



AIAA
Dayton-Cincinnati Section

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AERONAUTICS AND ASTRONAUTICS
DAYTON-CINCINNATI SECTION



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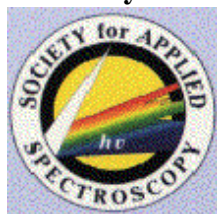
Greater Ohio Chapter



Dayton Section



Ohio Valley Section



Human Factors and
Ergonomics Society

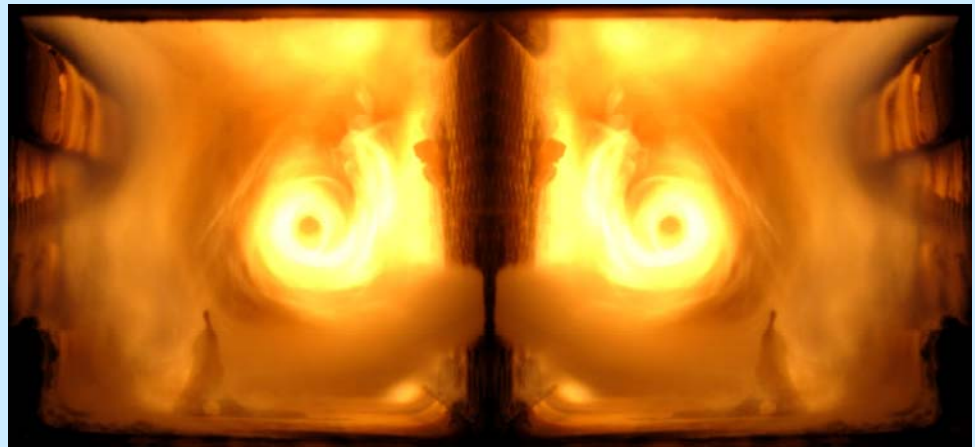


Society for the Advancement
of Material and Process



SYMPOSIUM GUIDE

The Fortieth Annual **Dayton-Cincinnati Aerospace Sciences Symposium**



Winning image from 2014 Art-In-Science competition:

"Fire in His Eyes", Submitted by:

Tim Erdmann, Innovative Scientific Solutions, Inc.

Jeff Monfort, University of Dayton Research Institute

Daniel Richardson, National Research Council

Craig Neuroth & Dale Shouse, Air Force Research Laboratory

4 March 2015

**Sinclair Conference Center
Dayton, Ohio**

www.aiaa-daycin.org/dcass

Welcome
to the
40th 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 143 technical presentations in both morning and afternoon sessions. Our invited keynote speaker is Mr. Michael Drake, Technical Fellow of Aircraft Configuration Design for The Boeing Company. This year's keynote presentation is entitled "Technology and Innovation in the 787 Dreamliner."

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 21, 2015.

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

Eric Swenson and Ryan Schmit
2015 DCASS Executive Co-Chairs

Keynote Program

Welcome and Announcements:

Dr. Eric Swenson

2015 DCASS Executive Chair

Keynote Address:

Technology and Innovation in the 787 Dreamliner

Mr. Michael Drake

Technical Fellow of Aircraft Configuration Design for The Boeing Company



Michael Drake is a Technical Fellow of Aircraft Configuration Design for The Boeing Company in Seattle, Washington, currently assigned to its New Airplane Product Development group. Michael was at the very earliest beginnings of the development of what evolved into the 7E7, and then 787. He saw the 787 through to Firm Configuration of the 787-8, the 787-9 models, and most recently, the 787-10 model. Michael is an AIAA Associate Fellow and

is a past Chairman of AIAA's Technical Committee on Aircraft Design. He is a graduate of the University of Texas at Arlington with a BS in Aerospace Engineering. He has worked as a Configuration Design Engineer (a role akin to airplane architect) since joining Boeing in 1984, and has a range of experience over a nearly every type and size of transport category aircraft Boeing has investigated since that time.

Abstract: The Boeing 787 is a breakthrough development in Commercial Aviation. In service today, with both the 787-8 and 787-9 variants, and with the 787-10 under development, the 787 represents the cutting edge of 21st century Aerospace technologies. Some perspective of the journey of the 787s evolution will be covered. This will be followed by an overview of the key airplane elements and features; including touching on its advanced technologies such as composite primary airframe design (a first for large commercial transports) and paradigm-shifting advanced more electric airplane systems. The development of this airplane is a truly global endeavor, and the talk will touch on the scope of this vast design and production effort. Finally, the talk will summarize the airplane as it stands today, and how it is just at the beginning of its development life.



2015 DAYTON-CINCINNATI SECTION AWARDS CALL FOR NOMINATIONS

Recognize the achievements of your colleagues. The local Awards Banquet, to be held on May 21, 2015 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 FAX or E-mail the information. Award selections will be made by an expert panel of judges. Submit nominations (FAX or E-mail) by 17 April 2015 to:

Dr. Marc Polanka

Tel: (937) 255-3636 x4714 Fax: (937) 656-7053 E-mail: marc.polanka@afit.edu

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

CATEGORY:

Nominee:
Affiliation:
Address:
Tel:
Fax:
E-mail:

Nominator:
Affiliation:
Address:
Tel:
Fax:
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 – 5:15 PM

First Block 8:10 AM – 9:30 AM

1 Fluid Dynamics I - HIFiRE	Room 116
2 Flow Control I	Room 119
3 Combustion I	Room 120
4 Thermal Management	Room 127
5 Optimization I	Room 131
6 Uncertainty Quantification	Room 133
7 Structures I	Room 164
8 Materials I	Room 165
9 Space I	Room 172

Second Block 9:45 AM – 11:05 AM

10 Fluid Dynamics II	Room 116
11 Flow Control II	Room 119
12 Combustion II	Room 120
13 CFD Applications I	Room 127
14 Optimization II	Room 131
15 Aeroelasticity	Room 133
16 Structures II	Room 164
17 Materials II	Room 165
18 Space II	Room 172

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

19 Fluid Dynamics III	Room 116
20 Experimental Methods I	Room 119
21 Combustion III	Room 120
22 CFD Applications II	Room 127
23 CFD Methods	Room 131
24 Acoustics	Room 133
25 Unmanned Vehicles	Room 164
26 Human Factors	Room 165
27 Space III	Room 172

Fourth Block 3:35 PM – 4:55 PM

28 Fluid Dynamics IV	Room 116
29 Experimental Methods II	Room 119
30 Combustion IV	Room 120
31 CFD Applications III	Room 127
32 Combustion V	Room 131
33 Heat Transfer	Room 133
34 Imaging & Diagnostics	Room 164
Empty	Room 165
35 Space IV	Room 172

