

# NOW

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College of Engineering & Technology Newsletter Winter 2005

## From the desk of Richard T. Johnson, Dean

As the spring semester begins, the weather is crisp with an ever-present expectation of snow, and engineering students are busy preparing for a new semester. This year 765 undergraduates and 153 graduate students are enrolled in the college's four departments. We have 48 full-time faculty members and searches underway for four additional faculty members. This past fall, we hired two new faculty members, promoted two to full professor and two to associate professor, and tenured two faculty members. At the end of the year we expect to have a college faculty with a solid combination of great long-term teachers and energetic new young members.

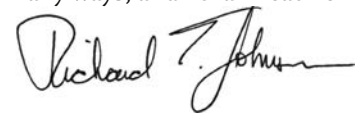
Other important additions to the College include wireless technology and mediated classrooms. This past fall, we installed wireless technology in Jobst and Morgan Halls to allow all our students access to the Internet and Bradley network via their laptops. Although laptops are not required, many of our students use them in the classroom. Two recently remodeled classrooms in Morgan Hall were equipped with advanced mediation equipment and configured for laptop use. Four classrooms in Jobst Hall received basic mediation this past summer.

Many exciting activities are underway. The Center for Emerging Technologies in Infrastructure just hosted the first, and very successful, International Construction Innovations Conference in Peoria. The conference featured a number of international organizers and participants and was keynoted by Mr. James Owens, CEO of Caterpillar Inc. (See page 3.) The College also conducted a very successful BEST/STEPS summer camp for over 70 ninth and tenth graders. The students spent an intensive week with Bradley engineering faculty, high school teachers, and professional engineers designing and building a rocket to be launched from a yard line through the football goal posts. Over 300 people attended the Saturday morning launch. (See page 6.) In this and upcoming newsletters, we will keep you informed of more events and accomplishments in the College.

I would also like to recognize the members of the

College of Engineering and Technology Executive Advisory Council. Twice a year they come to campus and provide valuable insight into the future of engineering and what employers are looking for in engineers. They are very influential in helping to develop resources for the College to meet its needs and to enhance its programs. I highly value their time and appreciate their willingness to support the College in numerous ways.

Finally, thanks to everyone who has supported the College this year. We appreciate alumni who encourage their employers to attend Bradley Job Fairs, hire BU students for internships, and those who support senior projects and other college activities. I especially want to thank those who have made a financial contribution—your gifts provide valuable resources for equipment and unique educational experiences that help students reach their potential. Alumni help in many ways, and I thank each of you for your support.



Jobst Hall

## Biomedical specialist is first Donald V. Fites Chair of Engineering and Technology



John C. Engdahl, PhD has been appointed as the initial holder of the Donald Fites Chair of Engineering and Technology. The Fites Chair was established to honor Donald V. Fites, former chairman/chief executive officer of Caterpillar, Inc. and chairman of Bradley University's Centennial Campaign.

Dr. Engdahl received his undergraduate and graduate training in nuclear engineering at the University of Michigan, where his primary field of study was nuclear radiation detection and measurements. His professional experience includes four years at TRW Defense and Space Systems working on spacecraft instruments, isotope separation, and defense-related projects. He spent the next 22 years working in the field of nuclear medicine for GE Medical Systems and Henry Ford Hospital. Concurrent with his tenure at Henry Ford Hospital, he

was an adjunct research scientist at the University of Michigan. He returned to the commercial world as vice president of clinical science for Sopha Medical Systems and then moved on to form his own consulting company, Applied Nuclear Imaging. Dr. Engdahl has spent the last seven years as director of advanced research for Siemens Nuclear Medicine Group. Dr. Engdahl has been involved in developing new detector technology for gamma-ray imaging, image reconstruction and processing algorithms and techniques, and the prototyping and testing of clinical applications. He holds ten issued patents and has six patent applications pending.

Dr. Engdahl's knowledge of both the clinical and business aspects of medical imaging gives him a unique perspective to convey to future engineers interested in biomedical applications. He will use his network of colleagues and collaborations in academe, business, and medicine to build new collaborations for Bradley University. He looks forward to developing strong ties to the medical and technical communities of Peoria and to working with Peoria NEXT in developing and commercializing new technology.

## 2004 AmerenCILCO Lectureship

David Carter, a materials engineer at Argonne National Laboratory, gave the 2004 AmerenCILCO Lectureship. His lecture, "The Hydrogen and Fuel Cell Economy," focused on recent events, such as the deregulation of California electric utilities, the blackout of the Northeastern US and Canada last summer, and the Middle East crisis.

