

Computer Science Merging with Electrical and Computer Engineering Department

The new Min Kao Electrical and Computer Engineering Building will now be home to a re-named and re-invigorated department: the Department of Electrical Engineering and Computer Science (EECS).

The merger of the Department of Electrical and Computer Engineering (ECE) and the Department of Computer Science (CS) was announced by UT Provost Robert Holub November 17, 2006. The joining of the two departments will be official July 1, 2007.

"We have a task force working right now to finalize details of the merger," said Dr. Samir El-Ghazaly, professor and head of the ECE department. "We are reviewing staffing, budget and administrative issues in order to work out the best arrangement for both departments. We will find a way to realize the benefits of the merger."

Dr. Jack Dongarra, a University Distinguished professor in the Department of Computer Science and the Director of the Innovative Computing Laboratory and the Center for Information Technology Research at UT, sees the merger as part of a nationwide trend.

"Most of the influential universities in the U.S. have a joint electrical engineering-computer science department," said Dongarra. "The combined department will be twice as large, and we will be able to have a broader depth of material available for teaching. We will also be able to offer more accessibility to students in the way of lab facilities and computing areas."

"Recent developments in computations, plus other initiatives going on at UT and ORNL show a strong bent toward this field. There is a particular emphasis on computing right now, since computers are part of most consumer products, from watches to television sets to automobiles. The emphasis is important," El-Ghazaly added.

Discussions are currently underway regarding a joint major combining academic components from both departments, Dongarra said.

The ECE department also enhanced the college's computing research partnership with ORNL by naming Dr. Thomas Zacharia, Director of the Joint Institute for Computational Sciences (JICS) as a full professor in the department. The JICS functions in tandem with ORNL's terascale computer laboratories, and is home to the Cray XT3, known as "Jaguar," currently listed as the 10th fastest computer in the world.

"We anticipate the merger will strengthen and enhance the UT-ORNL collaboration efforts in the computer and computations area," said El-Ghazaly.

A national search is also underway for a new head for the merged department.

Engineering Energy for a Better Environment

The term "global climate change" has made its way from headlines to classrooms as more and more professors turn toward their research fields to contribute answers to the global energy problem.

"It is scientifically proven, without a doubt, that global warming is a fact and human activity plays a role," said Dr. Loren Crabtree, chancellor of the University of Tennessee, Knoxville. "The question now is how do we deal with population, energy and the environment?"

Plant, housed within the Department of Mechanical, Aerospace and Biomedical Engineering (MABE). The project started in 2004 during UT's Environmental Semester, in which the university facilitated a grant competition for environmentally-related projects. John Miller, mechanical engineering master's student from the UT chapter of the Society of Automotive Engineers (SAE), won the competition with a proposal for an on-campus biodiesel production plant. After Miller graduated, the project lost steam until



Mechanical engineering senior Scott Curran (right) looks on as Dr. Loren Crabtree (left) pours biodiesel produced by the student-led UT Biodiesel project. The demonstration was part of last September's "Make Orange Green Week," which was developed to showcase environmental efforts on the Knoxville campus.

Professors, students and researchers in the College of Engineering (COE) are addressing these same questions as they apply engineering technologies to sustainable solutions in an effort to improve energy efficiency, production and consumption.

"The significant issue is the impact of energy production on the environment," said Dr. Wayne Davis, COE associate dean for research and technology. "Our insatiable desire to utilize gasoline causes a dependence on petrol-based fuels, which increases our dependence on foreign oil. As a result, the Department of Energy (DOE), various funding agencies and the federal government are looking at alternative energy sources, particularly alternative fuel sources in the transportation sector."

One initiative in the college that has received significant attention in the past year is the UT Biodiesel Pilot Production

Scott Curran and Sean Peterson, seniors in mechanical engineering, decided to take the \$10,000 grant and get to work building a test production plant.

Now, three years later, the UT biodiesel plant is in the middle of its first full-scale production batch and swimming in media attention for the innovative project. Kicking off the "Make Orange Green Week" last fall, Curran and Peterson unveiled the production plant and their plans to collect waste vegetable oil from UT Dining Services to convert into biodiesel for UT Facilities vehicles.

"The process is very slow right now," said Curran. "We will probably get 30 gallons of usable biodiesel from 40 gallons of waste vegetable oil." A reaction between vegetable oil, methanol and lye, similar to making soap, produces biodiesel. During the reaction, oil separates into glycerin and methyl esters, or

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From the Dean's Desk



Welcome to the Spring 2007 edition of *Tennessee Engineer*.

Our theme for this issue is the environment, and we are very excited about updating you on the ways in which both

the college and the university are discovering new methods to help enhance air and water quality, researching alternative forms of energy and determining ways to make our campus more environmentally friendly.

We are already utilizing current design and construction techniques to ensure that our new Min Kao Electrical Engineering and Computer Science Building is designated as a *green building*. UT Chancellor Loren Crabtree outlines other plans for the university's

Green Building Initiative in an article on page 5.

It is our hope that, with the construction of the new electrical and computer engineering building, Estabrook Hall and the Joint Institute for Advanced Materials (JIAM), the college can continue our progress toward improving and updating our laboratory and classroom facilities and offering our faculty and students more advanced study and research environments.

The Min Kao building will house the new Department of Electrical Engineering and Computer Science, created by a merger of the Department of Electrical and Computer Engineering and the Department of Computer Science. The official union of the two departments will take place July 1, 2007. For more information about this exciting new initiative, please see the article on page 1.

The college did receive good news in early November when an anonymous donor pledged \$50 million, the largest personal gift in UT history, to the university with the designation of that half of the gift be targeted to specific initiatives in Veterinary Medicine and the College of Engineering. The other half of the funding is to be designated for intercollegiate athletics, including the renovation of Neyland Stadium.

