AIAA Dayton-Cincinnati Section

AMERICAN INSTITUTE OF AERONAUTICS AND ASTRONAUTICS DAYTON-CINCINNATI SECTION

SYMPOSIUM GUIDE



Sinclair Ponitz Conference Center

Keynote Program: The Evolution of Hypersonic Flight Over Seven Decades and the Technical Breakthroughs That Got Us Here

https://www.aiaa-daycin.org/DCASS

AIAA Student Sections: Air Force Institute of Technology, Cedarville University, Miami University, Ohio Northern University, Ohio State University, Ohio University, University of Cincinnati, University of Dayton, University of Kentucky - Lexington, University of Kentucky - Paducah, Wright State University

Welcome

to the

50th AIAA Dayton-Cincinnati Aerospace Sciences Symposium (DCASS)

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The AIAA Dayton-Cincinnati Aerospace Sciences Symposium has reached its Golden Jubilee celebration! For *five decades* now, DCASS has served as a unique forum for bringing together our regional aerospace community. The symposium showcases cutting-edge scientific and engineering research and innovations in the one-day event through technical presentations across multiple aspects of aerospace science and technology, from modeling and design to manufacturing aspects.

The day-long symposium includes talks submitted from across the Section's aerospace professionals, students, and academics. This year, DCASS celebrates the legacy and future of hypersonic science & technology with our Keynote Speaker, Dr. Kevin Bowcutt, one of the pioneers and drivers in hypersonic research and development. Dr. Bowcutt's talk entitled "The Evolution of Hypersonic Flight over Seven Decades" will showcase the challenges faced by the US aerospace community in developing, testing, and fielding hypersonic systems, including the breakthroughs that made the technology behind the X-43 and X-51 scramjet-powered demonstrators possible. Dr. Bowcutt leads Boeing's advanced design and technology development efforts for hypersonic missiles, airplanes, and spaceplanes. In 2025, Dr. Bowcutt was presented with the AIAA Durand Lectureship Award for Public Service.

In promoting Science, Technology, Engineering, and Mathematics (STEM) culture in the region and to help prepare young engineering leaders for future aerospace careers, we continue to host a forum for aspiring aerospace engineers with a High School Students Session, providing a friendly and collegial platform at DCASS to support and inspire our future aerospace professionals.

The symposium has been organized by a group of dedicated volunteers who work throughout the year to make this meeting a success. This meeting would not be possible without the dedicated efforts of these passionate volunteers. On behalf of the Executive members, we thank the chapter and national AIAA leadership, the communities supporting DCASS, 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 all attendees to submit their vote for the art-in-science contest. The best presentations and art-in-science award winners will be recognized at the annual Dayton-Cincinnati Section Awards Program, to be scheduled for May 2025, stay tuned for details and plan to attend!

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

Drs. José Camberos & Christopher Ruscher

2025 DCASS Executive Chair & Co-Chair

AMERICAN INSTITUTE OF AERONAUTICS AND ASTRONAUTICS

DAYTON-CINCINNATI SECTION

2025 DAYTON-CINCINNATI SECTION AWARDS

CALL FOR NOMINATIONS

Recognize the achievements of your colleagues. The local Awards Banquet is going to be held in May 19 at the University of Dayton. Nominations are sought for several local awards. These include:

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

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

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

There is no specific format required. Simply complete the attached form and E-mail the information. Award selections will be made by an expert panel of judges. Submit nominations (by E-mail) by **11 April 2025** to:

Dr. Marc Polanka
E-mail: marc.polanka@afit.edu

NOMINATION FORM

(Nomination Package Must be Limited to 2 Pages)

CATEGORY:

Nominee:	**Nominator:**
Affiliation:	**Affiliation:**
Address:	**Address:**
Tel:	**Tel:**
E-mail:	**E-mail:**

Symposium Schedule At-A-Glance

Registration: 7:00 AM – 2:00 PM

Corporate Exhibits: 9:00 AM – 4:00 PM

Art in Science Competition: 9:00 AM–4:00 PM **VOTE ONLINE:** www.aiaa-daycin.org/DCASS/AIS.php

Please fill out the Survey: www.aiaa-daycin.org/DCASS/feedback.php

First Block 8:20 AM – 10:00 AM

1	Aerospace Vehicle Design	Room 116
2	Thermal Protection	Room 119
3	Combustion	Room 120
4	Space Systems	Room 127
5	Combustion	Room 131
6	Composite Materials	Room 133
7	Computational Fluid Dynamics	Room 171

Second Block 10:20 AM – 11:20 AM

8	Flight Dynamics & Controls	Room 116
9	Fluid Dynamics	Room 119
10	Imaging & Diagnostics	Room 120
11	Digital Engineering 1	Room 127
12	Additively Manufactured Structures	Room 131
	Room Not Used	Room 133
	Room Not Used	Room 171

Keynote Program in Frederick C. Smith Auditorium (Room 150) 11:40 AM – 12:40 PM

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

Third Block 1:40 PM – 3:00 PM

13	Acoustics	Room 116
14	Fluid Dynamics of Jets & Sprays	Room 119
15	High Speed Vehicle Modeling	Room 120
16	Space Systems & Robotics	Room 127
17	Materials & Structures 1	Room 131
18	Emerging Machine Learning Applications	Room 133
	Room Not Used	Room 171

Fourth Block 3:20 PM – 4:40 PM

19	High School Scholars	Room 116
20	Thermal Management	Room 119
21	Rotating Detonation Combustors	Room 120
22	Spaceflight Dynamics & Controls	Room 127
23	Materials & Structures 2	Room 131
24	Digital Engineering 2	Room 133
	Room Not Used	Room 171

The abstracts for the talks presented today may be found on the following website:
https://www.aiaa-daycin.org/DCASS/list_abs.php .
The Executive Committee encourages the use of this 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
Air Vehicle Technology	1, 8, 13, 15	Heat Transfer	2, 20
Combustion	3, 21	Materials & Structures	5, 12, 17, 23
Digital Engineering & Machine Learning	7, 11, 18, 24	Space Vehicle Technology	4, 16, 22
Fluid Dynamics	6, 9, 10, 14	High School	19

Session Chairs will provide scores based on the 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!

