



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
UD Student Section
WSU Student Section
U. Illinois Section



Dayton Section
UD Student Section
Cedarville Student Section
WSU Student Section

Wright-Kettering
Chapter



Greater Ohio Chapter



Dayton Section



Ohio Valley Section



Human Factors and
Ergonomics Society

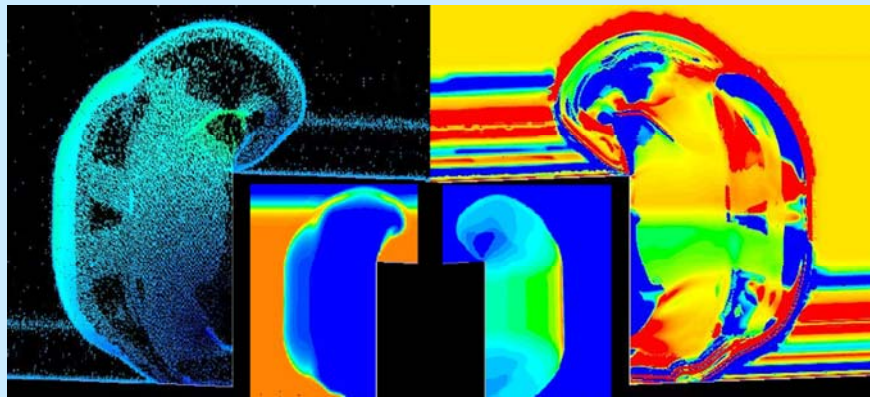


Society for the Advancement
of Material and Process



SYMPOSIUM GUIDE

The Thirty-Ninth Annual
Dayton-Cincinnati
Aerospace Sciences Symposium



*Winning image from 2013 Art-In-Science competition:
"Birds of a Blastwave"*

Submitted by William Stoddard, University of Cincinnati

5 March 2014

Sinclair Conference Center
Dayton, Ohio

www.aiaa-daycin.org/dcass

Welcome
to the
39th AIAA Dayton-Cincinnati Aerospace Sciences Symposium
(DCASS)

- - - - -

For nearly 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 175 technical presentations in both morning and afternoon sessions. Our keynote session includes opening remarks by special guest Mr. C. Douglas Ebersole, Director of the Aerospace Systems Directorate, Air Force Research Laboratory. Our invited keynote speaker is Mr. Dick Honneywell, Executive Director of the UAS Center & Test Complex, Springfield, OH. This year's keynote presentation "Aerospace Leadership and the Emerging Role of UAS Technology" is a topic of growing national importance with ties to future development and economic opportunity in our region.

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. These and best presentation awards will be recognized at the annual Dayton-Cincinnati Section Awards Banquet scheduled for May 21, 2014.

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

Rich Anthony and Eric Swenson
2014 DCASS Executive Co-Chairs

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 – 5:15 PM

First Block 8:10 AM – 9:30 AM

1 Combustion I	Room 116
Empty	Room 119
2 CFD Applications I	Room 120
3 CFD Methods	Room 127
4 Fluid Dynamics I	Room 131
5 Uncertainty Quantification	Room 133
6 Acoustics I	Room 164
7 Structures I	Room 165
8 HiFire I	Room 171
9 Flight Dynamics	Room 231
10 Space I	Room 262
11 Materials I	Room 282

Second Block 9:45 AM – 11:05 AM

12 Combustion II	Room 116
13 Heat Transfer I	Room 119
14 CFD Applications II	Room 120
15 Optimization	Room 127
16 Fluid Dynamics II	Room 131
17 CFD for Health Applications	Room 133
18 Acoustics II	Room 164
19 Aircraft Design	Room 165
20 HiFire II	Room 171
21 Structures II	Room 231
22 Space II	Room 262
23 Materials 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

24 CFD Applications III	Room 116
25 Heat Transfer II	Room 119
26 HiFire III	Room 120
27 Trajectory Optimization	Room 127
28 Combustion III	Room 131
29 Bio Applications and Human Factors	Room 133
30 Space III	Room 164
31 Flow Control	Room 165
32 Materials III	Room 171
33 Fluid Dynamics III	Room 231
34 Turbomachinery	Room 262
35 Structures III	Room 282

Fourth Block 3:35 PM – 4:55 PM

36 CFD Applications IV	Room 116
37 Imaging and Diagnostics	Room 119
Empty	Room 120
38 Optimization Involving CFD	Room 127
39 Combustion IV	Room 131
40 Unmanned Air Vehicles	Room 133
41 Space IV	Room 164
42 Fluid Dynamics IV	Room 165
Empty	Room 171
Empty	Room 231
Empty	Room 262
Empty	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. Just locate the menu for the AIAA Aerospace Sciences Symposium to access the abstracts.

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
Acoustics	6, 18	Hypersonics	8, 20, 26
Air Vehicles	9, 19, 40	Materials	11, 23, 32
Bio Applications	17, 29	Optimization & Uncertainty	5, 15, 27, 38
CFD	2, 3, 14, 24, 36	Space	10, 22, 30, 41
Combustion	1, 12, 28, 39	Structures	7, 21, 35
Experimental Methods	31, 37	Thermal & Power	13, 25, 34
Fluid Dynamics	4, 16, 33, 42		

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	133
	SESSION 1 Combustion I Chair: Mark D. Polanka AFIT		SESSION 2 CFD Applications I Chair: Chris Martin AFIT	SESSION 3 CFD Methods Chair: Markus P Rumpfkeil UD	SESSION 4 Fluid Dynamics I Chair: Aaron Altman UD	SESSION 5 Uncertainty Quantification Chair: Jose Camberos AFRL
8:10	39DCASS-117 Characterizing Thermal Profiles and Emissions at the Exit of an Ultra Compact Combustor Christopher Damele - AFIT Marc D. Polanka - AFIT James L. Rutledge - AFIT		39DCASS-023 Investigations of CFD Methods to Achieve Improved Performance Predictions of a Serpentine Diffuser Darius Sanders - AFRL Michael G. List - AFRL	39DCASS-002 Improved Kinetic Modeling of Continuum Gas Flows Using the Direct Simulation Monte Carlo Method Jonathan Burt - AFRL Eswar Josyula - AFRL	39DCASS-163 Two-dimensional electromagnetic perturbations of a magnetohydrodynamic duct flow Venkat Kotha - UD John C. Petrykowski - UD	39DCASS-073 Cloud-Induced Uncertainty for Visual Navigation Alyssa Gutierrez - AFIT Dr. Alan Jennings - AFIT
8:30	39DCASS-057 OH* Chemiluminescence and Combustion Performance Insights from Experimental Studies of an Ultra-Compact Combustor Tim Erdmann - ISSI Dale Shouse - AFRL Craig Neuroth - AFRL Amy Lynch - AFRL Balu Sekar - AFRL David L. Blunck - Other Alejandro M. Briones - Other Daniel Richardson - Other David L. Burrus - ISSI Justin T. Gross - ISSI Andrew Caswell - SE		39DCASS-049 Numerical Investigation of Exit Temperature from Serpentine Exhaust Nozzles Darrell Crowe - AFIT Christopher Martin - AFIT	39DCASS-034 Continuum Shape Sensitivity Analysis of Non-conforming Mesh Methods for Aeroelastic Response Analysis Koorosh Gopal - WSU Ramana V. Grandhi - WSU	39DCASS-085 Identification of Any Aircraft by its Unique Turbulent Wake Signature Sidaard Gunasekaran - UD Aaron Altman - UD	39DCASS-081 Depth Estimation from a Single Camera using Particle Filters Kyle Kenerley - AFIT Alan L. Jennings, Ph.D - AFIT Daniel D. Doyle, Ph.D - AFIT
8:50	39DCASS-152 Soot Temperature Measurement Using Digital High Speed Camera as Diagnostic Tool for Combustion Dynamics Arda Cakmakci - UC Dr. Jong Guen Lee - UC		39DCASS-174 Expansion-Based Model for the Flow Properties Across the Openings of Bleed-Hole Rows Normal to Supersonic Flow Morell Albert - UC Awatef Hamed - UC	39DCASS-054 A Harmonic Balance Method for Unsteady Conjugate Heat Transfer with a Discontinuous Galerkin Spatial Scheme Robert Knapke - UC Marshall C. Galbraith - UC Mark G. Turner - UC Paul D. Orkwis - UC	39DCASS-167 Effect of Dynamic Contact Angle on Early Stages of Linear Capillary Transport of Wetting Liquid through 3D Virtual Porous Media Nikhil kumar Palakurthi - UC Urmila Ghia - UC Ken Comer - P&G	39DCASS-012 Validation and Uncertainty Quantification for Macroscale Soft Tissue Constitutive Models Kumar Vemaganti - UC Sandeep Madireddy - UC Bhargava Sista - UC
9:10	39DCASS-046 Rotating Detonation Engine Integration with a T63 Turbine Section Daniel Welsh - AFIT Paul I King - AFIT Frederick R. Schauer - AFRL John L. Hoke - ISSI		39DCASS-159 Bleed Hole Simulation in Mixed Compression Inlet Sean Duncan - UC Paul Orkwis - UC Nathan Wukie - UC	39DCASS-183 Principle and Application of an Autonomous In-flow Control Device Charles Farbos de Luzan - UC Ephraim Gutmark - UC Liang Zhao - Other Frederic Felten - Other	39DCASS-087 Wing Performance Insight from Self-Preserved Turbulent Wake Sidaard Gunasekaran - UD Aaron Altman - UD	39DCASS-038 Software Development Process and Reliability Quantification for Safety Critical Embedded Systems Designs Jonathan Lockhart - UC Carla Purdy - UC Philip Wilsey - UC
9:30	Break					

