4th Annual Dayton Engineering Sciences Symposium

Room	156A	156B	156C	157A	157B	163A	163B
Time	*SESSION 1:* **Energy** Chair: Scott Stouffer, UDRI	*SESSION 2:* **Materials** Chair: Geoff Fair, AFRL	*SESSION 3:* **Fluid Dynamics / CFD** Chair: BG Shiva Prasad, Emerson Climate Technologies, Inc.	*SESSION 4:* **Engineering Education** Chair: Gary Dale, AFRL	*SESSION 5:* **Design & Optimization I** Chair: Tommy Baudendistel, PCK&A	*SESSION 6:* **Undergraduate Projects** Chair: Thomas Ramsay, Honda R&D	*SESSION 7:* **Structures & Solid Mechanics I** Chair: Larry Byrd, AFRL
8:40	*DESS08-0074* **Energy Concerns for the Aerospace Corporation** Scott Snelling Goodrich Aircraft Wheels & Brakes	*DESS08-0041* **Mechanical Testing to Determine Interface Properties of Fiber Reinforced Ceramics** Joy Davis, WSU Geoff Fair, AFRL	*DESS08-0004* **Computational Fluid Dynamics Analyses for Supersonic Nozzle at Ohio State University** Barbara Rodriguez, AFRL	*DESS08-0006* **Exposing Inner City Students to Engineering: The Kiser PK-8 Robotics Program** Douglas Smith, UD Eric Ebbers, UD Gerica Brown, UD Colin Gorey, UD	*DESS08-0077* **Mechanization of Shape-Changing, Rigid-Body Linkages** David Myszka, UD Andrew Murray, UD	*DESS08-0037* **A Hydrogen Storage and Generation System Utilizing Metal Hydrides for Varied Proton Exchange Membrane Fuel Cell Applications** Ian Fuller, WSU	*DESS08-0044* **Structural Health Monitoring of a Thermal Protection System for Fastener Failure** Randy Tobe , WSU Ramana Grandhi, WSU
9:00	*DESS08-0054* **Energy Requirements Planning for New Product Development: A Project Framework Approach** Adedeji Badiru, AFIT	*DESS08-0086* **Growth of Carbon Nanotubes on Porous Carbon Substrates** Ian Barney, WSU S.M. Mukhopadhyay, WSU	*DESS08-0014* **Flow Stability Analysis of Thermal Perturbation in Mach 1.5 Laminar Boundary Layer** Hong Yan, WSU Datta Gaitonde, AFRL	*DESS08-0048* **Engaging Student Learning with a Sustainability Initiative at Sinclair Community College** Robert Gilbert, UD / SCC Robert Woodruff, SCC	*DESS08-0046* **Optimization of Spherical Four Bar Devices for Spatial Tasks** David Perkins, UD Andrew Murray, UD	*DESS08-0012* **Solar Autoclave for Rural Nicaraguan Medical Clinics** Matt Pittinger, UD Chris Weiss, UD	*DESS08-0031* **Structural Vibration Measurements Using Hybrid Videogrammetry System** Chris Allen, AFIT Alan Jennings, AFIT Jonathan Black, AFIT
9:20	*DESS08-0047* **A Cost Benefit Analysis: Viability of Passive Solar Energy Systems for Large Facilities on Air Force Installations** Sang Lee, AFIT	*DESS08-0084* **Characterization of Carbon Nanotubes in Epoxy** Gerard Simon, WSU	*DESS08-0015* **A Numerical Investigation on the Performance of a Low-flow Thermodenuder** Alejandro Briones, UDRI Jamie Ervin, UDRI Matthew Dewitt, UDRI Scott Stouffer, UDRI Christopher Klingshirn,UDRI Meng-Dawn Cheng, ORNL Edwin Corporan, AFRL	*DESS08-0066* **SCADA Defense, A Hands-On Trainer to Educate Students on Control System Vulnerabilities** David Olander, AFIT Juan Lopez, AFIT Richard Raines, AFIT	*DESS08-0039* **Kinematic Synthesis in Designing Shape-Changing Mechanisms for Varying Cross-Section Profiles** Shamsul Shamsudin, UD Andrew P. Murray, UD	*DESS08-0088* **Solar Updraft Tower** James Menart, WSU Chase Nessler, WSU Christopher Grote, WSU Ryan Jones, WSU Jon Holmes, WSU Brian Selander, WSU	*DESS08-0024* **Calibration of Laser Steering for Vibration Measurements on Moving Objects** Alan Jennings, AFIT Jonathan Simpkins, Trinity U, Ryan Sollars, Trinity U, Chris Allen, AFIT Jonathan Black, AFIT