For online access to the Program-at-a-glance, please visit: https://www.aiaa-daycin.org/DCASS/glance.php

AIAA Dayton-Cincinnati Section

50th Dayton-Cincinnati Aerospace Sciences Symposium

Time	Room 116	Room 119	Room 120	Room 127	Room 131	Room 133	Room 171
	SESSION 1 **Aerospace Vehicle Design** Chair: Timothy Takahashi *AFIT*	SESSION 2 **Thermal Protection** Chair: Naibo Jiang *SE*	SESSION 3 **Combustion** Chair: Taber Wanstall *UD*	SESSION 4 **Space Systems** Chair: Yashvi Srivastava *HSEO*	SESSION 5 **Composite Materials** Chair: Anthony Palazotto *AFIT*	SESSION 6 **Computational Fluid Dynamics** Chair: James Rutledge *AFIT*	SESSION 7 **Machine Learning for Aerospace Applications** Chair: Karen Demille *AFRL*
8:20 AM	*50DCASS-002* Multi-Fidelity Aerostructural Optimization of ESAV including Flutter Constraints *Markus Rumpfkeil - UD* *Phil Beran - AFRL*	*50DCASS-004* Uncertainty Propagation in Transient Heat Transfer from an Extended Surface *Edwin Forster - AFRL* *Rama Gorla - AFIT*	*50DCASS-027* Near Lean Blowout Behavior in Lean Direct Injection Nozzle *Shyam Murali - UC* *Yuvi Nanda, Tharun Reddy,* *Grace Fischer, Kranthi Yellugari - UC* *Dr. Ephraim Gutmark - UC*	*50DCASS-013* Modeling, Simulation, and Design Optimization of Space Mobility and Logistics Architectures *Hunter Rausch - AFIT*	*50DCASS-023* Experimental Characterization of Bearing Fatigue of Fiber Metal Laminate Without Film Adhesive *Matthew Fadden - AFIT* *John Brewer - AFIT* *Michael Gran - AFRL*	*50DCASS-067* Development of a Polar Invariant Map for Turbulence Modeling *James Wnek - WSU* *Christopher Schrock - AFRL* *Eric Wolf - OAI* *Mitch Wolff - WSU*	50DCASS-050 Accelerated and Confidence-based Machine Learning with Dimension Reduction via Global Sensitivity Analysis for Conceptual Aerospace Vehicle Design *Harok Bae - WSU* *Atticus Beachy - AFIT* *Jos é A. Camberos - AFIT* *Ramana V. Grandhi - AFIT* *Jonathan Boston - AFRL*
8:40 AM	50DCASS-072 Flight Test Validation of Tandem Propeller Performance with Vertical Offset *Michael Foster - UD* *Jessica DeMoor - UD* *Sidaard Gunasekaran - UD* *Jielong Cai - UD*	50DCASS-035 Characterizing the Wavelength and Angular Dependence of Radiation Properties in TPS Materials *Yejajul Hakim - UKY* *Ahmed H. Yassin - UKY* *Ayan Banerjee - UKY* *Savio J. Poovathingal - UKY* *Michael W. Renfro - UKY*	50DCASS-037 BOS Analysis of TARS Combustor *Grace Fischer - UC* *Ephraim Gutmark - UC* *Shyam Murali - UC* *Yuvi Nanda - UC* *Tharun Reddy - UC*	*50DCASS-015* Launching a Deputy to a Target Area From a High Degrees-of-Freedom Space Manipulator on a Free-Floating Base *Sarah Hudson - UC* *Diego Quevedo - UC* *Donghoon Kim - UC*	*50DCASS-076* Fatigue Behavior of two Advanced C/SiC Composites at 1200 C *Conner Adams - AFIT* *M. B. Ruggles-Wrenn - AFIT*	*50DCASS-001* Numerical Simulation of Circulation Control For a Wing Section Using a Coanda Jet *Donald Rizzetta - AFRL* *Daniel Garmann - AFRL*	*50DCASS-014* Multi-Fidelity Machine Learning Modeling for Aerodynamic Response Prediction of Aerospace Vehicles *Ethan Jackman - AFIT* *Jos é Camberos - AFIT* *Harok Bae - WSU*
9:00 AM	*50DCASS-056* Aerospace Vehicle Conceptual Design Trade Studies Using ADAPT *Bryce Helmer - AFIT* *Samuel C. Atchison - AFIT* *Jos é A. Camberos - AFIT*	*50DCASS-043* Fuel Pump Power and Thermal Conceptual Design Investigation for a High Speed Vehicle *Jacob Jadischke - AC* *Jos é Camberos - AFIT* *Ramana Grandhi - AFIT* *Danielle Hollon - AFRL* *Mitch Wolff - WSU*	*50DCASS-059* Altitude System Design for Two-stroke Engines Between 50-200 cc *Jacob L. Ahles - AFIT* *Marc Polanka - AFIT* *Joseph K. Ausserer - AFIT* *Thomas C. Balaj - AFIT* *Jacob A. Baranski - ISSI*	*50DCASS-017* Design and Evaluation of a Deployment Mechanism for a Space-Based Origami Mirror in CubeSat Missions *Arturo Luna - AFIT* *Robert Bettinger - AFIT*	*50DCASS-084* Fatigue Behavior af an Advanced SiC/SiC Composite with an Array of Small Cooling Holes at 1200 C *Tess Panchyshyn - AFIT* *M. B. Ruggles-Wrenn - AFIT*	*50DCASS-095* Enhancing RANS Turbulence Predictions for 3D Automotive Flows Using the Ensemble Kalman Filter and Tensor Basis Neural Network *Tarun Kakarlamudi - OSU* *Dr. Lian Duan - OSU*	*50DCASS-038* Dreaming Falcon: Advanced Drone Control using Physics-Informed Model-Based Reinforcement Learning *Bhavanishankar Kalavakolanu - OSU* *Eashan Vytla - OSU* *Matthew McCrink - OSU* *Andrew Perrault - OSU*
9:20 AM	*50DCASS-003* Development of a High-Speed Vehicle Conceptual Design Process using ADAPT Framework *Samuel Atchison - AC* *Matthew Madayag - AFIT* *Jos é Camberos - AFIT*	*50DCASS-098* Implementation of Genetic Algorithms to Model the Modes of Heat Transfer in Fibrous Insulation Materials *James Senig - UKY* *John F. Maddox - UKY*	*50DCASS-040* Nonlinear behavior of thermoacoustic instabilities in swirl-stabilized combustor *Yuvi Nanda - UC* *Shyam Muralidharan - UC* *Tharun Reddy - UC* *Ephraim Gutmark - UC*	*50DCASS-073* Universal Model Based Systems Engineering Rendezvous and Proximity Operations Mission Planner *Thomas Kelly - AFIT* *Curtis, David H. - AFIT* *Stern, Jordan L. - AFIT*	*50DCASS-087* Mechanical Properties of Low Dimensional Materials Based Nanocomposites *Arun Nair - AFIT* *Abigail Eaton - AC*	*50DCASS-101* Computation Fluid Dynamics for Distributed Lift Configurations *Ainsley Rousseau - OSU* *Scott Sherer - AFRL* *Michael Mongin - AFRL* *Aaron Altman - AFRL*	*50DCASS-041* Online Identification of Free-Floating Dual-Arm Space Robot Dynamics With Interpretable Physics Informed Machine Learning *Aaron Borger - UC* *Donghoon Kim - UC*
9:40 AM	*50DCASS-079* On coupling approaches for mixed-fidelity aeropropulsive analysis and optimization *Neal Novotny - AFRL* *Jan Kiviaho - UDRI*	*50DCASS-065* Predictive Aeroheating for Conceptual Vehicle Design and Analysis *Amy Cinnamon - AFIT* *Jos é Camberos - AFIT*	*50DCASS-044* Simultaneous Z-type Schlieren and OH Chemiluminescence for the Analysis of Combustion Dynamics *Tharun Srinivas Karnam Reddy - UC* *Ephraim J. Gutmark - UC*	*50DCASS-090* Satellite Simulation and Association Utilizing Machine Learning for Congested Space *Mathew Core - AFIT* *Lt Col Rachel M. Derbis - AFIT* *Maj Timothy I. Machin - AFIT* *David W. Meyer - AFIT*	*50DCASS-088* Deformation of Composite Plates Under High Strain Rates *Arun Nair - AFIT* *Jackson King - AFIT* *Wyatt Hodson - AFIT* *John Hansen - AFIT*	*50DCASS-082* Implicit Large Eddy Simulations of F-BoLT Boundary Layer Transition *Tim Leger - OAI*	*50DCASS-074* Using Unsupervised Machine Learning to Detect Flow Separation on Low-Pressure Turbine Blades *Aaron Suter - AFRL* *Christopher Marks - AFRL* *Jared Kerestes - AFRL* *Mitch Wolff - WSU*
10:00 AM	Break						