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
Acoustics & Aeroelasticity	15, 24	Fluid Dynamics	1, 10, 19, 28
Unmanned Vehicles	25	Materials	8, 17
Human Factors	26	Optimization & Uncertainty	5, 6, 14
CFD	13, 22, 23, 31	Space	9, 18, 27, 35
Combustion	3,12,21,30,32	Structures	7, 16
Experimental Methods	20, 29	Thermal & Heat Transfer	4, 33
Flow Control	2, 11	Imaging & Diagnostics	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
Time	SESSION 1 Fluid Dynamics I - HiFiRE Chair: Roger Kimmel AFRL	SESSION 2 Flow Control I Chair: Carl Tillman AFRL	SESSION 3 Combustion I Chair: Rolf Sondergaard AFRL	SESSION 4 Thermal Management Chair: Jay Rutledge AFIT	SESSION 5 Optimization I Chair: Raymond Gordnier AFRL
8:10	40DCASS-007 Freestream Effects on Boundary Layer Disturbances for HiFiRE-5 Matt Borg - AFRL Roger L. Kimmel - AFRL		40DCASS-061 Crank Angle Resolved Exhaust Composition in a Small Internal Combustion Engine Using FTIR Kevin Horn - AFIT Marc D. Polanka - AFIT Joseph K. Ausserer - AFIT Paul J. Litke - AFRL Keith D. Grinstead, Jr. - ISSI	40DCASS-101 Modular Heat Dissipation Technique For a CubeSat Melih Eken - AFIT James L. Rutledge - AFIT Eric D. Swenson - AFIT	40DCASS-013 Optimal UAS Assignment and Trajectories for Data Collection from Wireless Sensor Networks Nidal Jodeh - AFIT Dr Richard Cobb - AFIT Riley Livermore - AFRL
8:30	40DCASS-099 HiFiRE-1 Turbulent Shock Boundary Layer Interaction Roger Kimmel - AFRL Dinesh Prabhu - NARC	40DCASS-002 Plasma-Based Control of Transition on a Wing with Leading-Edge Excrescence Donald Rizzetta - AFRL Miguel R. Visbal - AFRL	40DCASS-062 Quantification of Short-Circuiting and Trapping Efficiency using GC/MSD for Small Internal Combustion Engines Joseph Ausserer - AFIT Marc D. Polanka - AFIT Kevin P. Horn - AFIT Paul J. Litke - AFRL Keith D. Grinstead, Jr. - ISSI	40DCASS-078 Feasibility Study of a Liquefied Natural Gas Powered Directed Energy Weapon Sean Nuzum - WSU Rory Roberts - WSU Mitch Wolff - WSU	40DCASS-072 Progress on Stochastic Optimal Control as Applied to Aircraft Missile Avoidance Ryan Carr - AFIT Richard Cobb - AFIT
8:50	40DCASS-048 Correlation of HiFiRE-5 Flight Data With Computed Pressure and Heat Transfer Joseph Jewell - UTC James H. Miller - AFRL Roger L. Kimmel - AFRL	40DCASS-089 Lift-relaxation from fast-flap actuation Michael OL - AFRL Kenneth Granlund - AFRL	40DCASS-108 Simulation of Full RDE With Multiple Injection Modifications William Stoddard - UC Ephraim Gutmark - UC	40DCASS-055 Thermal-Aware Computing Using Computational Fluid Dynamics Ziad Youssfi - ONU Jed Marquard - ONU Eric Holodnak - ONU	40DCASS-073 Particle Swarm Optimization as Initial Guess in Nonlinear Programming Solver Clay Humphreys - AFIT Rich Cobb - AFIT Jonah Reeger - AFIT Alan Jennings - AFIT
9:10	40DCASS-018 Structural Integrity and Control Effectiveness Uncertainty Forecast for a HiFiRE-6 Design Variant Rick Graves - OAI William Humphreys - OAI	40DCASS-059 Assessing Modifications to a Plasma Actuator Model Applied to DBD Actuators Jeffrey Laten - SLU Raymond LeBeau - SLU	40DCASS-057 Radiation Heat Flux From Methane-Air Counter-flow Diffusion Flames Zhaojin Diao - UKY Michael Winter - UKY Tianxiang Li - UKY	40DCASS-067 Estimate of spalled particle size and velocity in arc-jet testing at the NASA Langley HYMETs facility Jacob Cottrell - UKY Sean Bailey - UKY Francesco Panerai - UKY Alexandre Martin - UKY	40DCASS-075 Closing the Loop on Aircraft Conceptual Sizing using the Merlin Flight Simulator Aaron Altman - UD
9:30	Networking Break - Great Hall Exhibit Area				

Affiliation Abbreviations

AFIT - Air Force Institute of Technology
AFRL - Air Force Research Laboratory
ARSI - Aerospace Research Systems Inc
AT - Adjoint Technologies, LLC
CCH - Cincinnati Childrens Hospital
GE - General Electric Aviation
ISSI - Innovative Scientific Solutions Inc.

ISU - Iowa State University
NARC - NASA Ames Research Center
NKU - Northern Kentucky University
NRL - Naval Research Laboratory
OAI - Ohio Aerospace Institute
ONU - Ohio Northern University
OSU - The Ohio State University

For online access to the Program-at-a-glance, please visit: <http://www.aiaa-daycin.org/dcass/glance.php>

