil, Dean of the College of Engineering and Computer Science, Wright State University
Dr. Siva Banda, Chief Scientist, Aerospace Systems Directorate, Air Force Research Laboratory
Dr. Timothy Bunning, Chief Scientist, Materials and Manufacturing Directorate, Air Force Research Laboratory
Dr. Rajesh Naik, Chief Scientist, 711 Human Performance Wing

CO-SPONSORING PROFESSIONAL SOCIETIES

Co-Sponsor	Contact	Email
AIAA Dayton-Cincinnati Section	Dr. Michael List	michael.list.2@us.af.mil
AIAA AFIT Student Section	Dr. Marc Polanka	Marc.Polanka@afit.edu
AIAA ONU Student Section	Dr. Jed Marquart	j-marquart@onu.edu
AIAA UC Student Section	Dr. Grant Schaffner	grant.schaffner@uc.edu
AIAA UD Student Section	Dr. Aaron Altman	aaltman1@udayton.edu
AIAA UK Student Section	Dr. Alexandre Martin	alexander.martin@uky.edu
AIAA WSU Student Section	Dr. Rory Roberts	rory.roberts@wright.edu
AIAA Illinois Section	Dr. Harry Hilton	h-hilton@uiuc.edu
AIAA Miami Univ Student Section	Dr. Jim van Kuren	vankurjt@muohio.edu
ASME Dayton Section	Dr. Tim Leger	timothy.leger.ctr@us.af.mil
ASME Cedarville Student Section	Dr. Bob Chasnov	chasnov@cedarville.edu
ASME Miami Univ Student Section	Dr. Robert Setlock	setlocrj@muohio.edu
ASME UD Student Section	Dr. David Myszka	dmyszka1@udayton.edu
ASME WSU Student Section	Dr. Ha-Rok Bae	ha-rok.bae@wright.edu
HFES Southern Ohio Chapter	Dr. Kristen Liggett	Kristen.Liggett@us.af.mil
SAMPE Midwest Chapter	Dr. Nick Titchenal	chair@midwestsampe.org
AUVSI Wright Brothers Chapter	Ms. Carrie Taylor	carriebtaylor@gmail.com
ACS Dayton Section	Dr. Freddie Jordan	chair@daytonacs.org
SAS Ohio Valley Section	Dr. Jamie Gengler	jamie.gengler.ctr@wpafb.af.mil
IEST Greater Ohio Chapter	Dr. Roland Watts	rolandjw@zoomtown.com
Affiliated Societies Council	Dr. Lyle Lockwood	llockwood@utcdayton.com



AIAA
Dayton-Cincinnati Section

AMERICAN INSTITUTE OF
AERONAUTICS AND ASTRONAUTICS
DAYTON-CINCINNATI SECTION

Volunteers Wanted!!!

If you are a seasoned, well-connected AIAA Fellow, a scientist with other useful skills (photography? publishing?), an aspiring new graduate, or anything in between, we want your help!!!

We have numerous opportunities on our local council for people of all ages and skills. Get involved! We need your ideas and elbow grease to serve and mentor our technical community.

We are always looking for new Council Members. Contact any of our current officers listed below or via our web site at: <https://info.aiaa.org/Regions/central/DayCin/default.aspx> and volunteer to lead or help with any of these positions:

Section Chair	Michael List	AFRL/RQ	937-255-7047	The buck stops here for the execution of all section activities!
Vice Chair	Jayesh Mehta			Develop the program agenda for the year and train to become the future chair.
Treasurer	Darius Sanders	AFRL/RQ	937-255-7636	Collect the money and keep the books.
Secretary	Don Rizzetta	AFRL/RQ	937-713-7104	Record the minutes, document the decisions, and assist with official council correspondence.
General Council Members	(Elected Positions)			Contribute your ideas and connections. Volunteer to lead specific programs and activities.
Newsletter Editor	Michael List	AFRL/RQ	937-255-7047	Keep our membership informed of our activities, events, and other news of professional interest.
Webmaster	Margo Ratcliff	NASIC	937-672-4042	Keep website up-to-date with fresh information by working closely with Newsletter Editor and event planners.
Membership Chair	Caleb Barnes	AFRL/RQ	937-713-7103	Promote membership at meetings and events, including membership upgrades and service opportunities within the sectional, regional, and national communities of the AIAA.