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SBHS = Stebbins High School
SE = Spectral Energies LLC
SLU = St. Louis University
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	Room 116	Room 119	Room 120	Room 127	Room 131	Room 133	Room 171
Time	SESSION 8 **Flight Dynamics & Controls** Chair: Donald Rizzetta *AFRL*	SESSION 9 **Fluid Dynamics** Chair: Rama Gorla *AFIT*	SESSION 10 **Imaging & Diagnostics** Chair: Joseph Miller *CDU*	SESSION 11 **Digital Engineering 1** Chair: Markus Rumpfkeil *UD*	SESSION 12 **Additively Manufactured Structures** Chair: Donghoon Kim *UC*		
10:20 AM	*50DCASS-028* Aerospace Vehicle Trajectory Analysis Using Stability & Controllability Bracketed Analysis *Rhonin Edwards - AFIT* *Will Lorenzo - AFIT* *Jos é Camberos - AFIT*	*50DCASS-053* Characterizing the Dynamics of a Spanwise Homogenous Shock Train using Large Eddy Simulation *Jack Sullivan - OSU* *Datta V. Gaitonde - OSU*	*50DCASS-033* Simultaneous Rayleigh Scattering and Rainbow Schlieren Deflectometry in Turbulent Binary Mixing Jets *Sushil Janardhana - UD* *C. Taber Wanstall - UD*	*50DCASS-054* Introduction to AIAA's Digital Engineering Integration Committee *Rick Graves - AFRL*	*50DCASS-012* Mechanical Response of Triply Periodic Minimal Surface Gyroid Structures Under Combined Loading *Capt Jay B. Patel - AFIT* *Maj John S. Brewer - AFIT* *Elizabeth K. Bartlett - AFRL*		
10:40 AM	*50DCASS-029* Aircraft Design, Analysis, Performance, and Trade Space (ADAPT) Plug-In for Stability & Controllability *Luis Javier Silva-gomez - AFIT* *Will Lorenzo - AFIT* *Samuel Atchison - AFIT* *Jos é Camberos - AFIT*	*50DCASS-075* Experimental Investigation of PRANDTL-D3C Near-Wake *Julian Pabon - UD* *Sidaard Gunasekaran - UD* *Grace Shreyer - UD* *Michael Mongin - AFRL* *Aaron Altman - AFRL*	*50DCASS-046* Quantifying Droplet Breakup Regimes in High-Speed Flow Fields with Diffuse Background Illumination *Joseph Kastner - UD* *C. Taber Wanstall - UD*	*50DCASS-089* Leveraging MBSE for Integration and Stakeholder Engagement in Autonomous Aerial Refueling Flight Tests *Kevin Keth - AFIT* *David R. Jacques - AFIT*	50DCASS-048 Selective Laser Sintering Based Additive Manufacturing of Nylon 12 Novel Hybrid Lattice Structures for Improved Compressive Strength *Ahkar Min Thant - MU* *Jianfeng Ma - SLU* *Muhammad P. Jahan - MU*		
11:00 AM	*50DCASS-063* X-15 High Fidelity Stability and Control Study *Hannes Rogers - AFIT* *Jos é Camberos - AFIT*	*50DCASS-093* Wake Characteristics of Non-Elliptical Lift Distribution *Charles Cain - UD* *Sidaard Gunasekaran - UD*	*50DCASS-071* Evolution of H-TALIF Signal After Nanosecond Discharges in Methane-Air Mixtures *Katherine Opacich - NRC* *Timothy M. Ombrello, Campbell D. Carter - AFRL* *Joseph K. Lefkowitz -* *Matthew K. Hay, Waruna D. Kulatilaka - TAMU*	*50DCASS-055* Digital Materiel Management for a Bio-Inspired Rotating Empennage Aircraft *Rick Graves - AFRL*	*50DCASS-060* Evaluation of Additive Manufactured GRX-810 Alloys in the AFIT Burner Rig Facility *Marlee Ruiz - AFIT* *Marc Polanka - AFIT* *Matthew R. Gazella - AFIT* *Ryan A. Kemnitz - AFIT*		
11:20 AM	Break						
11:30 AM	KEYNOTE PROGRAM (see next page for details)						
12:40 PM	Lunch Break						

