



UNIVERSITY of DAYTON

School of Engineering *Scholarship*

2009-2010



ENGINEERING EDUCATION AND RESEARCH

Today, the School of Engineering at the University of Dayton enrolls a record number of students and performs more sponsored research than any Catholic engineering school in the country.

Our faculty and staff develop the whole person. Their inspiring, caring and giving spirit has helped our School achieve the distinction of having one of the highest retention and graduation rates in engineering in the country.

This publication exhibits our research and scholarship as well as provides a glimpse of the School of Engineering's eight endowed professors.

Our endowed professors contribute expertise and academic leadership in areas of critical, national importance that include energy, Ladar and optical communication, nanomaterials, sensors, and bioengineering. Five of our programs have been named State of Ohio Centers of Excellence in Education and Research in Emerging Technologies:

- High Performance Materials
- Optoelectronics and Sensors
- Strategic Energy and Environmental Informatics
- Tissue Regeneration and Engineering at Dayton
- von Ohain Fuels and Combustion Center

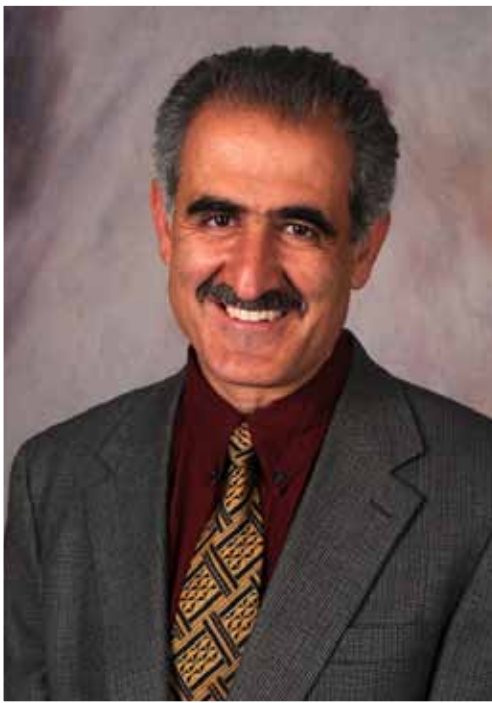
We are proud of the quality and quantity of our School's research, scholarship and continued global awareness. Our diversity of knowledge advances the state-of-the-art in composite materials, biomechanics, building energy systems, electro-optics, environmental solutions, fluid mechanics, materials, sensors, technical communications, and renewable energy systems.

Through our School's ETHOS program, we develop appropriate technology for our global service missions in Africa, India and South America.

Our faculty and staff create new opportunities and programs in strategic cross-disciplinary areas in order to build a brighter future for all.

As a comprehensive University that is Catholic and Marianist, the School of Engineering faculty and staff

work and support our mission to "discover and disseminate knowledge that advances engineering theory and practice and contributes to the good of society."



A handwritten signature in black ink that reads "Tony E. Saliba".

Tony E. Saliba
Dean, School of Engineering

October 7, 1999: Hans von Ohain Distinguished Professor

*Dr. Dilip Ballal, Hans von Ohain Distinguished Professor in Mechanical and Aerospace Engineering
Director, von Ohain Fuels and Combustion Center and Division Head, University of Dayton Research Institute*



Dilip Ballal was honored for his “lifetime of scholarly contributions to advancing gas turbine technology” with the 2011 ASME R. Tom Sawyer Award by the American Society of Mechanical Engineers. The award follows other accolades including his October 7, 1999, installation as Hans von Ohain Distinguished Professor,

named for the illustrious co-inventor of the jet engine.

Influenced by Dr. Hans von Ohain, Sir Frank Whittle and the Wright Brothers, Dr. Ballal studied in India and England at the College of Engineering and Cranfield Institute of Technology, respectively. He states, “As a youngster in India, with aeronautical inclinations . . . Dayton, Ohio, was the place to be.”

Dr. Ballal’s fundamental research on combustion

stability and pollutant emissions paved the way toward novel designs of low-emission gas turbine combustors. Sixty years ago, the Hans von Ohain jet engine produced a maximum thrust of 1100 lbs.—today’s engines are over 100 times as powerful, twice as efficient, one-third less polluting, 20 decibels quieter and produce 115,000 lbs. of thrust.

Under Dr. Ballal’s leadership, the von Ohain Fuels and Combustion Center enjoys an international reputation and has been named an Ohio Center of Excellence.

Research supported by the Center focuses on alternative and conventional fuels with an emphasis on optimizing fuel combustion processes and decreasing emissions. The investigation of environmentally-friendly algae and bio fuels as well as the environmental impacts of fuel use are priorities for Dr. Ballal and the von Ohain Fuels and Combustion Center. Ongoing research is assured through the Center’s \$49.97 million award.

April 21, 2005: Dr. and Mrs. Charles R. Wilke Distinguished Professor

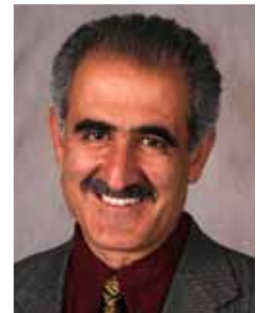
*Dr. Tony E. Saliba, Wilke Distinguished Professor in Chemical and Materials Engineering
Dean, School of Engineering*

Tony Saliba was named Wilke Distinguished Professor at the University of Dayton in 2005 through the generosity of Dr. Charles Wilke and his wife, Bernice. Throughout their lives, Dr. Wilke, chair and co-founder of the Department of Chemical Engineering at the University of California, Berkeley, and his wife, an elementary school teacher, were committed to education.

Following a similar path, Dr. Saliba’s devotion to excellence in engineering education and research is evident throughout his career and the School of Engineering. Named dean of the School of Engineering in 2009, he also served for many years as the chair of the Department of Chemical and Materials Engineering.

Dr. Saliba was a co-designer of the first undergraduate degree in composite materials engineering in the country and labeled by NSF evaluators as a curriculum innovator. Today, he leads a comprehensive curriculum revision to integrate engineering innovation, entrepreneurship, leadership, experiential, service and global learning to educate the complete engineer of the future.

Dr. Saliba’s teaching awards include the School of Engineering and the Alumni Awards of Excellence in Teaching as well as the Affiliate Societies Council of the Engineering and Science Foundation of Dayton Award for Outstanding Professional Achievement in Education.



Dr. Saliba’s research, supported by the U.S. Air Force, Chrysler Motors, General Electric, McDonnell Aircraft, and Boeing, includes the development and use of process models, expert systems, and expert models for the intelligent processing of advanced composite materials. He and his students developed sensors based on acoustic, magnetic, and fiber optic techniques to improve curing technology. SAMPE bestowed upon him its highest honor of fellow for his distinguished contributions to advanced materials processing.

April 24, 2006: John F. and Leona D. Torley Chair in Composite Materials Engineering

*Dr. Charles Browning, John F. and Leona D. Torley Chair in Composite Materials Engineering
Chair and Professor, Department of Chemical and Materials Engineering*



Charles Browning, previously AFRL director of the Materials and Manufacturing Directorate, was named the John F. and Leona D. Torley Chair in Composite Materials.

As a doctorate student, he worked in the pioneering area of high humidity effects on advanced composite, which led to solving quality barriers that prevented F-16 composite structures from production. At AFRL, he initiated first-ever programs in chemical quality assurance and processing science of advanced composites; provided technical support to Air Force systems; and lead an organization of nearly 530 government employees with a yearly budget of \$400 million.

He has also coordinated local and national coalitions between industry and academics, established an innovative Ohio small business program and lead an initiative to support Historically Black Colleges and Universities.

Recently, Dr. Browning worked alongside MIT, Notre Dame and NASA researchers on a National Research Council panel to examine the research and development strategies as well as the material needs for future military aerospace propulsion systems. The National Academy of Sciences organized the science and technology panel to assist the federal government in decision-making.

Dr. Browning is a fellow of SAMPE and a member of the American Chemical Society. His awards include the Presidential Meritorious Executive Ranks Award, the Federal Professional Employee of the Year Award, the Dayton Affiliate Societies Award, and the Dayton Intergovernmental EEO Council Award.

Graciously providing the endowment, the Torley's were prominent Dayton leaders from the 1960s until their deaths in 1998. Mr. Torley, a mechanical and industrial engineer, was President and CEO of Dayton Malleable (Amcast Industrial). Mr. Torley, a member of the University of Dayton Board of Trustees was elected chair in 1977 and received an Honorary degree from the University of Dayton in 1982.

February 19, 2010: Ohio Research Scholars Chair in Wide-Area Surveillance

*Dr. Vijayan Asari, Ohio Research Scholars Chair in Wide-Area Surveillance
Professor, Department of Electrical and Computer Engineering*

Vijayan K. Asari joined the University of Dayton School of Engineering in 2010 as the Ohio Research Scholars Chair in Wide-Area Surveillance. His focus through the School's Vision Laboratory is on the development of new algorithms and architectures for real-time applications in areas of signal processing, image processing, computer vision, pattern recognition, artificial neural networks and bio-mimetic object-vision recognition.

Dr. Asari's projects within the University's Vision Laboratory include: visibility improvement of images and videos captured in low lighting and bad weather conditions; multi-sensor image fusion; video stabilization; automatic face detection, tracking, and recognition; iris recognition; automatic vessel detection and identification; brain wave processing for intention analysis; and robotic navigation and visual data analysis for situational awareness.

In order to build real-time systems for defense and

homeland security applications, Dr. Asari combines the aspects of mathematical modeling of human visual perception, the extraction of representational features from visual data, and the statistical and logical methodologies for decision-making.

As the new chair, Dr. Asari will help to strengthen Ohio and its citizens and prepare them for global competition in the fields of science, technology, engineering, and mathematics (STEM), as well as the medical fields and STEM education.

Through the vision of the Ohio Research Scholars Program, this multi-university, statewide position was formed to develop and support an increase in highly-qualified research talent and focus on long-term regional economic development.



September 24, 2010: Wright Brothers Institute Chair in Nano Materials

*Dr. Joel R. Fried, Wright Brothers Institute Chair in Nano Materials
Professor, Department of Chemical and Materials Engineering*



Joel R. Fried became the University of Dayton's Wright Brothers Institute Chair in Nano Materials in 2010.

Prior to his appointment, Dr. Fried was Professor Emeritus and Fellow of the Graduate School at the University of Cincinnati where he also served as the head of the Department of Chemical Engineering, the director of the Polymer Research Center, and dual professor, Genome Science, College of Medicine.

In addition to authoring more than 150 journal articles and book chapters, Dr. Fried is the author of the widely used textbook, *Polymer Science and Technology*, as well as the recently released textbook, *Computational Chemistry and Molecular Simulation*.

Dr. Fried has served as the American Institute of

Chemical Engineering director of Materials Science and Engineering Division as well as a member of the Publications Committee. He is on the editorial boards of the *Journal of Polymer Engineering* and *Polymer* and is the editor of *Polymer Contents*.

Currently, Dr. Fried focuses on the mesoscale simulation of the self-assembly process of block copolymers and the organization of membrane proteins in biological and biomimetic membranes.

As the University's chair in Nano Materials, Dr. Fried will build and guide an interdisciplinary research program in bio-nano materials. In addition, he will lead and mentor collaborative research with the Air Force Research Laboratory (AFRL) at Wright Patterson Air Force Base and the University of Dayton Research Institute and will continue to forge University partnerships with industry and others while advancing the regional and national visibility of the University in this field.

September 24, 2010: Wright Brothers Institute Chair in LADAR and Optical Communications

*Dr. Mikhail A. Vorontsov, Wright Brothers Chair in LADAR and Optical Communication
Professor, Electro-Optics Graduate Program and Director, Intelligent Optics Laboratory*

Mikhail Vorontsov is the Wright Brothers Institute Endowed Chair for the LADAR and Optical Communications Institute (LOCI) at the University of Dayton.