9:40	*DESS08-0029* **An Evaluation of Solar Air Heating Technology at U.S. Air Force Installations** David Brown AFIT	*DESS08-0083* **Geometrical Modeling, Microstructural Analysis, and Surface Modification of Microcellular Carbon Structures** Anil Kumar Karumuri, WSU S. M. Mukhopadhyay, WSU	*DESS08-0061* **Initial Characterization of Three-Dimensional Flow Separation in a Compressor Stator** Samuel Bailie, AFRL Grant Hile, AFRL Steven Puterbaugh, AFRL		*DESS08-0075* **Dynamometer Design for Vertical Axis Wind Turbine Model Testing** Thomas Mooney, UDRI Steve Fuchs, UDRI	*DESS08-0001* **An Electric Auxiliary Engine for a Sailboat Using Renewable Energy - A Capstone Project** Russell Marcks, SCC	*DESS08-0003* **Fatigue Testing of Out-of-Plane Counterweights for a High Speed Application** David Myszka, UD
10:00	*DESS08-0019* **Efficiency Improvements for a Rural South American Community Electrical System** Thomas Wenning, UD Peter Kleinhenz, UD / Go Sustainable Energy, LLC	*DESS08-0072* **The Use of a Polymer Based Composite System For Repair of High Temperature Pipeline** Thomas Spradlin, WSU John Henshaw, U. of Tulsa	*DESS08-0067* **Direct, Real-time Measurement of Airfoil Lift and Moment Using Flow Bifurcation Points** Siva Mangalam, Tao Systems		*DESS08-0005* **Low-Cost/High-Speed Bearing Tester Using Torque Ripple Sensors** Tommy Baudendistel, PCK&A Steve Pekarek, Purdue U Eric Walters, PCK&A	*DESS08-0081* **Robotic Lawnmower** Joseph Mertz, WSU Jeff Baugher, WSU Kuldip S. Rattan, WSU	*DESS08-0027* **Optimized Designer Aero-Servo-Controls and Engineered Viscoelastic Material Properties** Harry H. Hilton, UIUC Daniel H. Lee, UIUC Craig G. Merrett, UIUC
10:20	*DESS08-0049* **Bio Green Waste to Energy: An Old Technology With a New Future** John Norton, Norton Engineering LLC	*DESS08-0093* **Ultrasonic Characterization of Thermally Aged Epoxy** Shaun Freed, UD	*DESS08-0010* **Calibration Model for Low Speed CFD Analysis** Stephen Warrener, AFRL		*DESS08-0064* **Inflatable/Rigidizable Space Structures** Brett Cooper, AFIT Jonathan Black, AFIT Richard Cobb, AFIT	*DESS08-0002* **Appropriate Ram Pump Technology in Quetzaltenango** Gordon Schweitzer, UD	*DESS08-0038* **Experimental Challenges for Mechanical Characterization of Thermal Barrier Coatings Using a Free-free Beam Setup at Elevated Temperature** Oliver Easterday, AFIT Anthony Palazotto, AFIT
10:40	Break	Break	Break	Break	Break	Break	Break
10:50	**Apollo Room** **Apollo Room**	**10:50-11:00 Welcome & Announcements** ***Carl Tilmann**, 2008 DESS Chair* **11:00-11:40 Keynote Address: Mr. William E. Harrison III, AFRL** *"Alternative Energy for Aerospace Applications"* **11:40-12:40 Lunch and Industry Informational Presentations** *Industry sponsors will be providing informational presentations in the Apollo Room* **12:40-1:10 Panel Session: "Energy: Present Challenges & Future Opportunities"** ***William Harrison**, AFRL Propulsion & Power* ***Dieter Multhopp**, AFRL Air Vehicles* ***Thomas Ramsay**, Honda R&D Americas* ***Gary Walzer**, Alternative Energy Technology, EMTEC*					**Apollo Room** **Apollo Room**