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50th AIAA Dayton-Cincinnati Aerospace Sciences Symposium

Please join us at 11:30 for the Keynote Program:

Welcome, Announcements:

DR. JOSÉ CAMBEROS

2025 DCASS Executive Chair

AIAA CEO Remarks:

MR. CLAY MOWRY

Keynote Address:

The Evolution of Hypersonic Flight Over Seven Decades and the Technical Breakthroughs That Got Us Here

DR. KEVIN BOWCUTT

Senior Technical Fellow and Chief Scientist of Hypersonics Boeing Company



Dr. Bowcutt's lecture will chronicle the major milestones that enabled air-breathing hypersonic flight, bringing future promise to current capability, and leading to worldwide pursuit of hypersonic capabilities and competition for leadership in the field. Hypersonic flight has the potential to dramatically impact national defense, significantly improve the speed of global travel, and the frequency & cost of space access. For more than 50 years following the first hypersonic flight in 1949, expendable rocket propulsion was the only available means of accelerating vehicles to hypersonic speed, limiting applications to costly spaceflight and military missiles. Although it took more than 40 years of dedicated R&D, the idea conceived in 1957 of a more efficient air-breathing engine employing supersonic combustion, the scramjet, was finally proven viable in 2004 by powering NASA's X-43A. Almost 10 years later, in 2013, hypersonic air-breathing propulsion was proven practical by flying a dual-mode ramjet on the USAF/DARPA X-51 Scramjet Engine Demonstrator. These achievements were enabled by continuous advancements in high-temperature materials; test facilities, test techniques & test campaigns; scramjet technologies, such as air intakes, isolators, injectors, mixers, flame holders, combustion chemistry, and nozzles; fluid dynamic and thermostructural simulation; and multidisciplinary design analysis and optimization.

Dr. Bowcutt is a Senior Technical Fellow and Chief Scientist of Hypersonics for The Boeing Company, with over 40 years of experience. He is an AIAA Fellow, a Fellow of the Royal Aeronautical Society, and a member of the National Academy of Engineering. In 2021 he was selected by Texas A&M to be a Fellow of the Hagler Institute of Advanced Studies. He holds BS, MS, and Ph.D. degrees in aerospace Engineering from the University of Maryland. Bowcutt is an internationally recognized expert in hypersonic aerodynamics, propulsion integration, and vehicle design and optimization. Notable accomplishments include developing the viscous-optimized hypersonic waverider, flight testing scramjets by launching them from a light gas gun, technically supporting the NASA X-43A scramjet flight test program, originating and optimizing the design of the X-51A scramjet-powered demo vehicle, helping the Space Shuttle Columbia accident investigation by simulating wing aero-thermal-structural failure, leading Boeing's contributions to the HIFiRE international hypersonic flight experiment program, and leading Boeing's hypersonic passenger airplane design investigation. In the spring of 2007, Dr. Bowcutt was a visiting professor at Princeton University's Mechanical and Aerospace Engineering department, where he taught a course on design in hypersonic aircraft design, and taught the same course at Texas A&M University in the spring of 2022. Dr. Bowcutt leads Boeing's advanced design and technology development efforts for hypersonic missiles, airplanes, and space-planes. In 2025, Dr. Bowcutt was awarded the AIAA Durand Lectureship for Public Service.





