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Dayton-Cincinnati Section

*AMERICAN INSTITUTE OF
AERONAUTICS AND ASTRONAUTICS
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SYMPOSIUM GUIDE

The Forty-Sixth Annual
Dayton-Cincinnati
Aerospace Sciences Symposium



Photo Courtesy of Dr. Angela Suplisson

2 March 2021
Virtual Symposium
<https://dcass2021.regfox.com/meet/dcass-2021/enter>
www.aiaa-daycin.org/dcass

Welcome

to the
46th AIAA Dayton-Cincinnati Aerospace Sciences Symposium
(DCASS)

For over four and a half 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.

The symposium program includes more than eighty technical presentations in a day-long virtual event. Our invited keynote speaker is Dr. Angela W. Suplisson, USAF Colonel (Ret). Col. Suplisson currently serves as a Program Manager and Flight Test Engineer for Denmar Technical Services, Inc. Drawing on her many years of experience, she will be discussing the “Testing at Holloman AFB and the Origins of Space Test.”

This year, to help ensure the health and safety of all of our attendees, the decision was made to host DCASS as a virtual event. While we understand that nothing can replace the information exchange and networking of an in-person event, we hope you find this year’s symposium informative and worthwhile, and that we can return to our regular in-person format next year. The symposium 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 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.

We hope you enjoy today's symposium, and we look forward to seeing you again (hopefully in person) next year!

Brian Bohan and Matthew Tufts
2021 DCASS Executive Co-Chairs



2021 DAYTON-CINCINNATI SECTION AWARDS
CALL FOR NOMINATIONS

Recognize the achievements of your colleagues. The local Awards Banquet is fast approaching. Nominations are sought for several local awards. These include:

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

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

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

There is no specific format required. Simply complete the attached form and E-mail the information. Award selections will be made by an expert panel of judges. Submit nominations (by E-mail) by **23 April 2021** to:

Dr. Marc Polanka

Tel: (937) 255-3636 x4714

E-mail: marc.polanka@afit.edu

NOMINATION FORM

(Nomination Package Must be Limited to 2 Pages)

CATEGORY:

Nominee:

Affiliation:

Address:

Tel:

E-mail:

Nominator:

Affiliation:

Address:

Tel:

E-mail:

Symposium Schedule At-A-Glance

Registration Online: <https://dcass2021.regfox.com/dcass-2021>

Art in Science Competition 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 – 9:40 AM

1 Navigation	Room 1
2 Flight Vehicles	Room 2
3 Thermal Protection Systems 1	Room 3
4 Additive Manufacturing	Room 4
5 Combustion	Room 5
6 Space: Past, Present, Future	Room 6
7 Unmanned Aerial Systems 1	Room 7

Second Block 9:50 AM – 11:30 AM

8 Fuels	Room 1
9 Propellers and Wings	Room 2
10 Applied Heat Transfer	Room 3
11 Composite Materials	Room 4
12 Combustors	Room 5
13 Spacecraft Intelligence, Attitudes, and Impact	Room 6
14 Unmanned Aerial Systems 2	Room 7

Keynote Program 11:40 AM – 12:50 PM

Lunch Break 12:50 PM – 2:00 PM

Third Block 2:00 PM – 3:20 PM

15 Turbomachinery	Room 1
16 Lighter Than Air Vehicles	Room 2
17 Thermal Protection Systems 2	Room 3
18 Materials	Room 4
19 Robotics and Artificial Intelligence	Room 5
20 Spacecraft Orbits and Optimization	Room 6
Room Not Used	Room 7

Fourth Block 3:30 PM – 4:30 PM

Room Not Used	Room 1
21 Acoustics	Room 2
22 Heat Transfer	Room 3
23 Pandemic Optimized Pedagogy	Room 4
24 Fluid Dynamics	Room 5
Room Not Used	Room 6
Room Not Used	Room 7

The abstracts for the talks presented today may be found on the following website:

http://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
Aerospace Enabling Technologies	1, 8, 15, 23	Materials Science	4, 11, 18
Combustion	5, 12	Space	6, 13, 19, 20
Flight Vehicles	2, 9, 16, 21, 24	Unmanned Aerial Systems	7, 14
Heat Transfer	3, 10, 17, 22		

Chat Room Moderators 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!

