Third Annual Business, Technology & Careers Conference

University of Delaware
Department of Mechanical Engineering

Friday, April 27, 2007

Clayton Hall Conference Center
University of Delaware Laird Campus
Schedule of Events

12:30  Registration (Lobby B)

1:00  Welcome (Room 128)
Dr. Thomas Buchanan, Chair of the Department of Mechanical Engineering

1:30  Seminars in Track A or Track B

**Track A - Technology**
- **Wind Turbine Aerodynamics**
  Dr. Leonard Schwartz
  Professor, Mechanical Engineering
  (Room 128)

**Track B - Career/Business**
- **Patent Law:**
  *Innovation, the Process and a Student’s Perspective*
  Gary Hecht ’80
  Partner, Synnesvedt and Lechner LLP
  (Room 119)

2:15  Networking (Pit Area)

2:30  Environmental Fluid Mechanics:
  *Naturally Occurring Flow Systems*
  Dr. Lian-Ping Wang
  Professor, Mechanical Engineering
  (Room 119)

3:15  Networking (Pit Area)

3:30  Airplane Forensics:
  *Reverse Engineering the Cause*
  Brian Murphy ’90
  National Research Specialist for Aircraft Structures, National Transportation Safety Board
  (Room 128)

3:30  Your Own Business:
  *Start, Grow, Go Forth, and Prosper*
  Jodie Morgan ’85
  President, SPI Foods
  (Room 128)

4:15  Networking (Pit Area)

4:30  Panel Discussion with all Distinguished Career Alumni (Room 128)

5:30  Reception (Pit Area)

6:30  Dinner (Room 101 A/B)

7:30  Distinguished Career Alumni Award Presentations (Room 101 A/B)

8:00  **Keynote Speaker:** Dr. Willett Kempton, Associate Professor, College of Marine and Earth Studies
**Wind Energy Offshore:** *Resource, Policy, and the Path Forward*
About Events

The dual-track program of UD-ME’s Third Annual Alumni Career Celebration includes seminars and a panel discussion by faculty, alumni, and students on engineering technology, engineering business topics, and career planning and experience.

ME professors will address such timely subjects as wind energy and environmental fluid mechanics, while seminars by ME alumni will cover topics ranging from patent law and airplane forensics to starting your own business and being successful in the 21st century workplace. A panel of Distinguished Alumni will discuss what has made them successful in their careers. The keynote speaker, Dr. Willett Kempton of the College of Marine and Earth Studies, will end our evening with a presentation on offshore wind energy.

Our program also includes opportunities for discussion of current research and development displays with graduate students, social times for reunion and further networking, and continuous refreshments, a cocktail hour, and dinner.

During the breaks between afternoon talks, technology displays will be set up throughout the Clayton Hall Lobby area. Poster presentations will include capstone design projects, as well as state-of-the-art graduate and undergraduate research being conducted in Mechanical Engineering. In addition, the UD SAE (Society for Automotive Engineering) club will have their mini-formula car on display. The newly unveiled UD hydrogen-powered transit bus will be available outside Clayton Hall to take alumni and guests on a zero-emission ride around north campus.

Continuing education credits will be provided at all seminars for those in professional registration programs requiring CEUs.
Presentation Abstracts

Wind Turbine Aerodynamics (1:30—Track A, Room 128)
Prof. Len Schwartz
For economic and environmental reasons, enormous numbers of wind turbine power plants are being built and commissioned worldwide. This clean energy resource is assuming a significant share of world electricity production. This talk will present an overview of the physics of extracting power from the wind, including the current design methodology for the turbine blades. The history of wind power, as well as recent achievements and opportunities in this burgeoning industry, will also be included.

Patent Law: Innovation, the Process and a Student’s Perspective (1:30—Track B, Room 119)
Gary Hecht (BME1980)
The patent system has encouraged and rewarded innovation, producing new products and processes, contributing to the improvement of the public health and public safety, protecting the individual and small businesses during the formative period of a new enterprise, and contributing to the achievement of the high standard of living now enjoyed by many people throughout the world. Yet, the patent process remains esoteric, confusing even for those having specialized legal or engineering training. This talk will discuss how the patent system protects and rewards innovation and will present examples to illustrate the patent process. The talk will also discuss the path to becoming a patent attorney.