Affiliation Abbreviations

AFIT - Air Force Institute of Technology
 AFMC - Air Force Material Command
 AFRL - Air Force Research Laboratory
 BAH - Booz Allen Hamilton
 CHIU - Chiba University
 DLR - DLR German Aerospace Center
 GE - General Electric Aviation
 GHI - GoHypersonic Inc.

ISSI - Innovative Scientific Solutions Inc.
 NGRC - NASA Glenn Research Center
 NIOSH - National Institute for Occupational Safety & Health
 NRC - National Research Council
 NRL - Naval Research Laboratory
 OSU - The Ohio State University
 P&G - Procter & Gamble
 PU - Purdue University

39th Dayton-Cincinnati Aerospace Sciences Symposium

164	165	171	231	262	282	Room
SESSION 6 Acoustics I Chair: Douglas Davis	SESSION 7 Structures I Chair: Jamie Gengler AFRL	SESSION 8 HIFiRE I Chair: Douglas Dolvin AFRL	SESSION 9 Flight Dynamics Chair: Ryan Schmidt AFRL	SESSION 10 Space I Chair: Charlie Bellows AFIT	SESSION 11 Materials I Chair: Richard Wills AFRL	Time
39DCASS-006 A Framework for Multidisciplinary Conceptual Design of Quiet Small Unmanned Aerial Systems Dean Bryson - AFRL Ryan Miller - AFRL Trenton White - AFRL Darrel Robertson - UDRI	39DCASS-024 Nonlinear Structural Analysis of an Icosahedron and its Application to Lighter than Air Vehicles under a Vacuum Ruben Adorno-Rodriguez - AFIT Anthony Palazotto, Distinguished Professor - AFIT	39DCASS-136 Thermo-structural Design and Analysis of HF6 Free Flyer Zachary Gaston - GHI Andrew Dwenger - GHI Lance Jacobsen - GHI Kevin Park - GHI	39DCASS-065 Toward a Flying Qualities Standard for Unmanned Aircraft Kara Greene - AFIT Donald L. Kunz - AFIT M. Christopher Cotting - USTPS	39DCASS-007 Disaggregated Imaging Spacecraft Constellation Optimization with a Genetic Algorithm Evelyn Abbate - AFIT Robert Thompson - AFIT Dr. Jon Black - AFIT	39DCASS-134 Interaction of Hafnium Diboride and Yttrium-Aluminum-Garnet in the Presence of Platinum Sheena Winder - AFIT Marina Ruggles-Wrenn - AFIT	8:10
39DCASS-160 A Direct Simulation Monte Carlo Solver for Determining Acoustic Impedances of Orifices Katsuo Maxted - UC Jongguen Lee - UC	39DCASS-093 Comparison of Low/High Speed Wear Rates using Abaqus Greg Cavallaro - AFIT Anthony Palazotto, Distinguished Professor - AFIT William Baker, Professor - AFIT Rodolfo Buentello Hernandez, PhD - AFIT	39DCASS-115 HIFiRE Flight 6: Design Development Status David Adamczak - AFRL	39DCASS-107 Indoor Flight Control Design, Implementation and Test Mark Mears - AFRL	39DCASS-060 Design and Analysis of an Attitude Determination and Control Subsystem for AFIT's 6U Standard Bus Erin Dannemeyer - AFIT Richard Cobb, Ph.D - AFIT Eric Swenson, Ph.D - AFIT	39DCASS-129 Strain-Induced-Bandgap-Opening-of-Silicene Zhonghang Ji - WSU Ruiping Zhou - PU	8:30
39DCASS-158 Experimental and computational investigation of flow and acoustic characteristics of a low supersonic rectangular nozzle with an extended side wall Bhupatindra Malla - UC Goutham Mylavaram - UC Ephraim Gutmark - UC Steven Martens - GE	39DCASS-028 Model Uncertainty and Test of a Segmented Mirror Telescope Luke Dras - AFIT	39DCASS-148 HIFiRE 6: Packaging, Instrumentation, and Systems Integration Kevin Park - GHI Andy Dwenger - GHI Rob Jacobsen - GHI	39DCASS-096 Gain-scheduled control of a hypersonic vehicle at subsonic speeds Raul Ordonez - UD Lance Jacobsen - GHI Andy Dwenger - GHI Kevin Park - GHI Zach Gaston - GHI	39DCASS-025 Indoor Star Tracker System Development for a Satellite Simulator Warren Grunwald - AFIT Eric Swenson - AFIT Cole Doupe - AFIT	39DCASS-133 Graphene nanocomposites for improved golf ball performance and lifetime Nathan Holliday - UC Dr. Jude Iroh - UC	8:50
	39DCASS-173 Nonreciprocal magnetostatic wave propagation in micro-patterned NiFe thin films Sheena Hussaini - WSU Gregory C. Hartman - WSU Yan Zhuang - WSU Robert Fitch - AFRL Sheena Hussaini - WSU	39DCASS-116 Hypersonic International Flight Research and Experimentation: Technology and Flight Test Development Strategy Douglas Dolvin - AFRL	39DCASS-045 The Attitude Control of a Magnetically Actuated Cubesat Using PD and LQR Controllers Sarthak Kukreti - UC Alex Walker - UC Kelly Cohen - UC	39DCASS-044 Optimal Multistatic Initial Orbit Determination Techniques Using Wideband Receivers Corey Broussard - AFIT Dr. Richard Cobb - AFIT	39DCASS-052 Thermal and Melt Wear Characterization of Materials in Sliding Contact at High Speeds Chris Alban - AFIT Dr. Anthony Palazotto, Distinguished Professor - AFIT Dr. William Baker - AFIT Maj James Rutledge - AFIT	9:10
Break						9:30

RWTH - RWTH Aachen University
SE - Spectral Energies LLC
TIOF - Tokyo Institute of Technology
UC - University of Cincinnati
UD - University of Dayton
UDRI - University of Dayton Research Institute
UIUC - University of Illinois at Urbana-Champaign
UKY - University of Kentucky

UM - University of Michigan
UMD - University of Maryland
UQ - University of Queensland
USTPS - USAF Test Pilot School
UTC - Universal Technology Corp.
UTCAS - UTC Aerospace Systems
WSU - Wright State University
WVU - West Virginia University

