Letter From The Chairman

Welcome to AME Highlights. I hope you enjoy this overview of some of the activities and accomplishments in the Department. This year we are pleased to introduce new faculty and a new facility. We recently successfully completed our national accreditation by ABET and continue to work to improve our undergraduate, graduate and research programs. As part of our accreditation process we are charged with explicitly stating the Educational Objectives of our undergraduate programs. Though one can describe “objectives” in many ways, these are broad statements that describe the career and professional accomplishments that the program is preparing the graduates to achieve and are defined in terms of accomplishments in the first few years after graduation. We appreciate the diverse set of individual goals to which our students aspire, so we express the Educational Objectives in two forms, those for all graduates of the program:

- Secure a position consistent with their personal aspirations and qualifications
- Assume a technical or managerial leadership role with their organization
- Participate as a volunteer with at least one professional or social service organization

and those that depend upon the career path an individual selects:

- Be recognized as the key technical specialist within their organization for a particular professional specialty
- Receive a graduate or professional degree
- Start their own company
- Be granted a patent.

Take a moment and let us know how these have applied to you. Whether you graduated in ’60 or ’00 - how well did your ND engineering education provide the foundation for your future?

Lastly, one of the important parts of our students’ undergraduate experiences is an industrial internship during the summer. If you would like to assist a current AME student in securing an internship with your organization, please let us know.

Thank you for your ongoing interest and support of the Department and the University. May Our Lady, patroness of Notre Dame, watch over you and pray for you.

Sincerely, Stephen Batill, Professor and Chair

2006 College Honor Award

The 2006 College of Engineering Honor Award from the AME Department was presented to Dennis Boyle, BSME ‘75. After graduating from Notre Dame, Dennis attended Stanford where he received a M.S. Degree in Industrial Design. In 1978 Dennis was one of the first few people hired into a new company in Palo Alto that has grown to become what is arguably America’s leading product design firm, IDEO. Dennis is now a principal and a senior design studio leader in the Palo Alto headquarters of IDEO. He has been involved in hundreds of product design projects and holds almost 50 patents ranging from office furniture to lap-top computers. He is particularly well known for his contributions to the development of Handspring’s Palm V handheld computer. Dennis is recognized for his development of the “Tech Box” and enhancing the role of prototyping in the creative aspects of product development. He has been a very active supporter of design education throughout his career. Dennis developed IDEO U, a continuing education activity for engineers, and he has worked with grade school, high school and college students in support of engineering education and outreach activities. Dennis has also enabled an ongoing interaction with IDEO and the mechanical engineering design program at Notre Dame. Dennis has demonstrated how much one can accomplish by using “both sides” of your brain!

Dennis Boyle with his wife Peggy and sons Taylor and Burke
New Multidisciplinary Research Building Opens

This summer five AME faculty members and their graduate students moved into the new Multidisciplinary Research Building adjacent to the Hessert Laboratory on the north end of campus. The $6.8M, 25,000 square foot building consolidates and expands research facilities in biomedical engineering across the College of Engineering. Initial occupants from AME include Dr. Tim Ovaert, Dr. Glen Niebur, Dr. Ryan Roeder, Dr. Steven Schmid and Dr. Diane Wagner. Current biomedical research activities in AME include both experimental and computational investigations of structure-function relationships in skeletal tissues and cells, as well as the design, manufacturing and evaluation of new synthetic biomaterials for orthopaedic devices. The Multidisciplinary Research Building (MRB) will house more than a dozen laboratories designed specifically for biomedical research including the Biomaterials Processing Laboratory, Biomedical Imaging Laboratory, Cell and Tissue Culture Laboratory, Histology and Specimen Preparation Laboratory, Manufacturing Laboratory, Micromechanics Laboratory, Tissue Mechanics Laboratory, Tissue Engineering Laboratory, and Tribology Laboratory. Specific research projects are currently funded by grants from the National Institute of Health, Department of Defense, Centers for Disease Control, National Science Foundation and private companies. The new facility will enhance the visibility of bioengineering at Notre Dame and be a valuable addition to the AME graduate program.
New Faculty in AME

**Dr. Katherine Liu**

![Dr. Katherine Liu](image)

Katherine W. Liu received her PhD degree from Carnegie Mellon University, and her B.S. and M.S. degrees in Mechanical Engineering from Tsinghua University, P. R. China. Dr. Liu conducts research in micro- and nanoscale thermal energy transport with applications to microelectronics, high-density data storage devices, and miniaturized biomedical systems. Her research interests specifically include the characterization of low-dimensional semiconductor and data storage materials, thermal analysis/management of microelectronics, and developing novel thermometry schemes. Katherine has been collaborating with other faculty members at the University of Notre Dame on energy harvesting projects, aiming at developing miniaturized energy conversion devices that collect the kinetic energy and/or thermal energy to drive portable biomedical devices.