These events have caused a reconsideration of how we produce energy to maintain our standard of living. Also, President Bush introduced the Hydrogen Fuel Initiative to transform the nation's dependence on imported fossil fuels to the use of hydrogen, providing for the development of hydrogen production, storage, and distribution to provide energy for cars, trucks, homes, and offices. The initiative also includes a push to develop fuel cells to efficiently convert hydrogen and oxygen directly into electricity through an electrochemical process, with the only by-product being water.

Established in 2001, the AmerenCILCO Energy-related Endowment supports a distinguished professorship within



the faculty of the College of Engineering and Technology. The focus of this individual is to bring knowledge and experience to address energy-related topics and issues

in the classroom and throughout the curriculum. D. Paul Mehta, professor of mechanical engineering, is the current distinguished professor. The CILCO Distinguished Visiting Engineer is supported under the AmerenCILCO Energy-Related Professor program. Each year a distinguished engineer from industry or academia is brought to the College for a period of interaction with students and faculty. This engineer meets with classes and faculty members to share knowledge and expertise. The visit culminates with a public presentation

by the Distinguished Visiting Engineer on a topic related to his/her area of expertise, but having broad interest across the technical community and the public in general. A publication from the presentation is distributed nationally.

A complete summary of the lecture can be found online at [www.bradley.edu/cegt](http://www.bradley.edu/cegt).

## Mechanical Engineering faculty receive Peoria NEXT grant

Drs. Julie Reyer and Martin Morris, along with Dr. Julian Lin of the University of Illinois College of Medicine at Peoria, received a \$25,000 Peoria NEXT Grant for “Development of an Electro-Mechanical Device for the Active Control of a Hydrocephalic Shunt System Using Microprocessor Control.”

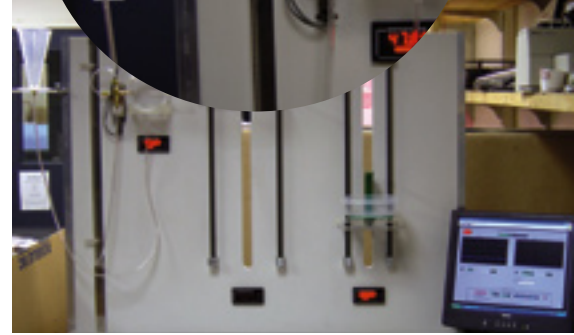
In the United States, one out of every 500 births is affected by hydrocephalus, a condition caused by an interference with the normal circulation of the cerebrospinal fluid (CSF) in the brain. Treatment includes the surgical placement of a shunt, which circumvents the blockage or diverts the excess CSF. Because of the failure rates of these shunts, patients suffering from this condition from birth usually will have undergone four shunt repairs by age 22. This is a medical problem requiring engineering methodologies. The grant is being used to modify a shunt testing apparatus with computer data acquisition developed by a 2000-01 ME senior design team.

The apparatus simulates the performance of a complete hydrocephalic shunt system in a standing or supine patient. This system has already been demonstrated to simulate *in vitro* performance of passive hydrocephalic shunt systems. The modification will include a control algorithm based

upon the results of this testing, potentially using nonlinear control theory, optimal control theory, and observer in the loop control guidelines.

The project is a step towards the overall goal of the project of designing an implantable actively controlled electro-mechanical hydrocephalic shunt system for hydrocephalus patients. Results from this study have the potential to dramatically improve system performance and completely change the approach to the treatment of hydrocephalus in all patients.

Dr. Reyer, an assistant professor of mechanical engineering, joined the faculty in 2002. She holds a BS from the University of Illinois, an ME from Carnegie Mellon University, and a PhD from the University of Michigan-Ann Arbor.



*Jim Owens, CEO of Caterpillar Inc., welcomed conference participants.*

## First international construction conference held in Peoria

“Partnering to Build a Better World” was the theme for the first International Construction Innovations Conference held in Peoria October 11-12, 2004. With a mission to introduce participants to innovative technologies and opportunities for productive alliances and global partnerships, the conference provided two full days of presentations and panel

discussion, with ample time for networking.

James Owens, CEO of Caterpillar Inc., welcomed the international group. Other distinguished presenters included S. M. AbouRizk, University of Alberta, speaking on construction productivity and simulation; Petter Berntzen, Duke Construction, on design-build; Mustafa Alshawi, editor of the *International Journal of Construction Innovation*, on construction automation; Stephen Sandherr, Associated General Contractors of America, on federal legislation affecting construction; Nick Billotti, Turner International,

on global construction; and many others.

Attendees included the former Iraqi minister of transportation, an Egyptian senator, the president of the National University of Science and Technology in Pakistan, and educators from England and Canada.