Room	116	119	120	127	131	133
	SESSION 12 Combustion II Chair: Paul Litke AFRL	SESSION 13 Heat Transfer I Chair: Soumya Patnaik AFRL	SESSION 14 CFD Applications II Chair: Don Rizzetta AFRL	SESSION 15 Optimization Chair: Angela Suplisson AFIT	SESSION 16 Fluids Dynamics II Chair: Mark Reeder AFIT	SESSION 17 CFD for Health Applications Chair: Goutham Mylavarapu UC
Time						
9:45	39DCASS-017 Development of an Air-Breathing, Pulse Detonation Engine-Crossover System <i>Robert Driscoll - UC Andrew St. George - UC David Munday - UC Ephraim J. Gutmark - UC</i>	39DCASS-138 Minimization of Secondary Reactions from Film Cooling Holes in a Fuel Rich Environment <i>Andrew Shewhart - AFIT Nathan J. Greiner - AFIT Marc D. Polanka - AFIT James L. Rutledge - AFIT</i>	39DCASS-014 Rapid Unsteady Turbine Simulations Behind Pulse Detonation Tubes using the Harmonic Balance Method <i>Kiran Siddappaji - UC Robert D. Knapke - UC Marshall C. Galbraith - UC Mark G. Turner - UC Paul D. Orkwis - UC</i>	39DCASS-005 Wide Area Search Algorithms and Obstacle Avoidance Methods - Revisiting the Mars Surveyor Challenge <i>Andrew Stubblebine - UC Tejas Deshpande - UC Dr. Elad Kivelevitch - UC</i>	39DCASS-068 Rigid and Flexible Plate Flowfield Response in Streamwise and Pitching Accelerations <i>Michael OL - AFRL Kenneth Granlund - AFRL Peter Mancini - UMD</i>	39DCASS-059 Simulation of patient-specific pediatric upper airway using fluid-structure interaction <i>Jie Chen - UC Ephraim Gutmark - UC Dhananjay Radhakrishnan Subramaniam - UC Goutham Mylavarapu - UC</i>
10:05	39DCASS-171 Development of a Rotating Detonation Engine Facility at the University of Cincinnati <i>Andrew St. George - UC Robert Driscoll - UC Ephraim Gutmark - UC</i>	39DCASS-077 Heat Transfer from an Open Cavity Submerged within in a Subsonic Turbulent Boundary Layer <i>Kurt Wagner - UC</i>	39DCASS-043 Aerodynamic Performance of a Transonic Compressor Blade at Low and High Incidence <i>Chuyoung Kim - UKY Vincent Capece - UKY</i>	39DCASS-042 Comparison of Approximate Approaches to Solving the traveling Salesman Problem <i>Anoop Sathyan - UC Kelly Cohen - UC</i>	39DCASS-020 Non-linearity of apparent mass for multi-element bodies <i>Kenneth Granlund - UTCAS Michael OI - AFRL Luis Bernal - UM</i>	39DCASS-098 Simulation of Laminar Flow Through a Porous Plate of a Screen- Bounded Channel in a Fiber Separator <i>Sandra Hernandez - UC Lana Sneath - UC Prahit Dubey - UC Nikhil K. Palakurthi - UC Urmila Ghia - UC</i>
10:25	39DCASS-131 Continued Numerical Study of Unique Rotating Detonation Engine Injection Designs <i>William Stoddard - UC Ephraim Gutmark - UC</i>	39DCASS-099 Effect of Variable Properties and Radiation on Convective Heat Transfer Measurements at Engine Conditions <i>Nathan Greiner - AFIT Marc D.Polanka - AFIT James L. Rutledge - AFIT Andrew T. Shewhart - AFIT</i>	39DCASS-153 Large-Eddy Simulation of a Non-Reacting Counter-Rotating Combustor Pre-Swirl Cup <i>Michael Downing - UC Mark G. Turner - UC San-Mou Jeng - UC</i>	39DCASS-103 Fuzzy Control System Methodology <i>Nick Stockton - UC Andrew Janson - UC Kelly Cohen - UC</i>	39DCASS-088 Analysis of Rapidly Pitching Wings using Superposition of Rotational Circulation <i>Sidaard Gunasekaran - UD Aaron Altman - UD</i>	39DCASS-168 Transient Flow Simulations in a Representative Human Respiratory Tract Geometry <i>Goutham Mylavarapu - UC Ephraim Gutmark - UC</i>
10:45	39DCASS-029 OH-PLIF Studies in a LDI Swirl-Stabilized Combustor <i>Rodrigo Villalva-Gomez - UC Brian J. Dolan - UC David E. Munday - UC Ephraim J. Gutmark - UC</i>	39DCASS-112 Thermal Characterization of the AFIT Solar Simulation Thermal Vacuum Chamber <i>Daniel M. Hatzung - AFIT</i>	39DCASS-108 Aero thermal analysis to support advanced high temperature erosion tunnel design <i>Dongyun Shin - UC Awatef Hamed - UC</i>	39DCASS-097 Design of Thermal Structures using Topology Optimization <i>Joshua Deaton - WSU Ramana Grandhi - WSU</i>	39DCASS-177 Large Eddy Simulations of Supersonic Corner Flow <i>Nicholas Bisek - AFRL</i>	39DCASS-035 Numerical Analysis of turbulent flow inside UNC Dustiness Tester during Injection Phase <i>Prahit Dubey - UC Dr. Urmila Ghia - UC Dr. Leonid A. Turkevich - NIOSH</i>
11:05	Break					
11:20	<p>Room 150 - Frederick Smith Auditorium</p> <p>Welcome & Announcements</p> <p>Dr. Richard J. Anthony, 39th DCASS General Chair</p> <p>Opening Remarks by Special Guest:</p> <p>Mr. C. Douglas Ebersole, Director of the Aerospace Systems Directorate, Air Force Research Laboratory</p>					
12:30	Lunch					

164	165	171	231	262	282	Room
SESSION 18 Acoustics II Chair: Michael List <i>UDRI</i>	SESSION 19 Aircraft Design Chair: Frank Eastep <i>AFRL</i>	SESSION 20 HIFIRE II Chair: Lance Jacobsen <i>GHI</i>	SESSION 21 Structures II Chair: Anthony Palazotto <i>AFMC</i>	SESSION 22 Space II Chair: Alan Jennings <i>AFIT</i>	SESSION 23 Materials II Chair: Oliver Leembruggen <i>AFRL</i>	Time
<i>39DCASS-102</i> Pressure Skewness in Heated Supersonic Jets From Round and Chevron Nozzles <i>Pablo Mora - UC Nick Heeb - UC Jeff Kastner - UC Ephraim J. Gutmark - UC K. Kailasanath - NRL</i>	<i>39DCASS-078</i> Designer systems of systems <i>Harry Hilton - UIUC Steven J. D'Urso - UIUC</i>	<i>39DCASS-124</i> HIFIRE Flight 6: N-Body, 6-DOF Stage Separation Simulation using Cart3D <i>James Tancred - AFRL David Adamczak - AFRL</i>	<i>39DCASS-166</i> Discontinuous Galerkin (DG) based Arlequin coupling in concurrent multiscale models <i>Sandeep Madireddy - UC Kumar Vemaganti - UC</i>	<i>39DCASS-027</i> Design of Experiments Approach to Atmospheric Skip Entry Maneuver Optimization <i>Robert Bettinger - AFIT Jonathan T. Black, Ph.D - AFIT Jeremy S. Agte, Ph.D - AFIT</i>	<i>39DCASS-092</i> Integrated Control of EBAM Microstructure by Linking Solidification Maps and Process Maps <i>John Thompson - WSU Nathan Klingbeil - WSU</i>	9:45
<i>39DCASS-142</i> Jet Noise Source Identification Through Forward Techniques <i>Unnikrishnan S - OSU Datta Gaitonde - OSU</i>	<i>39DCASS-037</i> A Lightweight Architecture for Multidisciplinary Computing <i>Richard Snyder - AFRL</i>	<i>39DCASS-123</i> HIFIRE 6 Wind Tunnel Experiment <i>Boyce Dauby - AFRL</i>	<i>39DCASS-145</i> Mechanical Properties and Fatigue Behavior of Unitized Composite Airframe Structures at Elevated Temperature <i>Michael Wilkinson - AFIT Marina B. Ruggles-Wrenn - AFIT</i>	<i>39DCASS-109</i> Analysis of Space Object Self-Tracker (SOS) Experiments <i>Megan Schaffer - AFIT</i>	<i>39DCASS-125</i> Micro-asperity Based Multiscale Model of Dry Static Friction Between Elastic-Perfectly Plastic Surfaces <i>Bhargava Sista - UC Kumar Vemaganti - UC</i>	10:05
<i>39DCASS-009</i> Aerodynamic Noise Propagation Comparisons <i>Markus Rumpfkeil - UD Darrel K. Robertson - UDRI Miguel R Visbal - AFRL</i>	<i>39DCASS-181</i> Zero-Lift Drag Prediction Including (Static) Aeroelastic Effects <i>Jose Camberos - AFRL Raymond M. Kolonay - AFRL Franklin E. Eastep - UD Ronald F. Taylor - WSU</i>	<i>39DCASS-155</i> HIFEX Wind Tunnel Test Entry and Preliminary Results <i>Andy Dwenger - GHI Lance Jacobsen - GHI</i>	<i>39DCASS-126</i> Investigating microstructural changes that occur in metals subjected to high strain rates <i>Lauren Wuertemberger - AFIT Dr. Anthony Palazotto - AFIT</i>	<i>39DCASS-051</i> KRUPS: A Platform for Validating Numerical Models Regarding Reentering Vehicle Breakup <i>Nathan Wright - UKY Steven Wright - UKY Tim Vonderschmitt - UKY Sean Tobey - UKY Tyler Ball - UKY</i>	<i>39DCASS-030</i> Three-dimensional Modeling of Pyrolysis Gas in Charring Ablative Materials <i>Haoyue Weng - UKY Alexandre Martin - UKY</i>	10:25
		<i>39DCASS-170</i> CFD Support to HIFIRE6 Program Using OVERFLOW <i>Scott Sherer - AFRL Rick Graves - AFRL</i>	<i>39DCASS-101</i> Investigation of Geometric and Material Instability for Unique Lighter than Air Vehicle Structural Configurations <i>Brian Cranston - AFIT Anthony Palazotto - AFIT</i>	<i>39DCASS-011</i> The Challenge of Augmenting Current Space Situational Awareness with Astronomical Data <i>Charlie Bellows - AFIT</i>	<i>39DCASS-050</i> Anisotropic Thermal Transport in MoS2 Thin Films <i>Jamie Gengler - SE Chris Muratore - UD Vikas Varshney - UTC Jianjun Hu - UDRI John Bultman - UDRI Ajit Roy - AFRL Barry Farmer - AFRL Andrey Voevodin - AFRL</i>	10:45
Break						11:05
Room 150 - Frederick Smith Auditorium						
Keynote Address						
Aerospace Leadership and the Emerging Role of UAS Technology Mr. Dick Honneywell, Executive Director of the UAS Center & Test Complex						11:20
Lunch						12:30