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

To access the conference, please visit: <https://dcass2021.regfox.com/meet/dcass-2021/enter>

Please make sure to check out our Sponsors, listed on the conference website!

	Room 1	Room 2	Room 3	Room 4	Room 5	Room 6	Room 7
	SESSION 1 Navigation Chair: Andrew Keys <i>AFIT</i>	SESSION 2 Flight Vehicles Chair: Donald Kunz <i>AFIT</i>	SESSION 3 Thermal Protection Systems 1 Chair: James Rutledge <i>AFIT</i>	SESSION 4 Additive Manufacturing Chair: Carl Hartsfield <i>AFIT</i>	SESSION 5 Combustion Chair: Marc D. Polanka <i>AFIT</i>	SESSION 6 Space: Past, Present, Future Chair: Robert Bettinger <i>AFIT</i>	SESSION 7 Unmanned Aerial Systems 1 Chair: Donghoon Kim <i>UC</i>
Time							
8:20 AM	<i>46DCASS-006</i> Optimizing a Bank Of Kalman Filters For Navigation Integrity <i>Luis Sepulveda - AFIT</i> <i>Robert C. Leishman - AFIT</i> <i>Jonathon Gipson - AFIT</i>	<i>46DCASS-001</i> Multi-fidelity, Aeroelastic Analysis and Optimization with Control Surface Deflections of an Efficient Supersonic Air Vehicle <i>Markus Rumpfkeil - UD</i> <i>Phil Beran - AFRL</i>	<i>46DCASS-062</i> Effects of Oxidation of Carbon/Carbon Composites in Hypersonic Environments <i>Ares Barrios-lobelle - UKY</i> <i>Raghava S. C. Davuluri - UKY</i> <i>Rui Fu - UKY</i> <i>Savio J. Poovathingal - UKY</i> <i>Alexandre Martin - UKY</i>	<i>46DCASS-015</i> Image Processing Techniques of In-situ Monitoring Data <i>Sabrina D'alesandro - WSU</i> <i>Joy Gockel - WSU</i> <i>Kelly Davis - WSU</i> <i>Joe Walker - WSU</i>	<i>46DCASS-065</i> Analyzing the Impact Discharge Type and Power Loadings have on Ignition Kernel Development in a Reactive Flow <i>Katherine Opacich - UD</i> <i>Joshua Heyne - UD</i> <i>Logan Scholla - UD</i> <i>Timothy Umbrello - AFRL</i> <i>Joshua A. T. Gray - AFRL</i> <i>Kenneth Busby - UTCAS</i>	<i>46DCASS-005</i> "Black Space" versus "Blue Space": A Proposed Structure of Future Space Operations <i>Carl Poole - AFIT</i> <i>Robert A. Bettinger - AFIT</i>	<i>46DCASS-042</i> Software-in-the-loop simulation for collision avoidance of unmanned aerial vehicles <i>Prithev Govindasamy Srinivasan - UC</i> <i>Daegyun Choi - UC</i> <i>Donghoon Kim - UC</i>
8:40 AM	<i>46DCASS-040</i> Modified Kalman filter algorithms for varying sensor noise situations <i>Jashwanth Rao Venepally - UC</i> <i>Anirudh Chhabra - UC</i> <i>Donghoon Kim - UC</i>	<i>46DCASS-022</i> String Stability of Predecessor Following Heterogeneous Aircraft <i>Shawn Stephens - AFIT</i> <i>David Casbeer - AFRL</i> <i>Donald Kunz - AFIT</i> <i>William Baker - AFIT</i> <i>Joshuah Hess - AFIT</i>	<i>46DCASS-066</i> Development of a