A committee of over 60 scholars and industry leaders from the US and around the world helped plan the conference. Bradley’s Center for Emerging Technologies in Infrastructure (CETI) sponsored the event. Dr. Amir Al-Khafaji is executive director of the CETI and chair of the Department of Civil Engineering and Construction.



*Dr. Amir Al-Khafaji, professor of civil engineering, (left) and Mr. Behnam Polis, former Iraqi minister of transportation, spoke at a news conference.*

## NSF grant for instrumentation and data acquisition education received

Drs. Iqbal Shareef, Jeries Abou-Hanna, and Ahmad Fakheri, in collaboration with Illinois Central College and Richland Community College, submitted a proposal to the National Science Foundation. The proposal was approved for over \$250,000 of funding for three years, starting fall 2004. The funding is used to integrate virtual instrumentation in a number of courses in mechanical engineering and industrial and manufacturing engineering as well as technology courses in the participating community colleges.

Virtual instruments are used in diverse applications, from measuring temperature to remotely testing a rover on the surface of the Mars. Virtual instrumentation combines sensors with computers and software to create custom-made systems for measurement and control. Virtual instruments replace traditional dedicated instrumentation systems by combining standard sensors, like thermocouples, pressure transducers, optical sensors, strain gages, flow meters, and accelerometers, with computers to develop powerful, sophisticated, versatile, and customized data gathering and analysis as well as process control systems. VI represents a new approach to instrumentation and data acquisition that has changed

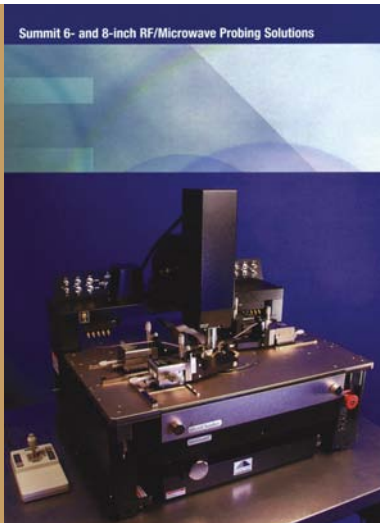
the way engineers and scientists approach measurement and automation, rapidly replacing many traditional instrumentation systems.

The investigators from the three institutions will develop experimental modules using VI to demonstrate basic concepts in their respective disciplines. These modules will be used in experimentation courses in Industrial and Manufacturing Engineering and Technology and Mechanical Engineering. The developed modules will be shared among the partners to use in courses that currently may not have a hands-on component. The curricular enhancement has already begun.

Dr. Shareef joined the Bradley faculty in 1984 and is a professor of manufacturing engineering. He holds BS and MS degrees from Osmania University in India and a PhD from the Illinois Institute of Technology.

Dr. Abou-Hanna, a professor of mechanical engineering, joined the Bradley faculty in 1986. He holds BS, MS, and PhD degrees from the University of Alabama.

Dr. Fakheri, a professor of mechanical engineering, joined the faculty in 1985. He holds BS, MS, and PhD degrees from the University of Illinois, Urbana-Champaign.



microwave laboratory. The funds have been used to purchase a state-of-the-art microwave network analyzer and wafer probe station, which are housed in newly renovated space in Jobst Hall.

## Electrical and Computer Engineering receives NSF grant

The Department of Electrical and Computer Engineering has received a \$270,000 grant from the National Science Foundation under the Major Research Instrumentation Program. Dr. Prasad Shastry and Dr. Brian D. Huggins submitted the proposal to establish an advanced

The new lab will enhance the capability to provide advanced research and design experience in radio frequency and microwave engineering, expand the scope of projects and partnerships with industry, strengthen Bradley's position to seek research funding from industry and government agencies, help attract and train students in the critical areas of RF and microwave engineering, and enrich the microwave engineering curriculum and education at Bradley.

Dr. Shastry joined the Bradley faculty in 1991 and is a professor of electrical and computer engineering. He holds a BS degree from Bangalore University, MS and PhD degrees from the Indian Institute of Technology, and a PDF from the University of Wisconsin-Madison.

Dr. Huggins joined the Bradley faculty in 1978 and is an associate professor of electrical and computer engineering and also serves as department chair. He holds BSEE, MSEE, and PhD degrees from the University of Wisconsin.

**Visit the College of Engineering & Technology  
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## Faculty honored for teaching, research, and scholarship

The College of Engineering and Technology annual faculty awards winners for Excellence in Teaching, Research and Scholarship, and Service were announced at the CEGT Engineering/Banquet.