Dr. Vorontsov has published over 250 papers and four books on the subjects of adaptive optics, nonlinear spatio-temporal dynamics, phase retrieval problem, imaging and laser communications through turbulence, parallel image processing and correction, optical synergetics, laser beam shaping, computer optics, optimal control theory, and optical neural networks.

He is a fellow of ARL, SPIE, and OSA and the recipient of many awards including the University of Maryland's Outstanding Systems Engineering Faculty, U.S. Army Research and Development Achievement Award, ARL Achievement Award for Best Publication, and ARL Achievement Award for Science for the development of a new generation of adaptive laser communication and imaging systems.

Through the vision of the Wright Brothers Institute, the chair in LADAR and Optical Communication was created to support the Air Force Research Laboratory's investment in LOCI through endowment by the University of Dayton, the LOCI partners, and the Ohio Research Scholars Program.

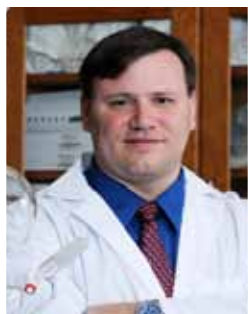


This position strengthens the University's role in unraveling the complex phenomena that obscure images and degrade information that pass through atmospheric disturbances.

The chair will grow our talent in critical areas of national need and provide leadership in developing future technologies to mitigate the deleterious effects of atmospheric turbulence on laser communications and remote sensing.

September 30, 2011: Ohio Research Scholars Endowed Chair in Multiscale Composites Processing

Dr. Scott A. Gold, Ohio Research Scholars Endowed Chair in Multiscale Composites Associate Professor, Department of Chemical and Materials Engineering



Scott Gold joins the University of Dayton School of Engineering as the Ohio Research Scholars Endowed Chair in Multiscale Composites Processing.

Dr. Gold is the owner of five inventions. His research includes the processing of nanoscale materials and composites and developing

techniques for the fabrication of nanostructured materials that can be used in electronic devices, batteries, fuel cells and composite materials. *Synthetic Metals*, a peer-reviewed scientific journal covering electronic polymers and electronic molecular materials, recently profiled his work.

Newly created, the Endowed Chair in Multiscale Composites is a multi-university, statewide initiative formed under the Ohio Research Scholars Program (ORSP). The

goal of the ORSP is to strengthen and increase university-led research clusters in Ohio.

This position is an integral part of a research cluster of excellence in technology for emerging materials. The cluster incorporates a cross-disciplinary collaboration between the University of Dayton, The Ohio State University and the University of Akron.

As the chair, Dr. Fried will lead and mentor collaborative research; expand the University of Dayton's materials program; and build upon activities to develop a new generation of composite materials, manufacturing methods, and test-bed methodologies that will enable revolutionary improvements in structural materials performance.

This position will work closely with ORSP positions at our partner institutions and develop relationships with the University of Dayton Research Institute, the Air Force Research Laboratory and the National Composite Center.

September 30, 2011: Wright Brothers Institute Endowed Chair in Nano Materials

Dr. Khalid Lafdi, Wright Brothers Institute Endowed Chair in Nano Materials Scientist, UDRI and Professor, Department of Chemical and Materials Engineering

Khalid Lafdi, with 20 years of carbon science and technology experience, joins the University of Dayton School of Engineering as the Wright Brothers Institute Endowed Chair in Nano Materials in the Department of Chemical and Materials Engineering.

In 2001, as Carbon Group Leader for the University of Dayton Research Institute (UDRI), Dr. Lafdi helped advance the University of Dayton's research vision in nanotechnology.

Dr. Lafdi was responsible for establishing the Nanoscale Engineering Science and Technology (NEST) Laboratory and the Carbon Research Laboratory.

Ten years ago, he built a state-of-the-art thermal management laboratory and a carbon manufacturing transition facility in order to facilitate scale-up processes and technology transfers of carbon materials and devices.

Dr. Lafdi has published more than 140 articles and chapters in refereed journals and edited four books about nanocomposites and thermal management. Furthermore,

he holds four patents and has licensed three major technologies in nanomanufacturing to Ohio companies.

Recognized for his expertise, the American Carbon Society selected Dr. Lafdi as their 2014 George D. Graffin Lecturer and their carbon "ambassador." As ambassador, Dr. Lafdi will travel the U.S. and highlight 40 years of carbon science and technology not only for academia but also for industry.

As the School's endowed chair, Dr. Lafdi will lead and mentor collaborative research; expand the University's nanomaterials program; and create new partnerships with industry, the Air Force Research Laboratory at Wright Patterson Air Force Base, and the University of Dayton Research Institute.



University of Dayton
School of Engineering

SCHOLARSHIP 2009-2010

Chemical and Materials Engineering

BOOKS

Lau, Alan, H. Farzana, and **K. Lafdi**. 2009. *Nano and bio-composites*. Francis and Taylor.

BOOK CHAPTERS

Lafdi, K. 2009. Carbon based nanocomposites: Processing and properties. In *Nano and bio-composites*, ed. Alan Lau, Farzana Hussain and Khalid Lafdi, CRC Press: Taylor & Francis Group.

Lafdi, K. and C. Grabinski. 2009. Nanocarbon toxicity and health risks. In *Nano and bio-composites*, ed. Alan Lau, Farzana Hussain and Khalid Lafdi, CRC Press: Taylor & Francis Group.

JOURNAL ARTICLES

Li, S., **J. Fried**, J. Colebrook, and J. Burkhardt. 2010. Molecular simulations of neat, hydrated, and phosphoric acid-doped polyben-zimidazoles. Part 1: poly(2,2'-m-phenylene-5,5'-bibenzimidazole) (PBI), poly(2,5-benzimidazole) (ABPBI), and poly(p-phenylene benzobisimidazole). *Polymer* 51, no. 23: 5640-5648 (Elsevier).

Li, S., **J. Fried**, J. Sauer, J. Colebrook, and D.S. Colebrook. 2010. Computational chemistry and molecular simulations of phosphoric acid. *International Journal of Quantum Chemistry*, Wiley, doi 10.1002/qua.22702.

Bearden, S.D., J.P. Cannon, and **S.A. Gold**. 2010. Spectroscopic and electrical evaluation of poly(3-hexylthiophene) nanotubes made using template wetting nanofabrication. *Synthetic Metals* 160, no.

19-20: 2045-2050.

Cannon, J.P., S.D. Bearden, and **S.A. Gold**. 2010. Effect of wetting solvent on poly(3-hexylthiophene) (P3HT) nanotubes fabricated via template wetting. *Synthetic Metals* 160, no. 23-24: 2623-2627.

Lafdi K., M. Almajali, and O. Huzayyin. 2009. Thermal properties of copper-coated carbon foams. *Carbon* 47, no. 11: 2620-2626.

Almajali, M., **K. Lafdi**, P. Prodhomme, and O. O. Ochoa. 2010. Mechanical properties of copper-coated carbon foams. *Carbon* 48: 1604-1608.

Evora, M.C., D. Klosterman, **K. Lafdi**, L. Li, and J.L. Abot. 2010. Functionalization of carbon nanofibers through electron beam irradiation. *Carbon* 48: 2037-2046.

Shaikh S., and **K. Lafdi**. 2010. C/C composite, carbon nanotube and paraffin wax hybrid systems for the thermal control of pulsed power in electronics. *Carbon* 48: 813-824.

Sarzynski M., **K. Lafdi**, and O.O. Ochoa. 2010. Multifunctional hybrid carbon foams: Integrating processing and performance. *Journal of Composite Materials* 44, no. 5.

Almajali M., and **K. Lafdi**. 2010. Assessment of carbon foam geometry during copper coating process. *Carbon* 48: 4238-4247.

PAPERS PUBLISHED IN CONFERENCE PROCEEDINGS

Cobucci-Ponzano, B., C. Zorzetti, A. Strazzulli, S. Carillo, E. Bedini, M.M. Corsaro, **D. Comfort**, R.M. Kelly, M. Rossi, and M. Moracci. 2010. A novel α -D-galactosynthase from *Thermotoga maritima* converts β -D-galactopyranosyl azide to α -galacto-oligosaccharides. Oxford: Glycobiology. 10.1093/glycob/cwq177

Eylon, D. 2009. Ultra-fine titanium microstructure development by rapid hot-compaction of Armstrong-process powder for improved mechanical properties and superplasticity. Proceedings of Plansee-Seminar, May 25-29, in Reutte, Austria.

Bearden, S.D., J.P. Cannon, and **S.A. Gold**. 2010. Solvent effects on conjugated polymer nanotubule fabrication via template wetting. AIChE Annual Meeting, in Salt Lake City, Utah.

Broadus, E.N., and **S.A. Gold**. 2010. Electrochemical impedance analysis of formic acid electrooxidation. AIChE Annual Meeting, in Salt Lake City, Utah.

Gold, S.A., S.D. Bearden, and J.P. Cannon. 2010. Optoelectronic evaluation of MEP-PPV and P3HT nanotubes fabricated via template wetting nanofabrication. AIChE Annual Meeting, in Salt Lake City, Utah.

York, J.D., S. Beravelli, C.A. Rice-York, and **S.A. Gold**. 2010. Direct methanol fuel cell performance enhancement with segregated sulfated zirconia-nafion composite membranes. AIChE Annual Meeting, in Salt Lake City, Utah.

Lafdi, K., and K. Teo. 2009. Friction of carbons part 2: Surface characterization. Carbon Conference, in Clemson, South Carolina.

Lafdi, K., and K. Teo. 2009. Aligned nanotube as thermal interface. Carbon Conference, in Clemson, South Carolina.

Shaikh S., and **K. Lafdi**. 2010. C/C composite, carbon nanotube and paraffin wax hybrid systems for the thermal control of pulsed power in electronics. Carbon Conference, July 11-16, in Clemson, South Carolina.

Jiang Q., M. Boehle, and **K. Lafdi**. 2010. Development of a fuzzy fiber sensor for real time structural health monitoring. Carbon Conference, July 11-16, in Clemson, South Carolina.