Novel Computational Framework to Investigate Thermochemistry of Melt Flow in Aerothermal Entry Physics <i>Tyler Stoffel - UKY</i> <i>Manuel Viqueira-Moreira - UKY</i> <i>Christoph Brehm - UMD</i> <i>Savio J. Poovathingal - UKY</i>	<i>46DCASS-028</i> Influence of Process Parameters on Microstructure and Microhardness in Additively Manufactured Nickel Superalloy 718 <i>Cherish Lesko - WSU</i> <i>Luke C. Sheridan - AFRL</i> <i>Joy E. Gockel - WSU</i>	<i>46DCASS-088</i> Water and Fuel Jet Droplet Distributions in Low and High Temperature Subsonic Crossflows <i>Vincent Shaw - UC</i> <i>Ephraim Gutmark - UC</i>	<i>46DCASS-010</i> Hybridized Spacecraft Attitude Dynamics and Control Methods through the Application of Reinforcement Learning <i>Cecily Agu - AFIT</i> <i>Joshuah Hess - AFIT</i> <i>Costantinos Zagaris - AFIT</i>	<i>46DCASS-014</i> Aircraft Inspection by Multirotor UAV Using Coverage Path Planning <i>Patrick Silberberg - AFIT</i> <i>Robert Leishman - AFIT</i>
9:00 AM	<i>46DCASS-105</i> Visual Navigation based on Forced Feature Selection through Segmentation <i>Tyler Hussey - AFIT</i>	<i>46DCASS-026</i> Shock Migration of an Oscillating Delta Wing Using an Unsteady Euler Solver <i>Alexander Brown - AFIT</i> <i>Donald L. Kunz - AFIT</i>	<i>46DCASS-081</i> Fully coupled internal radiative heat transfer for the 3D material response of heat shield <i>Raghava S. C. Davuluri - UKY</i> <i>Rui Fu - UKY</i> <i>Kaveh A. Tagavi - UKY</i> <i>Alexandre Martin - UKY</i>	<i>46DCASS-029</i> Selective Laser Melting of Tungsten Rhenium Alloys <i>Cayla Eckley - AFIT</i> <i>Ryan Kennitz - AFIT</i> <i>Todd Leonhardt -</i>	<i>46DCASS-097</i> Effect of Inter-nozzle Spacing on Flow Behavior in a Lean Direct Injection Combustor <i>Kranthi Yellugari - UC</i> <i>Mohamad Ghulam - UC</i> <i>Rodrigo Villalva Gomez - UC</i> <i>Ephraim Gutmark - UC</i>	<i>46DCASS-037</i> Six Degree-of-Freedom Analysis of the Apollo 10 Atmospheric Reentry <i>Jacob Olsen - AFIT</i> <i>Robert. A. Bettinger - AFIT</i>	<i>46DCASS-058</i> Application of Distributed Consensus Algorithms to Multi-UAS Swarm Command and Control <i>Evan Barnes - UC</i> <i>Kelly Cohen - UC</i>
9:20 AM	<i>46DCASS-051</i> Aircraft waypoint navigation using reinforcement learning <i>Justin Merrick - AFIT</i> <i>Donald Kunz - AFIT</i> <i>Joseph Curro - AFIT</i>		<i>46DCASS-084</i> Investigation of In-Depth Penetration of Radiative Heating in Thermal Protection Systems (TPS) <i>Ayan Banerjee - UKY</i> <i>Savio J Poovathingal - UKY</i>			<i>46DCASS-025</i> Multi-hypothesis Test Detection for Star Tracking Systems <i>Stephen Cain - AFIT</i> <i>Jordan Kirk - AFSPC</i>	
9:40 AM	Break						