39th AIAA Dayton-Cincinnati Aerospace Sciences Symposium

Keynote Program

Welcome and Announcements:

Dr. Richard Anthony

2014 DCASS Executive Chair

Opening Remarks by Special Guest:

Mr. C. Douglas Ebersole

Director, Aerospace Systems Directorate, Air Force Research Laboratory



Mr. C. Douglas Ebersole, a member of the Senior Executive Service, is the Director, Aerospace Systems Directorate, Air Force Research Laboratory, Wright-Patterson Air Force Base, Ohio. In this capacity he leads the Air Force's science and technology program in propulsion, power and air vehicles for advanced next-generation space, missile and aircraft applications. The Aerospace Systems Directorate consists of \$4 billion in research facilities spread over 65 square miles at Wright-Patterson AFB in Ohio and Edwards AFB in California and a work force of more than 1,800 military, civilians, and contractors executing a nearly \$700 million annual budget.

Mr. Ebersole entered civil service upon graduation from Purdue University in 1982 and was assigned to the Aeronautical Systems Division, Wright-Patterson Air Force Base, Ohio. He later served as the lead flight technology engineer for the F-117A Nighthawk and F-15E Strike Eagle programs, responsible for all performance and flying qualities functions. Mr. Ebersole broadened his technical base beyond his aero/mechanics foundation as the platform integration team lead in the Joint Airborne Signals Intelligence Program Office. He then held follow-on avionics development and integration roles in the Joint Strike Fighter Support and Aging Aircraft Program offices.

In 2000, Mr. Ebersole was selected as the Air Force candidate to the Sloan Fellows Program at the Massachusetts Institute of Technology. He returned to Wright-Patterson AFB and served in a variety of assignments including Chief, Special Test Programs Division and Director of Engineering for the F-22 Program. Prior to his current assignment, Mr. Ebersole was Director of Engineering for the F-35 Joint Program Office, responsible for the development, production and sustainment of the next generation strike aircraft for the Air Force, Marine Corps and Navy.

39th AIAA Dayton-Cincinnati Aerospace Sciences
Symposium

Keynote Program

Keynote Address:

**Aerospace Leadership and the Emerging
Role of UAS Technology**

Mr. Dick Honneywell

Executive Director, UAS Center & Test Complex



Mr. Honneywell is the Executive Director of the Ohio/Indiana Unmanned Aerial Systems (UAS) Center & Test Complex which is located in Springfield, Ohio. He directs UAS activities for the State of Ohio supporting UAS development, commercialization, operational employment and business attraction in collaboration with over 80 partners across the states of Indiana and Ohio. Dick leads operations across seven test ranges in Ohio and Indiana.

Dick retired from civil service with over 32 years of service in support of the United States Air Force in April 2011. His last duty position was serving as the Director of Nuclear Security, HQ AFMC at Wright- Patterson AFB. He retired as Colonel from the Air Force Reserve with 30 years of service in January 2009. He has held numerous acquisition management positions in the Air Force Research Laboratory, Aeronautical Systems Center, Electronic Systems Center and HQ Air Force Materiel Command. Dick graduated in December 1978 from Arizona State University with a Bachelor of Science Degree in Mechanical Engineering and was commissioned into the Air Force. He earned a Master's of Science in Engineering Management in 1987 from the University of Dayton and graduated from the Defense Leadership and Management Program in 2008. Dick is a member of the Association of Unmanned Vehicle Systems International, Air Force Association and the Armed Forces Communications and Electronics Association (AFCEA).

