ASME
DAYTON SECTION

The 13th Annual Dayton Engineering Sciences Symposium

October 23rd 2017

A.S.M.E. Dayton Section
Dayton Engineering Sciences Symposium

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WELCOME

DESS 2017 Welcome:

On behalf of the Organizing Committee, we would like to welcome you to the 13th Annual Dayton Engineering Sciences Symposium (DESS). Sponsored by the Dayton Section of the American Society of Mechanical Engineers (ASME) and the ASME Students Section at Wright State University, this symposium is expected to facilitate communication between local and regional scientists, engineers and students by providing a forum for presenting their work, sharpening their technical presentation skills, and creating outstanding opportunities for networking.

The keynote presentation will be delivered by Dr. Stephen Zoepf, Executive Director of the Center for Automotive Research at Stanford University. In addition, there will be multiple parallel sessions featuring technical presentations, posters spanning a broad range of topics in science, technology, and engineering, and a K12 STEM educator workshop.

We hope that this symposium serves the Dayton Region's professional community's needs in terms of technology exchange and networking opportunities. Its success would not have been possible without the active participation of speakers, session chairs, sponsors, students, faculty, government and industry representatives, the organizing committee, and the ASME Dayton Section Executive Board. We thank you for your participation and contributions, and we sincerely hope that you enjoy DESS!

Daniel Richardson
Symposium Chair

Joshua Heyne
Symposium Vice-Chair

KEYNOTE SPEAKER

Topic: Autonomous Vehicles

Dr. Stephen Zoepf is the Executive Director of the Center for Automotive Research at Stanford. He holds a Ph.D., M.Sc. and B.Sc. from MIT and has fifteen years of experience in transportation and mobility. Dr. Zoepf led U.S. Department of Transportation efforts to integrate confidential data into national vehicle energy policy modeling, and previously worked as an engineer and product manager at BMW and Ford. He was an ENI Energy Initiative Fellow, a Martin Energy Fellow, and a recipient of the Barry McNutt award from the Transportation Research Board and the Infinite Mile award from MIT. His research has been covered in numerous popular press articles, initiated a Congressional probe, and has been lampooned in The Onion.

DESS Committee

General Chair - Daniel Richardson
Vice-Chair - Joshua Heyne
Past Chair – Joseph Miller
Registration/Website - Tim Leger
Technical Program - Ben Halls, Tim Erdmann
Session Chair Organizer – Ben Halls
Venue/Facilities/AV/Food - Justin Warner
Outreach – Ben Halls, Joseph Miller
Student Chapter Relations - Josh Heyne***,*** Darren Holland
Sponsorship and Exhibits - Tim Erdmann, Sivaram Gogineni
Keynote/Gifts - Sivaram Gogineni
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STEM Educator Module Descriptions

High School 1: Brett Doudican

Title: Including Student Mindset and Skillset Development into Engineering Lessons

This hands-on workshop will give participants experiences in both high school engineering design challenges and content related engineering lessons. Participants will leave with a skill set and mindset to develop lessons engaging for all students as well as abundant resources for teaching engineering.

High School 2: Lauren Henry and Caroline Boeckman

Title: The Perfect Bottle Flip: A lesson in force, mass, and analysis

- Have you ever wanted to incorporate the Engineering Design Process into your content area classroom? This module is an example project of a classroom project that uses the engineering design process while teaching center of mass based on students interests.
- The project: Students will apply both the scientific method and engineering design process to achieve the perfect bottle flip. They will learn about the concepts of physical science such as forces, energy, and center of mass. They will also learn about the concepts of data analysis, probability, etc. Students will learn about the application of center of mass in building of structures and probability in recognizing the randomness.

Engineer Connection: Applying the idea of center of mass as well as the physical forces can be applied to how engineers design tall structures, bridge anchors. They also can apply these skills to how buildings are built to counteract against natural disasters as well as being a ballast in motor/aero vehicles, as well as the SpaceX reusable object. https://www.youtube.com/watch?v=lEr9cPpuAx8 This a great video to explain how this works in real life.

Intermediate School 1: Emma Cipriani

Title: *SHH! No talking in the Library!* An Introduction to Material Properties and the Scientific Method

Students will first explore with different materials to see which material or types of materials will reduce the most amount of sound when placed in a box. Each group will be assigned a different material and fill their entire tissue/shoebox with that specific material. Students will see the change in decibel reading before the material was placed in the box and after the material was placed in the box. Students will share this data with the class and analyze which types of materials absorb the most sound and which reflect the most sound. Students will then be presented with the following challenge: Your new school is under construction and the architect put the music room next to the library. Students need to design a room that will absorb the most amount of sound, so that the music room's sound does not disturb the library. Students will be given a tissue box and will need to create a design for the inside of the tissue box that will decrease the sound decibel's that are being measured from the outside of the tissue box. When creating their design, students will be referencing their previous activity to influence their design. To measure this challenge, there will be a speaker within the tissue box and an app to measure the sound decibels from the outside.