Environmental Fluid Mechanics (2:30—Track A, Room 119)
Prof. Lian-Ping Wang
Environmental fluid mechanics deals with naturally occurring flow systems on the earth and their impact on contaminant transport and natural phenomena such as weather, climate, and the water cycle. It encompasses a variety of scientific and engineering disciplines and an enormous range of scales from the microscale to the planetary scale and from a fraction of a second to years. The talk will first outline how environmental fluid
mechanics, while borrowing most of its elements from engineering fluid mechanics, has emerged as a new discipline aimed at prediction, decision-making, and ultimately policy formulation. Several specific examples in environmental fluid mechanics will be used to illustrate how advanced engineering research tools can be applied to yield a better understanding and prediction of critical natural phenomena, such as the warm rain process, air-sea interaction, and contaminant transport in the soil. Finally, related activities at UD will also be highlighted.

**Your Own Business: Start, Grow, Go Forth and Prosper (2:30—Track B, Room 128)**
Jodie Kuchler Morgan (BME1985)

You’re thinking about going into business for yourself. Why not? Just think of the advantages. You’ll be your own boss, and, if you’re going to work hard, you might as well get all the benefits. Besides, you have a great idea, and it will surely make a lot of money. All of this may be true, but 50% of small businesses fail in the first five years and most are started by equally enthusiastic entrepreneurs. In order to turn your dreams into reality, you’ll need a few critical strengths, a willingness to work very hard, and a bit of luck.

**Airplane Forensics: Reverse Engineering the Cause (3:30—Track A, Room 128)**
Brian Murphy (BME1990)

This talk will focus on the extensive structures investigation carried out by the National Transportation Safety Board (NTSB) following the crash of American Airlines flight 587 in Belle Harbor, NY, on November 12, 2001. The crash was attributed to separation of the vertical stabilizer from the fuselage, an unprecedented occurrence on a transport-category airplane. Speaker Brian Murphy will not only address this specific investigation but also provide general insight into his job as National Research Specialist for Aircraft Structures for the NTSB.
Being C.R.I.S.P. in the Twenty-First Century Workplace: Success in Contemporary Times (3:30—Track B, Room 119)

John Thackrah (BME1979)

Twenty-first century engineering graduates find themselves in a very different world than just 20 to 30 years ago when considering a career path or further education. The post-9/11 world we live in is filled with higher risks and, at the same time, the opportunity for higher reward. One fact remains constant—the United States is losing its edge in science and engineering. Today’s graduating engineer has a great opportunity to contribute to our nation’s competitiveness. Being “CRISP” in that opportunity is fundamental to your success: Commitment, Results, Investment, Sweat the details, and Personal performance and perception mean more today than ever. In this session, we’ll explore some ideas that may jump start you on your way to success.

Keynote Speaker

Wind Energy Offshore: Resource, Policy and the Path Forward

Willett Kempton

Wind-generated electricity is today the fastest-growing electric-generation technology. On the Eastern Seaboard, offshore wind power is a resource capable of producing more electricity than the entire region consumes. This talk will review current commercial technology for offshore wind power and the resource side in our region. It will also review environmental and policy issues with wind power and address the problem of the integration of wind power onto existing electric grids.
Conference Presenters

**Gary Hecht (BME1980)** is a partner in the law firm of Synnestvedt & Lechner LLP in Philadelphia. Raised in Wilmington, Delaware, he has been practicing law for 16 years. After completing his undergraduate degree, Hecht worked as an engineer for Atlantic Richfield Company and then as a senior engineer for SmithKline Beckman, Inc. He received his law degree from Temple University in 1991 and focuses his law practice on matters relating to intellectual property, representing companies at all stages, from start up to Fortune 500. He has prosecuted patent and trademark applications; litigated patent, trademark, and copyright matters; negotiated licenses; and provided infringement, validity, and due diligence counseling. His patent prosecution experience includes mechanical and electromechanical inventions, including medical devices, machinery, packaging, automotive products, seals and gaskets, battery technology, and integrated circuit fabrication.