40th Dayton-Cincinnati Aerospace Sciences Symposium

133	164	165	172	Room
SESSION 6 Uncertainty Quantification Chair: Oliver Leembruggen AFRL	SESSION 7 Structures I Chair: Anthony Palazotto AFIT	SESSION 8 Materials I Chair: Ramana Grandhi WSU	SESSION 9 Space I Chair: Charlie Bellows AFIT	Time
	40DCASS-032 Simulation of Locking Space Truss Deployments <i>Dylan Van Dyne - AFIT</i> <i>Dr. Alan Jennings - AFIT</i> <i>Dr. Jonathan Black - VT</i>	40DCASS-040 An Apparatus for Testing SiC Fiber Tows at Elevated Temperature in Silicic Acid-Saturated Steam <i>Scott J Robertson - AFIT</i> <i>Kevin B. Sprinkle - AFIT</i> <i>Marina B. Ruggles-Wrenn - AFIT</i>	40DCASS-001 Optimal Attitude Control of Agile Spacecraft Using Combined Reaction Wheel and Control Moment Gyroscope Arrays <i>Cole Doupe - AFIT</i> <i>Dr Eric Swenson - AFIT</i>	8:10
	40DCASS-127 Topology Optimization of Additively Manufactured Penetrating Warheads: Design and Testing <i>Hayden Richards - AFIT</i> <i>David Liu - AFIT</i>	40DCASS-056 Calcium Sulfate Induced Hot Corrosion <i>Matthew Krisak - AFIT</i> <i>Andrew Phelps - UDRI</i>	40DCASS-027 Characterization of a Control Moment Gyroscope <i>Dylan Penn - AFIT</i> <i>Dr. Eric D. Swenson - AFIT</i>	8:30
40DCASS-019 Impact of Prognostic Uncertainty in System Health Monitoring <i>Robert Vandawaker - AFIT</i> <i>Dr. David R Jacques - AFIT</i> <i>Maj Jason Freels - AFIT</i>	40DCASS-128 Evaluation of the Viscoplastic Properties of Treated 4130 of Flow and Failure Based on the Johnson and Cook Damage and Flow Model <i>Lauren Wuertemberger - AFIT</i> <i>Dr. Anthony Palazotto Distinguished Professor - AFIT</i>	40DCASS-113 Application of a microstructural characterization uncertainty quantification framework to additive manufactured Ti-6Al-4V <i>Gregory Loughnane - WSU</i> <i>Nathan Klingbeil - WSU</i> <i>Jaimie Tiley - AFRL</i>	40DCASS-097 Attitude Determination and Control of a 6U CubeSat <i>Michael Tibbs - AFIT</i>	8:50
40DCASS-103 DYNAMIC-MEASUREMENT UNCERTAINTY QUANTIFICATION (D-MUQ) <i>Tommy Baudendistel - PCKA</i> <i>Jon Zumberge - AFRL</i>	40DCASS-134 Modal Characterization of a Piezoelectric Shaker Table <i>Randall Hodkin - AFIT</i> <i>Dr. Anthony Palazotto - AFIT</i> <i>Lt Col DeLuca - AFIT</i>	40DCASS-136 Development of Microstructural Process Maps for Additive Manufacturing of Inconel 625 <i>Luke Sheridan - WSU</i> <i>Nathan Klingbeil - WSU</i>	40DCASS-104 Satellite Translational Maneuver Detection with Coverage Loss and Application to Attitude Maneuver Detection and Estimation <i>Joshuah Hess - AFIT</i> <i>Captain Gary Goff - AFIT</i> <i>Dr. Eric Swenson - AFIT</i> <i>Dr. Jon Black - AFIT</i>	9:10
Networking Break - Great Hall Exhibit Area				9:30

PCKA - PC Krause & Associates
 SE - Spectral Energies LLC
 SLU - St. Louis University
 UC - University of Cincinnati
 UCF - University of Central Florida
 UD - University of Dayton
 UDRI - University of Dayton Research Institute
 UIUC - University of Illinois at Urbana-Champaign

UKY - University of Kentucky
 UQ - University of Queensland
 UTC - Universal Technology Corp.
 UTL - Univeristy of Toledo
 VT - Virginia Tech
 WSU - Wright State University
 WVU - West Virginia University

Room	116	119	120	127	131
Time	SESSION 10 Fluid Dynamics II Chair: Aaron Altman UD	SESSION 11 Flow Control II Chair: Kenneth Granlund AFRL	SESSION 12 Combustion II Chair: Paul Litke AFRL	SESSION 13 CFD Applications I Chair: Donald Rizzetta AFRL	SESSION 14 Optimization II Chair: David Liu AFIT
9:45	40DCASS-023 Noise Analysis from a Rectangular Supersonic Jet <i>Florian Baier - UC</i> <i>Pablo Mora - UC</i> <i>Professor Ephraim Gutmark - UC</i> <i>Nicholas Heeb - GE</i>	40DCASS-060 Examining the Flow Structures Induced by an Undulating Airfoil Surface <i>Grant Spencer - SLU</i> <i>Justin Krofta - SLU</i> <i>Raymond P. LeBeau, Jr. -SLU</i> <i>Mark McQuilling - SLU</i>	40DCASS-008 Applying the Principle of Corresponding States to Multi-Component Hydrocarbon Mixtures (Jet Fuels) <i>Matthew Evanhoe - UDRI</i> <i>Dr. Zachary West - UDRI</i> <i>Milissa Griesenbrock - AFRL</i>	40DCASS-081 Computational fluid dynamics simulation of intracranial aneurysms – comparing size and shape <i>Hongtao Yu - WSU</i> <i>George P. Huang - WSU</i> <i>Zifeng Yang - WSU</i> <i>Bryan Ludwig - WSU</i>	40DCASS-080 Multi-Fidelity Optimization via Low-Fidelity Correction Technique <i>C. Corey Fischer - WSU</i> <i>Ramana V. Grandhi - WSU</i> <i>Phil Beran - AFRL</i>
10:05	40DCASS-033 An investigation of flow over rough surfaces with flow injection <i>Colby Borchetta - UKY</i> <i>Jacob P. Helvey - UKY</i> <i>Sean C.C. Bailey - UKY</i> <i>Alexandre Martin - UKY</i>	40DCASS-049 Evolution of Asymmetrically-Forced Transitional Supersonic Jets <i>David Gonzalez - OSU</i> <i>Datta V. Gaitonde - OSU</i> <i>Mark J. Lewis - Other</i>	40DCASS-116 Effects of Axial Stretch on the Flame Propagation Enhancement of Large Hydrocarbons by Addition of Ozone <i>Matthew Pinchak - UC</i> <i>Timothy Ombrello - AFRL</i> <i>Campbell Carter - AFRL</i> <i>Ephraim Gutmark - UC</i> <i>Viswanath Katta - ISSI</i>	40DCASS-095 A Novel CFD-FEA Approach to Evaluate Mechanical Properties of Pharyngeal Airway Tissue from Magnetic Resonance Images <i>Dhananjay Subramaniam - UC</i> <i>Goutham Mylavarapu - UC</i> <i>Ephraim J. Gutmark - UC</i>	40DCASS-112 A Distributed Surrogate Method for Global Optimization. <i>James Davidson - WSU</i> <i>Dr. Ha-Rok Bae - WSU</i>
10:25	40DCASS-041 Particle-based Modeling of Nonequilibrium Electronic Excitation in a Hypersonic Leading Edge Flow <i>Jonathan Burt - OAI</i> <i>Eswar Josyula - AFRL</i>	40DCASS-047 Active Control of Two-Dimensional Ground Vehicle Wake <i>Jacob Whiteman - OSU</i> <i>Mei Zhuang - OSU</i>	40DCASS-069 Predictive Scenario for Fires in Gaseous and Dust/Gas Environments: Premixed Flame Evaluation <i>Sinan Demir - WVU</i> <i>V'yacheslav Akkerman -WVU</i> <i>Ali S. Rangwala - Other</i> <i>Vitaly Bychkov - Other</i>	40DCASS-133 Numerical simulation of cerebrospinal fluid flow in the mammalian brain <i>Tianxiang Gao - UKY</i> <i>Tingting Tang - UKY</i> <i>J. M. McDonough - UKY</i>	40DCASS-037 Development of Computationally Efficient FEA Code for use in Topology Optimization <i>David Neifert - WSU</i> <i>Dr. Ramana V. Grandhi -WSU</i>
10:45	40DCASS-091 Streamwise vortex interactions with rigid and flexible wings <i>Caleb Barnes - AFRL</i> <i>Miguel Visbal - AFRL</i> <i>George Huang - WSU</i>	40DCASS-014 Numerical Investigation of the Physics and Control of a Twinjet Configuration <i>Kalyan Goparaju - OSU</i> <i>Datta V. Gaitonde - OSU</i>	40DCASS-138 ZND Analysis of Hydrocarbon Detonability Enhancement <i>Andrew St. George - UC</i> <i>Robert Driscoll - UC</i> <i>Vijay Anand - UC</i> <i>Ephraim Gutmark - UC</i>	40DCASS-074 Using Computational Fluid Dynamics and Stereoscopic PIV to reduce erosion caused by a slurry passing through rectangular apertures in a narrow annulus <i>Yuri Perelstein - UC</i> <i>Ephraim J. Gutmark - UC</i>	40DCASS-105 Topology Optimization of an Aircraft Wing <i>David Walker - AFIT</i> <i>David Liu - AFIT</i> <i>Alan Jennings - AFIT</i>
11:05	Networking Break - Great Hall Exhibit Area				
11:20	Room 150 - Frederick Smith Auditorium Welcome & Announcements Dr. Eric Swenson <i>40th DCASS General Chair</i>				
12:30	Networking Lunch - Great Hall Exhibit Area				