Abbreviations:

" " = None
AFIT = Air Force Institute of Technology
AFRL = Air Force Research Laboratory
AFSPC = Air Force Space Command

FLLC = Folderol, LLC
ISSI = Innovative Scientific Solutions Inc.
MU = Miami University
NARC = NASA Ames Research Center

OAI = Ohio Aerospace Institute
OSU = The Ohio State University
UC = University of Cincinnati
UD = University of Dayton

UKY = University of Kentucky
UMD = University of Maryland
UTCAS = UTC Aerospace Systems
WSU = Wright State University

	Room 1	Room 2	Room 3	Room 4	Room 5	Room 6	Room 7
	SESSION 8 Fuels Chair: Randall Boehm <i>UD</i>	SESSION 9 Propellers and Wings Chair: Donald Kunz <i>AFIT</i>	SESSION 10 Applied Heat Transfer Chair: James Rutledge <i>AFIT</i>	SESSION 11 Composite Materials Chair: Carl Hartsfield <i>AFIT</i>	SESSION 12 Combustors Chair: Marc D. Polanka <i>AFIT</i>	SESSION 13 Spacecraft Intelligence, Attitudes, and Impact Chair: Robert Bettinger <i>AFIT</i>	SESSION 14 Unmanned Aerial Systems 2 Chair: Stephen Cain <i>AFIT</i>
9:50 AM	<i>46DCASS-063</i> Hydrocarbon Isomer Identification Using Gas Chromatography with Ultra-Violet Spectroscopy <i>David Bell - UD John Feldhausen - UD Josh Heyne - UD</i>	<i>46DCASS-016</i> Dynamic Stall over a Pitching Natural-Laminar-Flow Airfoil <i>Patrick Hammer - OAI Daniel J. Garmann - AFRL Miguel R. Visbal - AFRL</i>	<i>46DCASS-021</i> Internal Design Effects on Cooling of an Ultra Compact Combustor Vane <i>Kevin J. Demarco - AFIT Polanka Marc D. - AFIT Brian T. Bohan - AFIT James L. Rutledge - AFIT</i>	<i>46DCASS-031</i> Fatigue of two oxide/oxide ceramic matrix composites at 1200°C in air and in steam. Effect of diamond drilled effusion holes. <i>Anthony Cabri - AFIT Marina B. Ruggles-Wrenn - AFIT</i>	<i>46DCASS-017</i> Development of Improved CFD tools for the Optimization of a Scramjet Engine <i>Francis Centlivre - WSU Mich Wolff - WSU Timothy Eymann - AFRL Mark Hagenmaier - AFRL</i>	<i>46DCASS-012</i> Debris Propagation Following a Catastrophic Mishap in Lunar Orbit <i>Nathan Boone - AFIT Robert Bettinger - AFIT</i>	<i>46DCASS-047</i> Cooperative Multi-Agent UAS Task Assignment for Disaster Response Scenario <i>Nicholas Degroote - UC Kelly Cohen - UC</i>
10:10 AM	<i>46DCASS-064</i> Prescreening of Sustainable Aviation Fuel <i>Harrison Yang - UD Shane Kosir - UD Joshua Heyne - UD</i>	<i>46DCASS-043</i> An experiment study on a dual-plane airfoil model with varying gap, stagger and decalage <i>Salome Nunes - WSU Zifeng Yang - WSU</i>	<i>46DCASS-023</i> Novel non-dimensionalization of film cooling <i>Matthew Fuqua - AFIT James Rutledge - AFIT</i>	<i>46DCASS-036</i> Static fatigue of Hi-Nicalon™-S SIC fiber tows at 600°C in air and in silicic acid-saturated steam <i>Caleigh Nelson - AFIT Marina B. Ruggles-Wrenn - AFIT</i>	<i>46DCASS-018</i> Application of a Compact Combustor in a Small-Scale JetCat Engine <i>Nathan A. Clark - AFIT Marc D. Polanka - AFIT Brian T. Bohan - AFIT</i>	<i>46DCASS-032</i> Comparing the Explainability and Performance of Reinforcement Learning and Genetic Fuzzy Systems for Safe Satellite Docking <i>Kyle Dunlap - UC</i>	<i>46DCASS-059</i> Development of a Genetic Fuzzy Inference System for Fault Recovery in a Quadrotor-Payload System <i>Akshay Elangovan - UC Catharine McGhan - UC</i>