- Boehle M., and **K. Lafdi**. 2010. Exfoliated graphite as a filler to enhance the EMI shielding of polymers. Carbon Conference, July 11-16, in Clemson, South Carolina.
- Almajali, M., **K. Lafdi**, P.H. Prodhomme, and O. Ochoa. 2010. Effect of copper coating on thermomechanical properties of carbon foam. Carbon Conference, July 11-16, in Clemson, South Carolina.
- Almajali, M., **K. Lafdi**, and A. Delort. 2010. Designing hybrid foam as heat exchanger for thermoelectric cooler in cooling vest. Carbon Conference, July 11-16, in Clemson, South Carolina.
- Almajali, M., **K. Lafdi**, and P. Prodhomme. 2010. PCM/foam under uniform heat load. Carbon Conference, July 11-16, in Clemson, South Carolina.
- Almajali, M., **K. Lafdi**, and A. Delort. 2010. Designing hybrid foam as heat exchanger for thermoelectric cooler in cooling vest. AIAA Cincinnati-Dayton, in Dayton, Ohio.
- Almajali, M., **K. Lafdi**, and P. Prodhomme. 2010. PCM/foam under uniform heat load. AIAA Cincinnati-Dayton, in Dayton, Ohio.
- Lafdi K.**, R. Harris and O. Memoun. 2010. Aligned nanotube as thermal interface. Carbon Conference, July 11-16, in Clemson, South Carolina.
- Czarnecki, J., **K. Lafdi**, R.M. Joseph, and P.A. Tsonis. 2010. Comparison of novel carbon-based scaffolds to graft jacket in tendon repair applications. Carbon Conference, July 11-16, in Clemson, South Carolina.
- Czarnecki, J., **K. Lafdi**, and P.A. Tsonis. 2010. Novel carbon foam/polycaprolactone scaffolds for tissue engineering applications. Carbon Conference, July 11-16, in Clemson, South Carolina.
- Almajali, M., and **K. Lafdi**. 2010. Design of carbon foam heat exchanger for thermoelectric cooler system. Carbon Conference, July 11-16, in Clemson, South Carolina.
- Almajali, M., and **K. Lafdi**. 2010. PCM/hybrid foam system in temperature control application. Carbon Conference, July 11-16, in Clemson, South Carolina.
- Almajali, M., and **K. Lafdi**. 2010. Effect of copper coating on thermophysical properties of carbon foam. Carbon Conference, July 11-16, in Clemson, South Carolina.
- Price, W.A., **K. Lafdi**, and N.A. Gagliardi. 2010. Polyimide + carbon nanotube functionalized hybrid fabric composites. High Temple, in Destin, Florida.
- Lee, C.W.**, T.T. Gibson, K. Tienda, and T. Storage. 2010. Reaction rate and viscosity model development for cytec's cycom(r) 5320-1 family of Salt Lake City, Utah. 42nd SAMPE International Technical Conference.
- Storage, T., **C.W. Lee**, T.T. Gibson, and K. Tienda. 2010. Reaction rate and viscosity models for RAVEN and WinASCOM. SAMPE International Symposium, in Seattle, Washington.
- Sandhu, S.**, and G.W. Brutchten. 2009. Mathematical formulation for the performance analysis of a lithium-ion insertion cell: Application of the formulation. Product Safety Corporation 16: 41-50, in Sissonville, West Virginia.
- Sarica, C., H.Q. Zhang, and **R.J. Wilkens**. 2009. Sensitivity of slug flow mechanistic models on slug length. Proc. 28th International Conference on Ocean, Offshore and Arctic Engineering, OMAE 2009 7: 621-627.
- Narvaez, J.A., L.J. Gschwender, C.E. Snyder, and **R.J. Wilkens**. 2010. Measuring the thermal conductivity of nanofluids using three different techniques. Proc. of ITCC/ITES, *Thermal Conductivity* 30, *Thermal Expansion* 18: 857-867.
- Corporation, The Greenbrier, January 14, in White Sulphur Springs, West Virginia.
- Sandhu, S.**, and G.W. Brutchten. 2010. Mathematical formulation of a lithium ion insertion cell: Application of the formulation. 16th International Conference on Electrical and Electronic Products, Product Safety Corporation, The Greenbrier, January 12, in White Sulphur Springs, West Virginia.
- Wilkens, R.J.** 2010. Physiological fluid mechanics. BIO 404, Physiology II, University of Dayton, in Dayton, Ohio.

PRESENTATIONS

- Sarangan, A.M., **D. Comfort**, J.J. Rowe, and P.J. Shah. 2009. Development of miniature microbial fuel cells. 5th Annual Dayton Engineering Sciences Symposium, October 26, in Dayton, Ohio.
- Comfort, D.**, P. Shah, H. Wang, T. Gorey, G.J. Frank, A.M. Sarangan, J.J. Rowe, J.J. Joo, P. Hrad, O. Wojnar, and G. Reich. 2010. Going small: Miniaturization of a microbial fuel cell. COMS, MANCEF, September 2, Albuquerque, New Mexico.
- Sarangan, A.M., J.J. Rowe, and **D. Comfort**. 2010. Glucose-based MEMS fuel cell. Multifunctional Materials for Defense Workshop, AFOSR, May 13, in Reston, Virginia.
- Topp, A., and **D. Comfort**. 2010. Isolation and characterization of glycoside hydrolases from caldicellulosiruptor saccharolyticus. Stander Symposium, University of Dayton, April 14, in Dayton, Ohio.
- Topp, A., and **D. Comfort**. 2010. Cellulose degradation using glycoside hydrolases from the hyperthermophilic microorganism caldicellulosiruptor saccharolyticus. North Central Regional Meeting, AIChE, Ohio University, April 9, in Athens, Ohio.
- Topp, A., and **D. Comfort**. 2010. Thermophilic cellulases: Identification and characterization. Honors Symposium, University of Dayton, March 12, in Dayton, Ohio.
- Lafdi, K.** 2010. Nanotechnology and nanocomposites. Seminar, Texas A&M University, in Texas.
- Lafdi, K.** 2010. Multifunctional composites. Seminar, Alfred University, in Alfred, New York.

INVITED LECTURES

- Browning, C.E.** 2009. History of advanced composites. American Society of Composites Annual Meeting, ASC, in Dayton, Ohio.
- Browning, C.E.** 2010. History of advanced composites. American Society of Composites Annual Meeting, ASC, in Dayton, Ohio.
- Lafdi K.** 2009. Carbons in functional biology. I2CB Conference, in Meknes, Morocco.
- Lafdi K.** 2010. Multifunctional adaptive composites. ACMA2010, in Marrakech, Morocco.
- M. Vangsness, and **K. Lafdi**. 2010. Nano technology approach to prevent bacterial contamination in aircraft fuel systems. ACMA2010, in Marrakech, Morocco.
- Sandhu, S.**, G.W. Brutchten, and J.P. Fellner. 2009. Mathematical formulation of a lithium ion insertion cell. 15th International Conference on Electrical and Electronic Products, Product Safety

Lafdi, K. 2010. Carbon nanotechnology. Seminar, Illinois State University, in Illinois.

Lee, J., **C.W. Lee**, and T. Storage. 2009. Characterization of high temperature resin using sensors. High Temple, February 9, in Napa, California.

Lee, J., **C.W. Lee**, R.E. Trejo, and T. Storage. 2010. Use of analytical tools and processing science as applied to fabrication of AFR-PE-4/AQIII laminates. High Temple Workshop, in Destin, Florida.

Myers, K. 2009. Aerobic fermenter scale-up: Why equal mass transfer scale-up doesn't always work. AIChE Annual Meeting, November 8, in Nashville, Tennessee.

Myers, K. 2009. Design mixers to minimize erosion and corrosion-erosion. AIChE Annual Meeting, November 8, in Nashville, Tennessee.

Myers, K., J.B. Fasano, and E.E. Janz. 2010. Effect of geometric variations on the performance of gas dispersion impellers with semicircular blades. Mixing XXII, NAMF, June 20-25, in Victoria, British Columbia, Canada.

Myers, K., E.E. Janz, and J.B. Fasano. 2010. Turbulent power draw during abnormal agitator operation. AIChE Annual Meeting, November 7, in Salt Lake City, Utah.

Wilkens, R.J. 2010. BIO 404 Physiology II, one week guest lecture on Physiological Fluid Mechanics.

Veydt, A.R., and **R.J. Wilkens**. 2010. Coolant loop evaluation of nanofluid heat transfer. 35th Dayton-Cincinnati Aerospace Sciences Symposium, AIAA, March 9, in Dayton, Ohio.

CONTRACTS, GRANTS AND SPONSORED RESEARCH

Browning, C.E. (Principal). Ohio research scholar in materials. Sponsor: State of Ohio, 4.5M.

Browning, C.E. (Principal). Minority leaders. Sponsor: Clarkson Aerospace, \$1.5M. (September 2006 - Present).

Browning, C.E. (Principal). Aligned carbon nanotubes for efficient energy generation and storage devices. Sponsor: AFOSR, \$75K. (August 2009 - Present).

Browning, C.E. (Co-Principal). Separation of

nanotubes. Sponsor: AFRL, \$30K. (January 2010 - Present).

Comfort, D. (Principal). Thermo Scientific Multiskan FC microplate reader with incubator for use in the characterization of thermophilic proteins for biofuels. Sponsor: UDRI Research Council Seed Grants, \$4,848. (October 31, 2009).

Comfort, D. (Principal). Characterization of thermophilic cellulolytic enzymes. Sponsor: UD SEE Seed Grant, \$10K. (February 15, 2009 - October 31, 2009).

Comfort, D. (Principal). Electrochemical characterization of electron-donor utilization by pseudomonas aeruginosa in a microbial fuel cell. Sponsor: UDRI RCGS, \$5,600. (October 22, 2010 - August 15, 2011).

Elsass, M. (Supporting). Sponsor: AFRL. (July 2010 - December 2010).

Eylon, D. (Principal). Case depth measurements in bearing steel. Sponsor: Fraunhofer, Germany, \$15K. (July 7, 2009 - July 6, 2010).

Eylon, D. (Principal). Surface damage measurements. Sponsor: Fraunhofer, Germany, \$15K. (April 1, 2009 - April 1, 2010).

Lafdi, K. (Co-Principal). Multifunctional composites for extreme environment. Sponsor: AFOSR, \$7.6M. (2009-2014).

Lafdi, K. (Principal). Hybrid Fabrics for Multifunctional Composites. Sponsor: ODOD, \$3M. (2009-2013).

Lafdi, K. (Principal). Friction and wear of carbons. Sponsor: Goodrich, \$100K. (2009-2010).

Lafdi, K. (Co-Principal). Evaluation of fuzzy fiber. Sensors for structural health monitoring. Sponsor: AFRL, \$375K. (2009-2010).

Lafdi, K. (Principal). Metal coating of nanoyarns. Sponsor: Northrop of Grumman, \$50K. (2009-2010).

Lafdi, K. (Principal). Thermal behavior APG based product. Sponsor: K-Tech, \$30K. (2009-2010).

Lafdi, K. (Principal). Nanotube fuzzy based carbon preforms. Sponsor: Army, \$200K. (2009).

Lee, C.W. (Co-Principal). Aerospace organic matrix composite materials. Sponsor: AFRL. (December 10, 2010).

Sandhu, S. (Principal). Modeling and simulation of solid state anode and cathode materials. Sponsor:

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- Zhan, Q.** 2010. Optimal plasmonic focusing for thin film metrology applications beyond diffraction limit. Optics Seminar, 3M Company and Optics Chapter of 3M, February, in St. Paul, Minnesota.
- Zhan, Q.** 2010. Spatial polarization engineering and its applications in optical engineering. Optics Seminar, OSA and OSA Minnesota Section, February in Twin Cities, Minnesota.
- Zhan, Q.** 2010. Optimal plasmonic focusing through matching plasmonic lens structure to illumination conditions. SPIE Photonics West Conference, January, in San Francisco, California.
- Zhan, Q.**, Z. Wu, W. Chen, D.C. Abeyasinghe, and R.L. Nelson. 2010. Spiral plasmonic lens as a miniature circular polarization analyzer. The International Conference on Nanophotonics, May, in Tsukuba, Japan.

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Banerjee, H., G. Cook, **P.P. Banerjee**, S. Basun, J. Carns, B. Wechsler, and D. Evans. 2010. Effect of stoichiometry and absorption on self-pumped two-beam coupling gain and photovoltaic fields in LiNbO₃:Fe. APS Annual Meeting, March 14, in Portland, Oregon.

Chatterjee, M.R., and **P.P. Banerjee**. 2010. Consideration of dispersion and group velocity dispersion in the determination of velocities of electromagnetic propagation. SPIE Annual Meeting, July 15, in San Diego, California.

Dierking, M.P., and **B.D. Duncan**. 2009. Genetically optimized periodic, pseudo-noise waveforms for multi-function coherent lidar. 15th Coherent Laser Radar Conference, Meteo-France and ONERA, June 23, in Toulouse, France.

Stafford, J.W., **B.D. Duncan**, and M.P. Dierking. 2009. Holographic aperture lidar laboratory demonstration. 15th Coherent Laser Radar Conference, Meteo-France and ONERA, June 23, in Toulouse, France.

Stafford, J.W., **B.D. Duncan**, and M.P. Dierking. 2009. Monte Carlo simulation of the effects of pulse and platform jitter on holographic aperture lidar systems. Defense, Security and Sensing Conference, SPIE, May 2, in Orlando, Florida.

Stokes, A.J., **B.D. Duncan** and M.P. Dierking. 2009. Increasing image contrast using Golay-like sparse aperture arrays. 15th Coherent Laser Radar Conference, Meteo-France and ONERA, June 23, in Toulouse, France.

Stokes, A.J., **B.D. Duncan**, M.P. Dierking, and N.J. Miller. 2009. Increasing mid-frequency contrast in sparse aperture optical imaging systems. Defense, Security and Sensing Conference, SPIE, May 2, in Orlando, Florida.