**Brian Murphy (BME1990)** is National Research Specialist for Aircraft Structures for the National Transportation Safety Board. His industry experiences include nearly sixteen years of performing detailed strength, fatigue and damage tolerance analysis on a variety of composite and metallic structures utilizing both hand analysis techniques and finite element methods. Prior to joining the NTSB, he worked for the FAA as a certification engineer in the area of structures on several Sikorsky helicopter programs. Since joining the Safety Board in September 2000, he has been a structures group chairman on more than two dozen aviation accidents and/or incidents including the September 11, 2001, crash of United Airlines flight 93.

**Prof. Len Schwartz** has taught mechanical engineering and applied mathematics for more than 25 years, and he has also worked in the aerospace and energy industries. Educated at Cornell and Stanford Universities, he has authored or coauthored more than 100 technical papers, primarily in the field of fluid mechanics. Prior to coming to UD in 1987 he was a Senior Staff Scientist at Exxon’s Corporate Research Laboratory and a Senior Lecturer in Applied Mathematics at Adelaide University in Australia. For the past four years, he has led a Winter Session program for Mechanical and Civil undergrads in Australia. He is currently teaching a new course entitled Wind Power Engineering.
John S. Thackrah (BME1979) is Deputy Assistant Secretary of the Navy for Management and Budget. Prior to joining government service in 2005, Thackrah held various program management, product design and development, and engineering support positions, including Vice President and General Manager, with United Technologies Corporation in the Pratt & Whitney and Otis Elevator divisions. He made major contributions to the JT9D-7R4 program, the PW4000 engine program, the Boeing 747-400 certification program, and the PW2000 and PW4000 engine programs. Thackrah has a Masters of Business Administration from Rensselaer Polytechnic Institute.

Lian-Ping Wang received his Ph.D. in Mechanical Engineering from Washington State University in 1990 and did post-doctoral work in turbulent dispersed flows at Brown University and Pennsylvania State University before joining University of Delaware in 1994. Dr. Wang uses advanced simulation tools and theoretical methods to study multiphase flows and transport in engineering applications and environmental processes. He is currently developing computational tools to study growth of cloud droplets in atmospheric clouds and its impact on warm rain initiation. He also develops numerical methods to study complex fluid flow and transport in fuel cells and soil porous media.

Keynote Speaker

Willett Kempton is Associate Professor in the College of Marine and Earth Studies at the University of Delaware. He has over 25 years’ experience with social and technical topics in the energy industry, including energy conservation, renewable energy, and conventional energy policy. He has coauthored or edited two books and more than 60 peer-reviewed articles. His current research comprises two areas: offshore wind power and the use of electric cars to support the power grid when parked (“vehicle to grid,” or V2G). Prior to joining the faculty at the University of Delaware in 1992, Kempton held research or teaching positions at Princeton University, Michigan State University, and the University of California campuses at Berkeley and Irvine.
Distinguished Career Alumni

Donald R. Cohee, PE (BME1968), is Vice President of Research and Technology for ILC Dover in Frederica, Delaware. He has been with the company since 1972, when he was hired as a Design Engineer. Cohee has worked in a variety of areas for ILC over the past three decades, focused on product and technology development for space, defense, and industrial applications. In the course of his career, he has been granted nine US patents. Most recently, he is credited with creating a new ILC business process for developing commercial products based in large part on the Toyota product development process. Cohee is a member of the Delaware Science and Technology Council and the Engineering Outreach Advisory Council at the University of Delaware. He is also a member of the Board of Directors of the Delaware State University’s High Technology Research Incubator Foundation. Prior to joining ILC, he spent five years with Newport News Shipbuilding and Dry Dock Company, where he was a design engineer on the Aircraft Carrier Nimitz project.