Intermediate School 2: Linda Hallinan

Title: Carbon Stabilization, Renewable Energy Technologies, and Design

About ten years ago I had a mid-life crisis. I realized that for over 20 years I had been sitting in meetings as an engineer working on the latest in automotive technology for which I hold three patents. The problem was that I was surrounded by almost all men. I knew that something had to change and I wanted to do something about it; so I went back to school and received my master's degree in middle school and secondary education and currently I am shaping young middle school minds, especially females, in the 21st century skills of scientific inquiry with real world scenarios. As my strongest passion is teaching my students to be stewards of the Earth, my module will include ways to break down the complexity of Global Climate Change as well as implement a real world scenario of carbon stabilization where students make recommendations to government agencies on the prioritization of renewable technologies through argumentation based discussion. The module is geared toward 7th grade Science Standards, but can easily be modified for high school as well as lower levels.

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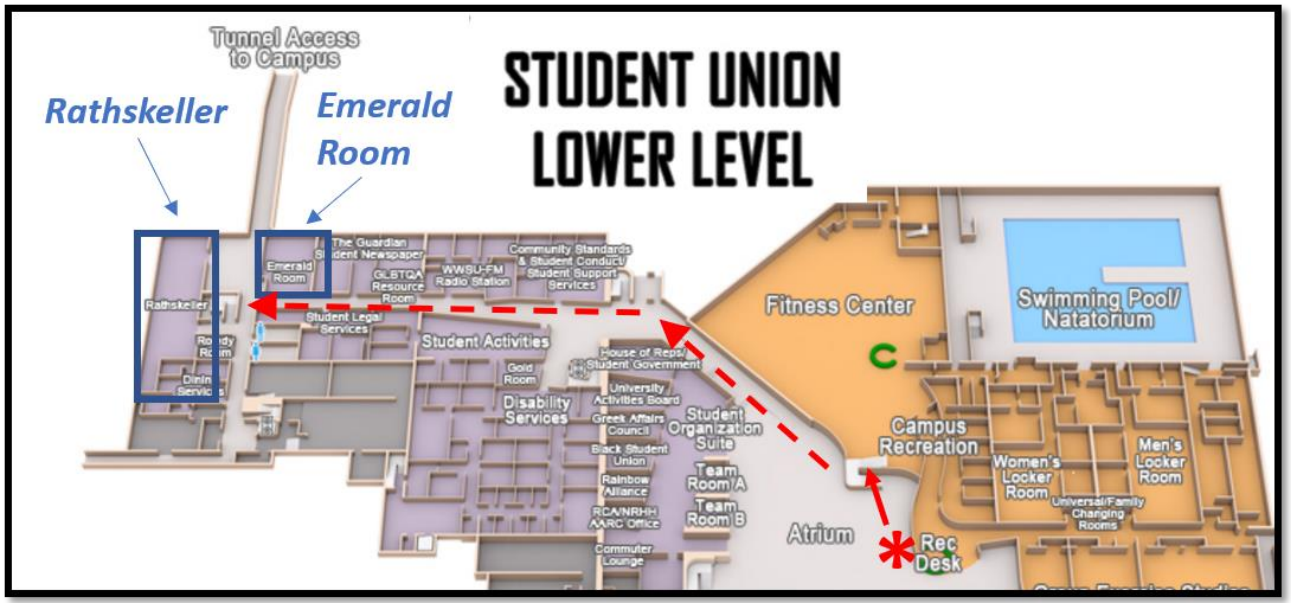
Room Locations