We are deeply grateful to the donors of this wonderful gift, and we plan to show our good stewardship by using these funds, as well as those from Dr. Min Kao and other generous supporters, to continue striving toward our goal to be one of the best engineering colleges in the nation.

We hope that you find this issue to be both interesting and informative. Please direct your comments to coe@utk.edu.

Way Kuo
Dean of Engineering and
University Distinguished Professor

Engineering Energy

Continued from page 1

biodiesel. Once the reaction is complete, glycerin is drained off and the biodiesel is washed. When burned in diesel vehicles, biodiesel reduces the emission of harmful pollutants such as carbon monoxide, particulate matter, hydrocarbons and sulfur oxides in the air. Currently, no facility vehicles are running off biodiesel.

"We made an agreement with Facilities Services that we'd wait until we can test a sample of biodiesel that meets the required standards," said Curran. "We'd hate for them to get a bad taste in their mouth because of a bad batch of biodiesel, but we're on track to deliver some fuel to them by the end of the semester."

This year, students in mechanical engineering had the opportunity to learn more about biodiesel through a special topics class on biodiesel production and application. "The class is reading and writing intensive with a final paper on applications of biodiesel," said Curran. "Our focus is on sustainability and quality of biodiesel."

Curran and Peterson have had help along the way from COE alum Jonathan Overly, coordinator of the East Tennessee Clean Fuels Coalition (ETCFC), part of the DOE Clean Cities Program "designed to advance the nation's economic, environmental and energy security by supporting local decisions to adopt practices that contribute to the reduction of petroleum consumption," according to its website.

"UT's College of Engineering already has a track record with alternative fuels. The biodiesel project is a natural extension," said Overly. "Dean Kuo's goal is to give students the opportunity to leave here with experience. More collaboration and research sets the stage for UT to become a nationally recognized university as one of the players to move the frontier forward. Heads of research for the entire university see this and are supportive in trying to see where bioenergy and biofuels can fill its potential partnerships across the departments."

Recognizing the need for energy independence and sustainability is an important first step in reduction of global energy consumption. Improving energy efficiency is important in all facets of energy consumption in the United States, including vehicles, residential and commercial buildings.

"Numerous sources of energy exist, from solar to wind, to nuclear and biofuels such as ethanol and biodiesel," said Davis. "We need reduce our dependency on foreign oil and reduce our emissions of CO₂. If we succeed in developing and utilizing these alternative energy/fuel sources, then we have the potential to reduce the impact of global warming."

—Story by Amanda Womac

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Dr. David Keffer—Forging the Future of Fuel Cell Technology

On the sixth floor of Dougherty Engineering Building, Dr. David Keffer, associate professor in the Department of Chemical Engineering, sits among piles of papers, books and files working on alternative ways of generating power. With drawings by his four-year-old daughter hanging on the walls of his office, Keffer is reminded of the need for alternative energy for the future generations.

"The idea here is that it doesn't matter if you're generating energy for power plants, your home or car, all these processes create CO₂ and contribute to the main cause of global warming," said Keffer. "We need to find alternative ways of generating power, and relevant to this theme of sustainable energy research being done in the college is the work we're doing with fuel cells."

Along with Dr. Brian Edwards, associate professor of chemical engineering, Keffer leads the Computation Materials Research Group, a group of students, professors and researchers who use computational tools to further understand the relationship between the molecular structure of a material and its effect on macroscopic properties and processability. One project Keffer is working on with seven other researchers is understanding the molecular structure of fuels cells.

"Fuel cells are the alternative for power generation," said Keffer. "We need to make them economically viable, which requires new material development."

In a fuel cell, hydrogen enters and is split into protons and electrons by a platinum catalyst. The electrons are carried off to do electrical work, but the protons have to complete the circuit by being transported through a membrane separating the electrodes. This is where Keffer comes in.

"Researchers do not fundamentally understand how the proton gets from this catalyst particle into the membrane, and if you don't understand that, you can't model it," said Keffer. "Our contract with the Department of Energy is to understand this question that has been out there for 40 years or more as to how the proton moves through the electrode-electrolyte interface."

In order to understand this process, Keffer and the research team have created a computer model membrane at the molecular level to look at the nanostructures that form.

"We want to see how the water wets the electrode, which gives us some idea of which

of these catalyst particles can contribute to the overall power generation of the fuel cell," said Keffer. "We're in year two of the project and making good progress."

According to Keffer, the research team has a strong indication as to what is going on inside the membrane and published some results, but want to have things nailed down unambiguously before all results are published.

"If we can fully understand this procedure, it will lead to improved fuel cell membrane electrode assembly designs," said Keffer.



Dr. David Keffer is investigating the molecular structure of fuel cells in order to produce more efficient energy sources for the future.

Keffer has always had a natural affinity for chemistry, but was undecided on a major when he first went to school at the University of Florida, so he took courses in both chemical engineering and materials science.

"What appealed to me about chemical engineering is that it has a very mathematically rigorous foundation," said Keffer. "When you want to describe a system from a chemical engineering point of view, you don't have to rely on intuition. You can instead rely on a methodical procedure with well-established, physically rigorous rules. If you are faithful to it, it can lead to the solution you're looking for. This is the hallmark of chemical engineering."

After three summer internships in industry, Keffer decided to be a professor.

"It became clear that I wanted to use more of my engineering training than it appeared I was going to use with a bachelor's degree in engineering," said Keffer. "There are several universities that have a reputation for producing faculty in chemical engineering, and Minnesota is one of them."

After completing his Ph.D. work at the University of Minnesota in 1996, Keffer moved to Washington, D.C., where he did his post-doctorate work in the Theoretical Chemistry group at the Naval Research Lab. He moved to Knoxville, Tenn., in 1998 as an assistant professor at UT and is now in his tenth year in the Department of Chemical Engineering.