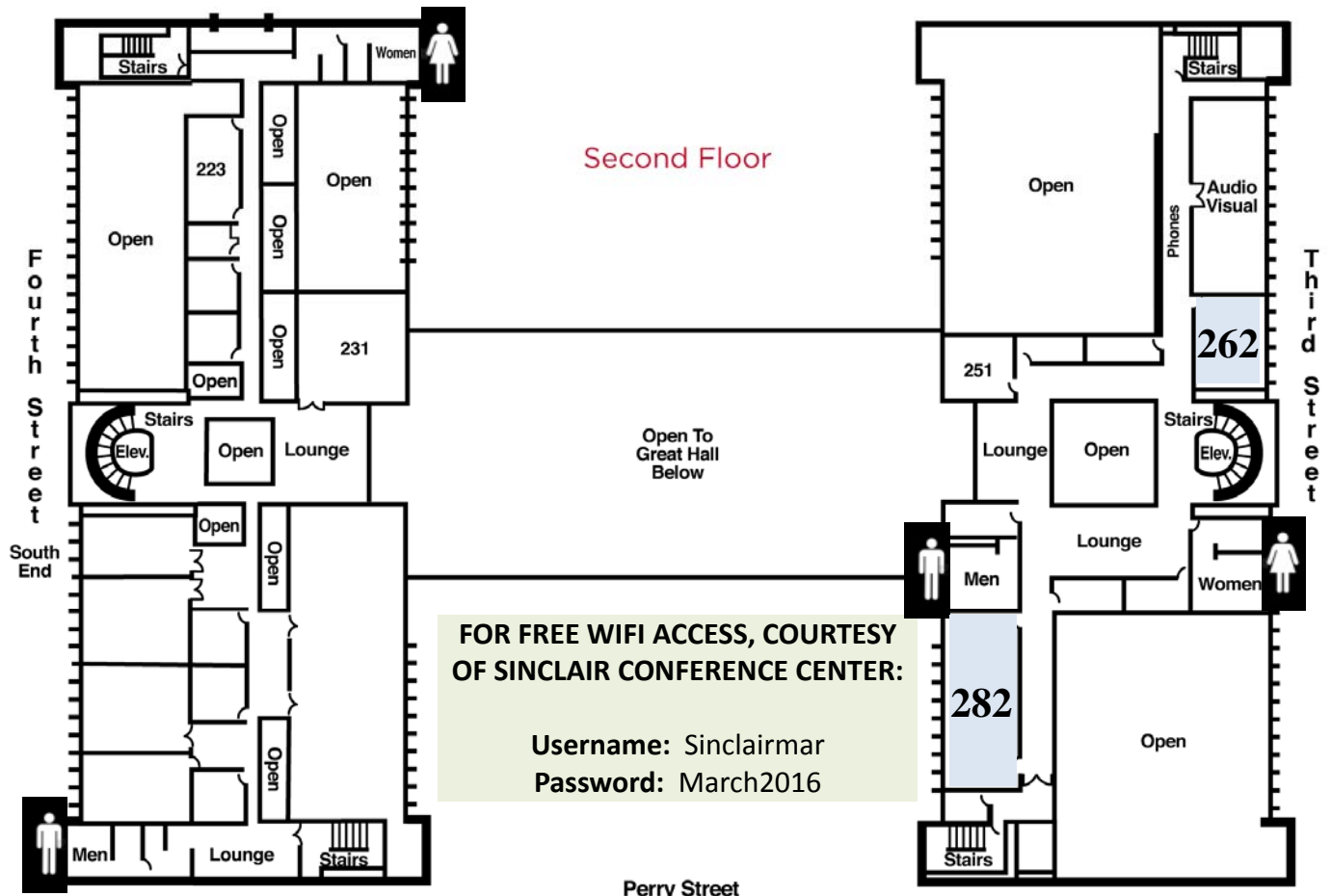
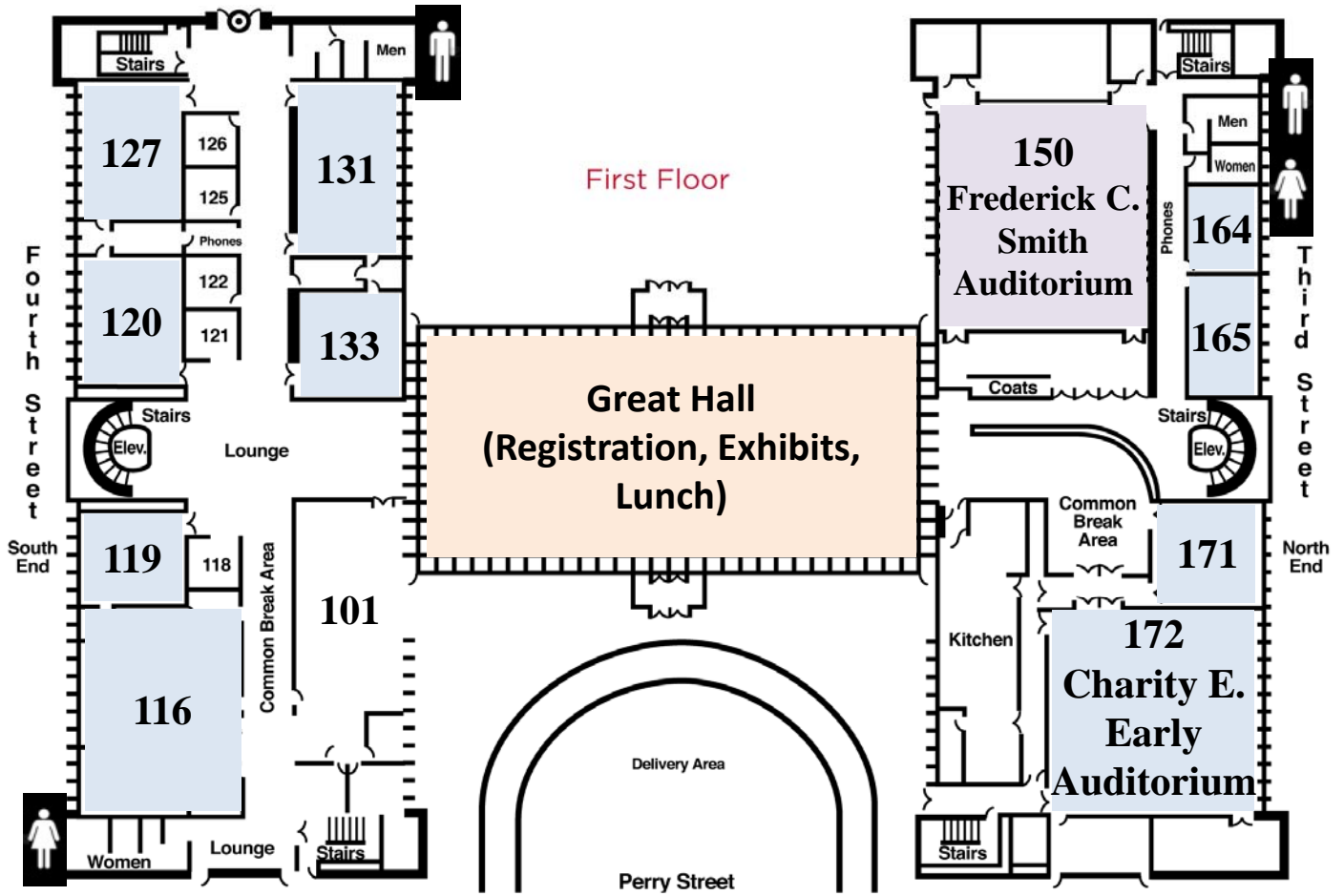
AIAA
Dayton-Cincinnati Section