10:30 AM	<i>46DCASS-067</i> Specific Fuel Consumption: A Potential Benefit of Sustainable Alternative Jet Fuel with High Thermal Stability <i>Randall Boehm - UD Logan Scholla - UD Joshua Heyne - UD</i>	<i>46DCASS-078</i> Changes in R/C Propeller Performance under Various Mounting Pitch Angle <i>Jielong Cai - UD Sidaard Gunasekaran - UD Michael OL - FLLC</i>	<i>46DCASS-038</i> Overall Cooling Effectiveness Simulations with Anisotropic Thermal Conductivity <i>Carol Bryant - AFIT James Rutledge - AFIT</i>	<i>46DCASS-044</i> Mechanical Properties and Performance of a Novel Nano-Engineered Unitized Composite for Aerospace Systems <i>Benjamin Lam - AFIT Marina B. Ruggles-Wrenn - AFIT</i>	<i>46DCASS-019</i> Rotating Detonation Engine with Gaseous Ethylene and Liquid Nitrous-Oxide using a Simplex Injection Scheme <i>Nathan J. Snow - AFIT Marc D. Polanka - AFIT Frederick R. Schauer - AFIT Nathan T. Fiorino - AFIT Brian C. Sell - ISSI</i>	<i>46DCASS-033</i> Artificial Intelligence Applied to Pursuer-evader Multi-satellite Differential Game <i>Rachel Derbis - AFIT Bryan Little - AFIT Gilbert Peterson - AFIT Joshuah Hess - AFIT</i>	<i>46DCASS-093</i> Improving Capabilities for Xelaya, A Custom Heavy Lift Hexacopter <i>Heath Palmer - UC Nicholas DeGroot - UC Evan Barnes - UC Jared Burton - UC Matthew Terry - UC Bryan Brown - UC Justin Ouwerkerk - UC Austin Wessels - UC Kelly Cohen - UC</i>
10:50 AM	<i>46DCASS-069</i> The Co-Optimization of Sustainable Aviation Fuel: Cost, Emissions, and Performance <i>John Feldhausen - UD David Bell - UD Shane Kosir - UD Joshua Heyne - UD</i>	<i>46DCASS-080</i> Propeller and Propeller-in-Wing Thrust Vectoring <i>Grace Culpepper - UD Sidaard Gunasekaran - UD Jielong (Jacky) Cai - UD</i>		<i>46DCASS-046</i> Creep of Hi-Nicalon™ S Fiber Tows at 500°C in Air and in Silicic Acid-Saturated Steam <i>Richard Reinink - AFIT Marina Ruggles-Wrenn - AFIT</i>	<i>46DCASS-027</i> Improving the Stability and Operating Envelope for a Small Scale, High Frequency Rotating Detonation Engine <i>Nathan T. Fiorino - AFIT Marc D. Polanka - AFIT Nathan J. Snow - AFIT Frederick R. Schauer - AFIT S. Alexander Schumaker - AFRL Brain C. Sell - ISSI</i>	<i>46DCASS-034</i> Deep Reinforcement Learning Applied to Spacecraft Attitude Control <i>Nathaniel Enders - AFIT Joshuah Hess - AFIT Costantinos Zagaris - AFIT Richard Cobb - AFIT Joseph Curro - AFIT</i>	<i>46DCASS-094</i> Investigation of Quadrotor Arm Dihedral and Motor Twist Angle Impact on Maneuvering Stability <i>Heath Palmer - UC Sebastian Lemieux - UC Bryan Brown - UC Justin Ouwerkerk - UC Austin Wessels - UC Kelly Cohen - UC</i>
11:10 AM	<i>46DCASS-071</i> Influence of Fuel Properties on Waste Heat Recovery in a Simplified Gas Turbine Engine Model <i>Logan Scholla - UD Randall Boehm - UD Joshua Heyne - UD</i>			<i>46DCASS-049</i> Fabrication and Physical Properties of Oxide Ceramics Processed for Creep Experiments at High Temperature <i>David Swanson - AFIT Marina B. Ruggles-Wrenn - AFIT</i>	<i>46DCASS-083</i> Studying the Operating Mechanism of Valved-Pulsejet Combustion Systems <i>Mohamad Ghulam - UC Vijay Anand - UC Erik Prisell - UC Owe Lyrsell - UC Ephraim Gutmark - UC</i>	<i>46DCASS-035</i> Low-Cost Terrestrial Demonstration of Autonomous Satellite Proximity Operations <i>Zackary Hewitt - AFIT Robert Leishman - AFIT Costantinos Zagaris - AFIT</i>	
11:30 AM	Break						
11:40 AM	KEYNOTE PROGRAM (see next page for details)						
12:50 PM	Lunch Break						