Although chemical engineering is his life's work, Keffer enjoys delving into the world of literature every once in a while.

"I was always interested in literature and took lots of courses in literature and creative writing at Florida," said Keffer. "I have pretty diverse literary interests, but mostly I'm interested in post-modernism."

Keffer's focus on authors with scientific training, the post-modern elements of their writing and how science played a role in their writing led Dean Edie Lawler from Drew University, a small liberal arts college in New Jersey, to invite him to speak to her freshman class.

"I published an article about Primo Levi on a post-modern literature website in 2001," said Keffer. "Someone from the university saw it and asked me to give a presentation on the role of chemistry in Levi's literature." (www.themodernword.com)

Keffer met his wife, Lynn, in 1993 when they were both students at the University of Minnesota. They were married in 2001 and have two children, Ruth, who is four, and Joseph, who is one-year-old. Keffer and his family live in South Knoxville, from where Keffer happily bikes into work on a regular basis.

Keffer's research through the Computation Materials Research Group contributes to a problem looked at by scientists and engineers for generations, which when solved, will improve energy consumption and sustainability for generations to come.

"Our research is a complimentary technique," said Keffer. "Through simulations, we can provide information alongside experiments, which enhance the understanding of fuel cells on the molecular level and mediate the effect humanity has on the environment."

—Story by Amanda Womac

Co-Op Assignments Lead to National Recognition for Outstanding CEE Student

The Cooperative Education Division (CED) of the American Society for Engineering Education (ASEE) recently recognized University of Tennessee civil engineering senior Joey Barbeauld as a 2006 National Co-op of the Year finalist for his work through the Office of Professional Practice (OPP).

"Let me just say that Joey is highly touted," said Mr. Walter Odom, OPP Director. "He started his work here in 2004 with high academic standards, 4.0 GPA all the way through and exceptional entrance scores, but the biggest thing that transpired with Joey was his maturity."

Founded in 1893, the ASEE is a nonprofit organization comprised of individuals and institutions committed to furthering education in engineering by enhancing professional opportunities for engineering students through cooperative education. Each year, employers and co-op representatives nominate students for the National Co-op of the Year Award, which provides the winning student with cash and national recognition at the annual CED Conference.

"Every major engineering program in the United States is involved with ASEE and every major co-op program in engineering is involved with CED," said Odom.

Cooperative education is an important component of an engineering education at UT. During his freshman year, Barbeauld learned about internship opportunities through the co-op office. As he finishes his senior year, Barbeauld is not stressed about finding a job, thanks to the OPP.

Barbeauld co-oped with the EMJ Corporation in Chattanooga, Tenn., where he worked with superintendents on job sites and saw first-hand how buildings were structured. The focus on project management appealed to



Civil engineering senior Joey Barbeauld is congratulated for his achievements by (seated) CEE Department Head Greg Reed, (standing left to right) OPP Director Walter Odom, Assistant Dean of Student Affairs Masood Parang and Dean Way Kuo.

Barbeauld, and after graduating this May, he will return to Chattanooga and begin working with EMJ.

"Joey is an outstanding student and employee. We are very proud of his accomplishments inside and outside the classroom and consider it an honor to have him on our team," said Doug Martin, Vice President of Construction Operations at EMJ Corporation. "We've had some outstanding UT students co-op, and several have come to work with us after they have graduated. We have been very impressed by the students at UT and look forward to interacting with them in the future."

When Barbeauld first came to the University of Tennessee from Chattanooga, he wanted to be an architect or a musician.

"When I applied to the architecture school, I realized it was more 'artsy' and not for me," said Barbeauld. "That's when I looked into civil engineering, and I've liked it ever since."

Organizational skills helped Barbeauld throughout his undergraduate career.

"Time management is about getting involved in the things you really like to do and not so much getting involved in so many things you can't make time for all them," said Barbeauld, who managed his time well by balancing his engineering studies with band practice, membership in Phi Mu Alpha and representing the co-op office as an Ambassador.

"As an Ambassador, the commitment you must exude is one of helping other students in engineering make the transition," said Odom. "Our focus is retention. The quest is not just to get them here, the quest is to see them through, and it takes people like Joey to help them get through."

—Story by Amanda Womac

Engineers Building Corporate Career Paths with UT's Executive MBA Program

During the past two decades, the field of engineering has become increasingly business-oriented, and individuals who develop strong financial acumen and business capabilities to go along with their technical skills are the high achievers in today's corporate world.

The UT College of Business Administration (CBA) now offers three executive Master of Business Administration programs specifically designed for engineering graduates working full-time.

The Executive MBA (EMBA) program is an internationally ranked, fully accredited MBA degree program where students can graduate in only 12 months. The program includes a 14-day international residency focused on global business in developing economies.



Dan Cochran

Dan Cochran, who received his bachelor's degree in electrical engineering and a master's in applied behavioral science from UT, returned to campus for the EMBA program after working for the Alcoa Company for 24 years. In addition to enhancing Cochran's knowledge of economics, business planning and manufacturing concepts, his group also traveled to Hong Kong, Singapore and Malaysia to study finance and manufacturing methods in other countries.

"The program has really met my expectations and then some," said Cochran, who graduated in December 2005.

The CBA also offers the Professional MBA (ProMBA) program, a 16-month weekend program for managers in the Knoxville region. A concentrated, integrated and thorough program for business professionals, with

classes meeting three Saturdays each month and additional interactive, live distance-learning sessions on Tuesday evenings, the program provides solid concepts in economics and manufacturing. An optional international experience is also available.

ProMBA offered Bill Fulghum, a UT graduate with a master's degree in civil engineering, an opportunity to gain a new perspective on managing his engineering firm.