50th Dayton-Cincinnati Aerospace Sciences Symposium

	Room 116	Room 119	Room 120	Room 127	Room 131	Room 133	Room 171
	SESSION 13 **Acoustics** Chair: Carl Tilmann *AFRL*	SESSION 14 **Fluid Dynamics of Jets & Sprays** Chair: Marc Polanka *AFIT*	SESSION 15 **High Speed Vehicle Modeling** Chair: John Brewer *AFIT*	SESSION 16 **Space Systems & Robotics** Chair:Robert Bettinger *AFIT*	SESSION 17 **Materials & Structures 1** Chair: Samuel Atchison *AC*	SESSION 18 **Emerging Machine Learning Applications** Chair: Gregory Roth *AFRL*	
Time							
1:40 PM	*50DCASS-021* Aerodynamic Valve Integration and Performance Analysis in Valveless Pulsejets *Remya Nair - UC* *Ephraim Gutmark - UC*	*50DCASS-091* Experimental Setup for a Closed-Loop Controlled Active Flow Control Jet *Julian Pabon - UD* *Sidaard Gunasekaran - UD* *Michael Mongin - AFRL*	*50DCASS-103* Multifidelity Surrogate Modeling of a Generic Hypersonic Vehicle *Evan Burke - AFRL* *Markus Rumpfkeil - UD*	*50DCASS-011* Bio-Inspired Motion Strategies for Robotic Arm-Equipped Satellites Using Computer Vision and Animal Pose Estimation *Alhim Adonai Vera Gonzalez - UC* *Daegyun Choi - UC* *Donghoon Kim - UC*	*50DCASS-020* Finite Element Modeling of a Taylor Test to Determine Material Properties *Armando Deleon - WSU* *Anthony N. Palazotto - WSU*	*50DCASS-058* Isotopic Analysis of Lithium Hydroxide Monohydrate Using Laser-Induced Breakdown Self-Reversal Isotopic Spectrometry (LIBRIS) and Machine Learning *Madison Moran - AFIT* *Ashwin Rao - AFRL* *Anil Patnaik - AFIT*	
2:00 PM	*50DCASS-042* Use of Sweeping Jet Actuator for Supersonic Jet Noise Reduction *Kaurab Gautam - UC* *Ephraim Gutmark - UC*	*50DCASS-092* Characterization of Agricultural Nozzle Spray Geometry in Propeller Wake using Spray Patternator *Brock Greenwood - UD* *Abdul Khan - UD* *Sidaard Gunasekaran - UD*	*50DCASS-051* Automating Geometry Generation, Meshing, and Aerodynamic Modeling *Christopher Humphrey - UC* *José Camberos - AFIT*	*50DCASS-016* Dynamic Modeling and Control of a High Degrees-of-Freedom Free-Flying Space Manipulator System Performing Robot-to-Robot Handover *Diego Quevedo - UC* *Sarah Hudson - UC* *Aaron Borger - UC* *Donghoon Kim - UC*	*50DCASS-031* Evaluating Wave Propagation using Johnson-Cook Equation *Katie Bruggeman - WSU* *Anthony Palazotto - AFIT* *Dan Young - WSU*	*50DCASS-061* A Geometrically Flexible Machine Learning Approach to Predict Stress Intensity Factors for Computationally Efficient Fatigue Analysis *Christopher Turner - UC* *Karen DeMille - AFRL*	
2:20 PM	*50DCASS-049* Exploration of Slot Injection for Noise Reduction on 2D-CD Style Nozzles *James Cramer - UC* *Ephraim Gutmark - UC*	*50DCASS-094* Effects of a Pulsed Jet in Crossflow on Flow Characteristics *Laura Senkar - UC* *Daniel Cuppoletti - UC*	*50DCASS-099* Model Based System Engineering Framework Applied to a Generic Hypersonic Vehicle *Charles Lampp - AFIT* *José Camberos - AFIT* *David Jacques - AFIT*	*50DCASS-019* A Modular Robotic Testbed for In-Space Mission Simulation *Anirudh Chhabra - UC* *Aaron Borger - UC* *Donghoon Kim - UC*	*50DCASS-086* Elastic Wave Propagation in Bio-inspired Structures *Arun Nair - AFIT* *Joshua DeMorris - AFIT* *Carson Willey - AFRL* *Vincent Chen - AFRL* *Abigail Juhl - AFRL*	*50DCASS-068* Testing the Cognitive Predictive Performance Equation Model on a Duolingo Dataset *Trevor Cross - AFIT* *Aihua Wood - AFIT*	
2:40 PM	*50DCASS-070* The Impact of Upstream Flow Variations on Acoustic Behavior in overexpanded nozzle *Arshad Mohammed - UC* *Gautam Kaurab - UC* *Ephraim Gutmark - UC*			*50DCASS-032* Exploring Dynamic Coupling in Space Manipulator System Using Nonlinear Correlation Tools *Gargi Das - UC* *Daegyun Choi - UC* *Donghoon Kim - UC*		*50DCASS-100* Hyperparameter Optimization for Training Multi-fidelity Robust Physics Informed Neural Networks *Mark Bergman - WSU* *Harok Bae - WSU*	
3:00 PM	Break						