133	164	165	172	Room
SESSION 15 Aeroelasticity Chair: Harry H. Hilton <i>UIUC</i>	SESSION 16 Structures II Chair: Josh Deaton <i>AT</i>	SESSION 17 Materials II Chair: Larry Byrd <i>AFRL</i>	SESSION 18 Space II Chair: Marc Polanka <i>AFIT</i>	Time
40DCASS-110 Overdetermined Trim Using FUN3D <i>Richard Snyder - AFRL</i>	40DCASS-142 Evaluating Unique Lighter than Air Vehicle Configurations with an Internal Vacuum <i>Brian Cranston - AFIT</i> <i>Anthony Palazotto - AFIT</i>	40DCASS-137 A beta finite element method for simulation of monocrystalline and polycrystalline plasticity <i>Wei Zeng - UC</i> <i>Guirong Liu - UC</i>	40DCASS-028 Navigation Constellation Design with a Multi-Objective Genetic Algorithm <i>Heather Diniz - AFIT</i> <i>Dr. Alan Jennings - AFIT</i>	9:45
40DCASS-130 Analysis of Designer / Tailored Linear Viscoelastic Energy Harvesting <i>Harry Hilton - UIUC</i>	40DCASS-145 Analysis of 3D frame in the form of a sphere <i>Mohammed Alghofaily - AFIT</i> <i>Anthony Palazotto - AFIT</i>	40DCASS-135 Effect of HfB2 Microstructure on the Oxidation of HfB2 Under Compressive Loads at 1500oC in Air <i>Sheena Winder - AFIT</i> <i>Marina Ruggles-Wrenn - AFIT</i>	40DCASS-071 Expected Position Error for an Onboard Satellite GPS Receiver <i>Anthony Williams - AFIT</i> <i>Dr. Alan Jennings - AFIT</i>	10:05
40DCASS-098 Fluid-Structure Interaction Applied to a Variable Camber Compliant Wing <i>Sam Miller - UD</i> <i>Markus P. Rumpfkeil - UD</i> <i>James J. Joo - AFRL</i>	40DCASS-021 Dynamic Response Analysis of an Icosahedron Frame Lighter than Air Vehicle <i>Luke Just - AFIT</i> <i>Dr. Anthony Palazotto - AFIT</i>	40DCASS-141 Toward Fully Equiaxed Microstructure in Additive Manufacturing of Ti-6Al-4V <i>Sarah Kuntz - WSU</i> <i>Dr. Nathan Klingbeil - WSU</i>	40DCASS-092 Updating Track Data from Serendipitous Satellite Streaks <i>Charlie Bellows - AFIT</i> <i>Paul W. Schumacher Jr. -AFRL</i> <i>Jonathan T. Black - VT</i> <i>Richard G. Cobb - AFIT</i> <i>Alan L. Jennings - AFIT</i>	10:25
40DCASS-139 Active Vibration Control of a Stator Vane <i>Gregorio Robles - UKY</i> <i>Matthew Jehnke - UKY</i> <i>Ezra McNichols - UKY</i> <i>Caterine Meza - UKY</i>	40DCASS-155 Hardware Validation of Hybrid Steering Logic for Single Gimbal Control Moment Gyroscopes <i>Jonathan Wright - AFRL</i> <i>Dr. Eric D. Swenson - AFIT</i>		40DCASS-146 Ground Station and Mission Operations Testing for the FalconSAT-7 CubeSat <i>David Dinh - AFIT</i> <i>Dr. Eric D. Swenson - AFIT</i>	10:45
Networking Break - Great Hall Exhibit Area				11:05
Room 150 - Frederick Smith Auditorium Keynote Address Technology and Innovation in the 787 Dreamliner Mr. Michael Drake, <i>Technical Fellow of Aircraft Configuration Design at The Boeing Company</i>				11:20
Networking Lunch - Great Hall Exhibit Area				12:30