Please join us at 11:40 for the Keynote Program:

Welcome and Announcements:

DR. BRIAN T. BOHAN

2021 DCASS Executive Chair

Keynote Address:

Testing at Holloman AFB and the Origins of Space Test

DR. ANGELA W. SUPLISSON

USAF Colonel (Ret)



Col Angela “Angie” Suplisson, USAF (Ret), serves as Program Manager and Flight Test Engineer for Denmar Technical Services, Inc. She joined Denmar in 2019.

Colonel Suplisson retired from the US Air Force on 1 Sep 2019 as the Vice Commander, Air Force Test Center. Headquartered at Edwards AFB, California, AFTC’s 31 billion dollar enterprise of more than 18,000 military, civilian and contractor personnel spans across Edwards AFB, Eglin AFB and Arnold AFB. The AFTC provides developmental test and evaluation of experimental and research manned and unmanned air, space and cyber systems for the military services, Department of Defense, DARPA, NASA, and international partners, in addition to operation of the Air Force Test Pilot School.

Colonel Suplisson received her commission from the US Air Force Academy Class of 1991 with a bachelor’s degree in Aeronautical Engineering and a minor in German. Her first assignment was as an Electronic Warfare and Weapons Test Engineer at Eglin AFB, Florida, where she tested F-15, F-16, and F-5 aircraft. At Eglin, she was selected to attend USAF Test Pilot School in Class 95A, a.k.a. the “Spin Doctors”. After graduating from Test Pilot School, Colonel Suplisson stayed at Edwards AFB and was assigned to the 416th Flight Test Squadron where she performed weapons and avionics flight testing on US and foreign military sales F-16s. She then moved to the 410th Flight Test Squadron at Plant 42, Palmdale, California, where she served as a Flight Test Engineer and Flight Commander for F-117 low observable and weapons testing. In 2000, she was selected to study in France for the Olmsted Scholarship. She was a Distinguished Graduate in the French Basic Course at the Defense Language Institute in Monterey, California, in 2001, and was assigned to study in Lyon, France. She graduated with a master’s degree in International Policy and Strategy from the University of Lyon III, France, in 2003. While assigned to the Joint Strike Fighter Program Office from 2003 to 2006, Colonel Suplisson was both the Executive Officer to the Program Executive Officer and an International Program Manager for Canada, Italy and Turkey. From 2006 to 2007 she was the F-16 Program Element Monitor in the Directorate of Global Power, responsible for the budget of the F-16 in SAF/AQ at the Pentagon. From 2007 to 2009, she served as Commander, 846th Test Squadron, 46th Test Group, 46th Test Wing, Holloman Air Force Base, New Mexico, where she led 120 people at the Holloman High Speed Test Track in the design, fabrication and testing of sub-, super- and hypersonic rocket sled-borne systems. From 2009 to 2011, she was the Deputy for Plans and Programs, the Deputy Department Head, and an Instructor of Aeronautics in the Department of Aeronautics, US Air Force Academy. She earned her doctorate in Aeronautical Engineering in 2015 with research in optimal aircraft trajectories for automatic ground collision avoidance systems (Auto GCAS) to prevent Controlled Flight Into Terrain by heavy military aircraft such as C-130s. Her team accomplished flight testing of Heavy Auto GCAS on the Learjet at Test Pilot School in 2015 and 2018. Colonel Suplisson led the Department of Aeronautics at the US Air Force Academy from 2015-2016. At the same time, she was the Director of the Unmanned Aerial Systems (UAS) Center from 2015-2017, responsible for all UAS research and UAS airmanship training at the US Air Force Academy.

She and her husband Fabrice Suplisson have two amazing sons, Joseph and Mark.