Fulghum was not only able to study companies such as Toyota, but also was able to learn from fellow students. "The sharing of knowledge was invaluable to me," Fulghum said.



Bill Fulghum

The Aerospace MBA (AMBA), a residence-based, 12-month program, is an aerospace-focused program that teaches the business of aerospace and is the first program of its type in the United States. Students participate in five, nine-day, on-campus residence periods and a sixth residence period in Europe.

The AMBA fosters an exceptional learning environment, said Shane Green, a former engineer at Teledyne Technologies. "The faculty was very top-notch. All had experience in the aerospace industry, so they understood the student's perspective," Green added.

The UT executive MBA programs have been recognized as a "best buy" by *Business Week* magazine and currently rank number 23 in the United States by the *Financial Times*.

For more information on the programs, visit <http://EMBA.utk.edu>.

COE Construction Projects Leading the Way for UT's Green Building Initiative

The stage is set for the groundbreaking of the new Min Kao Electrical Engineering and Computer Science Building, to take place Monday, May 14, 2007.

The 150,000 square foot building will be located beside Dougherty Hall, on the corner of Estabrook Drive and Cumberland Avenue, directly across from the 11th Street Parking Garage.

"We are planning for the site preparations to begin in the summer," said Wayne Davis, associate dean for research and technology. "The architectural design is almost completed, after which the university will seek bids for the construction contract. We're hoping the actual construction of the building will be completed within two and a half years, with occupancy in late summer to fall of 2009."

In addition to housing classrooms, laboratories, a state of the art clean room and a 2,500 square foot auditorium, the facility will also be constructed to function as an environmentally-friendly structure. UT administrators are encouraging similar design and construction techniques, referred to as *green building*, for several of the university's upcoming capital projects.

"The Min Kao Electrical Engineering and Computer Science Building is one of the first projects that we have tasked the architects to design for LEED certification. Using environmentally sound materials, siting the building to make best use of natural lighting and using indoor lighting that is both cost and energy efficient results in a *green building*," said UTK Chancellor Dr. Loren Crabtree.

Crabtree is enthusiastic about the green building initiative and expects that future projects will follow the College of Engineering's direction in developing energy-efficient buildings.

"The engineering college leads the way," Crabtree added. "It all fits in with what engineering is doing with alternative fuels, wind power, the biofuels initiative—all of these are ways to conserve energy."

UT is currently in the beginning stages to construct the first new residence hall since the 1970s. Crabtree said the administration is planning to have this facility built as a LEED-certified green building as well.

The university has also employed a portion of the Facilities Fee for a Student Environmental Initiative to purchase 3,000 additional blocks of green power from the TVA/Knoxville Utilities Board Green Power Switch Program (375 blocks were previously purchased on an annual basis



The 150,000 sq. ft. Min Kao Electrical Engineering and Computer Science Building will be one of the first projects on the Knoxville campus designed to meet LEED certification requirements for energy efficiency and environmental friendliness.

by the university). The 3,375 blocks amount to 506,250 KWh/month and offsets approximately 382 tons of CO₂, SO₂ and NO_x each month and is the equivalent of removing 732 cars from the road. The purchase is about 2.6 percent of the university's annual electricity use and is sufficient to allow the Knoxville campus to become an EPA Green Power Partner.

Another project in the spring of 2006, funded jointly by the Facilities Fee, University Housing and Facilities Services, allowed students in UT housing facilities to swap 60 watt incandescent bulbs they were using in their desk lamps for compact fluorescent bulbs. Almost 2,000 bulbs were swapped, resulting in over \$4,000/semester in electrical savings and over 100,000 pounds of air emissions savings per semester.

Crabtree is pleased that students, faculty, staff and administrators are all supportive of the university's goal to move forward with energy-saving initiatives.

"The UT campus administration plans to make all future buildings LEED-certified and environmentally friendly, from the new residence hall to the renovation of Estabrook and the construction of new academic buildings and the Joint Institute for Advanced Materials Science," said Crabtree.

Architectural planning/design for the Estabrook renovation is also progressing, Davis added. The project has been delayed by difficulties in the renovation of the Hesler Biology Building Phase 2. However, it is expected that a new contractor for Hesler Phase 2 will be in place by early summer. Once Hesler is completed, faculty and staff from the biology department will move back in from the current location in the Biology

Annexes on White Avenue and Neyland Drive, freeing these facilities up for the temporary relocation of engineering faculty and staff currently located in Estabrook and Berry Hall. The current schedule will provide for construction of the renovated Estabrook to begin in early 2009 with completion two years later. The Department of Civil and Environmental Engineering (CEE) will be housed in the renovated Estabrook.

Plans are also progressing on identifying the location of the new \$30 million Joint Institute for Advanced Materials (JIAM) building. The most likely site is Cherokee Farms located on Alcoa Highway (current site of the UT dairy barns). The recent budget submitted by Governor Phil Bredesen has proposed \$32 million to develop the proposed infrastructure on the site near the main Knoxville campus as an academic training and research location in advanced sciences, but final approval on funding must come from the Tennessee State Legislature. JIAM will be the first building to be constructed on the new Cherokee Campus.

In other COE facility-related news, plans are for the Department of Industrial and Information Engineering (IIE) to move into temporary quarters in Dunford Hall in July/August. The department has been located in the East Stadium Hall annex of Neyland Stadium, and ongoing construction for the remodeling of the stadium as well as problems with accessibility have necessitated the move. The IIE department will eventually move into Perkins Hall once the CEE department is relocated into the renovated Estabrook.

"These are exciting times for the university, with so many opportunities to upgrade our current buildings and construct new ones," Crabtree added. "We must plan carefully to provide facilities that are efficient, attractive and environmentally friendly for the future of our campus."

—Story by Kim Cowart

"We must plan carefully to provide facilities that are efficient, attractive and environmentally friendly for the future of our campus."