Greiner, M.A., **B.D. Duncan**, and M.P. Dierking. 2010. Boosting the SNR of detected light scattered from targets hidden within dense foliage. IEEE Aerospace Conference, March 10, in Big Sky, Montana.

Zhan, Q., Z. Wu, and **J.W. Haus**. 2009. Long-range surface plasmon excitations on gain assisted metal gratings. International Conference on Nanophotonics, OSA, May, in Harbin, China.

Zhan, Q., W. Cheng, and **J.W. Haus**. 2009. Propagation of scalar and vector vortex beams through turbulent atmosphere. SPIE Photonics

West, January, in San Jose, California.

J.W. Haus. 2010. LADAR and Optical Communications Institute: Research collaborations. Naval Surface Weapons Center, May 10, in Crane, Indiana.

Sarangan, A.M., and P.J. Shah. 2009. Non photolithographic technique for micro fluidic channels using wet etching in Pyrex glass wafer using paraffin wax mask. 5th Annual Dayton Engineering Sciences Symposium, ASME, October 26, in Dayton, Ohio.

Sarangan, A.M. 2010. Direct measurement of bend-induced mode deformation using a helical-core fiber. OSA Annual Meeting Frontiers in Optics, November, in Rochester, New York.

Sarangan, A.M., J. Moradmand, and J.J. Joo. 2010. MEMS valve for active flow regulation. Beijing West Industries Group, January, in Dayton, Ohio.

Sarangan, A.M., P.E. Powers, and J.A. Evans. 2010. A novel electro-optic beam switch in 5mol% magnesium-oxide doped congruent lithium niobate. OSA Annual Meeting Frontiers in Optics, November, in Rochester, New York.

Zhan, Q., J. Gao, and A.M. Sarangan. 2010. Fabrication and characterization of gallium phosphide thin films by RF magnetron sputtering. SPIE Optics+Photonics Conference, August, in San Diego, California.

Zhan, Q., D.C. Abeysinghe, W. Chen. 2009. Surface plasmon excitation on annular metallic slits with radially polarized illumination. International Conference on Nanophotonics, OSA, May, in Harbin, China.

Zhan, Q. and K. Drain. 2009. Efficient T/R switch design for beam steering with liquid crystal spatial light modulator. SPIE Defense and Security Symposium, April 16, in Orlando, Florida.

Zhan, Q., and W. Chen. 2009. Direct imaging of surface plasmon excitation with radially polarized beam. SPIE Photonics West, January, in San Jose, California.

Zhan, Q., W. Chen, and S. Yang. 2009. Tailoring optical focal field through laser beam polarization engineering. CLEO Pacific Rim 2009, OSA/IEEE, September 2, in Shanghai, China.

Zhan, Q., and J.W. Haus. 2010. Nanophotonics. International Conference on Nanophotonics, OSA, May, in Tsukuba, Japan.

Zhan, Q., W. Chen, and J. Wang. 2010. High purity

optical needle field with ultra-long depth of focus. Frontiers in Optics, OSA, October, in Rochester, New York.

Zhan, Q., W. Han, W. Chen, D.C. Abeysinghe, and R.L. Nelson. 2010. Generation of cylindrical polarization with concentric metallic rings fabricated on optical fiber end. International Conference on Nanophotonics, OSA, May, in Tsukuba, Japan.

Zhan, Q., J. Wang, and W. Chen. 2010. Creation of ultra-long diffraction limited optical pipe. Photonics Global Conference, IEEE, December 16, in Singapore.

Zhan, Q., L. Zhou, and D. Ouyang. 2010. Three dimensional imaging of nanoparticle ensemble trapped by cylindrical vector beam. Frontiers in Optics, OSA, October, in Rochester, New York.

PAPERS

Hisey, C., B. Gunn, D. Abreo, P.E. Powers, and **J.W. Haus**. 2010. Lasers and nonlinear parametric processes. Minority Leaders Program Spring Review, University of Dayton, April 20, in Dayton, Ohio.

Ibarra-Escamilla, B., E. Kuzin, O. Pottiez, **J.W. Haus**, Q. Zhan, and P.E. Powers. 2010. Wavelength tunable Er-Yb double-clad fiber laser. Conference on Solid State Lasers and Amplifiers III and High-Power Lasers, SPIE, April 12, in Brussels, Belgium.

Powers, P.E., **J.W. Haus**, and K. Kramb. 2010. Broadly tunable terahertz source. SPIE Photonics West Conference, January 26, in San Francisco, California.

Zhan, Q., R. Zhou, B. Ibarra-Escamilla, **J.W. Haus**, and P.E. Powers. 2010. Self-focusing in gain-guided optical fibers and pulse propagation characteristics. SPIE Photonics West Conference, January 26, in San Francisco, California.

CONTRACTS, GRANTS AND SPONSORED RESEARCH

Banerjee, P.P. (Co-Principal). Droplet characterization phase I. Sponsor: Army/DMS, \$100K. (January 2008 - January 2009).

Banerjee, P.P. (Principal). Studies and evaluations of dynamic optical materials technology. Sponsor: AFRL/ATT, \$91K. (October 2008 - April 2009).

- Banerjee, P.P.** (Principal). Novel properties of optical propagation through photorefractive polymers, crystals, and nanodispersed liquid crystals. Sponsor: ASEE, \$24K. (May 15, 2009 - August 15, 2009).
- Banerjee, P.P.** (Principal). High speed surface measurement device. Sponsor: Army/DMS, \$25,500. (June 16, 2009 - January 16, 2010).
- Banerjee, P.P.** High Speed surface measurement device (Option). Sponsor: Army/DMS, \$13K. (December 7, 2010 - January 31, 2011).
- Banerjee, P.P.** (Principal). Metamaterials lens phase II. Sponsor: DARPA/DMS, \$350K. (November 13, 2009 - November 12, 2011).
- Banerjee, P.P.** (Principal). Droplet characterization phase II. Sponsor: Army/DMS, \$330K. (November 1, 2009 - October 31, 2011).
- Duncan, B.D.** (Principal). Sub-aperture based EO imaging systems. Sponsor: RNET, Inc., \$50K. (October 1, 2008 - Present).
- Haus, J.W.** (Principal). Imaging through an extended atmosphere: effects on the received field at pupil plane. Sponsor: Lockheed-Martin, Raytheon, Textron Systems and Northrop-Grumman, \$200K. (August 13, 2009 - August 13, 2011).
- Haus, J.W.** (Principal). Midwave infrared lasers research. Sponsor: Lockheed Martin Co., \$50K. (August 16, 2009 - August 15, 2010).
- Haus, J.W.** (Principal). Multiple aperture laser radar research. Sponsor: Lockheed-Martin Corp, \$50K. (August 16, 2009 - August 15, 2010).
- Haus, J.W.** (Principal). LADAR and Optical Communications Institute. Sponsor: AFRL, \$5,015,000. (October 2006 - August 2012).
- Haus, J.W.** (Principal). Institute for the Development and Commercialization of Advanced Sensors Technology. Sponsor: Ohio Dept of Development, \$28M. (June 2007 - May 2010).
- Haus, J.W.** (Principal). Sense and avoid ladar for unmanned aircraft systems (UAS). Sponsor: Utopia Compression (AFRL), \$12K. (March 19, 2010 - January 19, 2011).
- Powers, P.E.** (Principal), and J.W. Haus (Co-Principal). Compact and ultra-high resolution terahertz spectroscopic/fingerprint system. Sponsor: NP Photonics (US Army STTR Program), \$30K. (October 15, 2010 - April 25, 2011).
- Powers, P.E.** (Co-Principal), and J.W. Haus (Co-Principal). Single mode THz crystal fiber as efficient THz parametric converter. Sponsor: USAF SBIR through NP Photonics, \$50K. (December 8, 2009 - December 8, 2011).
- Powers, P.E.** (Co-Principal), and J.W. Haus. (Co-Principal). Single mode THz crystal fiber as efficient THz parametric converter. Sponsor: USAF SBIR through NP Photonics, \$50K. (December 8, 2009 - December 8, 2011).
- Powers, P.E.** (Principal), and J.W. Haus. (Co-Principal). Compact and ultra-high resolution terahertz spectroscopic/fingerprint system. Sponsor: NP Photonics (US Army STTR Program), \$30K. (October 15, 2010 - April 25, 2011).
- Sarangan, A.M.** (Principal). Anti-reflection coatings. Sponsor: General Dynamics Information Technology (Air Force Research Laboratory), \$44,977. (April 2008 - September 2010).
- Sarangan, A.M.** (Principal). Development of spectral and polarimetric devices for lenslet imaging. Sponsor: L3 Cincinnati Electronics, \$34,158. (June 2009 - May 2010).
- Sarangan, A.M.** (Supporting). Ohio academic research cluster for layered sensing. Sponsor: Ohio Third Frontier Project, \$24,348,718. (August 18, 2008 - November 18, 2013).
- Sarangan, A.M.** (Co-Principal). MEMS thermoelectric devices for energy harvesting. Sponsor: AFRL, \$200K. (April 2009 - March 2011).
- Sarangan, A.M.** (Supporting). Interdisciplinary technology development for future MAV systems. Sponsor: AFRL, \$1,506,500. (October 1, 2008 - September 30, 2010).
- Sarangan, A.M.** (Principal). Exploration of the scalability of large-mode-area fibers. Sponsor: DARPA (sub from Univ. of Rochester), \$45,200. (April 2009 - August 2010).
- Sarangan, A.M.** Fabrication of MWIR micro-lenslet imaging arrays. Sponsor: IDCAST - OSCAR, \$24,530. (July 2009 - June 2010).
- Sarangan, A.M.** SMDC/MDA beam steering SBIR phase II. Sponsor: MDA, \$44,416. (April 2009 - March 2010).
- Sarangan, A.M.** (Principal). Polarimetric imaging equipment (under IDCAST). Sponsor: Ohio Department of Development, \$200K. (February 2007 - January 2010).
- Sarangan, A.M.** (Principal). Development and commercialization of long-wavelength infrared focal plane arrays. Sponsor: Ohio Third Frontier Project, \$1,092,800. (April 1, 2005 - April 1, 2009).
- Sarangan, A.M.** (Principal). Dual well focal plane array (FPA). Sponsor: Department of the Navy (SBIR Phase 1), \$13,745. (April 2010 - November 2010).
- Sarangan, A.M.** (Principal). Midwave infrared sensing technology advancement (MISTA). Sponsor: AFRL, \$100K. (October 2010 - September 2012).
- Sarangan, A.M.** (Co-Principal), and J.W. Haus. (Co-Principal). Optical super-resolution in metal-dielectric stacks. Sponsor: AFRL, \$14K. (September 2010 - February 2011).
- Sarangan, A.M.** (Principal). Investigation of Ge/InSb heterojunction properties. Sponsor: L3 Cincinnati Electronics, \$20K. (November 2010 - April 2011).
- Subramanyam, G.** (Principal), and A.M. Sarangan (Co-Principal). BioSense. Sponsor: AFRL Sensors Directorate and IDCAST, \$385,312. (October 1, 2010 - December 31, 2013).
- Vorontsov, M.** (Principal). Cooperative agreement #W911NF-09-02-0040. Sponsor: AFRL, \$1.2M. (September 1, 2009 - August 31, 2012).
- Vorontsov, M.** (Principal). Control system analysis for fiber laser pulse source. Sponsor: LGS Innovations, \$93,765. (November 1, 2009 - September 30, 2010).
- Zhan, Q.** Plasmonic antenna for near field Raman imaging. Sponsor: IZFP/HSEB, \$70K. (September 1, 2009 - August 31, 2010).
- Zhan, Q.** (Principal). Metamaterials - design, fabrication, testing. Sponsor: AFRL, \$250K. (January 1, 2009 - January 31, 2011).
- Zhan, Q.** (Principal). Fluorescence sensing. Sponsor: ODOD through IDCAST, \$198K. (December 15, 2006 - December 31, 2009).
- Zhan, Q.** (Principal). Nano Raman spectroscopy. Sponsor: ODOD through IDCAST, \$500K. (December 15, 2006 - December 31, 2009).
- Zhan, Q.** (Co-Principal), D. Ou-Yang (Principal), V. Dierolf, and I. Biaggio (Co-Principal). MRI: Development of a spectroscopic imaging optical bottle for nanoparticle analysis. Sponsor: NSF, \$420K. (October 1, 2009 - September 30, 2012).