	Room 1	Room 2	Room 3	Room 4	Room 5	Room 6	Room 7
	SESSION 15 Turbomachinery Chair: Randall Boehm <i>UD</i>	SESSION 16 Lighter Than Air Vehicles Chair: Markus Rumpfkeil <i>UD</i>	SESSION 17 Thermal Protection Systems 2 Chair: Matthew Fuqua <i>AFIT</i>	SESSION 18 Materials Chair: Joy Gockel <i>WSU</i>	SESSION 19 Robotics and Artificial Intelligence Chair: Javier Viana <i>UC</i>	SESSION 20 Spacecraft Orbits and Optimization Chair: Andrew Keys <i>AFIT</i>	
2:00 PM	<i>46DCASS-068</i> Comparison between a Single-Cup Combustor and an Auxiliary Power Unit <i>Randall Boehm - UD Jennifer Colborn - UD Joshua Heyne - UD</i>	<i>46DCASS-041</i> Design and Analysis of Air-Stiffened Vacuum Lighter-Than-Air Structures <i>Ruben Adorno - AFIT Anthony N. Palazotto - AFIT</i>	<i>46DCASS-050</i> Spallation Particle Characterization Resulting from Arc-Jet Experiments <i>Kristen Price - UKY J.M. Hardy - UKY C.G. Borchetta - UKY S.C.C. Bailey - UKY A. Martin - UKY</i>	<i>46DCASS-048</i> Optical Dilatometry Measurements for the Quantification of Sustainable Aviation Fuel Materials Compatibility <i>Conor Faulhaber - UD Joshua Heyne - UD Shane Kosir - UD</i>	<i>46DCASS-052</i> Preliminary Investigation of Failure Policies for Resilient Humanoid Robotics <i>Matthew Verbryke - UC Catharine McGhan - UC</i>	<i>46DCASS-004</i> Kinetically-Aggregated Infrastructure Revitalization of Spacecraft (KAİROS) <i>Dustin Hayhurst - AFIT Robert A. Bettinger - AFIT Ramana V. Grandhi - AFIT</i>	
2:20 PM	<i>46DCASS-075</i> Computational Study of Busemann Inlets with Varying Contraction Ratios <i>Kurtis Mcintosh - UD Megan Linton - UD Markus Rumpfkeil - UD Jose Camberos - AFRL</i>	<i>46DCASS-057</i> Numerical Investigation of Flow Around a Deformed Vacuum Lighter-Than-Air Vehicle at Sea Level <i>Jared Kerestes - WSU Mitch Wolff - WSU Anthony Palazotto - AFIT</i>	<i>46DCASS-073</i> Effective Permeability of Carbon Composites under Re-Entry Conditions <i>Brendan Soto - UKY Cameron Brewer - UKY Savio Poovathingal - UKY</i>	<i>46DCASS-061</i> Stochastic mechanical modeling of Duocel foam from micro- to macro-length scales <i>Mujan Seif - UKY Alexandre Martin - UKY Eric Stern - NARC Matthew J. Beck - UKY</i>	<i>46DCASS-072</i> A Unique Robotic Platform for On-Orbit Servicing Simulations <i>Anirudh Chhabra - UC Donghoon Kim - UC</i>	<i>46DCASS-020</i> Preliminary Orbit Determination Using the Transit of Satellites in Front of Space-Based Illumination Sources <i>Daniel Dombrowski - AFIT Robert A. Bettinger - AFIT</i>	
2:40 PM	<i>46DCASS-082</i> Preliminary Modeling of Computational Inlet Swirl Distortion <i>Marcus Acton - WSU Mitch Wolff - WSU Michael List - AFRL</i>	<i>46DCASS-091</i> A Reduced Order Model of the Celestial Icosahedron as the Substructure for a Lighter than Air Vehicle <i>Torin Quick - AFIT Anthony Palazotto - AFIT Travis Shelton - AFIT</i>	<i>46DCASS-079</i> Mesoscale structural analysis of inhomogeneities in ablative materials using statistical distribution of properties derived at the microscale <i>Sean Mcdaniel - UKY Mujan Seif - UKY Matthew Beck - UKY Alexandre Martin - UKY</i>	<i>46DCASS-087</i> A Novel, Efficient Approach for Determining the Post-Necking True Stress-Strain Response of Aerospace Metals <i>Luke Hoover - UD Robert L. Lowe - UD Jeremy D. Seidt - OSU Amos Gilat - OSU Dino A. Celli - AFRL Luke Sheridan - AFRL Onome E. Scott-Emuakpor - AFRL</i>	<i>46DCASS-076</i> Intelligent Multi-Robot Collaboration for Planetary Missions <i>Daegyun Choi - UC Donghoon Kim - UC</i>	<i>46DCASS-045</i> A Framework for Autonomous Cooperative Optimal Assignment and Control of Multi-Agent Satellite Formations <i>Devin Saunders - AFIT Costantinos Zagaris - AFIT Joshuah Hess - AFIT Richard Cobb - AFIT</i>	
3:00 PM				<i>46DCASS-102</i> Dynamic Analysis of a Hyperelastic Spherical Membrane Under Internal Pressurization <i>Asma Ul Hosna Meem - UD Robert L. Lowe - UD Christopher G. Cooley -</i>			
3:20 PM	Break						