Room	116	119	120	127	131	133
	SESSION 24 CFD Applications III	SESSION 25 Heat Transfer II	SESSION 26 HIFIRE III	SESSION 27 Trajectory Optimization	SESSION 28 Combustion III	SESSION 29 Bio Applications and Human Factors
Time	Chair: Nick Bisek <i>AFRL</i>	Chair: Carl Tilmann <i>AFRL</i>	Chair: Roger Kimmel <i>AFRL</i>	Chair: Mark Mears <i>AFRL</i>	Chair: Scott Stouffer <i>AFRL</i>	Chair: Grant Schaffner <i>UC</i>
13:40	<i>39DCASS-015</i> Investigation of Surface Radiation in Earth Re-entry Flows with Graphite Ablation <i>Christopher Alba - AFIT</i> <i>Robert Greendyke - AFIT</i> <i>Steven Lewis - UQ</i> <i>Guerric De Crombrughe de Looringhe - UQ</i> <i>Troy Eichmann - UQ</i> <i>Richard Morgan - UQ</i>	<i>39DCASS-070</i> Analysis of Preheated Starting Length Convection Effects on Military Aircraft Skins Subjected to Simulated Thermal Assault <i>Brian Babis - AFIT</i> <i>James L. Rutledge - AFIT</i> <i>Mark F. Reeder - AFIT</i> <i>James C. Petrosky - AFIT</i>	<i>39DCASS-022</i> HIFiRE-1 High-Reynolds-Number, High-Angle Ground Test Results <i>Thomas Juliano - AFRL</i> <i>Roger L. Kimmel - AFRL</i> <i>Sebastian Willems - DLR</i> <i>Ali Guelhan - DLR</i> <i>Steven P. Schneider - PU</i>	<i>39DCASS-033</i> Uncertainty Corridors for 3D Collision Avoidance <i>Nathan Smith - AFIT</i> <i>Richard Cobb - AFIT</i> <i>Scott Pierce - AFIT</i> <i>Vincent Raska - AFRL</i>	<i>39DCASS-139</i> The Use of an Ultra-Compact Combustor as an Inter-Turbine Burner for Improved Engine Performance <i>Jose Miranda - AFIT</i> <i>Marc D. Polanka - AFIT</i> <i>Ronald J. Simmons - AFIT</i>	<i>39DCASS-053</i> Production of pressure distribution between the vocal folds using Bernoulli's equation <i>Alexandra Maddox - UC</i> <i>Liran Oren - UC</i> <i>Sid Khosla - UC</i> <i>Effie Gutmark - UC</i>
14:00	<i>39DCASS-113</i> Application of a 3-D Thermal Elasticity in Simulation of Re-entry Ablation <i>Rui Fu - UKY</i> <i>Alexandre Martin - UKY</i>	<i>39DCASS-105</i> Analysis of a Wing Fuel Tank Energy Model to Determine Heat Sink Possibilities <i>Jason Roland - UD</i> <i>Markus P. Rumpfkeil, Ph.D. - UD</i>	<i>39DCASS-018</i> Crossflow Boundary-Layer Instability for HIFiRE-5 in a Mach-6 Wind Tunnel <i>Matthew Borg - AFRL</i> <i>Scott Stanfield - ISSI</i> <i>Roger Kimmel - AFRL</i>	<i>39DCASS-067</i> Optimal Airborne Trajectories for Data Collection from Emplaced Ground Sensor Arrays <i>Nidal Jodeh - AFIT</i> <i>Tim Coon - AFIT</i> <i>Tadeusz Masternak - AFIT</i> <i>Dr Richard Cobb - AFIT</i> <i>Lt Col Jeremy Agte - AFIT</i>	<i>39DCASS-121</i> Small Two Stroke Internal Combustion Engine Scaling Study <i>Alex Rowton - AFIT</i> <i>Marc D. Polanka - AFIT</i> <i>Joshua A. Rittenhouse - AFIT</i> <i>Joseph K. Ausserer - AFIT</i> <i>Paul J. Litke - AFRL</i> <i>Keith D. Grinstead, Jr. - ISSI</i>	<i>39DCASS-089</i> Estimation of soft tissue compliance in the upper airway and its relation to clinically relevant parameters <i>Dhananjay Radhakrishnan</i> <i>Subramaniam - UC</i> <i>Goutham Mylavarapu - UC</i> <i>Ephraim J. Gutmark - UC</i>
14:20	<i>39DCASS-069</i> Numerical study of spalled particle trajectory in an arc-jet environment <i>Raghava Davuluri - UKY</i> <i>Dr. Alexandre Martin - UKY</i>	<i>39DCASS-150</i> Design and validation of a flat plate wind tunnel facility to study film cooling effectiveness <i>Mouleeswaran</i> <i>Kandampalayam</i> <i>Kandasamy P - UC</i> <i>David E. Munday - UC</i> <i>Ephraim J. Gutmark - UC</i>	<i>39DCASS-019</i> HIFIRE Flight 1 Periodic Pressure Fluctuations <i>Roger Kimmel - AFRL</i> <i>Scott Stanfield - ISSI</i> <i>Thomas Juliano - NRC</i> <i>Matthew Borg - BAH</i>	<i>39DCASS-071</i> Optimal UAV Path Planning for Tracking a Moving Ground Vehicle with a Gimballed Camera <i>Riley Livermore - AFIT</i> <i>Richard Cobb - AFIT</i>	<i>39DCASS-140</i> Design and Implementation of a Waverotor to Supercharge a Two-Stroke Internal Combustion Engine <i>Mark Mataczynski - AFIT</i> <i>Marc D. Polanka - AFIT</i> <i>John L Hoke - AFRL</i> <i>Daniel E. Paxson - NGRC</i>	<i>39DCASS-164</i> A Framework for Semi-Autonomous Robotic Surgery in Remote Environments such as Spaceflight <i>Grant Schaffner - UC</i> <i>Christopher Korte - UC</i> <i>Evan Sneath - UC</i> <i>Vasile Nistor - UC</i> <i>Ravi Samy - UC</i> <i>Charles Doarn - UC</i> <i>Grant Schaffner - UC</i>
14:40	<i>39DCASS-172</i> Comparison of spanwise scales for Mach 1.7, 2,3, and 2.9 spatially developing boundary layers <i>Mbu Waindim - OSU</i> <i>Datta Gaitonde - OSU</i>	<i>39DCASS-120</i> Thermal Loss Measurements of a 55 cc Two-Stroke Remotely Piloted Aircraft Engine <i>Joshua Rittenhouse - AFIT</i> <i>Marc D. Polanka - AFIT</i> <i>Alexander K. Rowton - AFIT</i> <i>Joseph K. Ausserer - AFIT</i> <i>Paul J. Litke - AFRL</i> <i>Keith D. Grinstead, Jr. - ISSI</i>		<i>39DCASS-114</i> An Optimal Control Approach to Automatic Ground Collision Avoidance for Climb-limited and g-limited Aircraft <i>Angela Suplisson - AFIT</i> <i>Richard Cobb - AFIT</i> <i>William Baker - AFIT</i> <i>David Jacques - AFIT</i>	<i>39DCASS-075</i> Comparison of a Pressure Measuring Spark Plug and a Flush Mount Pressure Transducer in a Small Spark Ignition Engine <i>Joseph Ausserer - AFIT</i> <i>Marc Polanka - AFIT</i> <i>Keith D. Grinstead Jr. - ISSI</i>	<i>39DCASS-127</i> Enhancement of Information Throughput Using the Resource Management Component of the Multiple-Attribute Task Battery <i>Aerial Camden - WSU</i> <i>C. Walters - WSU</i> <i>C.A. Phillips - WSU</i> <i>A. Neidhard - WSU</i> <i>D. Kender - WSU</i> <i>A. McKinley - AFRL</i>
15:00	<i>39DCASS-072</i> Coupling CFD Analysis and Optimization Techniques for Scramjet Inlet Design <i>Daniel Harriman - UC</i> <i>Awatef Hamed - UC</i>			<i>39DCASS-157</i> Trajectory Optimization for Hypersonic Air-Breathing Vehicles Using Variable-Order Gaussian Quadrature Collocation Methods <i>Ted Masternak - AFIT</i> <i>Dr David Jacques - AFIT</i>	<i>39DCASS-031</i> Development of an Elevated Pressure Combustion Research Facility for Combustor Operability and Emissions Research <i>Scott Stouffer - UDRI</i> <i>Ray Townsend, Mark Laber, Jerry Grieselhuber, Chris Klingshirn, and Matt Dewitt - UDRI</i> <i>Jacob Diemer, Harold Day, and Richard Zehring - ISSI</i> <i>Edwin Corporan - AFRL</i> <i>Dale Shouse - AFRL</i>	<i>39DCASS-154</i> Use of Recurrent Neural Networks for Operator Training of Surgical Robots for Semi-Autonomous Procedures <i>Evan Sneath - UC</i> <i>Christopher Korte - UC</i> <i>Vasile Nistor - UC</i> <i>Ravi Samy - UC</i> <i>Charles Doarn - UC</i> <i>Grant Schaffner - UC</i>
15:20	Break					