Room	116	119	120	127	131
Time	SESSION 19 Fluid Dynamics III Chair: Mark Reeder AFIT	SESSION 20 Experimental Methods I Chair: Michael Ol AFRL	SESSION 21 Combustion III Chair: Matthew Dillsaver AFIT	SESSION 22 CFD Applications II Chair: Eastep Franklin AFRL	SESSION 23 CFD Methods Chair: Nicholas Bisek AFRL
13:40	40DCASS-036 Analysis of the Wingtip Vortices through the Lens of Exergy <i>Muhammad Omar Memon - UD</i> <i>Aaron Altman - UD</i>	40DCASS-029 Wing-tip vortex evolution in turbulence <i>Hari Ghimire - UKY</i> <i>Sean C.C. Bailey - UKY</i>	40DCASS-064 Modelling of Flame Evolution in Micro-Channels with Isothermal Walls <i>Berk Demircok - WVU</i> <i>Orlando Ugarte - WVU</i> <i>Vyacheslav Akkerman - WVU</i> <i>Damir Valiev - Other</i> <i>Vitaly Bychkov - Other</i>	40DCASS-005 Hydrokinetic Turbines: Design and Second Law of Thermodynamics <i>Kiran Siddappaji - UC</i> <i>Mark G. Turner - UC</i>	40DCASS-022 Numerical Implementation of 3D Adaptive Mesh Movement utilizing the Spring Analogy Method <i>Justin Cooper - UKY</i> <i>Haoyue Weng - UKY</i> <i>Alexandre Martin - UKY</i>
14:00	40DCASS-042 Analysis of Deep Dynamic Stall of a Plunging Airfoil using Dynamic Mode Decomposition <i>Arvind Mohan - OSU</i> <i>Dr. Miguel Visbal - AFRL</i> <i>Dr. Datta V. Gaitonde - OSU</i>	40DCASS-016 Wind Tunnel Testing of Variable Camber Wing with Multiple Load Cell Test Fixture <i>Lauren Zientarski - UD</i> <i>Christopher Marks - UDRI</i> <i>Aaron Altman - UD</i> <i>James Joo - AFRL</i>	40DCASS-054 Enormous Flame Acceleration and Detonation Initiation in Obstructed Combustors <i>Orlando Ugarte - WVU</i> <i>Berk Demircok - WVU</i> <i>Vyacheslav Akkerman - WVU</i> <i>Damir Valiev - Other</i> <i>Vitaly Bychkov - Other</i>	40DCASS-082 Novel Split Tip Compressor Blade Design Study <i>Abhay Srinivas - UC</i> <i>Kiran Siddappaji - UC</i> <i>Mark G. Turner - UC</i>	40DCASS-043 Nonlinear Fluid-Solid Interaction using Immersed Boundary Method <i>Koorosh Gopal - WSU</i> <i>Dr. Ramana V. Grandhi - WSU</i>
14:20	40DCASS-045 Characterization of the Motion Test Apparatus for Dynamic Wind Tunnel Testing <i>James Lancaster - AFIT</i> <i>Dr. Mark Reeder - AFIT</i> <i>Dr. Michael Sytsma - AFRL</i>	40DCASS-126 Stream-wise oscillation of airfoils into reverse flow <i>Kenneth Granlund - UTC</i> <i>Anya Jones, University of Maryland - Other</i> <i>Michael Ol - AFRL</i>	40DCASS-131 Hydrogen/Air Detonation Cell Size at Initial Pressures from One to Ten Atmospheres <i>Curtis Babbie - AFIT</i> <i>Paul I. King - AFIT</i> <i>Christopher A. Stevens - ISSI</i> <i>John L. Hoke - ISSI</i> <i>Frederick R. Schauer - AFRL</i>	40DCASS-030 Preliminary Investigation of Unstart-Related Transients in a Dual-Mode Scramjet <i>Logan Riley - OSU</i> <i>Datta Gaitonde - OSU</i> <i>Jeffrey Donbar - AFRL</i>	40DCASS-106 On the reliability of Páde Filtering for LES <i>Fernando Camacho - UKY</i> <i>Weiyun Liu - UKY</i> <i>J. M. McDonough - UKY</i>
14:40	40DCASS-076 Implicit LES Computation of a Vortical-Gust/Wing Interaction for Transitional Flow <i>Raymond Gordnier - AFRL</i> <i>Miguel Visbal - AFRL</i>	40DCASS-035 The Measurement of Turbulence with Unmanned Aerial Vehicles <i>Brandon Witte - UKY</i> <i>Jake Helvey - UKY</i> <i>Jon Mullen - UKY</i> <i>Mike Thamann - UKY</i> <i>Sean C.C. Bailey - UKY</i>	40DCASS-063 Reacting Flow Simulations in an Ultra Compact Combustor <i>Andrew Cottle - AFIT</i> <i>Marc D. Polanka - AFIT</i>	40DCASS-088 Computational Studies of the Velocity Field in an Autonomous Inflow Control Device <i>Charles Farbos de Luzan - UC</i> <i>Rodrigo Villalva - UC</i> <i>Paul Aghasi - UC</i> <i>Ephraim Gutmark - UC</i> <i>Liang Zhao - Other</i> <i>Weiqi Yin - Other</i> <i>Frederic Felten - Other</i>	40DCASS-118 Optimal SOR parameters for non-Dirichlet elliptic boundary-value problems <i>Bakhyt Alipova - UKY</i> <i>Tingting Tang - UKY</i> <i>J.M.McDonough - UKY</i>
15:00	40DCASS-090 Wing Performance Insight from Streamwise Evolution of Wake behind a Flat Plate <i>Sidaard Gunasekaran - UD</i> <i>Aaron Altman - UD</i>	40DCASS-038 Methodology for Reliable Emissivity Measurements at High Temperatures to support NASA Free-Flight Experiments at the University of Kentucky <i>Robert Bickel - UKY</i> <i>Dr. Michael Winter - UKY</i>	40DCASS-093 Transient Air Throttle Characterization for Scramjet Engine Cold Start <i>Victor Zimmer - AFIT</i> <i>Timothy M. Ombrello - AFRL</i> <i>James L. Rutledge - AFIT</i> <i>Marc D. Polanka - AFIT</i>	40DCASS-077 Aerodynamic Response Quantification of Complex Hypersonic Configurations using Variable Fidelity Surrogate Modeling <i>James Tancred - AFRL</i> <i>Markus Rumpfkeil - UD</i>	40DCASS-079 Sidewall Interaction of Supersonic Flow over a Compression Ramp <i>Nicholas Bisek - AFRL</i>
15:20	Networking Break - Great Hall Exhibit Area				