Zhan, Q. (Principal). Metamaterials structures and devices for RF Photonics. Sponsor: AFRL, \$178,785. (July 15, 2010 - August 31, 2011).

Zhan, Q. (Principal). Feasibility study of diffractive optical elements simulator using spatial light modulator. Sponsor: Alcon Research Ltd., \$35K. (August 15, 2010 - May 15, 2011).

Zhan, Q. (Co-Principal), J.W. Haus, (Principal), and M. Vorontsov. Imaging through deep turbulence. Sponsor: Collaborative Research, \$300K. (January 1, 2010 - December 31, 2012).

Engineering Management and Systems

BOOKS

Sweeney, P.J. 2009. *NAIL '67-'68*. Ohio: PJSA, Inc.

JOURNAL ARTICLES

Doty, J., C.J.A. 2009. Benefits of exergy-based analysis for aerospace engineering applications, part 1. *International Journal of Aerospace Engineering*, 409529, 11.

PAPERS PUBLISHED IN CONFERENCE PROCEEDINGS

Doty, J., C.J.A. 2009. Parallel coordinates for energy-exergy space: Aerospace application. Eds. D. Moorhouse, and G. Tsatsaronis, International Conference on Optimization Using Exergy-Based Methods and Computational Fluid Dynamics in Berlin.

Doty, J., C.J.A. 2009. Parallel coordinates for energy-exergy space: Power plant. Eds. D. Moorhouse, and G. Tsatsaronis, International Conference on Optimization Using Exergy-Based Methods and Computational Fluid Dynamics in Berlin.

Doty, J., C.J.A. 2009. Benefits of exergy-based analysis for aerospace engineering applications, part 2. American Institute of Aeronautics and Astronautics Conf., in Reston, Virginia.

Doty, J., J.A. Camberos, and D.J. Moorhouse. 2009. Designed experiments: Statistical approach to energy- and exergy-based optimization. *International Journal of Aerospace Engineering*.

Doty, J. 2010. Non-equilibrium thermodynamics of coupled unsteady power and thermal management systems. NATO, ed. M. Spector.

Doty, J. 2010. Statistical, modular systems integration using combined energy and exergy concepts. American Institute of Aeronautics and Astronautics Conf., in Reston, Virginia.

Stanley, D., **J. Doty**, and A. Altman. 2010. Optimization of a PIV based study using maximum work potential and design of experiments techniques. AIAA Aerospace Sciences Meeting AIAA 2010-0727, in Orlando, Florida.

INVITED LECTURES

Doty, J. 2009. Parallel coordinated for energy-exergy space: Aerospace application. International Conference on Optimization Using Energy Based Methods and Computational Fluid Dynamics, October 20, in Berlin, Germany.

Doty, J., and J.A. Camberos. 2009. Parallel coordinated for energy-exergy space: Power plant. International Conference on Optimization Using Energy Based Methods and Computational Fluid Dynamics, October 20, in Berlin, Germany.

Doty, J. 2010. Use of advanced statistics and the 2nd law of thermodynamics for integrated, optimized systems. University of Illinois, AFRL, December 6, in Champaign, Illinois.

Doty, J. 2010. Inferential statistics and exergy-based analyses for aerospace applications. Purdue University, AFRL, December 7, in West Lafayette, Indiana.

Doty, J. 2010. Use of advanced statistics and the 2nd law of thermodynamics for integrated, optimized systems. Georgia Tech, AFRL, November 12.

Doty, J. 2010. Design of experiments and the 2nd law of thermodynamics in system analysis and design. Arnold Engineering and Development Center, AFRL, October 12, in Tullahoma,

Tennessee.

Doty, J. 2010. North Atlantic Treaty Organization applied vehicle technology panel specialists' meeting, October 7, in Bucharest, Romania.

Doty, J. 2010. Designed experiment for thermophysical and statistical models of a two-phase refrigeration system. AFRL, June 30, Dayton, Ohio.

Sweeney, P.J. 2009. What's new, what works, why? ASC Annual Leadership Week, Affiliate Societies of Dayton, Miami University, October, in Oxford, Ohio.

PRESENTATIONS

Doty, J. 2009. Power plant system identification using inferential statistics: Towards feasible and efficient optimization. Mathematical Association of America, August 6, in Portland, Oregon.

Doty, J. 2009. Designed experiments: Statistical approach to energy- and exergy-based optimization. 41st American Institute of Aeronautics and Astronautics Thermophysics Conference, June 22, in San Antonio, Texas.

Doty, J. 2009. Benefits of energy based analysis for aerospace engineering applications. American Institute of Aeronautics and Astronautics Dayton-Cincinnati Aerospace Sciences Symposium, March 3, in Dayton, Ohio.

Doty, J. 2009. Exergy-based surrogate design application: Supersonic airfoil optimization. American Institute of Aeronautics and Astronautics Dayton-Cincinnati Aerospace Sciences Symposium, March 3, in Dayton, Ohio.

Doty, J. 2009. Optimization of a twin-spool turbofan using exergy destruction methodology. American Institute of Aeronautics and Astronautics Dayton-Cincinnati Aerospace Sciences Symposium, March 3, in Dayton, Ohio.

Doty, J. 2010. Non-equilibrium thermodynamics of coupled unsteady power and thermal management systems. 6th ASME Annual Dayton Engineering Sciences Symposium, October 25, in Dayton, Ohio.

Doty, J. 2010. Statistical modular systems integration using combined energy and exergy concepts. 48th Aerospace Sciences Meeting, January 4, in Orlando, Florida.

CONTRACTS, GRANTS AND SPONSORED RESEARCH

Doty, J. Advanced mathematical techniques for new systems-level analysis and optimization. Sponsor: AFOSR, \$600K. (October 1, 2010 - September 30, 2013).

Engineering Technology

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Edmonson, C.P. 2009. Facilities design. In *The handbook of technology management*, ed. H. Bidgoli, ISBN: 978-0-470-24947-5, vol. I: 770-780, Hoboken, New Jersey: Wiley.

Myszka, D.H. 2010. *Machines and mechanisms: Applied kinematic analysis*. 4th edition, Pearson/Prentice-Hall.

Summers, D.C. 2009. *Quality management*. 2nd edition, Upper Saddle River, New Jersey: Prentice Hall.

Summers, D.C. 2010. *Lean six sigma*. 1st edition, Upper Saddle River, New Jersey: Prentice Hall.

Summers, D.C. 2010. *Quality*. 5th edition, Upper Saddle River, New Jersey: Prentice Hall.

JOURNAL ARTICLES

Schneider, S.J., and **R.P. Blust**. 2009. Integrating Chinese students into an American capstone engineering technology design course. *Technology Interface Journal* 10, no. 2.

Blust, R.P. 2009. Integrating Chinese students into an American capstone engineering technology design course. Fall, no. 11.

Myszka, D.H., and A.P. Murray. 2010. Slider cranks as compatibility linkages for parameterizing center point curves. *Journal of Mechanisms and Robotics* 2, no. 2: 021007-1-7.

Myszka, D.H., A.P. Murray, and J.P. Schmiedeler. 2009. Assessing position order in rigid body guidance: An intuitive approach to fixed pivot selection. *Journal of Mechanical Design* 131, no. 1: 5.

Myszka, D.H., A.P. Murray, and J.P. Schmiedeler. 2009. Singularity analysis of an extensible kinematic architecture: Assur class N, order N-1. *Journal of Mechanisms and Robotics* 1, no. 1: 7.

Myszka, D.H., and A.P. Murray. 2010. Pole arrangements that introduce prismatic joints into the design space of four and five position rigid-body synthesis. *Mechanism and Machine Theory* 45, no. 9: 1314-1325.

Schneider, S.J., and R.P. Blust. 2009. Integrating Chinese students into an American capstone engineering technology design course. *Technology Interface Journal* 10, no. 2.

Untener, J., and H. McGrew. 2010. A primer on improving contingent faculty conditions. *ACADEME, Journal of the AAUP* (July/August): 43-45.

PAPERS PUBLISHED IN CONFERENCE PROCEEDINGS

Kozak, M. 2010. In-person versus synchronous remote delivery of mechanics lectures. ASEE, in Washington D.C.

Myszka, D.H., and A.P. Murray. 2009. Slider cranks as compatibility linkages for parameterizing center point curves. ASME IDETC.

Myszka, D.H., and A.P. Murray. 2009. Identifying sets of four and five positions that generate distinctive center-point curves. ASME IDETC.

Myszka, D.H., A.P. Murray, and J.P. Schmiedeler. 2010. Using a singularity locus to exhibit the number of geometric inversions, transitions, and circuits of a linkage. ASME IDETC.

INVITED LECTURES

Blust, R.P. 2010. University of Dayton Innovation Center. Joint ASQ and SME Meeting, University of Dayton, February 24, in Dayton, Ohio.

Segalewitz, S.I. 2009. Articulation and Credit (2 and 4 year college credit). 2009 Fall Conference, Project Lead the Way, November 5, in Dayton, Ohio.

Untener, J. 2010. The design and build of a great engineer. NUST School of Engineering Invited Lecture Series, Nanjing University of Science and Technology, September, in Nanjing, China.

Wolff, R.L. 2010. Our legacy members as I knew them. IFPS 50th Anniversary and Annual Meeting, International Fluid Power Society, September 16, Philadelphia, Pennsylvania.

PRESENTATIONS

Kozak, M. 2010. In-Person versus synchronous remote delivery of mechanics lectures. American Society for Engineering Education National Conference, June 22, in Louisville, Kentucky.

Schneider, S.J. 2010. Integrating Chinese students into American engineering classrooms. International Forum on Education and Teaching Methodology, Shanghai Normal University, May 21, in Shanghai, China.

Untener, J. 2010. Life after reaccreditation: Leveraging the self-study and visit process in deliberate ways. Annual Meeting, Higher Learning Commission of the North Central Association, April in Chicago, Illinois.

Untener, J., and P. Sweeney. 2010. Increasing the impact of general education assessment through alignment with professional schools. 10th Annual Assessment Conference, Texas A&M University, February, in College Station, Texas.

CONTRACTS, GRANTS AND SPONSORED RESEARCH

Blust, R.P. (Supporting). Promoting women through LEADER. Sponsor: NSF, \$2.86M. (September 2008 - August 2013).

Blust, R.P. (Supporting). Kern Entrepreneurship Education Network. Sponsor: Kern Family Foundation, \$50K. (July 2008 - June 2010).

Blust, R.P. (Co-Principal). Engineering innovation and design for STEM teachers. Sponsor: NSF, \$500K. (June 2010 - June 2012).

Blust, R.P. (Supporting). Kern Entrepreneurship Education Network (KEEN). Sponsor: Kern Family Foundation, \$150K. (May 2010 - June 2012).

Blust, R.P. (Co-Principal). Engineering innovation and design for STEM. Sponsored by NSF, \$164,081. (July 1, 2010 - December 30, 2011).

Falkowski, S.A. (Supporting). National center for manufacturing education. Sponsor: NSF, \$1.6M. (June 2007 - Present).

Globig, J. (Supporting), B.S. (Principal). University of Dayton sustainability sculpture design. Sponsor: Enhancing Student Culture for Academic Engagement and Excellence, \$11,500. (2007 - April 30, 2009).

Myszka, D.H. (Co-Principal). Novel concepts for spring-based mechanical energy storage in motor vehicles. Sponsor: General Motors Global Research and Development, \$158,085. (August 1, 2010 - July 31, 2012).

Wolff, R.L. (Co-Principal). Enhancing the resource center role of the national center for manufacturing education. Sponsor: NSF, \$1.8M. (2003 - Present).