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Banquet.



### Fred Edwin Dace Award for Excellence in Teaching and Learning

#### Dr. Gary Dempsey, associate professor of electrical and computer engineering

Dr. Dempsey was honored for the high teaching evaluations he received in his two undergraduate courses in control theory and his graduate course in neural networks. He also supervised two senior projects, two independent graduate projects, one MSEE Design Project and one MSEE Thesis. Dr. Dempsey also completed three lecture workbooks of approximately 720 pages each that are used in place of textbooks for the three courses he taught. Approximately half of all the senior projects that Dr. Dempsey has supervised have resulted in refereed conference papers, including two conference papers and one journal article based on 2002-2003 senior projects. Dr. Dempsey joined the Bradley faculty in 1992. He holds BS and MS degrees from the University of North Carolina at Charlotte and a PhD from the University of Virginia.



Morris's research has led to a better understanding of the fluid dynamic performance of the shunt system. His work has been reported in the *Journal of Neurosurgery* and as an invited paper at the 2003 Peoria NEXT Discovery Forum. This work has resulted in a new benchmark for the testing and development of new shunt systems and methodologies. The current focus is to develop active control shunt systems that could lead to improved operating modes and ultimately to reduced malfunctions. Dr. Morris joined the Bradley faculty in 1997 after 10 years work experience with McDonnell-Douglas (now Boeing). He holds a BSME and MSME from Bradley University and a PhD from the University of Illinois.

### John Andrews Award for Excellence in Service

#### Dr. Oleg Malinowski, assistant professor of electrical and computer engineering

Dr. Malinowski was honored for his service to IEEE, the Institute of Electrical and Electronics Engineers. He developed the web page for the IEEE Industrial Electronics Society. From this activity, his involvement in the national organization developed to include major responsibility for the annual IEEE Industrial Electronics technical conference and service as editor of the IES newsletter. His service as conference co-chair included the development of an online system for submitting papers and securing reviews from referees for papers for multiple conferences, some having as many as 700 papers. In 2003, he received The IEEE Industrial Electronics Society Anthony J. Hornfeck Service Award for his outstanding service to the professional society. Dr. Malinowski joined the Bradley faculty in 1998. He holds BS and MS degrees from the Technical University of Gdansk in Poland and a PhD from the University of Louisville.



### Faculty Award for Excellence in Research and Scholarship

#### Dr. Martin Morris, professor of mechanical engineering

Dr. Morris was honored for his research efforts that have led to improving treatment of hydrocephalus, a medical condition that is caused by interference with the normal circulation

of the cerebrospinal fluid and is often the result of trauma, disease, and/or congenital diseases. The ventriculoperitoneal shunt is currently the most commonly used treatment; however, the medical community estimates that 34% of shunts fail within the first 12 months and 80% fail within 12 years. Dr.





*BEST/STEPS participants got hands-on experience.*

## Bradley hosts BEST/STEPS Camp

Seventy-three incoming ninth and tenth graders were on campus June 20-26 for the second BEST/STEPS (Bradley Engineering Students for Tomorrow/Science, Technology and Engineering Preview

Summer) Camp hosted by the

College of Engineering and Technology. BEST/STEPS camp is an immersion into the exciting world of technology and engineering. Students participate in hands-on experiences with sophisticated engineering equipment and processes. They learn what engineers do, how they contribute to their communities, and how math and science are used to create products and solve problems. The camp exposes students to technical career opportunities early enough to influence their choices of math, science, and technical courses in high school. Supported by a grant from the Society of Manufacturing Engineers Education Foundation, the camp also enjoys strong support from Caterpillar Inc. personnel.

Most participants are from groups traditionally underrepresented in engineering. The 2004 camp built on the 2003 camp in using elements of the Mechanical Engineering Department's junior-level laboratory class, in which the students built and launched a rocket as the foundation of the camp's curriculum. The camp focuses on the use of math, science, and engineering processes to predict the trajectory of a rocket



*BEST/STEPS participant (left) watches a rocket launch with Professors Julie Reyer and Richard Deller.*

with the objective of traveling through a goal post on the football field. The camp culminates on Launch Day, when parents and invited guests join camp participants at the football stadium. Based on calculations for their rocket, each student selects the yard line and trajectory angle for launching his or her rocket and then launches the rocket for the very first time in attempting to score a field goal!

## Engineers for Tomorrow update

The College has initiated a program to develop a technical workforce from constituent communities through scholarship support and work experience for college-bound students from a community. Each community establishes its own coordination and support structure with some collaboration of industry, community college, school system, and other interested local entities. The student is responsible for one-third of the cost of tuition at Bradley, industry and the community are required to support one-third of the cost of tuition, and Bradley will provide the appropriate financial aid for the last third of the tuition cost. It is anticipated that a large

percentage of program graduates will return to their home community to join the technical workforce.