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	SESSION 19	SESSION 20	SESSION 21	SESSION 22	SESSION 23	SESSION 24	
	High School Scholars	**Thermal Management**	**Rotating Detonation Combustors**	**Spaceflight Dynamics & Controls**	**Materials & Structures 2**	**Digital Engineering 2**	
	Chair: Anil Patnaik	Chair: Christopher Ruscher	Chair: Troy Hoeger	Chair: Rachel Derbis	Chair: Arun Nair	Chair: Rick Graves	
Time	*AFIT*	*SE*	*AFLCMC*	*AFIT*	*AFIT*	*AFRL*	
3:20 PM	*50DCASS-047* Evaluation and Comparison of Large Language Models *Isaiah Goble - SBHS* *Kara Combs - AFRL*	*50DCASS-026* A Nitinol-Actuated Passive Dynamic Radiator for Spacecraft Electronic Component Cooling *Anthony Lococo - UD* *Dr. Rydge Mulford - UD* *Abigail Boyer - UD* *Ashley Anderson - UD* *Andrew Gabriel - UD*	*50DCASS-024* Analysis of Rotating Detonation Wave Interaction with Reactive Core Flow *Tyler Pritschau - UC* *Rachel Wiggins - UC* *Ephraim Gutmark - UC*	*50DCASS-006* Poincare Mapping and Trajectory Analysis in the Circular Restricted N-Body Problem (CRNBP) for the Jovian, Saturnian, and Plutonian Systems *Annika Gilliam - AFIT* *Robert Bettinger - AFIT*	*50DCASS-018* Design of a Force Transmission System Within a Real-Time Apogee Control System on a High-Powered Model Rocket *Seth Mitchell - CDU* *Joseph Copeland, Daniel Hogsed, Keneth Lee III, Jackson Maley, Grant Parker, Elisa Schmitt, Joseph Miller, and Thomas Ward - CDU*	*50DCASS-064* Implementation of a Digital Hangar for Vehicle Analysis, Design, and Decision Making *Jack Bruer - AFIT* *Samuel C. Atchison - AFIT* *Jos é A. Camberos - AFIT*	
3:40 PM	*50DCASS-069* On the Frequency Assignment of Packet Radio Networks *Grant Zhou - OWHS*	*50DCASS-085* Conformal Triply Periodic Minimal Surface Heat Exchanger Design and Evaluation *Tanner Barber - AFIT* *John Brewer - AFIT*	*50DCASS-062* Thin Filament Pyrometry to Measure Temperature in a Rotating Detonation Engine *Theodore B. Guetig - AFIT* *Marc Polanka - AFIT* *Larry P. Goss - ISSI* *Brian C. Sell - ISSI*	*50DCASS-007* 6DOF Reentry Reachability Optimization of a Vehicle Resembling SpaceX's Starship *Emma Webb - AFIT* *Robert A. Bettinger - AFIT*	*50DCASS-045* Experimental and Simulation Analysis of the Mechanical Properties of 3D Printed Octet Lattice Structures *Lucas Stevenson - UKY* *Xingsheng Sun - UKY*	*50DCASS-066* Variable-Fidelity Analysis of Aerothermal Effects on a Generic Aerospace Vehicle *Andrew Setzer - AFIT* *Jos é A. Camberos - AFIT*	
4:00 PM	*50DCASS-083* Constructing an Affordable Homemade Wind Tunnel *Audrey Flaute - AHS*	*50DCASS-005* Investigation of the Operating Mechanism of the Ranque-Hilsch Vortex Tube *Matthew N. Fuqua - AFLCMC* *James Rutledge - AFIT*	*50DCASS-034* Effects of Fuel-Throttling on the Operation of a Flow-Through Rotating Detonation Engine *Anthony Centofanti - UC* *Peter Glaubitz - UC* *Tyler Pritschau - UC* *Ephraim Gutmark - UC*	*50DCASS-009* Adaptive Online Optimization-Based Control for Soft-Landing Maneuvers on Asteroids: Performance and Safety Assurance Despite Gravity Field Uncertainty *Felipe Arenas Uribe - UKY* *T. Michael Seigler - UKY* *Jesse B. Hoagg - UKY*	*50DCASS-080* Gradient-based aeroelastic optimization of a generic flying wing model *Neal Novotny - AFRL* *David Sandler - UDRI* *Nathan Wukie - AFRL*	*50DCASS-102* Uncertainty Propagation for a Hypersonic Vehicle through a Model Validation Hierarchy Framework *Alexander Wade - CFD* *Andrew Kaminsky - CFD* *Alexander Schreiner - CFD*	
4:20 PM		*50DCASS-008* Adiabatic and Overall Effectiveness Superposition Theory for Upstream Phantom Cooling on a Film Cooled Leading Edge *Nathaniel Stout - AFIT* *James Rutledge - AFIT*	*50DCASS-039* Unwrapped Detonation Wave Structure from Thermal Imaging *Peter Glaubitz - UC* *Tyler Pritschau - UC* *Ephraim Gutmark - UC*	*50DCASS-036* A Bio-Inspired Fuzzy-Driven Control Approach for Real-Time Autonomous Spacecraft Inspection *Daegyun Choi - UC* *Donghoon Kim - UC*			
4:40 PM		*50DCASS-077* CFD Analysis of a TPMS-Based Conformal Heat Exchanger *Nathan Lewan - WSU* *Mitch Wolff - WSU*	*50DCASS-097* CFD Analysis of Fuel Mixing in a Flow-Through Rotating Detonation Combustor *Bret Lane - UC* *Ephraim J. Gutmark - UC*				
5:00 PM	Adjourn						