—Dr. Loren Crabtree

"Using environmentally sound materials, siting the building to make best use of natural lighting, and using indoor lighting that is both cost and energy efficient results in a green building."

—Dr. Loren Crabtree

RESEARCH *initiatives*

Departments Focus on Environmental Research Challenges with Global Consequences

CHEMICAL ENGINEERING

When Dr. Paul Frymier talks about his research on energy and sustainability, his face lights up.

"I always tell students we're working on saving the planet," said Frymier, associate professor in the Department of Chemical Engineering (ChE).

Through an Environmental Protection Agency (EPA)-funded award competition, Frymier has the opportunity to learn more about a question that has been on his mind for 20 years—is there any way to produce energy sustainably? The Annual P3 (People, Prosperity and the Planet) Award competition was launched in 2004 as a response to challenges of the developed and developing world in moving toward sustainability. This national competition enables college students to research, develop and design scientific, technical and policy solutions to sustainability challenges. Drs. Robert "Pete" Counce and Barry Bruce are collaborating with Frymier on this project.

"What we proposed was a design study to determine if you could produce hydrogen sustainably using algae, how much land area would that consume, what would the price of the hydrogen be and how would that compare to the current price we pay for gasoline," said Frymier. "We want to address two big questions - can you generate more transportation energy in the form of hydrogen than the power required to operate the equipment needed to produce it; and, if so, what is the net energy recovered?"

Concerns about oil shortages also fuel his research.

"We are doing the most wasteful thing," said Frymier on the subject of petroleum. "It's like someone gave you diamonds and you crushed them up and used them for sandpaper. We're taking this valuable resource that took over millions of years to form and burning it to go back and forth from work every day. It's crazy! We're going to have to start thinking differently about how we make transportation fuels. We can't make them like we are now."

In addition to his EPA grant, Frymier received the Scholarly Activity and Research Incentive Funds (SARIF), a collection of small programs that provide specific support for faculty at UT. With this funding, Frymier continues his research looking at alternatives, using live algae for hydrogen production by taking cell parts out and embedding them in synthetic membranes, making what are essentially organic photovoltaic membranes.



Dr. Paul Frymier (right) and graduate assistant Mehrsa Raeiszadeh (left) are investigating production of hydrogen from algae, which may ultimately be used in hydrogen-powered vehicles.

side. At the risk of oversimplifying the whole cell work, we're basically making the algae upset so they burp hydrogen. With the membrane work, we hope to make the process more efficient by using only the parts of the algae we need."

Frymier was also recently chosen for the Joint Directed Research and Development Program (JDRD), a joint UT and Oak Ridge National Laboratory (ORNL) collaborative research venture that supports innovative new ideas, concepts or device development at the forefront of science and technology. With his collaborator, Dr. John Sanseverino, Frymier looks at different mi-

"On one side of a synthetic membrane, you can split water into oxygen and protons and allow the protons to diffuse across the membrane," said Frymier. "In this process, four protons for each molecule of molecular oxygen can be recombined to make molecular hydrogen with a hydrogenase enzyme on the other

crobial cell types to make electricity or hydrogen from organic carbon-based fuels in microbial fuel cells.

"I hope the college can capture some of the resources expended at the national level and really gain the reputation for doing this kind of work," said Frymier about future research on energy in COE. "If global warming actually ends up being a serious problem, it ultimately may not be survivable, so I hope there is a moderate level of activity in the college until the problem is, at least in theory, solved."

ELECTRICAL AND COMPUTER ENGINEERING

On the application side of hydrogen research is Dr. Leon Tolbert, associate professor in the Department of Electrical and Computer Engineering (ECE), whose research is focused in two areas: hybrid electric vehicles and distributed energy resources.

Funded by FreedomCAR, a U.S. Department of Energy (DOE) program focused on developing more energy efficient and environmentally friendly highway transportation technologies, Tolbert's research involves working on power electronics and electric machinery for the drive train in hybrid electric vehicles. Tolbert's main goal is to move to hydrogen-powered vehicles in order to reduce dependence on gasoline-powered vehicles, but his interim goal is to work on hybrid-electric vehicles using a conventional gasoline powered engine and combining it with electric motor and power electronics.



Dr. Leon Tolbert (left) and student Hui Zhang (right) are working with new silicon carbide materials to develop advanced power converter systems.

"As engineers, we always have to have an eye on economic issues," said Tolbert. "We need to bring the price down [on hybrid vehicles] so we're working on trying to make smaller, lighter, cheaper and more reliable power electronics for hybrid electric vehicles."

Tolbert also works on distributed energy resources, such as solar cells, wind power, fuel cells, microturbines and diesel generator sets, and their interface with the utility grid. Again, the question he seeks to answer is how to make these energy resources more economically competitive.

"Most alternative energy sources are still more expensive than conventional sources such as coal or nuclear, which can produce power at two to three cents per kilowatt hour, whereas solar power is roughly 15 cents per kilowatt hour and wind is down to about five cents," said Tolbert, who works with researchers at ORNL to design a cheaper power electronics interface that is able to work for several different energy sources.

"It's all about economics, and even though we want to take an environmental point of view on installing these things, they really need to be economically competitive," said Tolbert. "My research now is about applying what I know to areas I really think can help us conserve our natural resources and make the world a better place."

Students also benefit from Tolbert's research through integration into the classroom. Currently, Tolbert teaches a class on alternative energy sources, which he had previously taught as a special topics class.

"By teaching these classes, I'm able to bring the information back to the classrooms and expose lots of students to research in energy and sustainability," said Tolbert.

UT Driving the Development of Alternative Fuels and Hybrid Vehicles

Although alternative fuels may be a “hot topic” at the present moment, the UT College of Engineering has been involved in the development of hybrid vehicles for over 18 years.