1:10	Break	Break	Break	Break	Break	Break	Break

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Time	*SESSION 8:* **Aircraft Efficiency I** Chair: Kevin Hallinan, UD	*SESSION 9:* **Manufacturing** Chair: Larry Dosser, MLPC	*SESSION 10:* **Design & Optimization II** Chair:Rebecca Hoffman, SIMULIA	*SESSION 11:* **Computer Sciences** Chair: Bonnie Schwartz, AFRL	*SESSION 12:* **Human Factors & Biomedical** Chair: Tarun Goswami, WSU	*SESSION 13:* **Structures & Solid Mechanics II** Chair: Stephen Clay, AFRL	*SESSION 14:* **Sensors I** Chair: James Gord, AFRL
1:20	*DESS08-0057* **An Overview of SensorCraft Capabilities and Key Enabling Technologies** Juan Martinez, AFRL Peter Flick, AFRL Gary Dale, AFRL	*DESS08-0089* **A Stochastic Production Planning Model Under Uncertain Demand** Meenakshi Prajapati, WSU Xinhui Zhang, WSU	*DESS08-0043* **Laser Shock Process Optimization by Employing 2D, Symmetric 3D, and Parametric Plate Model** Gulshan Singh, WSU Ramana V. Grandhi, WSU David Stargel, AFRL	*DESS08-0025* **Robust Learning of Robotic Motions and Their Effects** Alan Jennings, UD Raul Ordonez, UD	*DESS08-0068* **Temporomandibular Joint Disorders: Joint Loading AND Biomechanical Analysis** Shirish Ingawale, WSU Tarun Goswami, WSU	*DESS08-0018* **Improving the Matrix Condition Number of Weakly-Enforced Boundary Value Systems** Douglas Wickert, AFIT Robert A. Canfield, AFIT	*DESS08-0096* **30-kHz Thermometry and Species-Concentration Measurements with Time-Division-Multiplexed (TDM) Absorption** James Gord, AFRL Scott T. Sanders, U.Wisc. Sukesh Roy, SE
1:40	*DESS08-0076* **Key Aerodynamic Technologies for SensorCraft** Gary Dale, AFRL	*DESS08-0052* **Accelerating Design-to-Manufacturing Transition in the Aerospace Industry** Dan Sokol, Renaissance Services	*DESS08-0059* **Optimization of a Hub Sleeve Using PSO and Meta-Model** Jong-Bin Im, ,WSU	*DESS08-0055* **A Novel Methodology for Detecting and Tracking Contraband Digital Files Transmitted Via the BitTorrent Peer-to-Peer Protocol** Karl Schrader, AFIT Barry E. Mullins, AFIT	*DESS08-0090* **Deep Brain Stimulation: Mechanisms of Design and Placement** Melissa Jones, WSU	*DESS08-0062* **Effect of a Graded Layer on the Plastic Dissipation during Mixed-Mode Fatigue Crack Growth on Plastically Mismatched Interfaces** Craig Baudendistel, WSU Nathan Klingbeil, WSU	*DESS08-0095* **1-kHz Thermometry with Amplified Femtosecond Lasers** Sukesh Roy, SE Robert P. Lucht, Purdue U. James R. Gord, AFRL
2:00	*DESS08-0050* **Endurance Limits of Unmanned Air Vehicles** Trenton White, AFRL	*DESS08-0087* **High Speed Laser Welding of Fuel Cell Components** Scott Cornell & Kevin Hartke Mound Laser & Photonics Center, Inc.	*DESS08-0069* **Risk Based Design of Cracked Stiffened Panels.** Venkateswaran Shanmugam, WSU Ravi C. Penmetsa, WSU Eric Tuegel, AFRL	*DESS08-0053* **Subjective Audio Quality over Secure IEEE 802.11 Local Area Networks** Benjamin Ramsey, AFIT Barry E. Mullins, AFIT	*DESS08-0091* **Dissociation of the Humeral Prosthesis – Retrieval, Load, and Torque Analysis** Alyssa George, WSU Michael Iossi, WSU Tarun Goswami, WSU Ronald Markert, WSU Lynn A. Crosby, WSU	*DESS08-0051* **Material Model Investigation of a High Strain Rate Process** Hemanth Amarchinta, WSU Ramana Grandhi, WSU Kristina Langer, AFRL David Stargel, AFRL	*DESS08-0078* **Performance Results for the Optical Turbulence Reduction Cavity** Ryan Schmit, AFRL Chris McGaha, AFRL John Tekell, AFRL Jim Grove, AFRL Michael Stanek, AFRL