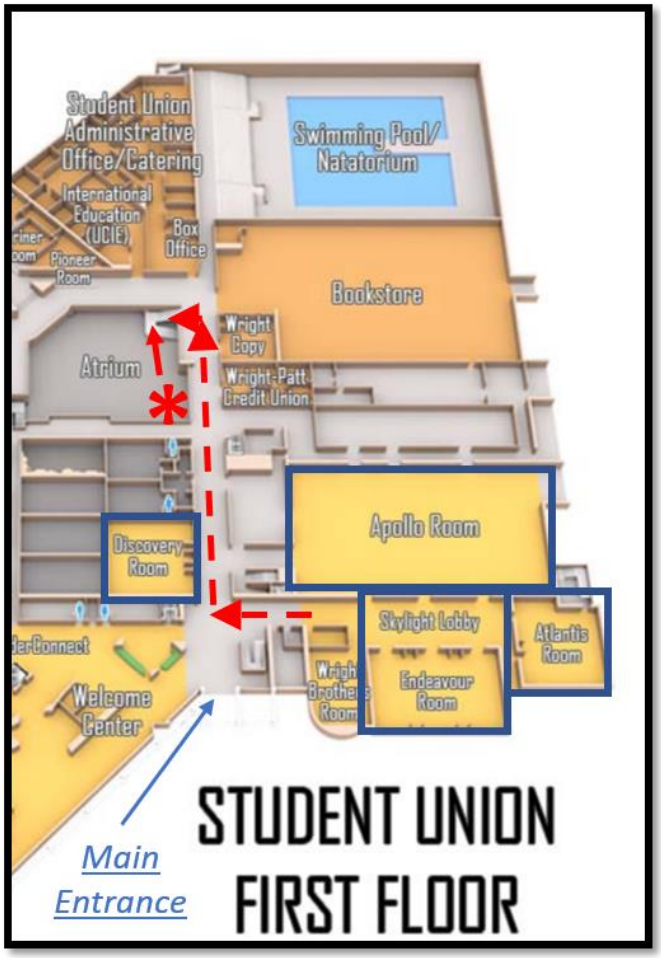


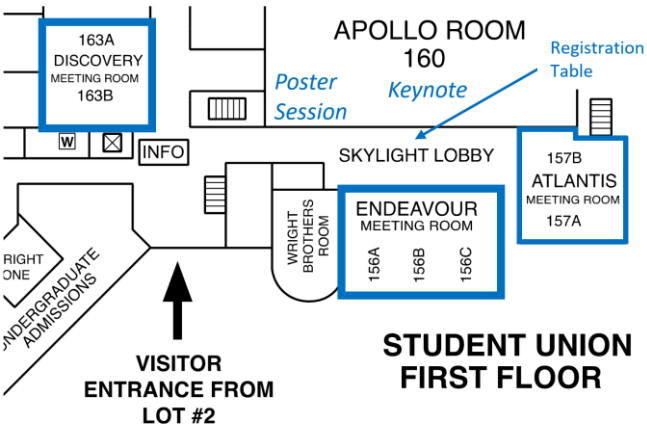
*Room Locations for DESS are located with the **blue boxes***