**Dr. Diane Wagner**

![Dr. Diane Wagner](image)

Diane Wagner earned her BS in mechanical engineering at the University of Michigan; was employed at Hewlett Packard as a design engineer, working in an inkjet printer division, and then received her Ph.D. in mechanical engineering from the University of California at Berkeley. Dr. Wagner was a post-doctoral research fellow at Stanford University, where she studied the influence of mechanical forces on multi-potent cells. Dr. Wagner’s research focuses on the process by which mechanical loads remodel living biological tissues, particularly orthopaedic soft tissues. Dr. Wagner’s research interests include the underlying microstructure of collagenous tissues and how the microstructure contributes to tissue material properties, as well as the effect of mechanical loading on the tissue architecture and cellular response. Her research combines theoretical, experimental, and computational mechanics with biological techniques.

**Dr. Vikas Tomar**

![Dr. Vikas Tomar](image)

Vikas Tomar received his Ph.D. from the Georgia Institute of Technology and his research focuses on quantitative characterization of thermo-electro-mechanical performance of complex materials using advanced molecular-level simulation techniques. His research projects focus on obtaining multiscale thermomechanical behavior of advanced composite materials. For his simulations he uses advanced high performance computing systems. He also has experience in experimental analyses of high strain rate failure of materials. His research area is highly interdisciplinary. Currently he is collaborating with AME faculty in the areas of material design for synthetic development of future advanced materials, molecular-level bone fracture modeling for advanced biomedical material development, nanoelectromechanical (NEMS) systems development with excellent heat dissipation characteristics, and advanced high temperature structural composite development for future earth and space based power generation systems. He will be teaching undergraduate solid mechanics and graduate advanced mechanics of solids.
Dr. Meng Wang

**Meng Wang** joins the AME Department as an Associate Professor. Prior to that he worked at the Stanford/NASA Center for Turbulence Research as senior research scientist. Dr. Wang did his graduate work at the University of Colorado, Boulder, where he received MS and PhD degrees in Mechanical Engineering, specializing in fluid mechanics and acoustics. Dr. Wang is interested in applying computational tools to solve engineering fluid dynamics problems and study flow physics. In particular, he employs emerging flow simulation methods including Large-Eddy Simulation (LES), Direct Numerical Simulation (DNS), and hybrid LES/RANS approaches to obtain high-fidelity, time-dependent solutions for complex turbulent flows. He is also interested in developing mathematical models and numerical techniques for computational fluid dynamics and aeroacoustics.

John Ott joined the AME Department in late 2005. He has a BS degree in electrical engineering from Tri-State University and an MS in EE from Notre Dame. He worked in industry as a microphone design engineer and in 1984 joined the EE department at Notre Dame as a computer systems administrator. His responsibilities in EE continued to expand, but he was interested in becoming more engaged in the teaching mission of the University and joined AME as a member of the special professional faculty. John contributes to the undergraduate program through the design, development, implementation and support of laboratory and “hands-on” learning activities. He is the Manager of the Undergraduate Design Studio and coordinates the activities of the graduate teaching assistants in the solid mechanics, fluid mechanics and measurements courses.

Mr. John Ott

**AME Faculty Activities, Honors and Awards**

Professor **Meng Wang** received the 2006 ASME Fluids Engineering Division Lewis F. Moody Award for a paper presented at the 2005 ASME Summer Meeting and Exhibition.

Professor **Frank Incropera** was named a fellow of the American Association for the Advancement of Science, AAAS. Frank stepped down as Dean of Engineering this summer and is now “just a professor” in AME. We are excited about Frank focusing his unbounded energy on developing new ideas and initiative in energy science in AME. Through Frank’s efforts as Dean, AME is now seeking candidates to fill the Dorini Chair in Energy Science, an endowed chair resulting from a generous gift from the Dorini family.

Professor **Thomas Corke** was invited to serve on the National Academies, National Research Council panel that prepared the national policy statement, a “Decadal Survey of Civil Aeronautics.”

Professor **Samuel Paolucci** was named a fellow of the ASME. Dr. Paolucci’s work in the areas of fluid mechanics and nonlinear dynamics was recognized.

The Minerals, Metals and Materials Society (TMS) named Professor **Ryan Roeder** as the first recipient of its Early Career Faculty Fellow Award. Ryan will deliver the Young Leaders Tutorial Lecture at a 2007 TMS meeting.

The Applied Mechanics Division of the ASME appointed Professor **Edmundo Corona** as the Chair of the Instability in Solids and Structures Technical Committee.

The AIAA Journal of Propulsion and Power reappointed Professor **Joseph Powers** as an Associate Editor.

Professor Emeritus **K.T. Yang** presented the Keynote Lecture at the International Symposium of Forest Fires hosted by Japan’s National Research Institute of Fire and Disaster in Tokyo in December 2005.