Mechanical and Aerospace Engineering

BOOK CHAPTERS

Pinnell, M.F., C. Schreir, P. Aaron, and B. Eager. 2009. The Engineers In Technical Humanitarian Opportunities For Service-Learning (ETHOS) program at the University of Dayton: Using service-learning to provide international and technical experience. In *Service-learning in higher education: Paradigms and challenges*, eds. M. Moore, and P.L. Lin, Indianapolis, Indiana: University of Indianapolis Press.

Pinnell, M.F. 2010. In search of something more: My path towards international service-learning in engineering education. In *What is global engineering education for? The making of international educators (Synthesis lectures on global engineering)*, eds. G.L. Downey and K. Beddoes, San Rafael, California: Morgan and Claypool Publishers.

JOURNAL ARTICLES

Garnet, M., and **A. Altman**. 2009. Identification of any aircraft by its unique turbulent wake signature. *Journal of Aircraft* 46, no. 1: 263-268.

Bigelow, K.E., and N. Berme. 2010. Development of a protocol for improving the clinical utility of posturography as a fall-risk screening tool. *Journal of Gerontology A: Biological and Medical Sciences*, 66A, no. 2: 228-233.

Bigelow, K.E. 2010. Utilizing on-line forums within course management systems to create beneficial relationships between first-year students and practicing engineers. *International Journal of Applications and Practices in Engineering Education* 1, no. 2: 70-78.

Jackson, K., **K.E. Bigelow**, C. Bowshire, M.

Weston, and E. Grant. 2010. The effects of an eight-week group kickboxing program on balance, functional mobility, and quality of life in individuals with multiple sclerosis: A case series. *Journal of Bodywork and Movement Therapies*.

Chiasson, A.D. 2009. A design tool for hybrid geothermal heat pump systems in cooling-dominated buildings. *ASHRAE Transactions* 115, no. 2.

Chiasson, A.D. 2009. A design tool for hybrid geothermal heat pump systems in heating-dominated buildings. *ASHRAE Transactions* 115, no. 2.

Yavuzturk, C., and **A.D. Chiasson**. 2009. Simulation model for ground loop heat exchangers. *ASHRAE Transactions* 115, no. 2.

Chiasson, A.D. 2010. Optimization of the ground thermal response in hybrid geothermal heat pump systems. *ASHRAE Transactions* 116, no. 1.

Briones, A.M., **J.S. Ervin**, S. Putnam, L. Byrd, and L. Gschwender. 2010. Micrometer-sized water droplet impingement dynamics and evaporation on a flat dry surface. *Langmuir* 26: 13272-13286.

Jain, V.K. 2009. Investigation into wear of Ti-6Al-4V under reciprocating sliding conditions. *Wear* 267: 368-373.

Mall, S., and **V.K. Jain**. 2009. Effects of shot-peening on fretting fatigue crack growth behavior in Ti-6Al-4V. *Strain*. doi 10.1111/j.1475-1305.2008.00591.x

Carpenter, K., **J.K. Kissock**, J. Seryak, and S. Moray. 2010. Profiling and forecasting daily energy use with monthly utility-data regression models. *ASHRAE Transactions*, TRNS-00110-2.

Cotton, S., **A.P. Murray**, and P. Fraisse. 2009. Estimation of the center of mass: From humanoid robotics to human beings. *IEEE/ASME Transactions on Mechatronics* 14, no. 6.

Myszka, D.H., **A.P. Murray**, and J.P. Schmiedeler. 2009. Assessing position order in rigid body guidance: An intuitive approach to fixed pivot selection. *Journal of Mechanical Design* 131, no. 1: 5.

Myszka, D.H., **A.P. Murray**, and J.P. Schmiedeler. 2009. Singularity analysis of an extensible kinematic architecture: Assure class N, order N-1. *Journal of Mechanisms and Robotics* 1, no. 1: 7.

Persinger, J., J. Schmiedeler, and **A.P. Murray**. 2009. Synthesis of planar rigid-body mechanisms

approximating shape changes defined by closed curves. *ASME Journal of Mechanical Design*.

Myszka, D.H., and **A.P. Murray**. 2010. Pole arrangements that introduce prismatic joints into the design space of four- and five-position rigid-body synthesis. *Mechanism and Machine Theory* 45, no. 9: 1314-1325.

Myszka, D.H., and **A.P. Murray**. 2010. Slider cranks as compatibility linkages for parameterizing center point curves. *Journal of Mechanisms and Robotics* 2, no. 2: 021007-1-7.

Pinnell, M.F., P. Kolis, R. Schlosser, J. Kaczmarek, A. Haec, and P. Thomas. 2009. Solar cooker glass failure analysis. *International Journal for Service Learning in Engineering* 4, no. 1: 20-33.

Rumpfkeil, M., and D. Mavriplis. 2010. Efficient Hessian calculations using automatic differentiation and the adjoint method with applications. *AIAA Journal* 48, no. 10: 2406-2417.

Rumpfkeil, M., and D. Zingg. 2010. A hybrid algorithm for far-field noise minimization. *Computer and Fluids* 39, no. 9: 1516-1528.

Rumpfkeil, M., and D. Zingg. 2010. The optimal control of unsteady flows with a discrete adjoint method. *Journal of Optimization and Engineering* 11, no. 1: 5-22.

Zabarnick, S., R. Adams, Z. West, M.J. DeWitt, L. Shafer, R. Striebich, C.L. Delaney, and D.K. Phelps. 2010. Compatibility of DiEGME and TriEGME fuel system icing inhibitor additives with BMS 10-39 aircraft tank topcoat material. *Energy & Fuels* 24: 2614-2627.

PAPERS PUBLISHED IN CONFERENCE PROCEEDINGS

Bichal, A., **A. Altman**, A. Briones, and S. Stouffer. 2009. Comparative study of three flow diagnostic techniques applied to a nearbody flowfield. 47th AIAA Aerospace Sciences Meeting and Exhibit, January, in Orlando, Florida.

Garnet, M., and **A. Altman**. 2009. Identification of any aircraft by its unique turbulent wake signature. 47th AIAA Aerospace Sciences Meeting and Exhibit, January, in Orlando, Florida.

Genco, N., and **A. Altman**. 2009. Parametric study of the performance of a biplane joined at the tips. 47th AIAA Aerospace Sciences Meeting and Exhibit, January, in Orlando, Florida.

- Kang, H., N. Genco, and **A. Altman**. 2009. Gap and stagger effect on biplanes with end plates part I. 47th AIAA Aerospace Sciences Meeting and Exhibit, January, in Orlando, Florida.
- Kang, H., N. Genco, and **A. Altman**. 2009. Gap and stagger effect on biplanes with end plates part II. 47th AIAA Aerospace Sciences Meeting and Exhibit, January, in Orlando, Florida.
- Landolfo, G., and **A. Altman**. 2009. Aerodynamic and structural design of a small nonplanar wing UAV. 47th AIAA Aerospace Sciences Meeting and Exhibit, January, in Orlando, Florida.
- Rausch, J., and **A. Altman**. 2009. Effect of plunge velocity profile on formation parameter applied to flat plates. 47th AIAA Aerospace Sciences Meeting and Exhibit, January, in Orlando, Florida.
- Reich, G., F. Eastep, F., and **A. Altman**. 2009. Transient post-stall aerodynamic modeling for extreme maneuvers in MAVs (IFASD 2009-141). International Forum on Aeroelasticity and Structural Dynamics, June 21-25, in Seattle, Washington.
- Bani-Younes, A., and **A. Altman**. 2010. PIV investigation of Reynolds number 200 photodriven flapping wings in air. AIAA Aerospace Sciences Meeting, 2010-1032, January, in Orlando, Florida.
- Hammer, P., **A. Altman**, and F. Eastep. 2010. A discrete vortex method for application to MAV perching. AIAA Applied Aerodynamics Conference, 2010-4391, January, in Chicago, Illinois.
- OL, M., **A. Altman**, J. Eldredge, D. Garmann, and Y. Lian. 2010. Résumé of the AIAA FDTC low Reynolds number discussion group's canonical cases. AIAA Aerospace Sciences Meeting, 2010-1085, January, in Orlando, Florida.
- Ross, I., **A. Altman**, D. Bowman, T. Mooney, and D. Bogart. 2010. Aerodynamics of vertical axis wind turbines: Assessment of accepted wind tunnel blockage practice. AIAA Aerospace Sciences Meeting, 2010-0397, January, in Orlando, Florida.
- Stanley, D., J. Doty, and **A. Altman**. 2010. Optimization of a PIV based study using maximum work potential and design of experiments techniques. AIAA Aerospace Sciences Meeting, AIAA 2010-0727, January, in Orlando, Florida.
- Bigelow, K.E.** 2009. Detrended fluctuation analysis of center of pressure data reveal underlying complexity of postural control. *American Society of Mechanical Engineers Early Career Technical Journal* 8: 11.1-11.7.
- Bigelow, K.E.** 2010. Reflections of college students promoting engineering through biomechanical outreach activities indicate dual benefit. ASEE, in Louisville, Kentucky.
- Bigelow, K.E.**, G. Wheatley, and D. Tomasko. 2010. Gains in knowledge and perception of engineering after participation in an engineering design web-experience are gender dependent. ASEE, in Louisville, Kentucky.
- Chiasson, A.D.** 2010. Modeling horizontal ground heat exchangers in geothermal heat pump systems. COMSOL Multiphysics Conference, in Boston, Massachusetts.
- Michalak, T.E., A. Cole, and **A.R. Kashani**. 2010. Two phase thermal energy management system. SAE Power Systems Conference, in Ft. Worth, Texas.
- Wenning, T., and **J.K. Kissock**. 2009. Methodology for preliminary assessment of regional wind energy potential. ASME International Solar Energy Conference.
- Ahmad, F., R. Komp, I. Ahmad, and **J.K. Kissock**. 2010. Photovoltaic module assembly as appropriate technology in Pakistan. ASME International Conference on Energy Sustainability.
- Trombley, D., and **J.K. Kissock**. 2010. How building assessment centers can leverage the success of the industrial assessment centers to train the next generation of efficiency experts. ACEEE Summer Study on Energy Efficiency in Buildings.
- Cotton, S., **A.P. Murray**, and P. Fraise. 2009. Estimation of the center of mass using statically equivalent serial chains. ASME IDETC.
- Myszka, D.H., and **A.P. Murray**. 2009. Slider cranks as compatibility linkages for parameterizing center point curves. ASME IDETC.
- Myszka, D.H., and **A.P. Murray**. 2009. Identifying sets of four and five positions that generate distinctive center-point curves. ASME IDETC.
- Perkins, D., and **A.P. Murray**. 2009. Comparison of torque and coupler-driven four-bar mechanisms as solutions to planar four position and spherical four orientation tasks. ASME IDETC.
- Cotton, S., P. Fraise, and **A.P. Murray**. 2010. On the manipulability of the center of mass of humanoid robots, application to design. ASME IDETC.
- Myszka, D.H., **A.P. Murray**, and J.P. Schmedeler. 2010. Using a singularity locus to exhibit the number of geometric inversions, transitions, and circuits of a linkage. ASME IDETC.
- Perkins, D., and **A.P. Murray**. 2010. Singularity-free RPR and SPS chains for actuating single degree of freedom planar and spherical mechanisms. ASME IDETC.
- Rumpfkeil, M.**, and D. Mavriplis. 2009. Optimization-based multigrid applied to aerodynamic shape optimization. 21st Century Challenges in Computational Engineering and Science.
- Rumpfkeil, M.**, and D. Mavriplis. 2010. Efficient Hessian calculations using automatic differentiation and the adjoint method. AIAA 2010-1268, AIAA.
- Rumpfkeil, M.**, W. Yamazaki, and D. Mavriplis. 2010. Uncertainty analysis utilizing gradient and Hessian information. Sixth International Conference on Computational Fluid Dynamics.
- Yamazaki, W., **M. Rumpfkeil**, and D. Mavriplis. 2010. Design optimization utilizing gradient/Hessian enhanced surrogate model. AIAA 2010-4363, AIAA.