***Rathskeller and Emerald Room are located on the Lower Level (Purple Region) of the Student Union.**

***Follow the signage or dotted path to arrive at the destination of interest.**

***Stairs are designated by the * on both Student Union First Floor and Lower Level maps.**





Dayton Engineering Sciences Symposium
Dayton Section of ASME

Wright State University
October 23, 2017

Room	Endeavour 156A	Endeavour 156B	Endeavour 156C	Discovery 163A	Discovery 163B	Atlantis 157A	Atlantis 157B
	SESSION 1 **Design and Optimization I** Chair: Prof. Richard Cobb	SESSION 2 **Combustion & Diagnostics I** Chair: Prof. Paul Hsu	SESSION 3 **Biomedical I** Chair: Prof. Allison Kinney	SESSION 4 **Fluid Dynamics & CFD I** Chair: Prof. Prashant Khare	SESSION 5 **Materials** Chair: Prof. Joseph Slater	SESSION 6 **Manufacturing I** Chair: Prof. Emily Fehrman Cory	SESSION 7 **Undergraduate Research** Chair: Prof. Darren Holland
Time	*AFIT*	*SE*	*UD*	*UC*	*WSU*	*UD*	*CDU*
8:20AM	*DESS2017-053* Metamodeling for Effectiveness Based Design of an Aircraft with Uncertainty *Daniel Clark - WSU* *Ha-rok Bae - WSU* *Darcy Allison, Edward Alyanak, and Edwin Forster - AFRL*	*DESS2017-034* Preferential Vaporization's Effect on Lean Blow Off *David Bell - UD* *Joshua Heyne - UD*	*DESS2017-096* Neuroprosthetic Hands - A Focus on Feedback *Evan Helton - WSU*				*DESS2017-012* Computational Aeroelasticity Study of Prototype Aircraft *Tyler Adqalanis - AFRL* *Dr. Charles Tyler - AFRL*
8:40AM	*DESS2017-028* Multi-UAV Control and Supervision with ROS *Anthony Lamping - UC* *Nicklas Stockton - UC* *Bryan Brown - UC* *Dr. Kelly Cohen - UC* *Dr. Manish Kumar - UC*	*DESS2017-026* Modeling and Characterizing Wood Stove Efficiencies in Natural Draft and Induced Turbulent Environments *Sari Mira - UD* *Joshua Heyne, PhD. - UD*	*DESS2017-104* Quantified Self: Variation of Spirometer Readings in Relation to Varied Activity Levels, Asthma Medication, and Age *Neeti Prasad - DRSS*	*DESS2017-051* Physics of Impinging Liquid Jets: Primary and Secondary Atomization *Prashant Khare - UC*	*DESS2017-005* Two-dimensional nanoparticle array and cluster formation by supercritical fluid deposition *Joanna Wang - AFRL* *Gail Brown - AFRL* *Scott Apt - AFRL* *Chien Wai - UI*		*DESS2017-013* Variable Pitch Quadcopter Flight Control *Austin Wessels - UC*
9:00AM	*DESS2017-083* Bio-Inspired Optimization of the Traveling Salesman Problem *Jutshi Agarwal - UC* *John McClellan - RCHS* *Ryan Wright - RHS* *Jeffrey Kastner - UC* *Kelly Cohen - UC*	*DESS2017-027* LBO, Ignition, and Spray Feature Importances from Year 3 of the National Jet Fuels Combustion Program *Erin Peiffer - UD* *Joshua Heyne - UD*	*DESS2017-100* Controlling lower limb socket temperature *Juan Maldonado - WSU* *Adviser- Dr. Goswami - WSU*	*DESS2017-055* Experimental Investigation of Endwall Flow Control for Front Loaded Turbine Blades *Nathan Fletcher - WSU* *Mitch Wolff - WSU* *Christopher R. Marks - AFRL* *Ryan Petrie - AFRL* *Rolf Sondergaard - AFRL*	*DESS2017-049* Silica Nanosprings Used to Enhance Mechanical Properties of Carbon Composites *Tomasz Niedzwiecki - MU* *Dr. Luigi Corti Calderon - MU*	*DESS2017-036* Investigating the Biocompatibility of the Ti-6Al-4V Surface Machined by Electrical Discharge Machining *Md. Rashef Mahbub - MU* *Roan Kirwin, Paul F. James - MU* *Muhammad P. Jahan - MU*	*DESS2017-023* Implementation of Open Source Autopilot for Fixed Wing Aircraft on Custom Ground Station *Nicholas Degroote - UC* *Anthony Lamping - UC* *Dr. Kelly Cohen - UC* *Dr. Manish Kumar - UC*
9:20AM	*DESS2017-079* A Cellworks Method for Structural Shape and Topology Optimization *Hao Li - WSU* *Dr. Ramana V. Grandhi - WSU*	*DESS2017-067* A new experimental test bed for cavity-stabilized reacting flows *Kyle B. Brady - NRC* *Brent A. Rankin - AFRL* *Andrew W. Caswell - AFRL*	*DESS2017-095* Combining Pressure-Sensing Materials With Adjustability to Optimize Prosthetic Socket Fit *John Inkrott - WSU*	*DESS2017-076* Non-Axisymmetric Endwall Contouring for the L2F *Jacob Dickel - AFRL* *Christopher R. Marks - AFRL* *John Clark - AFRL* *Rolf Sondergaard - AFRL* *Mitch Wolff - WSU*	*DESS2017-048* Identification of Nonlinear Constitutive Properties of Damping Coatings *Mackenzie Tidball - WSU* *Joseph Slater - WSU*	*DESS2017-037* Mechanical and Microstructural Characterization of Laminated Steel Structures made via Ultrasonic Additive Manufacturing *Tianyang Han - OSU* *Dr. Leon Headings - OSU* *Dr. Aslan Miriyev - COU* *Prof. Marcelo Dapino - OSU*	*DESS2017-025* Controller Development for a Non-Stationary UAV Landing Platform *Nicholas Little - UC* *Nicklas Stockton - UC* *Dr. Manish Kumar - UC* *Dr. Kelly Cohen - UC*
9:40AM	*DESS2017-081* Space-based Maneuver Detection using Multiple Model Adaptive Estimation *Justin Katzovitz - AFIT* *Dr. Joshuah Hess - AFIT*	*DESS2017-066* Experimental Study of Centrifugally-Loaded Backward-Facing Step Burner Dynamics *Tim Erdmann - ISSI* *Andrew Caswell, Brent Rankin - AFRL* *Ephraim Gutmark - UC*	*DESS2017-093* Passive Above Knee Prosthetic Kinematics Improvement *Michael Collier - WSU*	*DESS2017-045* Suppression of Vortex-Induced Vibration of an Elliptical Cross Section Using Convective Heat Transfer *Jeffrey Desroches - AFIT* *Dr. Anthony Palazotto - AFIT* *Dr. Hui Wan - AFRL*	*DESS2017-009* Mousai: An Open Source Harmonic Balance Solver for Nonlinear Systems *Joseph Slater - WSU*	*DESS2017-024* Autonomous Controls in Industrial Energy Efficiency *Louis De Gruy - UD* *Danny Ulbricht - UD* *Zachary Siefker - UD*	*DESS2017-103* A New Finite Difference Scheme to Study Reaction-Diffusion Models *William Shovelton - UD*
10:00AM	Break						