2:20	*DESS08-0094* **Energy Efficiency; Past Trends, Future Needs** Ryan Plumley, AFRL	*DESS08-0028* **Free-Edge Effects on Solidification Microstructure in Beam-Based Solid Freeform Fabrication of Thin-Wall Geometries** Joy Davis, WSU Nathan Klingbeil, WSU	*DESS08-0040* **Reliability Based Design of a Supercavitating Projectile** Matthew Riley, WSU Ramana V. Grandhi, WSU William P. Krol, NUWC	*DESS08-0056* **VoIP over MANETS: A Performance Analysis of OLSR** Lady Noreen Santos, AFIT Barry E. Mullins, AFIT	*DESS08-0016* **Growth of Biological Cells on Microcellular Carbon Foam** Elizabeth Maurer, WSU&AFRL Sharmila M. Mukhopadhyay, WSU Saber Hussain, AFRL	*DESS08-0034* **Consideration of Wear at High Velocities** Chad Hale, AFIT Anthony N. Palazotto, AFIT William P. Baker, AFIT	*DESS08-0035* **Schlieren Based Seedless PIV in Large Scale Wind Tunnel Facilities** Chris McGaha, AFRL Sivaram Gogineni, SE Gary Settles, PSU Mike Haragather, PSU JD Miller, PSU Lori Dodson, PSU
2:40	*DESS08-0022* **Efficiency of Large Transport Aircraft** William Blake, AFRL Cale Zeune, AFRL	*DESS08-0021* **Effect of Finite Geometry on Solidification Microstructure in Beam-Based Fabrication of Thin-Wall Structures** Satish Kuchi, WSU Nathan Klingbeil, WSU	*DESS08-0085* **Quantification of Model Uncertainty for LSP Simulation** Inseok Park, WSU Hemanth Amarchinta, WSU Ramana Grandhi, WSU David Stargel, AFRL		*DESS08-0058* **Streamlining the Flight Line: Preserving Mental Energy & Temporal Demand Using Hands Free Data Collection Methods** Nicole Arbuckle, UDRI Kristie Nemeth, UDRI Laurie Quill, UDRI	*DESS08-0060* **Simultaneously Coupled Least-Squares Finite Element Formulation for Fluid-Structure Interaction** Cody Rasmussen, AFIT Robert Canfield, AFIT	*DESS08-0097* **High Bandwidth Plasma Sensor Suite for Flow Parameter and Vibration Measurement** Sivaram Gogineni, SE Eric Matlis, UND Tom Corke, UND
3:00	Break	Break	Break	Break	Break	Break	Break

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Time	*SESSION 15:* **Aircraft Efficiency II** Chair: Lance Chenault, ABDA	*SESSION 16:* **Flight Operations** Chair: Carl Tilmann, AFRL	*SESSION 17:* **Aerospace Vehicle Design** Chair: Daniel Tejtel, AFRL	*SESSION 18:* **Micro Air Vehicles** Chair: David Allen, OAI		*SESSION 19:* **Heat Transfer & Thermal Sciences** Chair: Kevin Klasing, GE	*SESSION 20:* **Sensors II** Chair: Sivaram Gogineni, SE
3:20	*DESS08-0063* **Development and Flight Test of a Multi-Function Controller for Automated Cruise Flaps on an Aircraft Wing** Craig Cox, AFRL	*DESS08-0026* **Replicating the Bay of Biscay: Issues in Agent-Based Modeling Validation** Brian Heath, WSU Ray Hill, AFIT Frank Ciarallo, WSU	*DESS08-0007* **Ramstar Orbital Spaceplane as a Model for Advanced Concepts Visualization** Pamela Menges, ARSI	*DESS08-0065* **Tools for Conceptual Design and Engineering Analysis of Micro Air Vehicles** Mustafa Turan, AFIT Robert A. Canfield, AFIT Fred Harmon, AFIT		*DESS08-0017* **3D Thermal-Fluid & Stress Analysis for Single Chip SiC Power Sub-Modules** Bang Tsao, UDRI Katie Sondergelt, UDRI Jacob Lawson, UDRI James Scofield, AFRL Levi Elston, AFRL	*DESS08-0082* **Lucky Imaging of Low Earth Orbiting Satellites** Chris Carlton, AFIT Richard Cobb, AFIT