164	165	171	231	262	282	Room
SESSION 30 Space III	SESSION 31 Flow Control	SESSION 32 Materials III	SESSION 33 Fluid Dynamics III	SESSION 34 Turbomachinery	SESSION 35 Structures III	
Chair: John Black <i>AFIT</i>	Chair: Kenneth Granlund <i>UTCAS</i>	Chair: Ramanda Grandhi <i>WSU</i>	Chair: Michael Ol <i>AFRL</i>	Chair: John Clark <i>AFRL</i>	Chair: Bob Guyton <i>AFRL</i>	Time
<i>39DCASS-144</i> Trade Space Analysis of Simulated Geolocation CubeSat Missions <i>James Basel - AFIT</i>	<i>39DCASS-003</i> Plasma-Based Flow Control for Delay of Excrescence-Generated Transition <i>Donald Rizzetta - AFRL</i> <i>Miguel Visbal - AFRL</i>	<i>39DCASS-082</i> Failure Analysis and Investigations of Polyurethane (PU) Coating Degradation <i>Narayanan Venkat - UDRI</i> <i>Zongwu Bai - UDRI</i> <i>Thomas Sutter - UDRI</i> <i>Gyaneshwar Tandon - UDRI</i> <i>Douglas Hufnagle - UDRI</i> <i>Ryan S. Justice - AFRL</i>	<i>39DCASS-130</i> A Backward facing steps nozzle for low and high altitudes <i>Mohamed Mandour Eldeeb - UC</i> <i>Shaaban Abdallah - UC</i>	<i>39DCASS-058</i> Unsteady Pressure Measurements of a Low-Speed Single-Stage Axial-Flow Compressor Near Stall <i>Bradley Butler - UKY</i> <i>V. R. Capece - UKY</i>	<i>39DCASS-149</i> Finite Element Model Failure Criteria for High Speed Water Simulation <i>Armando DeLeon - AFIT</i> <i>Anthony Palazotto, Distinguished Professor - AFIT</i> <i>William Baker, Professor - AFIT</i> <i>Rodolfo Buentello Hernandez, PhD - AFIT</i>	13:40
<i>39DCASS-032</i> Navigation Solution to Maneuver a Spacecraft Relative to Spheres Centered on Multiple Cooperative Satellites <i>Abraham Leigh - AFIT</i> <i>Jonathan T. Black - AFIT</i>	<i>39DCASS-110</i> Effectiveness of NS-DBD Actuators to Control Flow Over a Retreating Airfoil Using LES <i>Kelsey Shaler - OSU</i> <i>Datta V. Gaitonde - OSU</i>	<i>39DCASS-074</i> A framework for modeling microstructural characterization errors and their effect on the accuracy of grain ensemble statistics <i>Gregory Loughnane - WSU</i> <i>Michael Groeber - AFRL</i> <i>Michael Uchic - AFRL</i> <i>Ramana Grandhi - WSU</i>	<i>39DCASS-016</i> Predicting Acoustic Wave Generation and Amplification inside a Rectangular Cavity <i>Ryan Schmit - AFRL</i> <i>James Grove - AFRL</i>	<i>39DCASS-062</i> Demonstration of Harmonic Balance to Capture Distortion Transfer in a Transonic Fan Stage <i>Michael List - AFRL</i> <i>Mark G. Turner - UC</i>	<i>39DCASS-021</i> Experimental Foundation Used to Validate a Reduced Order Model for Mistuned Rotors <i>Geoffrey Cox - AFIT</i> <i>Anthony N. Palazotto, Ph.D. Distinguished Professor - AFIT</i> <i>Joseph A. Beck, Ph.D. -AFRL</i> <i>Jeffrey M. Brown, Ph.D. -AFRL</i>	14:00
<i>39DCASS-084</i> Development of a Concept of Operations for the FalconSat-7 CubeSat <i>Brian Kester - AFIT</i>	<i>39DCASS-141</i> Response of an Imperfectly Expanded Jet to Active Control <i>Kalyan Goparaju - OSU</i> <i>Datta Gaitonde - OSU</i>	<i>39DCASS-086</i> Cross-linked Carbon Nanotube sheets and yarns <i>Rachit Malik - UC</i> <i>Qingyue Yu - UC</i> <i>Noe Alvarez - UC</i> <i>Vesselin Shanov - UC</i>	<i>39DCASS-176</i> Investigation of Streamwise-Oriented Vortex/Wing Interactions in Rigid and Flexible Wings <i>Caleb Barnes - WSU</i> <i>Miguel Visbal - AFRL</i>	<i>39DCASS-090</i> Modeling and CFD Analysis of a Low-Speed Compressor, Part I: Solid Modeling <i>Jeremy Beale - UKY</i> <i>Vincent Capece - UKY</i>	<i>39DCASS-026</i> Characterization of CH-47D Rotor System Fault Signatures Using a Comprehensive Model <i>Christopher Terpening - AFIT</i>	14:20
<i>39DCASS-013</i> Non-Cooperative Orbit Determination for Maneuvering Spacecraft Using Multiple Model Adaptive Estimation <i>Gary Goff - AFIT</i> <i>Dr. Jonathan T. Black - AFIT</i>	<i>39DCASS-146</i> Analysis of NS-DBD Based Control of Stalled NACA0015 Airfoil using Dynamic Mode Decomposition <i>Arvind Mohan - OSU</i> <i>Dr. Datta Gaitonde - OSU</i>	<i>39DCASS-162</i> Carbon Nanotube Fiber Spinning at Industrial Rates <i>Noe T. Alvarez - UC</i> <i>Peter Miller - UC</i> <i>Mark Schulz - UC</i> <i>Vesselin Shanov - UC</i>	<i>39DCASS-187</i> Time-Varying Liquid Volume Beneath Single Droplet Impacts into a Static Liquid Layer <i>John Kuhlman - WVU</i> <i>Nicholas L. Hillen - WVU</i> <i>J. Stephen Taylor - WVU</i> <i>Krishna Medam - WVU</i> <i>Murat Dinc - WVU</i> <i>Donald D. Gray - WVU</i>	<i>39DCASS-079</i> Pre-Stall Hotwire Measurements of a Low Speed Axial Flow Compressor <i>Elisabeth Morris - UKY</i> <i>V. R. Capece - UKY</i>	<i>39DCASS-111</i> Experimental Investigation of a Perturbation Model for the Nonlinear Response of a Fatigue Cracked Beam <i>Phillip Cooley - WSU</i> <i>Joseph C. Slater - WSU</i>	14:40
<i>39DCASS-156</i> Moment of Inertia Approximation for Terrestrial Based Satellite Simulators <i>Jonathan Wright - AFIT</i> <i>Eric D. Swenson - AFIT</i>	<i>39DCASS-106</i> Investigation of Helicopter Ground Resonance Subject to a Nonlinear Energy Sink <i>Jon Aspinwall - AFIT</i>	<i>39DCASS-056</i> High Temperature Carbon Nanotube Annealing <i>Aaron Johnson - UC</i> <i>Kumar Vemaganti - UC</i> <i>David Mast - UC</i> <i>Vesselin Shanov - UC</i> <i>Mark Schulz - UC</i>	<i>39DCASS-076</i> Wingtip Vortices from an Exergy-Based Perspective <i>Muhammad Omar Memon - UD</i> <i>Kevin Wabick - UD</i> <i>Aaron Altman - UD</i> <i>Rainer M. Buffo - RWTH</i>	<i>39DCASS-010</i> Investigation of an Inverse Brayton Cycle in a Single Cycle Configuration <i>Nicholas Grannan - UC</i> <i>Ephraim J. Gutmark - UC</i>	<i>39DCASS-137</i> Characterization of grain boundary conductivity of spin-sprayed ferrite using scanning microwave microscopy <i>Joshua Myers - WSU</i> <i>T. Nicodemus - WSU</i> <i>Y. Zhuanf - WSU</i> <i>T. Watanabe - TIOF</i> <i>N. Matsushita - TIOF</i> <i>M. Yamaguchi - CHIU</i>	15:00
Break						15:20

Room	116	119	120	127	131	133
	SESSION 36 CFD Applications IV Chair: Scott Sherer AFRL	SESSION 37 Imaging and Diagnostics Chair: Waruna Kulatilaka AFRL		SESSION 38 Optimization involving CFD Chair: Jie Chen UC	SESSION 39 Combustion IV Chair: John Hoke AFRL	SESSION 40 Unmanned Air Vehicles Chair: Richard Cobb AFIT
Time						
15:35	39DCASS-048 Modeling the Effects of Underwing Missile Canards on F-16 Limit Cycle Oscillations Mark Gabbard - AFIT	39DCASS-041 Collision-Independent Detection of Molecular Species by Time-Resolved Parametric Four-Wave Mixing Hans Stauffer - SE Waruna D. Kulatilaka - SE Sukesh Roy - SE James R. Gord - AFRL		39DCASS-008 Practices for Deterministic and Stochastic Design Optimization Komahan Boopathy - UD Markus P. Rumpfkeil - UD	39DCASS-061 Flame Dynamics in a Staged Multiple Nozzle Combustor at High Power Brian Dolan - UC Rodrigo Villalva - UC David Munday - UC Ephraim Gutmark - UC Spencer Pack - UTCAS	39DCASS-055 Discovery Lab 3D Printed Small UAS Projects Robert Williams - AFRL Nathan Kidder - OSU Jason Hall - WSU
15:55	39DCASS-039 Geometric Modification and their Impact on the Performance of the Vortex Tube Arun Gopal Rajagopalan - UC Dr. Peter J. Disimile - UC	39DCASS-169 Two-dimensional femtosecond TALIF imaging of key atomic species in non-equilibrium plasmas at moderate pressure Jacob Schmidt - SE Waruna D. Kulatilaka - SE Sukesh Roy - SE Kraig Frederickson - OSU Ivan Shkurenkov - OSU		39DCASS-185 Preliminary Spray Cooling Simulations Using a Full-Cone Water Spray Murat Dinc - WVU Donald D. Gray - WVU John M. Kuhlman - WVU Nicholas L. Hillen - WVU Krishna T. Medam - WVU J. Stephen Taylor - WVU	39DCASS-091 The Effects of Hydrodynamic Stretch on the Flame Propagation Enhancement of Ethylene by Addition of Ozone Matthew Pinchak - UC Timothy Ombrello - AFRL Campbell Carter - AFRL Ephraim Gutmark - UC Viswanath Katta - ISSI	39DCASS-094 Design and Testing of Flexible Wings for Flapping Wing MAVs Isaac Weintraub - AFRL Todd Smith - AFRL Michael Oppenheimer - AFRL David Sigthorsson - AFRL David Doman - AFRL George Huang - WSU
16:15	39DCASS-184 A Single Drop Impact on a Liquid Film: Comparisons of Computational Results and Experimental Measurements Krishna Teja Medam - WVU Murat Dinc - WVU J. Stephen Taylor - WVU Nicholas L. Hillen - WVU Dr. John M. Kuhlman - WVU Dr. Donald D. Gray - WVU	39DCASS-080 Geographic Information Systems and Remote Sensing Rebecca Unruh - AFIT Jonathan T. Black, PhD - AFIT		39DCASS-083 Scaling Between Multiple Fidelities - A Bounded Adjustment Factor Approach Christopher Fischer - WSU Ramana V. Grandhi - WSU	39DCASS-100 Calibration of Hot Gas Valves for Flow Control and Measurement of Liquid JP7 Mark Shaker - AFRL Mark Gruber - AFRL Stephen Smith - AFRL Tarun Mathur - ISSI	39DCASS-180 Florescent Oil Flow Visualization for Transition Identification on UAS Wing Section Timothy Cleaver - AFRL Brock C. Andrews - AFRL
16:35	39DCASS-040 CFD investigation and analysis of Hot Surface Ignition Dhaval Shiyani - UC Peter J. Disimile - UC	39DCASS-186 Visualization Techniques to Quantify Dynamic Phenomena of Spray Droplets Impinging on a Smooth Surface Jon Stephen Taylor - WVU Nicholas Hillen - WVU Dr. John M. Kuhlman - WVU Murat Dinc - WVU Krishna Medam - WVU Dr. Donald Gray - WVU		39DCASS-175 Unsteady Optimization of a Rapidly Pitching Airfoil under Dynamic Stall Conditions Sathyaram Balasubramani - UD Markus P. Rumpfkeil - UD	39DCASS-004 A comprehensive analysis of Solid Oxide Fuel Cells from a micro-scale level Chao Wang - WSU George Huang - WSU Ryan Miller - AFRL	39DCASS-047 Analysis of a SOFC Combustor in a SOFC/GT Hybrid Power System Ryan Sinnamon - WSU Dr. Rory Roberts - WSU
16:55	Adjourn					