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Room	Endeavour 156A	Endeavour 156B	Endeavour 156C	Discovery 163A	Discovery 163B	Atlantis 157A	Atlantis 157B
	SESSION 10 **Design & Optimization II** Chair: Prof. Ha-rok Bae *WSU*	SESSION 11 **Combustion & Diagnostics II** Chair: Dr. Naibo Jiang *SE*	SESSION 12 **Biomedical II** Chair: Prof. Kimberly Bigelow *UD*	SESSION 13 **Fluid Dynamics & CFD II** Chair: Prof. Mitch Wolff *WSU*	SESSION 14 **Structures & Solid Mechanics I** Chair: Prof. Anthony Palazotto *AFIT*	SESSION 15 **Manufacturing II** Prof. Muhammad Jahan *MU*	SESSION 16 **Undergraduate Competition** Chair: Prof. Darren Holland *CDU*
Time							
10:20AM	*DESS2017-015* Satellite articulation characterization from an image trajectory matrix using optimization *David Curtis - AFIT* *Richard Cobb - AFIT*	*DESS2017-039* Digital Holographic Microscopy based on Reflective Point Diffraction *Hongjie Zhao - WSU* *Zifeng Yang - WSU*	*DESS2017-091* Smart Materials for Prosthetic Sockets *Wendy Fisher - WSU* *Dr. Tarun Goswami - WSU*	*DESS2017-044* Characterization of a Toroidal Jet Stirred Reactor Using Hot-Wire Anemometry *Robert Stachler - UD* *Joshua Heyne - UD* *Scott Stouffer - UDRI* *Joseph Miller - AFRL*	*DESS2017-046* In Depth Structural Analysis of the Hexakis Lighter Than Air Vehicle *Anthony Castello - AFIT* *Dr. Anthony Palazotto - AFIT*	*DESS2017-047* Integration of aluminum and non-metals using ultrasonic additive manufacturing for structural reinforcement, joining, and electro-thermal tailoring *Leon Headings - OSU* *M. Bryant Gingerich - OSU* *Hongqi Guo - OSU* *Yongsen Rong - OSU* *Marcelo Dapino - OSU*	*DESS2017-006* The Effect of Inlet Pulsations on Primary Atomization of Liquid Jets *Kyle Windland - UC* *Himakar Ganti - UC* *Prashant Khare - UC*
10:40AM	*DESS2017-021* Design Optimization of a Heavy Lift SUAS *Justin Ouwerkerk - UC* *Dr. Kelly Cohen - UC* *Dr. Manish Kumar - UC* *Bryan Brown - UC*	*DESS2017-042* High-speed 2D Raman imaging *Naibo Jiang - SE* *Paul Hsu, Jason Mance, Sukesh Roy - SE* *Yue Wu, Mark Gragston, Zhili Zhang - SE* *Joseph Miller, James R. Gord - AFRL*	*DESS2017-094* Energy Efficiently Of Hand Prosthetics *Stephen Whatley - WSU*	*DESS2017-002* Unsteady Endwall Flow Measurements in a Front Loaded Low Pressure Turbine Passage *Emma Veley - AFRL* *Chistopher Marks - AFRL* *Rolf Sondergaard - AFRL* *Mitch Wolff - WSU*	*DESS2017-056* Potential of Lighter than Air Vehicles under a Vacuum *Ruben Adorno - AFIT* *Anthony N. Palazotto, PhD - AFIT*	*DESS2017-040* Investigating the Effect of Wire Feed Rate and Wire Tension on the Corner and Profile Accuracies During Wire-EDM of Ti-6Al- 4V *Roan Kirwin - MU* *Md. Rashef Mahbub - MU* *Muhammad P. Jahan - MU*	*DESS2017-010* High-Fidelity Modeling and Simulations of Newtonian and Non-Newtonian Liquid Jets in Crossflow *Austin Johnston - UC* *Prashant Khare - UC*