INVITED LECTURES

- Altman, A.** 2009. Aerodynamic force estimation of photorestrictive flapping wings. AFRL Materials Directorate.
- Altman, A.** 2010. Identification of any aircraft by its turbulent wake signature. Ohio State University, November 29, in Columbus, Ohio.
- Altman, A.** 2010. Detection of any aircraft by its unique turbulent wake signature. AFRL/RB, Wright-Patterson AFB, November 17, in Dayton, Ohio.
- Bigelow, K.E.** 2009. Lessons learned from research focused on traumatic physical injury. Exploring the user experience: Learning with disability: Interdisciplinary winter workshop, Wright State University, December 4, in Dayton, Ohio.
- Bigelow, K.E.** 2010. Engineering wellness and health: Utilizing posturography and wearable sensors for clinical detection of older adults at-risk of falling. Mechanical Sciences and Engineering Department Bio-Interest Group Seminar Series, University of Illinois' Mechanical Sciences and Engineering Department, February 19, in Urbana-Champaign, Illinois.

PRESENTATIONS

- Chiasson, A.D.** 2009. Ground source heat pumps – the fundamentals, ground source heating and cooling. American Ground Water Trust, November 19, in Cincinnati, Ohio.
- Chiasson, A.D.** 2010. Pitfalls of rules of thumb in geothermal heat pump system design. Dayton ASHRAE Tech Session, February 8, in Dayton, Ohio.
- Hallinan, K.P.** 2010. Building energy recommissioning for Wilmington Ohio. Energize Clinton County, October 19, in Wilmington, Ohio.
- Hallinan, K.P.** 2010. Building energy informatics and energy reduction. Energy Efficiency Roundtable, Mound, June 15, in Miamisburg Ohio.
- Hallinan, K.P.** 2010. Yellow Springs home energy reduction project. Yellow Springs Home Energy Reduction, April 15, in Yellow Springs, Ohio.
- Kashani, A.R.** 2009. Active Vibration Control. Abu Dhabi Petroleum Institute, February 24, in Abu Dhabi.
- Kashani, A.R.** 2010. Low frequency acoustic damping. Audio Engineers Society Meeting, Audio Engineers Society, November 6, in San Francisco, California.
- Kissock, J.K.** 2009. A tale of two Institute of Management Accountants, Dayton Chapter. October, in Dayton, Ohio.
- Kissock, J.K.** 2009. E3 pilot energy efficiency results. Smart Companies Star with E3 Event, American Electric Power, October.
- Kissock, J.K.** 2009. Low-cost measures for energy efficient process heating. ITP's Top Low- or No-Cost Improvements Webinar, U.S. Department of Energy, April.
- Kissock, J.K.** 2009. Principles of energy efficiency. Ohio Energy Management and Restructuring Conference, February.
- Kissock, J.K.** 2010. Energy environment economy. Oakwood High School, January, in Oakwood, Ohio.
- Pinnell, M.F., J. Mihelcic, and D. Munoz.** 2010. Societal implications in the environmental era. 2010 Global Engineering Management Conference, ASME, April 11, in Dallas, Texas.
- Rumpfkeil, M.** 2010. Progress on optimization-based multigrid and Hessian calculations. Research Seminar, German Aerospace Center (DLR), July 7, in Braunschweig, Germany.
- Bani-Younes, A., and A. Altman.** 2009. Experimental investigation of the flowfield surrounding a photodriven flapping wing. DCASS, AIAA, in Dayton, Ohio.
- Ross, I., and A. Altman.** 2009. Investigating critical design aerodynamics of vertical-axis wind tubrines to improve power efficiency. DCASS, AIAA, in Dayton, Ohio.
- Stanley, D., and A. Altman.** 2009. An investigation of flow three-dimensionality using a flat plate and insects. 47th AIAA Aerospace Sciences Meeting and Exhibit, AIAA 09-0389, January, in Orlando, Florida.
- Stanley, D., and A. Altman.** 2009. An investigation of flow three-dimensionality using a flat plate and insects. AIAA 09 -0389, AIAA.
- Altman, A., and J. Frias.** 2010. Effect of crested roof orientation on Savonius wind turbine performance. DCASS, Dayton-Cincinnati AIAA Section, March, in Dayton, Ohio.
- Altman, A., and B. Hagen.** 2010. PIV on simple mechanical flapping wings. AIAA Region III Regional Student Conference, April, in West Lafayette, Indiana.
- Altman, A., and B. Hagen.** 2010. PIV on simple mechanical flapping wings for hover-like kinematics. DCASS, Dayton-Cincinnati AIAA Section, March, in Dayton, Ohio.
- Altman, A., and P. Hammer.** 2010. A discrete vortex method for application to MAV perching. AIAA Region III Regional Student Conference, April, in West Lafayette, Indiana.
- Altman, A., and P. Hammer.** 2010. A discrete vortex method for application to MAV perching. DCASS, Dayton-Cincinnati AIAA Section, March, in Dayton, Ohio.
- Altman, A., and E. Harper.** 2010. Force measurement for flapping airfoil. DCASS, Dayton-Cincinnati AIAA Section, March, in Dayton, Ohio.
- Altman, A., and J. Puttmann.** 2010. Transient force on a rotating AR 2 semi-span flat plate. AIAA Region III Regional Student Conference, April, in West Lafayette, Indiana.
- Altman, A., and J. Puttmann.** 2010. Transient force on a rotating AR 2 semi-span flat plate. DCASS, Dayton-Cincinnati AIAA Section, March, in Dayton, Ohio.
- Altman, A., and I. Ross.** 2010. Wind tunnel blockage corrections: An application to vertical axis wind turbines. AIAA Region III Regional Student Conference, April, in West Lafayette, Indiana.
- Altman, A., and I. Ross.** 2010. Aerodynamics of vertical axis wind turbines: Assessment of accepted wind tunnel blockage practice. DCASS, Dayton-Cincinnati AIAA Section, March, in Dayton, Ohio.
- Altman, A., T. Szelag, and B. Cranston.** 2010. Leading edge serrations on flat plates. DCASS, Dayton-Cincinnati AIAA Section, March, in Dayton, Ohio.
- Bani-Younes, A., and A. Altman.** 2010. Experimental investigation of the flowfield surrounding a photodriven flapping wing. DCASS, Dayton-Cincinnati AIAA Section, March, in Dayton, Ohio.
- Ross, I., and A. Altman.** 2010. Investigating critical design aerodynamics of vertical-axis wind tubrines to improve power efficiency. DCASS, Dayton-Cincinnati AIAA Section, March, in Dayton, Ohio.
- Bigelow, K.E.** 2009. Utilizing center of pressure measurements from force-measuring platforms in the prevention of falls. American Society of Mechanical Engineers Dayton Engineering Sciences Symposium, Wright State University, October 26, in Dayton, Ohio.
- Bigelow, K.E.** 2009. Detrended fluctuation analysis of center of pressure data reveal underlying complexity of postural control. American Society of Mechanical Engineers Early Career Technical Conference, October 2, in Tuscaloosa, Alabama.
- Bigelow, K.E., H.C. Guler, J.J. Ober, and N. Berme.** 2009. Instrumented treadmills: Reducing the need for gait labs. 30th Canadian Medical and Biological Engineering Conference, June 18, in Toronto, Canada.
- Bigelow, K.E.** 2010. Reflections of college students promoting engineering through biomechanical outreach activities indicate dual benefits. American Society of Engineering Education, June 22, in Louisville, Kentucky.
- Bigelow, K.E., G. Wheatley, and D. Tomasko.** 2010. Gains in knowledge and perception of engineering after participation in an engineering design web-experience are gender-dependent.

- American Society of Engineering Education, June 22, in Louisville, Kentucky.
- Taylor, M.R., E.E. Sutton, J.M. Schaeffer, D.M. Kinor, **K.E. Bigelow**. 2010. Position and weight distribution of grocery bags to minimize center of pressure displacement. American Society of Mechanical Engineers Dayton Engineering Sciences Symposium, Wright State University, October 25, in Dayton, Ohio.
- Chiasson, A.D.** 2009. Simulation and optimization of a hybrid geothermal heat pump district heating system in Yukon, Canada. American Society of Mechanical Engineers, Dayton Engineering Sciences Symposium, Wright State University, October 26, in Dayton, Ohio.
- Chiasson, A.D.** 2010. Optimization of the ground thermal response in hybrid geothermal heat pump systems. ASHRAE Winter Meeting, January 26, in Orlando, Florida.
- Chiasson, A.D.**, and C. Ampong. 2010. TRNSYS simulation to harness thermal energy from abandoned oil and gas wells. Dayton Engineering Sciences Symposium, ASME, October 6, in Fairborn, Ohio.
- Chiasson, A.D.**, and J.Q. Kelley. 2010. Hybrid geothermal heat pump systems using nocturnal and seasonal rejection with radiators. Dayton Engineering Sciences Symposium, ASME, October 6, in Fairborn, Ohio.
- Chiasson, A.D.**, and D. Langille. 2010. Toward optimization of systems with combined geothermal heat pumps and solar hot water heating in residential buildings. Dayton Engineering Sciences Symposium, ASME, October 6, in Fairborn, Ohio.
- Doyle, G.R.** 2010. Student Activities. Student Leadership Seminar, ASME, March 24, in Erie, Pennsylvania.
- Byrd, L., L. Gschwender, A.M. Briones, **J.S. Ervin**, and S. Putnam. 2009. Understanding heat and mass transport at liquid/vapor interfaces and interfaces with programmable surface properties. AFOSR Thermal Sciences Portfolio Review, October, in Dayton Ohio.
- Ervin, J.S.**, D. Johnson, and Q. Leland. 2009. Studies of DARPA thermal ground plane. DCASS, AIAA, March, Dayton, Ohio.
- Ervin, J.S.**, and Q. Leland. 2009. Studies of wax infused carbon foam. DCASS, AIAA, March, in Dayton, Ohio.
- Jiang, H., **J.S. Ervin**, and S.S. Zabarnick. 2009. Studies of jet fuel degradation under conditions of high heat flux and flow rates. DCASS, AIAA, March, in Dayton, Ohio.
- Johnson, D., S. Clement, **J.S. Ervin**, and Q. Leland. 2009. Studies of thermally conductive foams infused with paraffins for thermal storage applications. 5th Annual ASME Dayton Engineering Sciences Symposium, Wright State University, October, in Dayton, Ohio.
- Rolinski, N., D. Woodburn, **J.S. Ervin**, and Q. Leland. 2009. Dynamic testing of electromechanical actuators. 5th Annual ASME Dayton Engineering Sciences Symposium, Wright State University, October, in Dayton, Ohio.
- Byrd, L., A.M. Briones, **J.S. Ervin**, S. Putnam. 2010. Understanding heat and mass transport at liquid/vapor interfaces and interfaces with programmable surface properties. Air Force Office of Scientific Research Thermal Sciences Contractor's Meeting, Air Force Office of Scientific Research, in Dayton, Ohio.
- Zabarnick, S.S., H. Jiang, Z.J. West, and **J.S. Ervin**. 2010. Effects of a step change in flow geometry on the surface deposition from jet fuel within a tube. Coordinating Research Council Aviation Meeting, May, in Alexandria Virginia.
- Magaziner, R.S., **V.K. Jain**, and S. Mall. 2009. Investigation in wear of Ti-6Al-4V under reciprocating sliding conditions. Presented at 17th International Conference on Wear of Materials, April 19-22, in Las Vegas, Nevada.
- Kashani, A.R.** 2009. Vapor compression cycle control. Wright Patterson AFB, WPAFB, December 15, in Dayton, Ohio.
- Kashani, A.R.** 2009. Augmentor damping design. GE Aviation, February 10, in Evendale Ohio.
- Kashani, A.R.** 2010. Semi active dampers for augmentors. GE Aviation, October 10, Evendale Ohio.
- Myszka, D.H., and **A.P. Murray**. 2009. Identifying sets of four and five positions that generate distinctive center-point curves. International Design Engineering Technical Conferences, ASME, September 2, in San Diego, California.
- Myszka, D.H., and **A.P. Murray**. 2009. Slider-cranks as compatibility linkages for parameterizing center-point curves. International Design Engineering Technical Conferences, ASME, September 1, in San Diego, California.
- Begovich, A., E. Whitney, K. Hallinan, C.M. Krane, and **M.F. Pinnell**. 2009. Effects of harmonic power level and weld duration on tissue sealing. University of Dayton, April 16, in Dayton, Ohio.
- Rumpfkeil, M.** 2010. Optimization-based multigrid applied to aerodynamic shape design. 11th Copper Mountain Conference on Iterative Methods, University of Wyoming, April 7, in Copper Mountain, Colorado.
- Rumpfkeil, M.**, and D. Mavriplis. 2010. Uncertainty analysis using gradient and Hessian enhanced surrogates. V&V Workshop for Nuclear System Analysis, Department of Energy, May 26, in Myrtle Beach, South Carolina.
- Jiang, H., Z. West, **S. Zabarnick**, and J. Ervin. 2010. Effects of a step change in flow geometry on the surface deposition from jet fuel within a tube. Coordinating Research Council (CRC) Aviation Meeting, May 3-6, in Alexandria, Virginia.
- West, Z., R. Adams, and **S. Zabarnick**. 2010. Homogeneous catalysis of hydroperoxide decomposition in liquid hydrocarbons. Central Regional Meeting of the American Chemical Society (CeRMACS), June 16-19, in Dayton, Ohio.
- Jiang, H., Z. West, **S. Zabarnick**, and J. Ervin. 2010. Effect of a step change in flow geometry on the surface deposition from jet fuel within a tube. 35th Dayton-Cincinnati Aerospace Sciences Symposium, March, in Dayton Ohio.