**AMERICAN INSTITUTE OF
AERONAUTICS AND ASTRONAUTICS
DAYTON-CINCINNATI SECTION**

Honors/Awards Chair	Marc Polanka	AFIT/ENY	937-255-3636 x4714	Run the section awards program, promote national award opportunities within the section, and plan the year-end awards banquet.
Public Policy Chair	Mike White	AFRL/RQ	937-713-7077	Keep the section informed on AIAA, governmental, and public policy issues from all levels that are important to the aerospace community.
Young Professional Chair	Rob Mitchell	AFMC/ AFLCMC	937-904-4504	Represent the interests and concerns of our future leaders.
STEM K-12 Outreach	Jose Camberos	AFRL	937-904-4757	Advocate the aerospace profession to youth by organizing innovative education activities in the name of AIAA.
University Coordinator	Aaron Altman	UD	937-229-5353	Coordinates Technical Committee activities with the section.
Technical Committee Coordinator	Available			Coordinates Technical Committee activities with the section
Historian	Marc Polanka	AFIT/ENY	937-255-3636 x4714	Provides historical perspective on Section plans and maintains documentation on Section activity for historical file.
Career and Workforce Development Chair	Available			Promote programs for professional development, and keep the section informed of employment opportunities.
Affiliated Societies Delegate & Regional Representatives	Sivaram Gogineni	Spectral Energies	937-266-9570	Liaison between our section and the AIAA Regional Activities Council. Represent the section on Dayton Affiliated Societies Council.
Industry Focal Point	Margo Ratcliff	NASIC	937-672-4042	Industry Focal Point
Social Media Outreach	Oliver Leembruggen	Sumaria Systems	937-656-8502	Focal point for providing session news and events through various social media outlets.

Dayton-Cincinnati Aerospace Sciences Symposium

Sinclair Conference Center



FOR FREE WIFI ACCESS, COURTESY OF SINCLAIR CONFERENCE CENTER:

Username: Sinclairmar
Password: March2016



AIAA
Dayton-Cincinnati Section

Forty-First Annual
DAYTON-CINCINNATI AEROSPACE SCIENCES SYMPOSIUM
and
Corporate Exhibitions
2 March 2016,
Sinclair Conference Center, Dayton, OH

Thank You Corporate and Educational Sponsors:



An opportunity for companies to informally discuss options with the brightest local students from numerous local and regional Universities; AIAA Education outreach will also be on hand.

An excellent forum for students to learn about career options and collaborative opportunities in the Dayton - Cincinnati region. For additional information see our website at <http://www.aiaa-daycin.org/>