11:00AM	*DESS2017-031* Autonomous Vehicle Task Selection Under Operational Constraints *Christopher Olsen - AFIT* *Dr. Donald L. Kunz - AFIT*	*DESS2017-043* Fiber-coupled, UV–SWIR hyperspectral imaging sensor for combustion diagnostics *Paul Hsu - SE* *Naibo Jiang, Daniel Lauriola - SE* *Sukesh Roy - SE* *Joseph Miller, James Gord - AFRL*	*DESS2017-097* Design and Optimization of Lower Limb Prosthesis *Anmar Salih - WSU* *Dr. Tarun Goswami - WSU*	*DESS2017-008* The investigation of flexible trailing edge fringes on the wake of an airfoil S833 *Hongtao Yu - WSU* *Zhengkai He - WSU* *Zifeng Yang - WSU*	*DESS2017-065* Investigation of Multi-material Projectile Impact *Aadit Patel - AFIT* *Dr. Anthony Palazotto - AFIT*	*DESS2017-038* Investigating Tool Wear Mechanisms in Machining of Ti-6Al-4V Using Coolant, Dry and Minimum Quantity Lubrication (MQL) Conditions *Ashutosh Khatri - MU* *Muhammad Jahan - MU*	*DESS2017-035* 3D Printed Metal Parts with Embedded Sensors and Electronics via Ultrasonic Additive Manufacturing *Emilie Baker - OSU* *Prof. Marcelo Dapino - OSU* *Dr. Leon Headings - OSU*
11:20AM	*DESS2017-073* Fuel Optimal, Finite Thrust Guidance Methods to Circumnavigate with Lighting Constraints *Eric Prince - AFIT* *Richard Cobb - AFIT*	*DESS2017-032* Three-dimensional temperature measurements in a turbulent flame *Benjamin Halls - AFRL* *Paul S. Hsu, Naibo Jiang - SE* *Ethan S. Legge, Sukesh Roy - SE* *Terrence R. Meyer - PU* *James R. Gord - AFRL*	*DESS2017-099* Sensing Materials for Prosthetic Sockets *Rachel Hatridge - WSU*	*DESS2017-019* Lift and Drag Coefficient Studies for the NACA 0012 and the NREL S829 Airfoils *Barathkumar Mohanarangan - WSU* *Dr. James Menart - WSU*	*DESS2017-001* Induction Coil Design for Full View and Accurate Optical Measurement of Temperature and Strain *Michelle Wong - WHS* *Kayla Johnson - SSA* *Casey Holycross - AFRL* *Onome Scott-emuakpor - AFRL* *Tommy George - AFRL*	*DESS2017-041* Investigating Micro Scale Machinability of Polycarbonate Glass *Craig Hanson - MU* *Muhammad P. Jahan - MU*	*DESS2017-070* Scaling-Up the Production of Biodiesel from a Lab Bench Environment to a Continuous-Flow Reactor *Lily Behnke - OHS*
11:40AM	*DESS2017-074* Design Optimization of Transient Systems *Alexander Henz - WSU* *Rory Roberts - WSU* *Mitch Wolff - WSU*	*DESS2017-061* Femtosecond vs Nanosecond Laser-Induced-Breakdown Stability Analysis *Anil Patnaik - SE* *Paul Hsu, Sukesh Roy - SE* *James R. Gord - AFRL* *Adam Stolt, Jordi Estevadeordal - NDSU*	*DESS2017-098* Design Optimization of an Additve Manufactured Prosthetic Foot *Paul Ley - WSU* *Dr. Tarun Goswami - WSU*	*DESS2017-068* Effects of Fan Blade Blending on Unsteady Aerodynamics *Clint Knapke - AFRL*	*DESS2017-029* A finite-strain electro-magneto-elastic framework for modeling soft multiferroic materials *Hafez Tari - UD* *Robert L. Lowe - UD*	*DESS2017-003* Impact welding of dissimilar material combinations and of additively manufactured materials *Bert Liu - AFIT* *Anthony Palazotto - AFIT* *Anupam Vivek - OSU* *Glenn S. Daehn - OSU*	*DESS2017-072* Reducing Passive Muscle Force: A Process for Patient-Specific Muscle Model Parameter Calibration in RTSA Patients *Kayla Pariser - UD* *David R. Walker - RI* *Allison L. Kinney - UD*