133	164	165	172	Room
SESSION 24 Acoustics Chair: David Munday <i>UC</i>	SESSION 25 Unmanned Vehicles Chair: Alan Jennings <i>AFIT</i>	SESSION 26 Human Factors Chair: Goutham Myavarapu <i>UC</i>	SESSION 27 Space III Chair: Richard Cobb <i>AFIT</i>	Time
<i>40DCASS-004</i> Heated Supersonic Jet from a Chevrons Nozzle <i>Pablo Mora - UC</i> <i>Jeff Kastner - UC</i> <i>Ephraim Gutmark - UC</i> <i>K. Kailasanath - NRL</i>	<i>40DCASS-003</i> Kinematic Selection and Fabrication of a Tailless Flapping Wing Micro-Air Vehicle <i>Isaac Weintraub - AFRL</i> <i>David Sigthorsson - AFRL</i> <i>Michael Oppenheimer - AFRL</i> <i>David Doman - AFRL</i>	<i>40DCASS-052</i> A new method of model construction for use in experimental validation <i>Alexandra Maddox - UC</i> <i>Liran Oren - UC</i> <i>Ephraim Gutmark - UC</i>	<i>40DCASS-011</i> Achieving Orbit Estimation Covariance Realism using Expectation Maximization with Gaussian Mixtures <i>Gary Goff - AFIT</i> <i>Dr. Jonathan Black - VT</i> <i>Dr. Joseph Beck - AFRL</i>	13:40
<i>40DCASS-009</i> Directivity and spectral analysis of jet turbulence through Synchronized Large Eddy Simulations <i>Unnikrishnan S - OSU</i> <i>Datta V. Gaitonde - OSU</i>	<i>40DCASS-020</i> Flying Qualities Criteria for Unmanned Aircraft <i>Kara Greene - AFIT</i> <i>Donald Kunz - AFIT</i>	<i>40DCASS-132</i> Aortic Blood Flow Simulations Using CFD & Phase Contrast Magnetic Resonance Images. <i>Goutham Mylavarapu - UC</i> <i>Ephraim Gutmark - UC</i> <i>Iris Gutmark-Little - CCH</i>	<i>40DCASS-010</i> HYDROS Thruster Component Testing in Atmospheric and Simulated Space Environment <i>Kan Liu - OSU</i> <i>Dylan Stelzer - AFIT</i> <i>Colin Bunker - AFIT</i> <i>John Alredge - AFIT</i> <i>Andrew Wang - AFIT</i>	14:00
<i>40DCASS-147</i> Spectral Energy Transfers in Uncontrolled and Controlled Supersonic Cavity Flows <i>Philip Abolmoali - UC</i>	<i>40DCASS-044</i> Performance Characterization of Tightly-Coupled GNSS Precise Point Positioning Inertial Navigation within a Simulation Environment <i>Jason Gross - WVU</i> <i>Ryan M. Watson - WVU</i> <i>Victor Sivaneri - WVU</i>	<i>40DCASS-140</i> Simulation of airflow in Upper Airway for various virtual surgeries and their correspondence with AHI data of respective patients. <i>Raghuvir Reddy Jonnagiri -UC</i> <i>Dhananjay Subramaniam -UC</i> <i>Goutham Mylavarapu - UC</i> <i>Ephraim Gutmark - UC</i>	<i>40DCASS-124</i> Cockpit design study for a modular commercial spaceplane <i>Pamela Menges - ARSI</i>	14:20
<i>40DCASS-070</i> On Using Steady RANS Simulations For Airfoil Noise Predictions <i>Markus Rumpfkeil - UD</i>	<i>40DCASS-107</i> Developing UAV's for Practical Applications <i>Jeffrey Bennett - UC</i> <i>Dr. Kelly Cohen - UC</i> <i>Bryan Brown - UC</i>	<i>40DCASS-123</i> Crew resource compatibility management (CRCM) in commercial spaceplane operations <i>Thomas Edwards - NKU</i> <i>P. A. Menges - ARSI</i>	<i>40DCASS-068</i> Investigating the Increasing Inventory of Clouds and Dark Spots on Uranus and Neptune through Computational Simulation <i>Raymond LeBeau - SLU</i> <i>Csaba Palotai - UCF</i>	14:40
<i>40DCASS-066</i> Acoustic Coupling to the Kelvin-Helmholtz Instability in the Approximation of Viscous Potential Flows <i>Serdar Bilgili - WVU</i> <i>Orlando Ugarte - WVU</i> <i>Vyacheslav Akkerman - WVU</i>	<i>40DCASS-114</i> 3D-Printed Octocopter with Motor Failure Compensation <i>Nathaniel Richards - UC</i> <i>Dr. Kelly Cohen - UC</i> <i>Bryan Brown - UC</i>		<i>40DCASS-039</i> Orbit Determination Using Vinti's Solution <i>Steven Wright - AFIT</i> <i>William E. Wiesel - AFIT</i>	15:00
Networking Break - Great Hall Exhibit Area				15:20

Room	116	119	120	127	131
	SESSION 28	SESSION 29	SESSION 30	SESSION 31	SESSION 32
	Fluid Dynamics IV	Experimental Methods II	Combustion IV	CFD Applications III	Combustion V
Time	Chair: Ryan Schmit AFRL	Chair: Richard Anthony AFRL	Chair: Brook Bentley AFIT	Chair: Markus P. Rumpfkeil UD	Chair: Donald Kunz AFIT
15:35	40DCASS-117 Aerial Firebombing: An empirical approach to determining Drop Patterns <i>Saad Qureshi - UD Aaron Altman - UD</i>	40DCASS-026 Methods of Measuring Stress Relaxation in Tape Springs <i>Justin Heppe - AFIT Dr. Alan Jennings - AFIT</i>	40DCASS-129 Design for a Premixed Rotating Detonation Engine Mixture Feed System <i>Ionio Andrus - AFIT Paul I. King - AFIT Frederick R. Schauer - AFRL John L. Hoke - ISSI</i>	40DCASS-083 Development of Thermo-Mechanical Solver in Simulation of Re-entry Ablation <i>Rui Fu - UKY Alexandre Martin - UKY</i>	40DCASS-086 High-Speed Imaging of Combustion Oscillations in a Multiple Nozzle Staged Combustor <i>Brian Dolan - UC Rodrigo Villalva - UC Ephraim Gutmark - UC</i>
15:55	40DCASS-025 Design, development and validation of a flat plate wind tunnel facility to study film cooling effectiveness <i>Mouleeswaran Kandampalayam Kandasamy P - UC Paul Aghasi - UC David Munday - UC</i>	40DCASS-051 Remote Recession Measurements of Ablative Heat Shield Materials <i>Bradley Butler - UKY Dr. Michael Winter - UKY</i>	40DCASS-094 Operating Map and Wave Speed Performance of a Rotating Detonation Engine for Three Fuel Injection Schemes <i>Vijay Anand - UC Andrew St. George - UC Robert Driscoll - UC Ephraim J. Gutmark - UC</i>	40DCASS-046 A Study of Ablative Phenomena at Varying Initial Conditions <i>Troy Soileau, Jr. - UKY Dr. Alexandre Martin - UKY</i>	40DCASS-087 Study on the Isothermal Flowfields of Interacting Swirl-Stabilized Nozzles <i>Brian Dolan - UC Rodrigo Villalva - UC Ephraim Gutmark - UC</i>
16:15	40DCASS-121 Boiling Dynamics of Superheated Liquids <i>Elisabeth Morris - UKY Jose Grana-Otera - UKY</i>	40DCASS-085 Error in Off-Axis Loading of Off-the-Shelf 6 Component Force Transducers: A Cautionary Tale <i>Sidaard Gunasekaran - UD Aaron Altman - UD Michael Ol - AFRL</i>	40DCASS-100 Continued Numerical Investigation of Inlet Injection within a Rotating Detonation Engine <i>Robert Driscoll - UC Andrew St. George - UC Vijay Anand - UC Ephraim J. Gutmark - UC</i>	40DCASS-015 Comparison of Carbon Ablative Shock-Layer Radiation under Earth Re-entry Conditions <i>Christopher Alba - AFIT Robert B. Greendyke - AFIT Steven W. Lewis - UQ Richard G. Morgan - UQ Timothy J. McIntyre - UQ</i>	40DCASS-120 A Parametric Study of Micro Atomizing Nozzles on a Rotary Fuel Slinger <i>Nicholas Jones - PCKA Dr. Terry Ng - UTL</i>
16:35	40DCASS-109 Scale Modeling Investigation of Vortex Shedding Generation Behind a Cylinder <i>Greg Pullen - UKY Colby Borchetta - UKY Bradley Butler - UKY</i>	40DCASS-024 X-ray diagnostics of liquid mass distribution in impinging jet sprays <i>Benjamin Halls - AFRL James R. Gord - AFRL Terrence R. Meyer - ISU Theodore Heindel - ISU Sukesh Roy - SE Alan L. Kastengren - Other</i>	40DCASS-125 Thermodynamic Modeling of a Rotating Detonation Engine <i>Nihar Shah - AFIT Dr. Paul King - AFIT</i>		40DCASS-058 Experimental Magnetohydrodynamic Power Extraction from a Pulsed Detonation Tube <i>Kaz Teope - AFIT Paul I. King - AFIT Frederick R. Schauer - AFRL John L. Hoke - ISSI</i>
16:55	Adjourn				