This program began in 2002 and has six students enrolled for this academic year. The Moline Foundation, Danville Chamber of Commerce, and Caterpillar Inc. sponsor these students. In 2005, the program should have 12 students enrolled, with the additional students sponsored by Caterpillar Inc., the Galesburg Chamber of Commerce, the Sterling Development Corporation, and Advanced Technology Services in Peoria. For more information, or to become involved in the program, please visit [www.bradley.edu/cegt](http://www.bradley.edu/cegt).

## Society of Women Engineers (SWE) grows by leaps and bounds

Bradley University's SWE Chapter has made great strides in the past two years. SWE is a stronger and larger chapter offering services to all female engineering students. The organization is currently seeking mentors. Alumni interested in mentoring female engineering students should contact the Dean's office at (309) 677-2720 for more information or to volunteer.



## Klasing receives Harper Heritage Award

The Chicago Area Bradley Alumni Chapter presented its first Harper Heritage Award to Wayne Klasing BSIE '64. The Harper Heritage Award recognizes a donor whose contributions significantly benefit the lives of Bradley students.

The award is named for Dr. William Rainey Harper, president of the University of Chicago and Bradley's first president, who organized the first Bradley Chicago alumni chapter in 1904.

Wayne has served on the College of Engineering and Technology Executive Advisory Council and assists with the Engineers for Tomorrow Program (*see page 6.*) In 2002, he established the College of Engineering Endowed Excellence Fund to provide support for academic programs for years to come.

## Bradley honors CEGT alumni on Founder's Day 2004

Bradley University honored four College of Engineering and Technology alumni on Founder's Day, October 28, 2004.



**Ralph W. Grandle BSIE '58** was inducted into the Bradley Centurion Society. The Centurion Society honors alumni who have become national or international leaders in their field and recognizes them for achievements in business, public life, and their professions. Grandle, president of Tricon Industries, Inc., is a former member of the Bradley University Board of Trustees and of the Bradley Council. He is past president of the Bradley Parents Association Board and a former member of the Bradley University Alumni Association. He has also served as a member of the American Society for Quality Control; Good Samaritan Hospital Governing Council; American Institute of Industrial Engineering; Indian Boundary YMCA; and Love Christian Clearing House.

*Grandle*

**Dru A. Neikirk BSEET '88** was recognized with the 2004 BU Alumni Association's Outstanding

Young Graduate Award. He is principal of MRE Consulting, an information technology and management consulting firm based in Houston, Texas. In 1992 he launched Quality Consulting Services (QCS), an information systems consulting business. In 1998, he merged QCS with MRE. Now employing more than 100 people, MRE recently formed Anadarko Industries to focus on government sector services. Neikirk has funded both an annual and an endowed scholarship at Bradley and is an active volunteer for the United Way, Special Olympics, and Child Advocates.

**Rajesh Soin MSIE '71** was inducted into the Centurion Society and received the Distinguished Alumni Award. Soin, chairman, president, and CEO of Soin International, began his career with Firestone Tire and Rubber Company. In 1984, he and his wife founded Modern Technologies Corporation (MTC), which quickly became an incubator that spawned numerous businesses in a variety of industries. Soin founded the Ohio-India Project that includes the Ghandi House, a transitional house for women in need, and the annual Day of Caring. In August 2000, Wright State University's Raj Soin College of Business became the first college in the country to be named for an Asian Indian. He is the primary contributor and driving force behind Sukh Dev Raj Soin Hospital in India, built in memory of his father.

**John H. Winzeler, Jr. BSME '65** received the 2004 Lydia Moss Bradley Award for outstanding commitment and

service to Bradley. President of Winzeler Gear, he is a founding member of the Mechanical Engineering Alumni Advisory Council. He has funded two graduate assistantships in partnership with Dupont, provided equipment and materials to BEST/STEPS summer camp students (*see page 6*), and helped fund the Formula SAE and Mini-Baja senior projects. His involvement in these projects has become the basis for an ongoing, externally funded research program involving students and faculty that brings Bradley international exposure in the gear manufacturing community. He is a member of the permanent collection committee at the Chicago Museum of Contemporary Art and is past president of the Tooling and Manufacturing Association.



*Left to right, Soin, Winzeler, and Neikirk*

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**Send to:** Shelly Smith, Bradley University, 1501 W. Bradley Ave., Peoria, IL 61625