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Time							
12:00PM	**160 - Apollo Room** Lunch and Networking (Visit Buffet and be Seated)						
12:30PM	**Welcome & Opening Remarks:** Josh Heyne, *13th DESS Co-Chair* **Keynote Address:** "Autonomous Vehicles" Dr. Stephen Zoepf, *Executive Director of the Center for Automotive Research (CARS) at Stanford*						
1:40PM	Break						
Room	Endeavour 156A	Endeavour 156B	Endeavour 156C	Discovery 163A	Discovery 163B	Atlantis 157A	Atlantis 157B
	SESSION 19 **Design & Optimization III** Chair: Prof. Megan Reissman *UD*	SESSION 20 **Thermal & Fluid Systems** Chair: Prof. Rory Roberts *WSU*	SESSION 21 **Assistive Technology** Chair: Prof. Tim Reissman *UD*	SESSION 22 **Fluid Dynamics & CFD III** Chair: Dr. Samir Naboulsi *AFRL*	SESSION 23 **Structures & Solid Mechanics II** Chair: Prof. Matthew Bond *SCC*	SESSION 24 **Renewable & Clean Energy** Chair: Prof. James Menart *WSU*	SESSION 25 **Engineering Education** Chair: Linda Hallinan
2:00PM	*DESS2017-077* Model-Based Systems Engineering and Aerospace Conceptual Design *Brendan Rooney - AFRL*	*DESS2017-062* High-Temperature Fuel Cells in Hypersonic Applications *Jack Chalker - WSU* *Rory Roberts, Mitch Wolff - WSU* *Scott Thomas - WSU* *Praveen Cheekatamarla - AE*	*DESS2017-014* Development and Evaluation of a SmartWalker Posture Monitor *Jack Schultz - UD*	*DESS2017-090* Investigation of Near Wake Turbulent Fluctuations and its Relation to Wing Performance *Steven Goodman - UD*	*DESS2017-018* Laser Shock Peening for Aircraft Life Extension *Colin Engebretsen - AFIT* *Dr. Anthony Palazotto - AFIT* *Dr. Kristina Langer - AFRL* *Capt. David Eisensmith - AFRL*	*DESS2017-082* Computer Program for Optimum Design and Analysis of Wind Turbine Rotors *Valentina Jami - WSU* *Dr. James Menart - WSU*	*DESS2017-050* Using Model Solar Boats to Provide a Continuous Renewable Energy Education from Middle School to the University *Tim Dewhurst - CDU*
2:20PM	*DESS2017-059* Analysis of Cube Satellite Formations *Robert Larue - AFIT* *Kirk Johnson - AFIT*	*DESS2017-054* A Cryogenic Palletized High Energy Pulse System *Nathan Butt - WSU* *Rory Roberts - WSU* *Witch Wolff - WSU*	*DESS2017-102* Adult Bracing and Orthotics *Lazette Carter - WSU*	*DESS2017-052* Comparative Analysis: Low-Fidelity and High-Fidelity Hypersonic CFD *Jose Camberos - AFRL* *Farrell Hohman - AFRL*	*DESS2017-016* Nonlinear Static Analysis of a Celestial Icosahedron Vacuum Lighter Than Air Vehicle *Kyle Moore - AFIT* *Anthony N. Palazotto PhD - AFIT*	*DESS2017-063* A Look at the Optimum Slope of a Fixed Solar Panel for Maximum Energy Collection for a One Year Time Period *Salah Alhaidari - WSU* *Dr.James Menart - WSU*	*DESS2017-017* McCook Aviation Engineering STEM challenge *Wayne Lundberg - AFLCM*
2:40PM	*DESS2017-084* Parameter Study of Orbit Debris Defender Using Three Player Differential Game Theory *David Spendel - AFIT* *Joshuah Hess - AFIT*	*DESS2017-078* Rapid Response Temperature Control of High-Heat Flux Loads *Andrew Ellicott - WSU* *Dr. Mitch Wolff - WSU* *Dr. Rory Roberts - WSU*	*DESS2017-058* Laser Biofeedback for Improving Lower Extremity Motor Control *Luke Schepers - UD* *Bridget Dues, Kayla Kress - UD* *Drs. Megan Reissman, Kimberly Bigelow - UD*	*DESS2017-022* Grid Independence in Large Eddy Simulations of a Premixed Bluff-Body Flame *Joshua Sykes - ISSI* *Christopher A. Fugger - SE* *Drs. Andrew Caswell, Brent Rankin - AFRL*	*DESS2017-004* Tracking a Nonlinear Melt Region Produced During High Velocity Event *Armando Deleon - AFIT* *Dr. William Baker - AFIT* *Dr. Anthony Palazotto - AFIT*	*DESS2017-088* Computational Modelling of a Williams Cross Flow Turbine *Sajjan Pokhrel - WSU* *James Menart - WSU* *Subramania I. Sritharan - CSU*	
3:00PM	*DESS2017-060* Linear Modeling of an Electromechanical Actuator Test Rig *Jeremiah Hoffman - AFIT* *Dr. Anthony Palazotto - AFIT* *Dr. Nicholas Niedbalski - AFRL*	*DESS2017-086* Transient Thermal Management System for High-Heat Flux Loads *Stephen Shock - WSU* *Dr. Rory Roberts - WSU* *Dr. Mitch Wolff - WSU*	*DESS2017-080* Moving Towards Tuning of Ankle-Foot Orthoses (AFOs): The Influence of Carbon and Plastic AFOs for Individuals with Multiple Sclerosis *Sarah Hollis - UD* *Kayla Kress - UD* *Dr. Kimberly Bigelow - UD* *Dr. Kurt Jackson - UD*	*DESS2017-057* Unsteadiness and Modal Decomposition of Scramjet Unstart Computations *Logan Riley - OSU* *Jeffrey M. Donbar - AFRL* *Mark A. Hagenmaier - AFRL* *Datta V. Gaitonde - OSU*	*DESS2017-030* Economically Improving Signal Strength in Fiber Optic (EFPI) Strain Sensors *James Sebastian - UDRI* *William Boles - AFRL* *Bryan Eubanks - AFRL* *James Taylor - AFRL*		
3:20PM	*DESS2017-075* Optimal Path Planning for SUAS Waypoint Following in Urban Environments *Michael Zollars - AFIT* *Richard G. Cobb - AFIT* *David J. Grymin - AFRL*	*DESS2017-064* Power/Thermal Interaction within an Adaptive Turbine Engine *Andrew Desomma - WSU* *Drs. Mitch Wolff, Rory Roberts - WSU*					
3:40PM	Adjourn						