Michael J. Doyle (BME1992), is a Special Agent for the Federal Bureau of Investigation in Newark, New Jersey. He also holds an MBA with a finance concentration from Drexel University. After he joined the FBI and was assigned to a counter-terrorism squad, the FBI chose to leverage his engineering experience by naming him the Newark Division Weapons of Mass Destruction (WMD) Coordinator while a member of the Joint Terrorism Task Force. He has also accepted assignments investigating public corruption and foreign counterintelligence national security matters. Additionally, he is the Newark Division Hostage Negotiation Coordinator, where he oversees eight Special Agents and is responsible for all aspects of the team. In his ten years with the FBI, Doyle has been involved in a number of significant cases, and he has twice been nominated for the FBI Director’s Award.
James B. Foulk (BME1959), is the Chief Executive Officer of the SURVICE Engineering Company and President/CEO of the recently formed Chesapeake Defense Services, Inc., in Belcamp, Maryland. After working for Standard Oil Company and the Army Research Laboratory, Foulk joined Sikorsky Aircraft in 1974 as head of Safety and Survivability, and in 1976 he was promoted to manager of System Engineering for the UH-60 Black Hawk helicopter development program. In 1978, he moved to Science Applications, Inc. (now SAIC), eventually opening a Bel Air, Maryland, office of SAI. In 1981, Jim and his wife Nancy (BSEd1973) started the SURVICE Engineering Company in the basement of their home. Their son Jeff (BME1982) joined them after graduation and is now President of SURVICE Engineering. Throughout his career, Jim has held leadership positions in a number of professional societies, national coordinating groups, joint working groups, etc. His work on the UH-60A Blackhawk was instrumental in Sikorsky being given American Helicopter Society's Grover E. Bell Award for outstanding contributions to helicopter development. In November 2003, he received the NDIA Combat Survivability Division's Award for Leadership. In May 2006, he received the American Institute of Aeronautics and Astronautics (AIAA) 2006 Survivability Award.

Jerry Kegelman (BME1978), is Associate Director of Aerodynamics, Aerothermodynamics, and Acoustics Research and Technology at the NASA Langley Research Center. After earning his bachelor’s degree from the University of Delaware, he went on to earn an M.S. in aerospace engineering and a Ph.D. in fluid mechanics/transition physics, both from the University of Notre Dame. In addition to his expertise in aero sciences, Kegelman has made contributions to the areas of complex mechanical systems, instrumentation and sensor systems, optical and laser systems, and major facility ground test systems. He is the author of over 50 technical publications and presentations.
Jodie (Kuchler) Morgan (BME1985), is President of SPI Polyols, Inc. After earning her bachelor’s degree in ME at UD, she completed an MBA at West Chester University. Morgan joined ICI Americas, one of the previous owners of SPI, in 1985. Since then, she has held engineering, quality, sales and marketing, business development, and business management roles within various business operations. SPI Polyols, which sells ingredients to the food, confectionery, and personal-care markets, has achieved double-digit profit growth over the past three years under her leadership. Morgan repositioned the under-performing business, and she is credited with restructuring the company’s benefits program, diversifying its product line, and extending the business to global markets. She is a member of TEC/Vistage, a worldwide organization of CEOs and business leaders, and President of The Structures Company, LLC, which handles commercial and residential real-estate investments.

Nancy Sottos (BME1986 and PhD1991), is the Donald B. Willett Professor of Engineering and Professor of Materials Science and Engineering at the University of Illinois at Urbana-Champaign. Sottos is co-chair of the Molecular and Electronic Nanostructures Research Initiative and a part-time faculty member at the Beckman Institute for Advanced Science and Technology. Her research group studies the mechanics of complex, heterogeneous materials such as advanced composites, thin film devices, and microelectronic packaging. Sottos’s research and teaching awards include the Office of Naval Research Young Investigator Award (1992), Outstanding Engineering Advisor Award (1992, 1998, 1999 and 2002), the Robert E. Miller award for Excellence in Teaching (1999), the University of Delaware Presidential Citation for Outstanding Achievement (2002), University Scholar (2002), the Hetényi Award from the Society for Experimental Mechanics (2004), and Fellow of the Society for Engineering Science (2007). In addition, her research group was awarded the American Society for Composites Best Paper Award in 2002 and 2003, and the Tech Museum of Innovation Award for Technology Benefiting Humanity in 2001 for her work on self-healing polymers.
Highlights

- Overview of the Mechanical Engineering Department at the University of Delaware
- Seminars by faculty and alumni on engineering technology, engineering business topics, and career planning and experience. CEU credits offered.
- Extensive periods for interaction and networking among alums, faculty and students
- Review and discussion of current research and development displays with graduate students
- Social times for reunion and further networking
- Continuous refreshments, cocktail hour, and dinner, followed by a keynote speaker and a time to honor and hear from six alums who have been cited as “Distinguished Career Alumni,” class of 2007
- SAE mini-formula car and hydrogen fuel-cell transit bus on display