Since 1989, UT student teams have scored several first-place wins or have placed in the top rankings of advanced vehicle technology design competitions, sponsored by the Department of Energy (DOE) and the U.S. auto industry. These unique, multi-year programs bring together the resources of industry, government and academia in a cooperative effort to address important environmental and energy-related automotive issues.

Dr. Jeff Hodgson, an emeritus professor in mechanical engineering at UT, initiated the COE's involvement in vehicle design programs and served as faculty advisor to the majority of the student teams until 2002.

The university has received nearly \$3.3 million in contracts and resources as a result of participation in the alternative-fuel vehicle competitions.

Dr. David “Butch” Irick, Hodgson's successor, now serves as faculty advisor to the student team involved in the most recent competition, Challenge X. The competition, sponsored by General Motors, is now in its fourth year. The students are currently modifying a 2005 Chevrolet Equinox.

“Our goal for the final year of the Challenge X competition is to have a vehicle that is a 99 percent production-ready, biodiesel-electric hybrid. In the end, we want to have an environmentally friendly vehicle that is also acceptable to consumers; the type of automobile that you would buy off a showroom floor,” said Irick.

Team Tennessee is composed of seniors in mechanical engineering (ME) and electrical and computer engineering (ECE). The ME students are primarily divided between students interested in machine design versus thermal sciences, while ECE majors are focusing on electronic controls. The group is lead by graduate students in mechanical engineering who have past industry and HEV competition experience.

The fourth year of the competition will primarily consist of testing, evaluation and improvements to make the vehicle appealing to consumers, Irick said.



Dr. Butch Irick (left) and members of the University of Tennessee student chapter of the Society for Automotive Engineers (SAE) continue to develop their biodiesel-electric hybrid vehicle as part of the multi-year Challenge X competition.

Irick is also the director of the COE's Graduate Automotive Technology Education program (GATE), established in 1999. The goal of the GATE program is to provide training to a future workforce of interdisciplinary automotive engineering professionals who have experience in developing and commercializing cost-effective, fuel-efficient vehicles.

In 2005, the program received a \$625,000 grant from the DOE and the university to assist with updating and expansion of initiatives in the area of advanced hybrid vehicle propulsion and control systems.

Irick sees the future of automotive engineering research at UT as extremely promising.

“We have a very strong automotive engineering program with both research and teaching,” Irick said. “The automotive industry projects that sales of hybrid vehicles will increase by 80 percent over the next few years. We are going to be educating engineers who can help meet the demand for those automobiles.”

—Story by Kim Cowart



Environmental engineering graduate student Josh Cummins (left) and CEE Research Associate Professor Dr. Joshua Fu retrieve data from an air quality monitoring station in West Knoxville.

CIVIL AND ENVIRONMENTAL ENGINEERING

While research into energy sustainability and efficiency is important, impacts of energy production on the environment is equally crucial, according to researchers in the Department of Civil and Environmental Engineering (CEE).

“The Air Pollution Group has done quite a bit of modeling with respect to how different kinds of transportation and electricity production activities will impact future air quality here in the Tennessee Valley,” said Dr. Gregory Reed, professor and head of CEE. “Our results show that we either have to achieve extraordinary high levels of pollution control at the source, or we have to change the source, in other words, stop using fossil fuels.”

According to Reed, pollution from industry and transportation are the two kinds of energy use that needs to be addressed from an environmental point of view.

“However,” said Reed, “other environmental issues exist. If you use coal, the whole business of mining and processing the coal come into play. If you produce electricity from nuclear,

the question becomes what are you going to do with the waste. Every technology has its pluses and minuses. We look at how to minimize the minuses and maximize the pluses.”

Sustainability is part of the civil engineering code of ethics and the only discipline code of ethics that says engineers should design things to be consistent with sustainable development, according to Reed.

“Civil engineers are ethically bound to look for sustainable options in everything we do,” said Reed.

Researchers in the COE are working on the global energy problem at every level in order to contribute solutions to future generations.

“We should push the envelope,” said Dr. Wayne Davis, associate dean of research and technology. “We don't know what the future will look like, and we should do a little bit of everything relevant to research in order to influence the future.”

—Story by Amanda Womac

ALUMNI *profile*

McDougle's Success and Support Helps Shape the Future of the Knoxville Campus

It's probably an understatement to say that Edwin A. McDougle's (BS/CE '69, MS/CE '75) blood runs deep orange.

McDougle, a Principal with Ross Bryan Associates, Inc., an engineering firm in Nashville, Tenn., received both his Bachelor of Science and Master of Science degrees in civil engineering from the University of Tennessee.

McDougle grew up in Knoxville, graduating from Young High School in 1964. The son of an engineer, McDougle decided to follow in his father's footsteps and chose to major in civil engineering. He also entered the Cooperative Engineering Program, which was then under the direction of Wiley Thomas and Elizabeth Corlew, and he was assigned a position at Ross Bryan Associates.

"The co-op experience, in one word, was 'invaluable,'" McDougle said. "I would not be where I am today without it. I was fortunate to get an assignment with a good company, and the work experience that I gained put me light years ahead of everyone else when I graduated."

The co-op job also helped pay for McDougle's education. During his years as a co-op participant at Ross Bryan, Robert Whitaker, the company's chief engineer, mentored McDougle. He also was involved in drawing the plans for several UT buildings, including the Humanities and Social Science Building and the Presidential Court dormitory complex.

McDougle maintains a close relationship with Dr. Edwin Burdette, a civil engineering professor who still teaches at the university.

"I was a junior when Dr. Burdette returned to UT after receiving his Ph.D.," McDougle recalled. "He was an outstanding teacher. We had a class called



Outstanding alumnus Edwin McDougle

'Influence Lines' that met at 7:50 a.m. three days a week, including Saturdays. You'd better believe that everyone always showed up after Dr. Burdette took over that class. He became my favorite professor and was also my advisor during graduate school."