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Room	Emerald 010	Rathskeller 008
Time	SESSION 8 **STEM Educator Workshop I** Chair: Emma Cipriani	SESSION 9 **STEM Educator Workshop II** Chair: Brett Doudican
8:20AM	Intermediate Education, Module I SHH! No talking in the Library! An Introduction to Material Properties and the Scientific Method	High School Education, Module I Including Student Mindset and Skillset Development into Engineering Lessons
8:40AM		
9:00AM		
9:20AM		
9:40AM		
10:00AM	Break 1	

Room	Emerald 010	Rathskeller 008
Time	SESSION 17 **STEM Educator Workshop III** Chair: Linda Hallman	SESSION 18 **STEM Educator Workshop IV** Chairs: Lauren Henry & Caroline Boeckman
10:20AM	Intermediate Education, Module II Carbon Stabilization, Renewable Energy Technologies, and Design	High School Education, Module II The Perfect Bottle Flip: A lesson in force, mass, and analysis
10:40AM		
11:00AM		
11:20AM		
11:40AM		
12:00PM	Lunch and Networking	

160 - Apollo Room 1:40PM - 3:40PM Poster Session			
DESS2017-007 **The Effect of Inlet Pulsations on Primary Atomization of Liquid Jets** *Kyle Windland - UC* *Himakar Ganti - UC* *Prashant Khare - UC*	*DESS2017-011* **High-Fidelity Simulations of Water Jets in Air Crossflow** *Austin Johnston - UC* *Prashant Khare - UC*	*DESS2017-020* **Biomass Cookstove Thermal Efficiency and Tending Practices** *Erin Peiffer - UD* *Joshua Heyne - UD* *Sari Mira - UD*	*DESS2017-033* **Python Module for Extrapolating Three-Dimensional Data from EBSD Images** *Ryan Slater - BBHS* *Dr. Kevin Chaput - AFRL* *Dr. Sean Donnegan - AFRL*
DESS2017-071 **The STEM Gender Gap: An Evaluation of the Efficacy of Women in Engineering Camps** *Malle Schilling - UD*	*DESS2017-085* **Carbon Nanotube Nanocomposite Materials for Electronics Interface Enhancement** *Brian Calderon - UDRI* *Levi Elston - UDRI* *Charles Ebbing - UDRI* *Qiuhong Zhang - UDRI*	*DESS2017-087* **Open-Source, Virtual, Online Materials Laboratory including Tensile, Hardness, and Impact Testing** *Matthew Bond - SCC* *Larraine Kapka - SCC* *Steven Wendel - SCC* *Karl Kapp - BU* *Brian Seely - BU*	*DESS2017-089* **Finite-Element Modeling of Deformation, Damage, and Failure in Additively Manufactured Parts** *Alex Elsbrock - UD* *Rocky Bowman - UD* *Dr. Robert Lowe - UD* *Dr. Thomas Whitney - UD*
DESS2017-101 **McCook Challenge (Middle School Team)** *Shirley Lee - STMS* *Esha Reddy, Nithya Kothnur - STMS* *Ryan Cheng, Nathan Green - STMS* *Sohom Dey - STMS*			

Abbreviations:

AE = Antrex Energy
AFIT = Air Force Institute of Technology
AFLCM = Air Force Life Cycle Management Center
AFRL = Air Force Research Laboratory
BBHS = Bellbrook High School
BU = Bloomsburg University
CDU = Cedarville University
COU = Columbia University
CSU = Central State University
DRSS = Dayton Regional STEM School
ISSI = Innovative Scientific Solutions Inc.
MU = Miami University
NDSU = North Dakota State University
NRC = National Research Council
OHS = Oakwood High School
OSU = The Ohio State University
PU = Purdue University
RCHS = Reading Community High School
RHS = Ryle High School
RI = Rehoboth Innovations LLC
SCC = Sinclair Community College
SE = Spectral Energies LLC
SSA = Stivers School for the Arts
STMS = Scientific Touch Middle School
UC = University of Cincinnati
UD = University of Dayton
UDRI = University of Dayton Research
UI = University of Idaho
WHS = Wayne High School
WSU = Wright State University