133	164	165	172	Room
SESSION 33	SESSION 34		SESSION 35	
Heat Transfer	Imaging and Diagnostics		Space IV	
Chair: Mark Turner UC	Chair: Jake Schmidt SE		Chair: Christopher Geisel AFIT	Time
40DCASS-065 Film Cooling Studies at Elevated Temperatures Subject to Surface Curvature and Varying Mach Number <i>Andrew Lynch - AFIT</i> <i>Marc D. Polanka - AFIT</i> <i>Andrew T. Shewhart - AFIT</i> <i>James L. Rutledge - AFIT</i>	40DCASS-111 Kilohertz PIV Investigation of a Supersonic Jet, With and Without Screech <i>David Munday - UC</i> <i>Ephraim Gutmark - UC</i>		40DCASS-031 A CubeSat Mission Analysis for Locating and Mapping Spot Beams of Geostationary Comm-Satellites <i>Jacob LaSarge - AFIT</i> <i>Dr. Jonathan Black - AFIT</i>	15:35
40DCASS-053 Heat conduction through light weight charring ablates with water contaminant <i>Ali Omidy - UKY</i> <i>David Smith - UKY</i> <i>Alexandre Martin - UKY</i>	40DCASS-148 Selective Two-photon Absorptive Resonance Femtosecond-Laser Electronic-Excitation Tagging (STARFLEET) in combustion and flow diagnostics <i>Naibo Jiang - SE</i> <i>Benjamin R. Halls - SE</i> <i>Hans U. Stauffer - SE</i> <i>Sukesh Roy - SE</i> <i>James R. Gord - AFRL</i>		40DCASS-096 Characterizing the Effects of Unknown Error Injection on SOSI Network Performance <i>James Lesko - AFIT</i> <i>Dr. Jonathan Black - VT</i>	15:55
40DCASS-119 Time Scale Analysis, Experiments, and Simulations for a Monte Carlo Model of Spray Cooling <i>John Kuhlman - WVU</i>	40DCASS-115 Using intelligent systems for object recognition in thermal imaging analysis <i>Owen Macmann - UC</i> <i>Dr. Kelly Cohen - UC</i> <i>Bryan Brown - UC</i>		40DCASS-102 Aiding Geostationary Space Situational Awareness Using Small Aperture Commercial Telescopes <i>Daniel Moomey - AFIT</i>	16:15
	40DCASS-156 Visualizing the effects from plasma-assisted combustion in vitiated air with 10-kHz OH PLIF <i>Jacob Schmidt - SE</i> <i>Naibo Jiang - SE</i> <i>Waruna Kulatilaka - SE</i> <i>Sukesh Roy - SE</i> <i>James R. Gord - SE</i>		40DCASS-152 Space Object Self-Tracker Experiment Design and Analysis <i>Daniel Jenson - AFIT</i>	16:35
Adjourn				16:55

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AIAA
Dayton-Cincinnati Section

AMERICAN INSTITUTE OF
AERONAUTICS AND ASTRONAUTICS
DAYTON-CINCINNATI SECTION

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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	Lance Chenault	ABDA, Inc	937-318-1640	The buck stops here for the execution of all section activities!
Vice Chair	Michael List	AFRL/RQ	937-255-7047	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	Tim Cleaver	AFRL/RQVX	927-713-6706	Promote membership at meetings and events, including membership upgrades and service opportunities within the sectional, regional, and national communities of the AIAA.