164	165	171	231	262	282	Room
SESSION 41 Space IV Chair: David Liu <i>AFIT</i>	SESSION 42 Fluids Dynamics IV Chair: Ryan Gosse <i>AFRL</i>					Time
<i>39DCASS-143</i> Design, Integration, and Environmental Test Analysis of a Satellite Payload <i>Dominic Perry - AFIT</i>	<i>39DCASS-064</i> Stereoscopic PIV measurements of confined vortical flow in a narrow annulus. <i>Yuri Perelstein - UC</i> <i>Ephraim Gutmark - UC</i>					15:35
<i>39DCASS-122</i> Survey of Optimal Multi-Target Satellite Slew Control via CMG and Reaction Wheel Actuation <i>Cole Doupe - AFIT</i> <i>Eric D. Swenson - AFIT</i>	<i>39DCASS-118</i> Liquid Spray Characterization in Flow Fields with Centripetal Acceleration <i>Andrew Brinker - AFIT</i> <i>Marc D. Polanka - AFIT</i> <i>Daniel R. Richardson - AFRL</i>					15:55
<i>39DCASS-095</i> Structural Analysis of a 6U CubeSat Chassis <i>Robert Latta - AFIT</i>	<i>39DCASS-063</i> Analysis of 100 Kilohertz Total Pressure Datasets from the AIP of a Serpentine Diffuser <i>Michael List - AFRL</i> <i>William W. Copenhaver - AFRL</i>					16:15
<i>39DCASS-161</i> Identification and Reduction of Higher Order Disturbance Torques on Terrestrial Based Satellite Attitude Simulators <i>Jonathan Wright - AFIT</i> <i>Eric D. Swenson - AFIT</i>	<i>39DCASS-147</i> New Measurement and Image Processing Techniques for Particle Image Velocimetry Using Solid-Phase Carbon Dioxide <i>Mei-Ling Liber - AFIT</i> <i>Dr. Mark Reeder - AFIT</i>					16:35
Adjourn						16:55

ORGANIZING COMMITTEE CHAIRS

Committee	Chair	Deputy
Executive	Rich Anthony	Eric Swenson
Technical Program	Eric Swenson	Ryan Schmit
Aide	Markus Rumpfkeil	
Registration	Amy Lynch	Tim Leger
Venue/Gift	Beth Huelskamp	Darcy Allison
Keynote	Lance Chenault	
Website	Tim Leger	
Publications	Travis Michalak	Trina Bornejko
Art in Science	Levi Elston	Tony Puntel
Exhibits and Displays	Mike Brown	
Corporate Sponsors	Sivaram Gogineni	Cindy Obringer
Government Approval	Rich Snyder	Michael List, Anthony Deluca

CORPORATE AND EDUCATIONAL SPONSORS

Sponsor	Contact	Email
<u>Platinum Level</u>		
University of Cincinnati, College of Engineering and Applied Science	Ms. Teri Ambrosius	ambrost@ucmail.uc.edu
<u>Gold Level</u>		
Spectral Energies, LLC	Dr. Sivaram P. Gogineni	goginesp@gmail.com
Cradle Computing	Ms. Eri Sakurai	sakurai@cradle-cfd.com
GE Aviation	Dr. Mike Phillips	johnmichael.phillips@ge.com
Booz Allen Hamilton	Dr. Oliver Leembruggen	oliver.leembruggen.ctr@us.af.mil
<u>Silver Level</u>		
MacAulay-Brown, Inc.	Mr. Denny Kirlin	denny.kirlin@macb.com
Motion Engineering Co., Inc.	Mr. John Huhn	jh@highspeedimaging.com
Ohio Aerospace Institute	Dr. Michael Heil	michaelheil@oai.org
Innovative Scientific Solutions, Inc.	Dr. Jim Crafton	jwcrafton@innssi.com

GENERAL CO-CHAIRS

Mr. C. Douglas Ebersole, Director, Aerospace Systems Directorate, Air Force Research Laboratory
Dr. Teik Lim, Interim 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. Tony Saliba, 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. Barry Farmer, Chief Scientist, Materials and Manufacturing Directorate, Air Force Research Laboratory
Dr. Morley Stone, Chief Scientist, 711 Human Performance Wing
Dr. Richard Rivir, Chief Scientist Emeritus, Aerospace Systems Directorate, Air Force Research Laboratory

CO-SPONSORING PROFESSIONAL SOCIETIES

Co-Sponsor	Contact	Email
AIAA Dayton-Cincinnati Section	Dr. Oliver Leembruggen	oliver.leembruggen.ctr@wpafb.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	aaron.altman@notes.udayton.edu
AIAA UK Student Section	Dr. Suzanne Smith	ssmith@engr.uky.edu
AIAA WSU Student Section	Dr. Felix Wu	yanhua.wu@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. Rory Roberts	rory.roberts@wright.edu
HFES Southern Ohio Chapter	Dr. Carolyn Sommerich	sommerich.1@osu.edu
SAMPE Midwest Chapter	Dr. Kristin Cable	chair@midwestsampe.org
AUVSI Wright-Kettering Chapter	Ms. Carrie Taylor	carrie.taylor.ctr@wpafb.af.mil
ACS Dayton Section	Dr. Wayne Cook	wayne.cook@kodak.com
SAS Ohio Valley Section	Dr. Jamie Gengler	jamie.gengler.ctr@wpafb.af.mil
IEST Greater Ohio Chapter	Dr. Roland Watts	rolandjw@zoomtown.com
AIAA Affiliated Societies Council	Ms. Amy Solko	asc@dnaco.net



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	Oliver Leembruggen	Booz Allen/AFRL/RQ	937-255-2691	The buck stops here for the execution of all section activities!
Vice Chair	Lance Chenault	ABDA Inc	937-427-2229 x180	Develop the program agenda for the year and train to become the future chair.
Treasurer	Jon Poggie	AFRL/RQ	937-255-3413	Collect the money and keep the books.
Secretary	Michael List	AFRL/RQ	937-255-7047	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	Christopher Martin	AFIT	937-255-3636 x4403	Promote membership at meetings and events, including membership upgrades and service opportunities within the sectional, regional, and national communities of the AIAA.