Abbreviations:

" " = None
AFIT = Air Force Institute of Technology
AFRL = Air Force Research Laboratory
AFSPC = Air Force Space Command

FLLC = Folderol, LLC
ISSI = Innovative Scientific Solutions Inc.
MU = Miami University
NARC = NASA Ames Research Center

OAI = Ohio Aerospace Institute
OSU = The Ohio State University
UC = University of Cincinnati
UD = University of Dayton

UKY = University of Kentucky
UMD = University of Maryland
UTCAS = UTC Aerospace Systems
WSU = Wright State University



46th Dayton-Cincinnati Aerospace Sciences Symposium

	Room 1	Room 2	Room 3	Room 4	Room 5	Room 6	Room 7
Time		SESSION 21 Acoustics Chair: Markus Rumpfkeil <i>UD</i>	SESSION 22 Heat Transfer Chair: Matthew Fuqua <i>AFIT</i>	SESSION 23 Pandemic Optimized Pedagogy Chair: Joy Gockel <i>WSU</i>	SESSION 24 Fluid Dynamics Chair: Donald Rizzetta <i>AFRL</i>		
3:30 PM		<i>46DCASS-008</i> Acoustic Analysis Framework for Prediction of UAM Noise Radiation from Subscale Data <i>Troy Riley - UC</i> <i>Daniel Cuppoletti - UC</i>	<i>46DCASS-007</i> Modeling a High Speed Pin-on-Disc Experiment by Comparison of Numerical Solutions to a Moving Boundary Nonlinear Heat Equation <i>Aron Wing - AFIT</i> <i>Anthony Palazotto - AFIT</i> <i>Tony Liu - AFIT</i>	<i>46DCASS-003</i> A Systems-Based Structure for Curriculum Development post-COVID-19 <i>Adedeji Badiru - AFIT</i>	<i>46DCASS-002</i> Closed-Loop Control of Transition by Local Dynamic Surface Modification <i>Donald Rizzetta - AFRL</i> <i>Miguel Visbal - AFRL</i> <i>Sandipan Mishra - Michael Amitay -</i>		
3:50 PM			<i>46DCASS-090</i> Strain-Dependent Thermal Conductivity in Flexible Fibrous Insulation Materials <i>Christopher Barrow - UKY</i> <i>John Maddox - UKY</i> <i>Kaveh Tagavi - UKY</i>		<i>46DCASS-011</i> Single Liquid Drop Impact onto a Dry Surface: Effects of Drop Shape <i>Murat Dinc - MU</i>		
4:10 PM					<i>46DCASS-024</i> CFD simulations of dye diffusion in a laminar pipe flow <i>Mark Johnson - WSU</i> <i>Zifeng Yang - WSU</i>		
4:30 PM	Adjourn						

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 AFIT = Air Force Institute of Technology
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OAI = Ohio Aerospace Institute
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UKY = University of Kentucky
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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://engage.aiaa.org/Dayton-Cincinnati/home> and volunteer to lead or help with any of these positions, or any of the others listed on the website:

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



AIAA
Dayton-Cincinnati Section

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

Honors/Awards Chair	Marc Polanka	AFIT/ENY	937-255-3636 x4714	Run the section awards program, promote national award opportunities within the section, and plan the year-end awards banquet.
Public Policy Chairs	Oliver Leembruggen Jayesh Mehta	Sumaria Systems	937-656-8502	Keep the section informed on AIAA, governmental, and public policy issues from all levels that are important to the aerospace community.
Young Professional Chair	Available			Represent the interests and concerns of our future leaders.
STEM K-12 Outreach	Jose Camberos	AFRL	937-713-7055	Advocate the aerospace profession to youth by organizing innovative education activities in the name of AIAA.
Education Chair	Aaron Altman Krista Gerhardt	AFRL/RQ		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	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	Rob Mitchell	AFLCMC	937-904-4504	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	Available			Industry Focal Point
Social Media Outreach	Oliver Leembruggen	Sumaria Systems	937-656-8502	Focal point for providing session news and events through various social media outlets.



AIAA
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Forty-Sixth Annual
DAYTON-CINCINNATI AEROSPACE SCIENCES SYMPOSIUM

2 March 2021

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