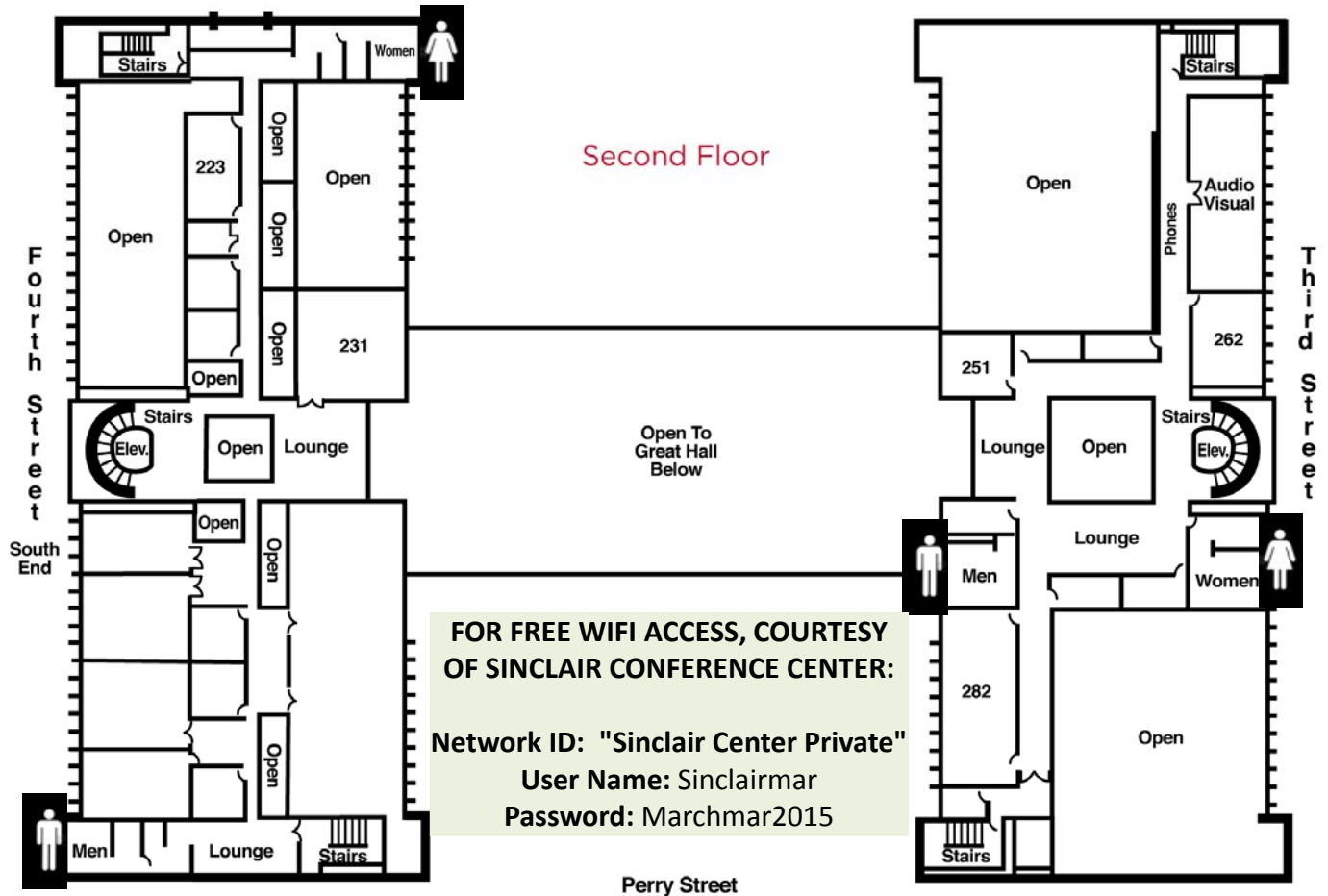
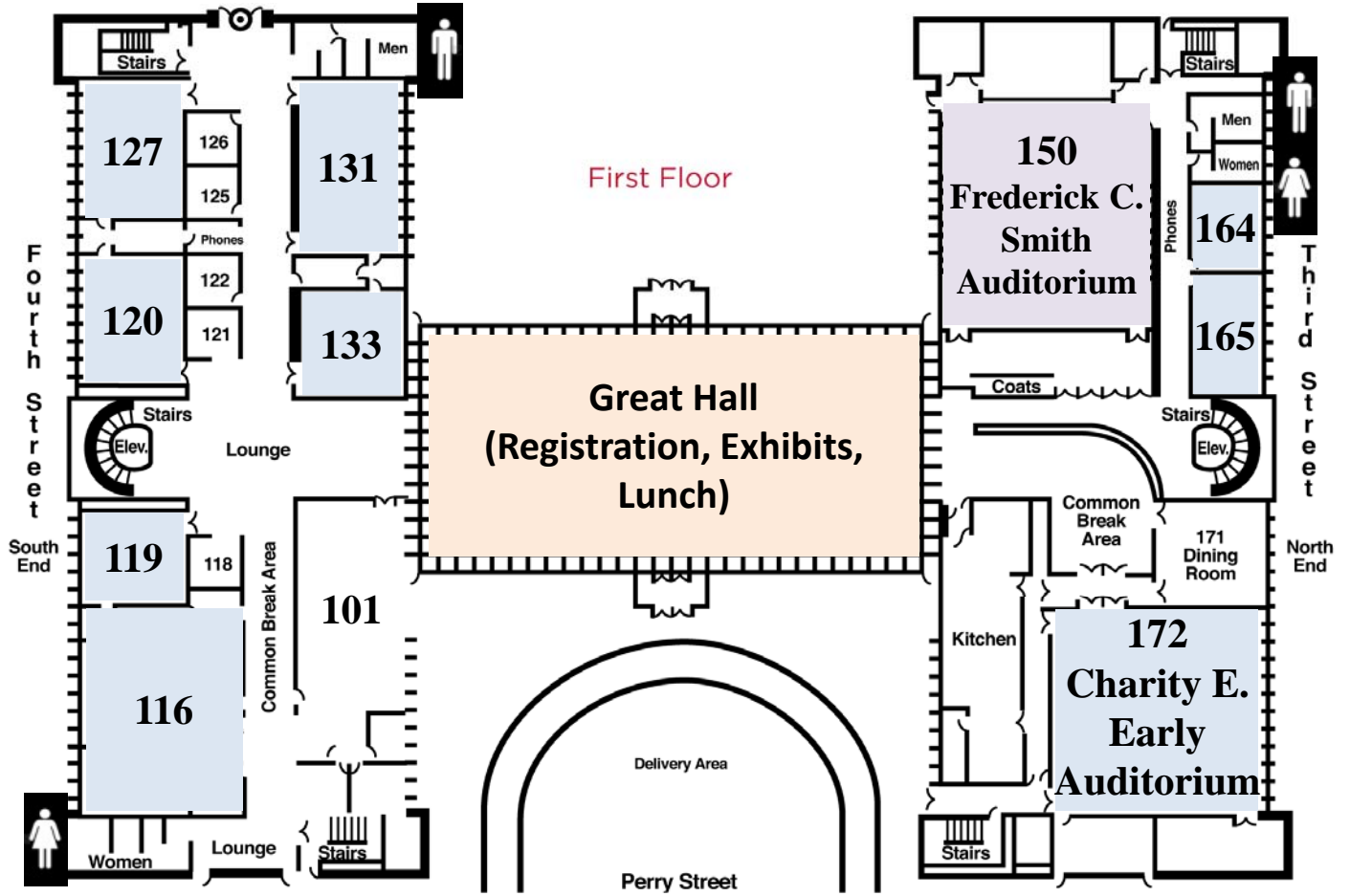
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Technical Committee Coordinator	Available			Coordinates Technical Committee activities with the section
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