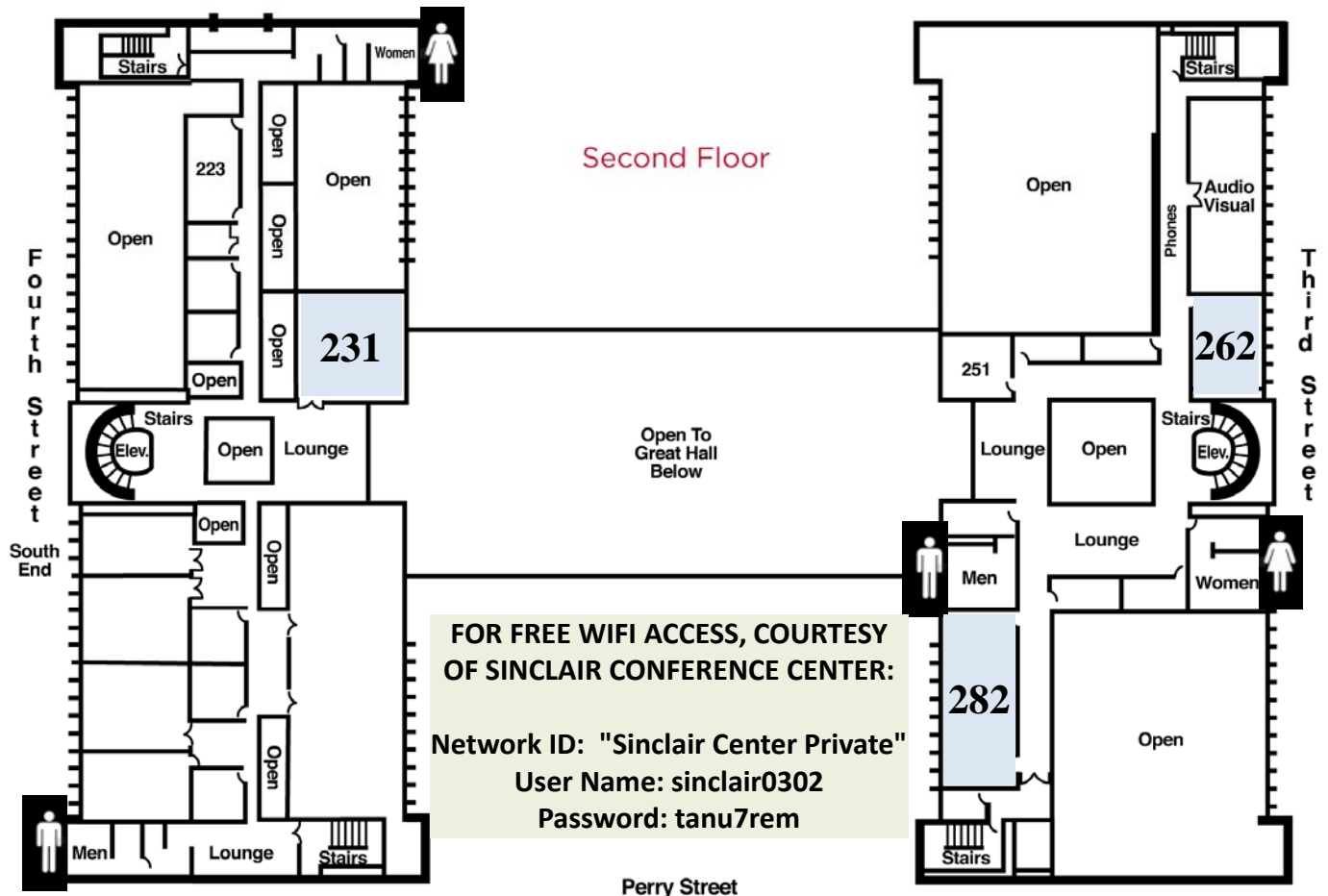
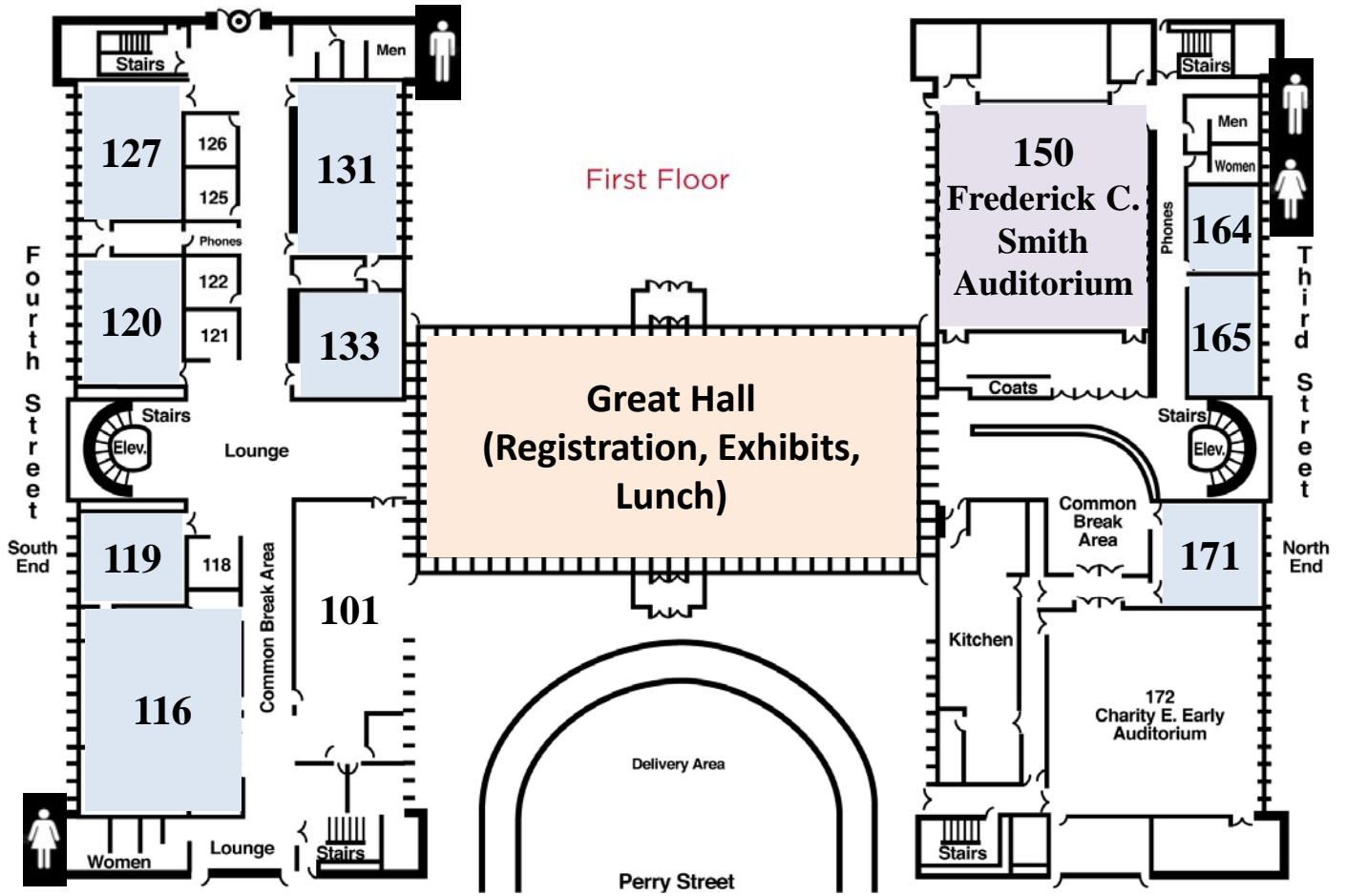


AIAA
Dayton-Cincinnati Section

**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	312-713-7077	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	Carl Tilmann	AFRL/RQ	937-255-4077	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	Ray Kolonay	AFRL/RQ	937-255-6686	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	Darius Sanders	AFRL/RQ	937-785-7636	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

Dayton-Cincinnati Aerospace Sciences Symposium Sinclair Conference Center



FOR FREE WIFI ACCESS, COURTESY OF SINCLAIR CONFERENCE CENTER:
Network ID: "Sinclair Center Private"
User Name: sinclair0302
Password: tanu7rem



AIAA
Dayton-Cincinnati Section

Thirty-Ninth Annual
DAYTON-CINCINNATI AEROSPACE SCIENCES SYMPOSIUM
and
Corporate Exhibitions
5 March 2014,
Sinclair Conference Center, Dayton, OH

Thank You Corporate and Educational Sponsors:


UNIVERSITY OF
Cincinnati.
College of Engineering
and Applied Science
<http://ceas.uc.edu/>

**Spectral
Energies, LLC**
www.spectralenergies.com

 **GE Aviation**
www.geaviation.com/

CRADLE
www.cradle-cfd.com

Booz | Allen | Hamilton
strategy and technology consultants
www.boozallen.com/

MACB
MACAULAY-BROWN, INC.
www.macb.com


OAI
Ohio Aerospace Institute
www.oai.org

ISSI
www.innssi.com



www.highspeedimaging.com

An opportunity for companies to informally discuss options with the brightest local students AFIT, CHIU, OSU, PU, TIOF, UC, UD, UIUC, UK, UIUC, UM, UMD, UQ, USTPS, WSU, WVU; 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/>