Professor Emeritus **Thomas Mueller** was recognized as STAI Member Emeritus by the Executive Committee of the Supersonic Tunnel Association International for his significant contributions to the organization during his career.
AME Student News

Graduate students, Alice Nightingale and Donald Wittich each received scholarships from the Directed Energy Professional Society. Only 7 students from across the U.S. were awarded these scholarships this year and Notre Dame was the only university to receive 2 awards. Alice also won the student paper competition at the 2006 AIAA Plasmadynamics and Laser Conference held in San Francisco. Both Alice and Donald are advised by Professor Eric Jumper.

Sean O'Donnell BSME '06 and Kaleb Van Ort BSME '06 were on the Notre Dame Cross Country team that finished in 3rd place in the NCAA Nationals.

Michael Bartowitz, BS AE '06, received a Hall Spirit Award at commencement which recognizes an individual “who has most exemplified the spirit of Notre Dame through personality, character and actions.”

Lydia Szeligowski AE '07 and Erin Mulholland AE '08 presented their study “Camera-Space Manipulation Robotics: Decoding the Martian Surface” at the 2006 Revolutionary Space Concepts Forum sponsored by the Universities Space Research Association in Florida. Their work was mentored by Professor Steven Skaar.

William Jenista, BSME '06 received a Citation of Merit Award at graduation for his “contributions to Notre Dame’s residential mission through service in the residence halls.”

Robert Woods BSME '06 was honored with the Top Gun Award as the graduating senior varsity athlete with the highest cumulative GPA - 3.953. Rob was a scholarship football player and you thought it was Charlie Weis who was the mastermind of the program!

AME Alumni News

Jack V. Moriarity, BSAE '63, is a patent lawyer and partner in the law firm Woodard, Emhardt, Moriarity, McNett and Henry in Indianapolis. After a recent tour of the Hessert Laboratory, Jack commented that “the school has come a long way to its present status.”

Brian McDonald, BSAE '89, is a Senior Principal Product Planning Specialist in Cardiac Rhythm Disease Management at Medtronic, Inc. in Minneapolis. Brian joined Medtronic a couple of years ago and was excited to learn about the growing initiatives in bioengineering in AME.

Wayne Struble, BSAE '72, is the Chief of Staff for Congressman David Hobson from Ohio. Wayne visited campus to tour a number of facilities last spring as some of our new facilities have been assisted by congressional funding.

Joseph Roman, BSAE '68, MSAE, '70, received the Robert S. Sterns Award from the National Defense Industrial Association in recognition of his leadership and contributions to efficiency and standardization.

Randy Gallagher, BSAE '89, was on campus last fall interviewing for ITAC and he has worked to assist with internships for ND students at ITAC. Providing intern experiences for our students is a great investment for any company!

Dave Amidon, BSAE '59, wrote to say Dave Cloud, BSAE '70, who works at Pratt-Whitney in East Hartford is the Harford area ND Alumni Club President.

Dr. Jim Schmiedeler, BSME '96, who is a professor on the faculty at The Ohio State University recently was awarded an NSF CAREER award, a very important recognition for a “young” professor.

Dr. Eric Baumgartner, BSAE '88, PhD '93, was appointed the Dean of the College of Engineering at Ohio Northern University. Eric had most recently been at JPL and contributed to many robotic control aspects of the Mars rovers, Spirit and Opportunity. Other news out of Ohio Northern University, Dr. J.D. Yoder, BSME '91, MSME '94, PhD '96 is an Associate Professor and was a 2006 recipient of the SAE Ralph Teetor Educational award.

Sadly we note that Ben Cosgrove, BSAE '49, Doctor of Engineering (Honorary) '93, passed away in early September. Ben retired as senior Vice President of the Boeing Commercial Airplane Company and contributed in many important ways to AME during his career.

Its amazing what some “surfing” can do: Daniel M. Fitzgerald, BSME '89, is a partner in the Armstrong Teasdale LLP law firm in St. Louis, in the intellectual property area. John M. Abele, BSME '89, joined the Cleveland offices of Heidrick and Struggles International, an executive search and consulting firm. This was not intentional but '89 seems over-represented. It must have been a particularly good year. How about others letting us know what you are doing?
AME Highlights

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Hessert Laboratory for Aerospace Research Celebrates 15 Years
The Department will host a special event in November 2006 honoring the Hessert Family and celebrating the 15th anniversary of the Hessert Laboratory. There will be several speakers including Fr. Hesburgh, Dr. Thomas Corke and several AME graduates.

Industry Supporters
Each year AME receives financial support from both individual and corporate donors. These funds are used to assist in the mission of the Department in many important ways. The University is well-known for the generous support of its alumni, but it is particularly helpful when organizations, with the encouragement of our alums, contribute either by participation in events such as Industry Day, by supporting intern programs or through grants or gifts. This year we wish to recognize those organizations that have provided direct support to AME; they include: Procter and Gamble, Rockwell Automation, Bell Helicopter, Orbital Research, Innovative Scientific Solutions, Inc., Phillip Morris, AgiOptics, Northrup Grumman Systems, Volpe, Daimler-Chrysler, Honeywell, Zimmer, Honda Corporation, Mittall Steel and Smurfit-Stone.

Does Anyone Recognize these “Engineers”?