After receiving his bachelor's degree in 1969, McDougle was enrolled in graduate school at UT for two years, but he then entered the Tennessee National Guard. Commissioned as a second lieutenant, McDougle trained as a pilot and flew for the guard until 1973.

McDougle and his wife, Carla, were married in 1969. The day after he graduated from flight school, the couple welcomed their first child, a daughter.

After his stint in the guard, McDougle returned to Nashville and a full-time position with Ross Bryan. He became a Principal in 1977 ("it's still my title," he joked) and continues to work on designing projects for the university.

Ross Bryan has been involved in the structural design of numerous facilities on the UT campus, including the Life Sciences Building, the College of Veterinary Medicine, Hodges Library and Thompson-Boling Arena.

Currently, McDougle is working with the College of Engineering on the structural design of the new Min Kao Electrical Engineering and Computer Science Building and the Joint Institute for Advanced Materials facility.

"We're also involved in the Howard Baker Center, the new Glocker Business Building and the Pratt Basketball Practice Pavilion," McDougle added. "Other projects include strengthening the roof of Thompson-Boling and adding luxury suites and the ongoing renovations to Neyland Stadium. Our engineers designed the new club seating level and improvements on the north concourse and are currently designing upgrades to the home team locker rooms, the addition of a media room and improvements to the west concourse."

Ross Bryan has also worked with McCarty Holsaple McCarty Architects on the Knoxville Convention Center and is currently designing the new arts center at Maryville College.

In addition to construction projects, Ross Bryan conducts investigations on buildings damaged by severe weather or fire. The company is currently working with the university to evaluate the structural damage sustained by Dougherty Hall during the recent fire.

McDougle hopes to work a while longer to log in 40 years full-time and 47 overall at Ross Bryan.

"In 2012, I can say that I've been with the same company for almost 50 years," McDougle said. "I love what I do."

The McDougles have three daughters, Allison Peters, Meredith Burns and Elizabeth Graham, and four grandchildren.

"All three of my daughters and two of my son-in-laws graduated from UT," McDougle added. "We are big promoters and advocates of the university and the College of Engineering. And you'd better believe that we love those UT football and basketball games! We tailgate at the football games and have a ball."

—Story by Kim Cowart

Dougherty Fire Destroys Labs and Classrooms

A fire broke out in the Dougherty Engineering Building Friday, November 17, 2006, during an experiment in an automotive testing lab and spread to several levels of the building. Although there were no injuries, the automotive testing labs and several classrooms were destroyed in the fire.

UT and contracted cleaning crews from ServPro worked long hours throughout the weekend and during the following week and Thanksgiving holiday to get the building re-opened for classes to be conducted and administrative offices to function.

Although the majority of the building was cleaned, part of the basement and mezzanine areas, including the engine test cells, must be rebuilt. The cleanup of debris and redesign of these areas is in progress, and plans are to rebuild these sections as soon as the design is completed and construction contracts can be issued.

UT and COE officials are currently evaluating structure and safety updates for the building.



Knoxville Fire Department crews worked hard to contain the fire that erupted in an automotive testing lab.



As part of his continuing support of UT and the College of Engineering, Ed McDougle (right), was instrumental in organizing a welcoming reception for Dean Way Kuo (left) to meet with other alumni in Nashville.

Wet Weather Fails to Dampen Homecoming Celebration

The fall 2006 Homecoming Celebration took place on an extremely overcast and wet day, but the rain did not dampen the spirits of COE alumni, guests, students, faculty and staff who gathered in the shelter of a tent in the courtyard between Perkins and Ferris Hall for lunch, conversation and fun.

While the UT-Marshall game (which UT went on to win 33-7 later that day) was one of the main topics of conversation, attendees also enjoyed a visit from University of Tennessee Chancellor Loren Crabtree and Provost and Vice Chancellor for Academic Affairs Robert Holub and their wives, as well as UT President John Petersen. The group of administrators sat down with the other guests for a lunch of barbeque, baked beans, cole slaw, chips and cookies.

"Although the weather was terrible, it was great to see so many of our alumni having such a good time," said Way Kuo, COE Dean. "It was wonderful that our guests had the occasion to meet Dr. and Mrs. Crabtree, Dr. and Mrs. Holub and Dr. Petersen. I know many people were delighted that they had the opportunity to talk with these administrators one-on-one in a casual setting."

The COE will host the 2007 Homecoming Barbeque November 3, 2007, prior to the UT-Louisiana Lafayette game. If you are interested in attending, please contact the Engineering Development Office at (865) 974-2779.



Distinguished guests UT President John Petersen (left), UTK Chancellor Loren Crabtree (center) and COE Dean Way Kuo (right) mingle with alumni and faculty during the Homecoming festivities.



Dr. John Petersen visits with COE alumni at the annual Homecoming Celebration.



UT Provost Dr. Robert Holub and his wife Sabine braved the rain to attend the college's Homecoming alumni event.

Numerous Naming Opportunities

As the college prepares for the construction of the Min Kao Electrical Engineering and Computer Science Building, the Joint Institute for Advanced Materials and the renovation of historic Estabrook Hall, now is the perfect time to consider honoring or memorializing a family member, a favorite professor or a deserving individual by making his or her name a lasting part of the UT College of Engineering campus.