3:40	*DESS08-0023* **Formation Flight for Drag Reduction** William Blake, AFRL	*DESS08-0036* **Vision-Based Navigation for Airfield Surface Operation** Bonnie Schwartz, AFRL Eric W. Frew, CU Tristan Gerritsen, CU Stephen Pledgie, MATM Chris Brinton, MATM Shivang Patel, MATM	*DESS08-0079* **Exergy-Based Methods for Analysis and Design of Aerospace Vehicles** John Doty, UD José Camberos, AFRL David Moorhouse, AFRL	*DESS08-0032* **Simulation of Low Reynolds Number Airfoil in High Frequency Pitch and Plunge Motions using SC/Tetra** Sunil Vytla, WSU P. G. Huang, WSU N. Watanabe, CRADLE, Japan		*DESS08-0030* **Implementation of Water Cooled Load Bank** Larry Burich, AFRL&WSU Jonathan Potter, AFRL & WSU	*DESS08-0011* **Adaptive Control of Woofer-Tweeter Adaptive Optics** Jimmie Perez, AFIT
4:00	*DESS08-0073* **Measurement of Energy Exchange in Fluid-Structure Interactions** Arun Mangalam, Tao Systems	*DESS08-0080* **Support for Planning of Air Refueling Tasking and Allocation (SPARTA)** Gina Daniels, AFRL Rob Wnek , NGC Randall Whitaker, NGC Christopher Weimer, AFRL Samuel Kuper, AFRL	*DESS08-0071* **Optimal Re-entry Trajectory Terminal State Due to Variations in Waypoint Locations** William Karasz, AFIT	*DESS08-0042* **Aerodynamic Performance of Two-Dimensional Bio-Inspired Wing Sections in Micro-Air-Vehicle Applications** Charles Webb, WSU Haibo Dong, WSU		*DESS08-0020* **Numerical Analysis of Copper Coated Thickness in Carbon Foam** Mohammad Almajali , UD Khalid Lafdi , UD	*DESS08-0070* **A Frequency Agile Patch Antenna Using Ferroelectric Thin Film Varactor Technology** Mark Patterson, UD Guru Subramanyam, UD Hai Jiang, UD Jiadong Wang, UD
4:20	*DESS08-0098* **Oil Depletion Estimations** Ryan Plumley, AFRL Jack Byrnes, AFRL	*DESS08-0045* **Autonomous Intelligent Systems Integration in Safety in Flight Test and Launch Operations** Jeff Hadhazy, ARSI Pamela Menges, ARS	*DESS08-0009* **Roughness Considerations for the HIFiRE-1 Vehicle** Roger Kimmel, AFRL	*DESS08-0033* **Verification of a Transpiration Aeroelastic Solver.** Ernest Thompson, UD		*DESS08-0092* **Calculating Modulating Steam Boiler Efficiency and Quantifying Energy Savings for Preheating Combustion Air** Steve Mulqueen, UD	*DESS08-0013* **An Algorithm for Automated Feature Extraction from Flash Ladar** JN Markiel, OSU C. Toth, Center for Mapping D. Grejner-Brzezinska, OSU

Abbreviations:

ABDA: Aerospace Business Development Associates
AFIT: Air Force Institute of Technology
AFRL: Air Force Research Laboratory
ARS: Aerospace Research Systems, Inc.
CU: University of Colorado at Boulder
MATM: Mosaic ATM
NGC: Northrop Grumman Corporation
NUWC: Naval Undersea Warfare Ctr
OAI: Ohio Aerospace institute
ORNL: Oak Ridge National Lab
OSU: The Ohio State University
PCK&A: P.C. Krause and Associates
PSU: Penn State University
SCC: Sinclair Community College
SE: Spectral Energies, LLC
UD: University of Dayton
UND: University of Notre Dame
UDRI: Univ of Dayton Research Institute
UIUC: U. of Illinois at Urbana-Champaign
U.Wisc: University of Wisconsin
WSU: Wright State University