Abbreviations:

AC = AFIT Contractor
AFIT = Air Force Institute of Technology
AFLCMC = Air Force Lifecycle Management Center
AFRL = Air Force Research Laboratory
AHS = Anna High School
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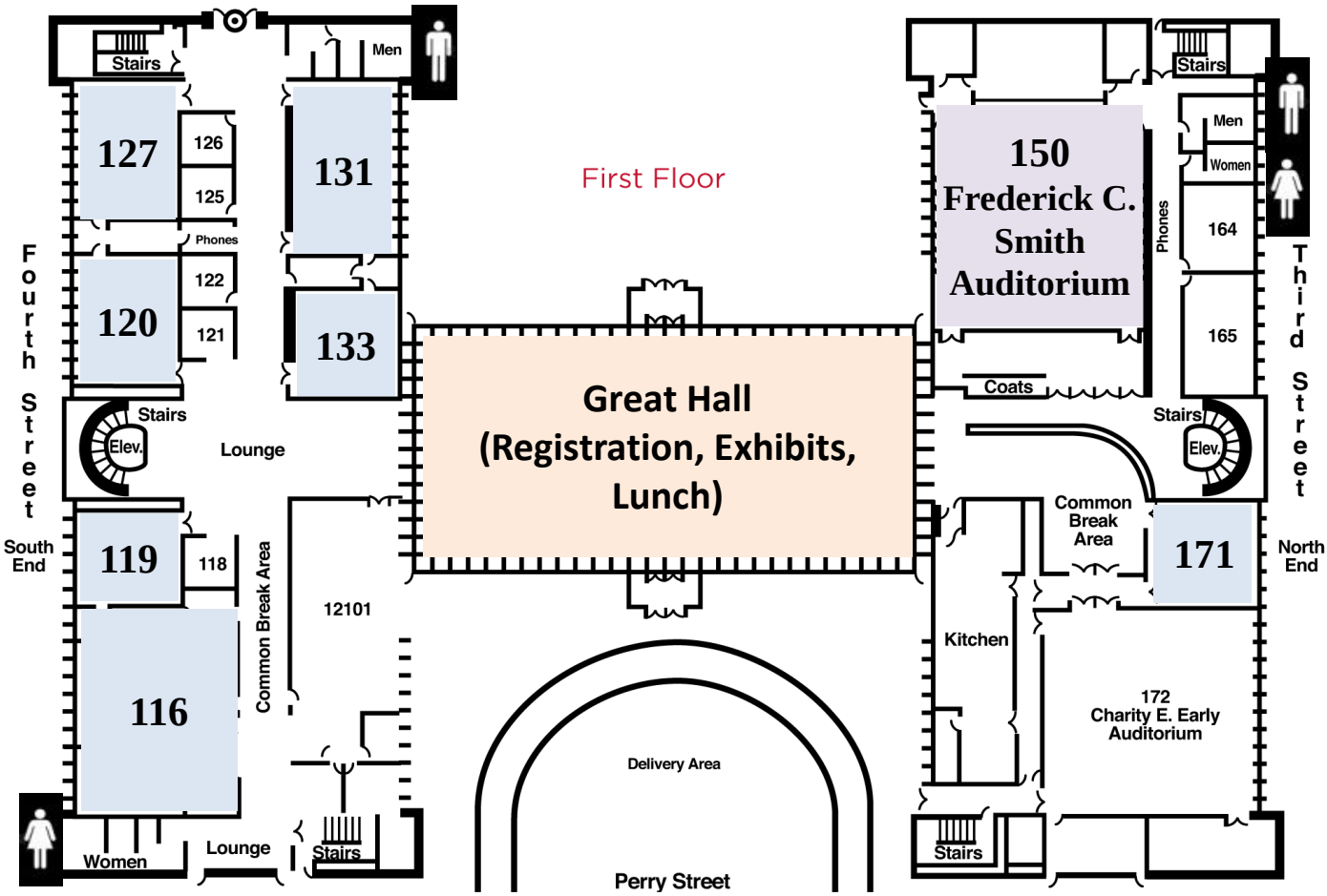
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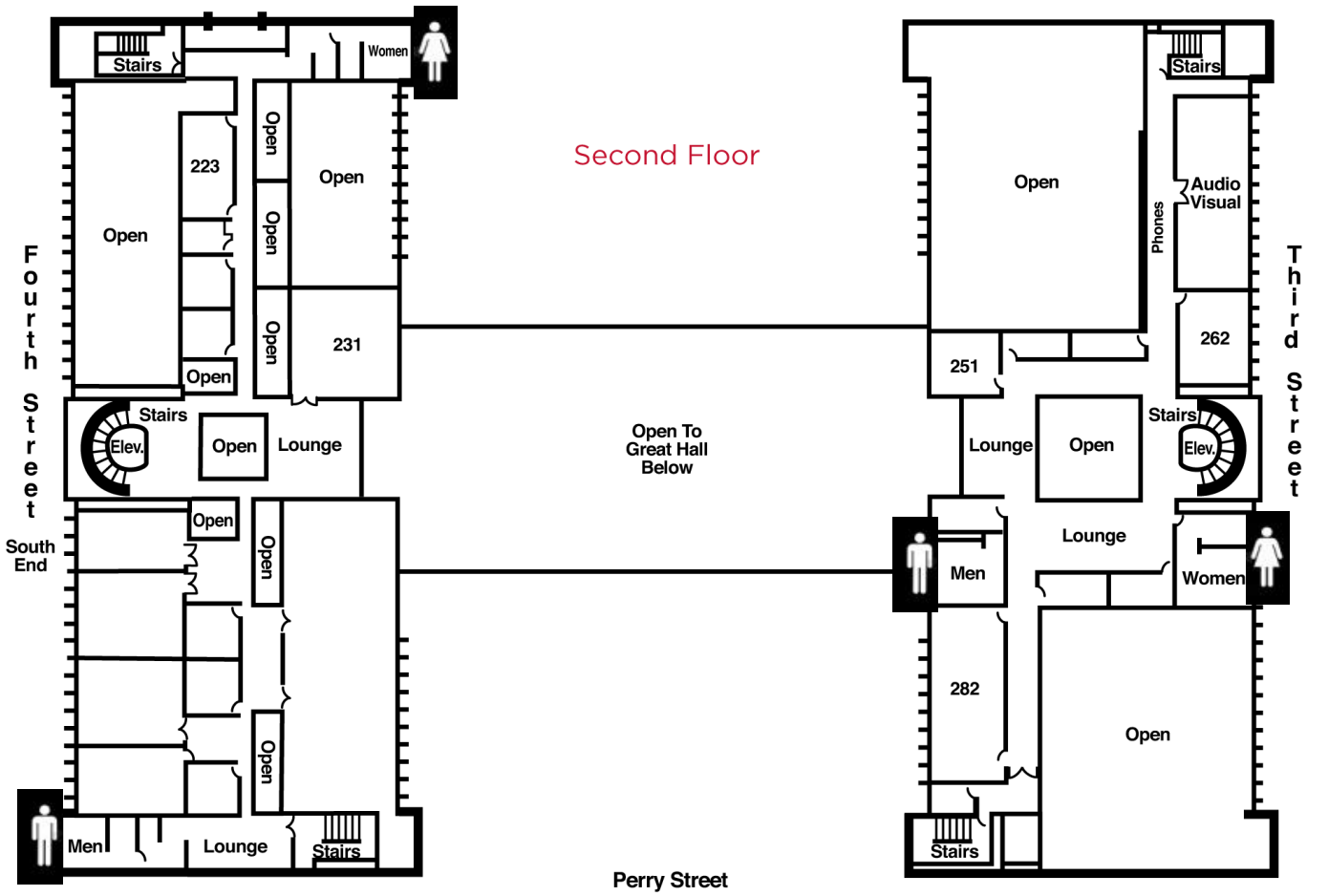
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and volunteer to lead or help with any of these positions, or any of the others listed on the website:

Section Chair	Troy Hoeger	tchoeger@earthlink.net	The buck stops here for the execution of all section activities!
Vice Chair	Eric Ruggiero	eric.ruggiero@geaerospace.com	Develop the program agenda for the year and train to become the future chair.
Treasurer	Darius Sanders	darius.sanders@us.af.mil	Collect the money and keep the books.
Secretary	Don Rizzetta	donald.rizzetta@us.af.mil	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	michael.list@gmail.com	Keep our membership informed of our activities, events, and other news of professional interest.
Webmaster	Don Rizzetta	donald.rizzetta@us.af.mil	Keep website up-to-date with fresh information by working closely with Newsletter Editor and event planners.
Membership Chair	Caleb Barnes	caleb.barnes.1@us.af.mil	Promote membership at meetings and events, including membership upgrades and service opportunities within the sectional, regional, and national communities of the AIAA.

Honors/Awards Chair	Marc Polanka	Marc.Polanka@afit.edu	Run the section awards program, promote national award opportunities within the section, and plan the year-end awards banquet.
Public Policy Chairs	Available		Keep the section informed on AIAA, governmental, and public policy issues from all levels that are important to the aerospace community.
Young Professional Chair	Yashvi Srivastava	srivasyi@mail.uc.edu	Represent the interests and concerns of our future leaders.
STEM K-12 Outreach	José Camberos	jose.camberos@us.af.mil	Advocate the aerospace profession to youth by organizing innovative education activities in the name of AIAA.
Education Chair	Aaron Altman Krista Gerhardt	aaron.altman.1@us.af.mil krista.gerhardt@us.af.mil	Advocated the aerospace profession and membership in the society to our student members.
Technical Committee Coordinator	Available		Coordinates Technical Committee activities with the section
Historian	Marc Polanka	Marc.Polanka@afit.edu	Provides historical perspective on Section plans and maintains documentation on Section activity for historical file.
Career and Workforce Development Chair	Rob Mitchell	robert.mitchell.61@us.af.mil	Promote programs for professional development, and keep the section informed of employment opportunities.
Affiliated Societies Delegate & Regional Representatives	Sivaram Gogineni	sivaram.gogineni@ spectralenergies.com	Liaison between our section and the AIAA Regional Activities Council. Represent the section on Dayton Affiliated Societies Council.
Industry Focal Point	Available		Industry Focal Point
Social Media Outreach	Troy Hoeger	tchoeger@earthlink.net	Focal point for providing session news and events through various social media outlets.

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