TECHNICAL REPORTS

- Zabarnick, S.**, and J.S. Ervin. 2010. The effects of operating jet fuels below the specification freeze point temperature limit. DOT/FAA/AR-09/50.
- DeWitt, M.J., **S. Zabarnick**, T.F. Williams, Z. West, L. Shafer, R. Striebich, S. Breitfield, R. Adams, and R. Cook. 2010. Determination of the minimum use level of FSII in JP-8 that will provide adequate icing inhibition and biostatic protection for air force aircraft. AFRL-RZ-WP-TR-2009-2217.
- Zabarnick, S.**, D.K. Phelps, Z.J. West, L.S. Shafer, J.S. Ervin, M.J. DeWitt, K.E. Binns, T.F. Williams, G.L. Dieterle, L.M. Balster, and W.E. Harrison, III. Evaluation and testing of the suitability of a coal-based jet fuel. AFRL-RZ-WP-TR-2009-2063.

CONTRACTS, GRANTS AND SPONSORED RESEARCH

- Altman, A.** (Co-Principal). Perching MAV aerodynamics. Sponsor: AFRL/RBSA, \$225K. (September 2008 - Present).
- Altman, A.** (Principal). Small turbine engine advanced augments research program. Sponsor: AFRL/RZ, \$11,366. (October 1, 2009 - November 22, 2010).
- Altman, A.** (Principal). Photo-fueled flapping wings. Sponsor: AFRL/RXP, \$52K. (September 2008 - August 2009).
- Altman, A.** (Co-Principal), and S.S. Altman. (Co-Principal). Wind tunnel flow diagnostics. Sponsor: AFRL/RBAX, \$180K. (October 2009 - October 2010).
- Altman, A.** (Co-Principal), and S.S. Altman (Co-Principal). Wind tunnel flow diagnostics. Sponsor: AFRL/RBAI, \$150K. (February 2008 - January 2010).
- Altman, A.** (Supporting), and R. Scudder. (Principal). Center for UAV exploitation wind tunnel upgrades. Sponsor: State of Ohio, \$190K. (October 2009 - Present).
- Altman, A.** Merlin engineering flight simulator. Sponsor: Industrial, \$200K. (November 2010 - Present).
- Bigelow, K.E.** (Supporting), G. Wheatley (Principal), D. Tomasko, (Supporting), and J. Heimlich (Supporting). Engineering design for middle school girls: Designing the housing of a cell phone. Sponsor: 2008 Motorola Inc Innovation Generation Grant, \$50K. (June 2008 - June 2009).
- Bigelow, K.E.** (Principal). Utilization of stepwatch 3 sensor system to measure real world physical activity in patients with knee osteoarthritis. Sponsor: University of Dayton Research Council (Seed Award), \$8,595. (December 1, 2010 - September 30, 2011).
- Bigelow, K.E.** (Principal). Changes in complexity of physiological signals due to flight and flight simulation. Sponsor: Ohio Space Grant Consortium, \$10K. (January 2010 - June 2011).
- Bigelow, K.E.** (Principal). Furthering skill development in statistical analysis of biological data to strengthen research and teaching performance. Sponsor: LEADER Consortium Mini-Grant, \$5K. (January 2010 - December 2010).
- Bigelow, K.E.** (Principal). Utilization of wearable sensors to develop a fall risk prediction algorithm based on gait of older adults. Sponsor: University of Dayton Research Seed Award, \$6K. (January 2010 - December 2010).
- Bigelow, K.E.** (Principal). American Society of Engineering Education Women in Engineering Division apprentice faculty grants. Sponsor: American Society of Engineering Education, \$2K. (June 2010).
- Bigelow, K.E.** (Principal), W.S. Diestelkamp, C.M. Krane, and M.F. Pinnell. Sponsor: NSF Advance - LEADER Consortium, \$5K. (December 2010 - December 2011).
- Bigelow, K.E.** (Other), D.M. Kinor (Co-Principal), A.P. Jules (Co-Principal), M.S. Piskiewicz, (Co-Principal), J.M. Schaeffer, (Co-Principal), E.E. Sutton (Principal), and M.R. Taylor (Co-Principal). Learn. Lead. Serve.: Balance education for Dayton's elderly adults. Sponsor: University of Dayton School of Engineering Learn, Lead, Serve Grant Program, \$1,800. (December 2010 - December 2011).
- Chiasson, A.D.** (Principal). Finite element analysis of the thermal performance of hyperloop ground and pond heat exchangers. Sponsor: Water Furnace International, Inc., \$7,200. (May 1, 2010 - July 31, 2010).
- Chiasson, A.D.** (Principal). Modeling the effects of groundwater flow on closed-loop geothermal heat pump systems. Sponsor: University of Dayton, \$5K. (May 1, 2010 - August 31, 2010).
- Chiasson, A.D.** (Co-Principal), C. Yavuzturk (Co-Principal), J. Kelley (Supporting), and D. Langille (Supporting). Development of a software design tool for hybrid solar-geothermal heat pump systems in heating- and cooling-dominated buildings. Sponsor: U.S. Department of Energy, \$180K. (February 1, 2010 - February 1, 2011).
- Ervin, J.S.** (Principal). Aircraft thermal management research. Sponsored by AFRL, \$5.5M. (May 2008 - November 2013).
- Ervin, J.S.** (Supporting), L. Byrd, (Co-Principal), L. Gschwender (Co-Principal), and S. Putnam (Supporting). Understanding heat and mass transport at liquid/vapor interfaces and interfaces with programmable surface properties -Grant No. 2303BR5P FY09-FY12. Sponsor: Air Force Office of Scientific Research, \$480K. (November 2008 - November 2011).
- Ervin, J.S.** (Principal), and A.R. Kashani (Co-Principal). Control of vapor compression refrigeration cycle for aircraft thermal management. Sponsor: AFRL/RZPS, \$50K. (August 2010 - August 2011).
- Ervin, J.S.** (Co-Principal), D. Ballal (Principal), M.J. DeWitt (Co-Principal), S.S. Zabarnick (Co-Principal), T.F. Williams (Co-Principal), and S.D. Stouffer (Co-Principal). FA8650-10-2-2934; Fuels and combustion technologies for aerospace propulsion. Sponsor: Air Force Research Laboratories, \$49.5M. (December 2010 - December 2016).
- Ervin, J.S.** (Principal), A.D. Chiasson (Supporting), M. Elsass (Supporting). Simulations of aircraft fuel tank heat transfer. Sponsor: Air Force, \$150K. (October 2010 - December 2011).
- Ervin, J.S.** (Other), and R.J. Wilkens (Co-Principal). Visualization of two phase flow. Sponsor: AFRL/RZPS, \$65K. (2010 - 2011).
- Hallinan, K.P.** (Principal). Development of an effective R-value calculator tool. Sponsor: Performance Concrete, \$40K. (December 2009 - November 2010).
- Hallinan, K.P.** (Principal), and R.J. Brecha (Co-Principal). Commercial building recommissioning program. Sponsor: Vectren, \$175K. (August 2009 - December 2013).
- Hallinan, K.P.** (Co-Principal), and A.D. Chiasson (Co-Principal). Distance learning for the masters in renewable and clean energy program. Sponsor: University of Dayton, \$7,500. (December 2009 - November 2010).
- Hallinan, K.P.** (Principal). Effective R-value calculator development for high mass walls. Sponsor: Performance Concrete, \$40K. (January 2010 - Present).
- Hallinan, K.P.** Clean energy education initiative. Sponsor: Department of Energy, \$486K. (December 2010 - December 2011).
- Kashani, A.R.** (Principal). Active acoustic instability control in aircraft engines. Sponsor: Air Force, \$90K. (May 15, 2007 - February 15, 2010).
- Kashani, A.R.** (Co-Principal), and J.S. Ervin. (Principal). Control of vapor compression refrigeration cycle for aircraft thermal management. Sponsor: Air Force, \$50K. (August 15, 2009 - August 15, 2011).

Kashani, A.R. (Co-Principal), and J.S. Ervin (Principal). Control of vapor compression refrigeration cycle for aircraft thermal management. Sponsor: Air Force, \$50K. (August 15, 2009 - August 15, 2010).

Kissock, J.K. (Principal). University of Dayton Industrial Assessment Center. Sponsor: U.S. Department of Energy, \$150K. (September 2008 - August 2009).

Kissock, J.K. (Principal). University of Dayton Industrial Assessment Center. Sponsor: U.S. Department of Energy, \$140K. (October 2010 - September 2011).

Kissock, J.K. (Principal). University of Dayton Industrial Assessment Center. Sponsor: U.S. Department of Energy, \$108K. (October 2010 - September 2011).

Kissock, J.K. (Principal). University of Dayton Industrial Assessment Center. Sponsor: U.S. Department of Energy, \$68K. (January 2010 - May 2011).

Murray, A.P., and D.H. Myszka. Novel concepts for spring-based mechanical energy storage in motor vehicles. Sponsor: General Motors Global Research and Development, \$140K. (August 2010 - July 2012).

Diestelkamp, W.S. (Supporting), C.M. Krane (Co-Principal), and **M.F. Pinnell** (Co-Principal). Assessing the feasibility of intraluminal ultrasonic tissue welder. Sponsor: Ethicon Endo-Surgery, \$115,596. (October 2008 - June 2010).

Pinnell, M.F. (Principal), and C.M. Krane (Principal). Assessing the feasibility of intraluminal ultrasonic welder. Sponsor: Ethicon Endo-Surgery, \$80K. (May 15, 2009 - December 31, 2009).

Pinnell, M.F. (Principal). Engineering in urban education: Robotics outreach at Dayton area middle schools. Sponsor: Otterbein College - Ohio Campus Compact, \$5K. (September 1, 2009 - August 31, 2010).

Pinnell, M.F. (Principal), C.M. Krane (Principal), and W.S. Diestelkamp, (Other). Assessing the effect of device geometry and load. Sponsor: Ethicon Endosurgery, \$91,656. (December 15, 2009 - June 1, 2011).

Pinnell, M.F. (Principal), C.M. Krane (Principal), and W.S. Diestelkamp, (Principal). Assessing the viscoelastic properties of porcine arteries: An integrated approach. Sponsor: LEADER Consortium - NSF Advance Program, \$5K. (January 1, 2010 - December 31, 2010).