Examples include:

Min Kao Electrical Engineering and Computer Science Building—Faculty, staff and student areas; Classrooms; Laboratories and Clean rooms (\$25,000–\$3,000,000)

Estabrook Hall—Faculty, staff and student areas; Classrooms; Laboratories and Atrium (\$50,000–\$1,500,000)

If you are interested in learning more about naming opportunities in the Min Kao Electrical Engineering and Computer Science Building, the renovated Estabrook Hall or the Joint Institute for Advanced Materials, please contact the Engineering Development Office:

Patty Shea, Development Director
120 Perkins Hall
Knoxville, TN 37996-2012
Phone: (865) 974-2779
E-mail: pwshea@utk.edu

While plans for the COE's current new and renovated facilities provide many opportunities for naming rooms, libraries, study areas, laboratories, auditoriums and atriums after individuals, additional opportunities also exist in the college.

We encourage you to contact us to discuss these opportunities and more.

College of Engineering • Board of Advisors

Dr. Bert Ackermann Jr.
(BS/NE '65, MS/NE '67, PhD/NE '71)
CEO, SPINLAB
Knoxville, Tenn.

Mrs. Karyl Bartlett
(BS/ME '84, MBA '00)
Director, Composite Manufacturing
Center, Boeing Fabrication
The Boeing Company
Seattle, Wash.

Mr. Howard E. Chambers
(BS/ME '64)
Vice-President and General Manager
Boeing Company Foundation
Seal Beach, Calif.

Dr. Tom F. Cheek Jr.
(BS/EE '61, PhD/EE '69)
Vice President of R & D
Epic Systems, Inc.
Dallas, Texas

Mr. Joe C. Cook Jr.
(BS/IE '65)
Founder and Principal
Mountain Group Capital, LLC
Nashville, Tenn.

Dr. Mark E. Dean
(BS/EE '79)
IBM Fellow and Vice President
Almaden Research Center
San Jose, Calif.

Dr. R. G. Gilliland
(BS/ChE '58, MS/MetE '63)
Retired
Pittsburgh, Pa.

Mr. Ron Green
(BS/EPh '70, MS/EPh '78)
Chairman
ADVATECH, LLC
Charlotte, N.C.

Dr. Michael W. Howard
(BS/EE '80, PhD/Eng' '96)
Senior Vice President for R & D
Electric Power Research Institute
Charlotte, N.C.

Mr. Dwight N. Hutchins
(BS/ChE '86)
Partner
Accenture
Washington, D.C.

Mr. Raja J. Jubran
(BS/CEE '81)
Chairman and CEO
Denark Construction, Inc.
Knoxville, Tenn.

Dr. H. Lee Martin
(BS/ME '78 PhD/ME '86)
Managing Member
Clarity Resources, LLC
Knoxville, Tenn.

Mr. Edwin A. McDougale
(BS/CEE '69, MS/CEE '75)
Principal
Ross Bryan Associates, Inc. Engineers
Nashville, Tenn.

Mr. Mark A. Medley
(BS/ME '69, MBA/Ind. Mgmt., '70)
President and CEO
Control Technology, Inc.
Knoxville, Tenn.

Mr. Andrew K. Phelps
Associate Director, Los Alamos National
Laboratory
Principal Vice President
Bechtel National, Inc.
Los Alamos, N.M.

Mr. James B. Porter Jr.
(BS/ChE '65)
Vice President of Engineering and
Operations
E.I. DuPont de Nemours and Co., Inc.
Wilmington, Del.

Mr. Richard T. Snead
(BS/IE '73)
President and CEO
Carlson Restaurants Worldwide
Carrollton, Texas

1950s

Roy Hardin (BS/Engr '50) retired and lives in Greensburg, Pa.

A. Odell Leinart (BC/CE '50) retired and lives in Chattanooga, Tenn.

1960s

Ronald Thompson (BS/EE '62) was elected to a second four-year term as Sumner County executive. He lives in Hendersonville, Tenn.

John Chambers (BS/CE '67) retired from ExxonMobil after 35 years of service. He lives in Houston, Texas.

1970s

Dr. William W. Vaughan (PhD/EngrSci '76) has been elected as Fellow of the American Institute of Aeronautics and Astronautics. He lives in Huntsville, Ala.

E. Douglas Hiloreth, Jr. (BS/EE '77) received his fourth U.S. Patent. He lives in Clarksville, Tenn.

Greg Parks (BS/ChE '78) has joined the Lyondell Company as manager of North America TiO₂ Distribution. He lives in Snellville, Ga.

Linda Dawbarn Vandergriff (BS/EngrPh '79) received a doctorate in engineering management and systems engineering from George Washington University. She lives in Centerville, Va.

1980s

John W. Watts (BS/CE '80) has owned and operated John Watts Construction, Inc. for 17 years. He lives in Duluth, Ga.

David Soukup (MS/IE '81) is managing director/centers for the American Society of Mechanical Engineers in New York City and adjunct professor in the Department of Mechanical, Aerospace and Manufacturing Engineering at Polytechnic University. He lives in Sunnyside, N.Y.

Paul Horne (MS/ChE '82) is Senior Vice President of Product and Market Development for Buckeye Technologies. He lives in Germantown, Tenn.

Norman P. Pih (BS/ChE '82) is with W. L. Gore & Associates as a liaison between the intellectual property and R&D groups in the medical products division. He lives in Flagstaff, Ariz.

Dan Powell P.E. (BS/CE '82) is commercial manager for Alabama, Mississippi and Tennessee with Hanson Pipe & Precast. He lives in Germantown, Tenn.

Rosemary D. Carswell (BS/EngrSci '83) is with Barge Waggoner Sumner & Cannon as water resources project manager for the Chattanooga office. She lives in Soddy-Daisy, Tenn.

Ron Miller (BS/CE '83) has spent more than three years traveling to the hidden corners of the planet and recently published a book titled *Escape From the Happy Cannibal*, which chronicles the physical and spiritual aspects of his journeys around the world.

Todd A. Knuckey P.E. (BS/CE '84; MS/CE '97) is with Hanson Professional Services, Inc. and will serve as vice president and principal of Hanson's aviation market. He lives in Nashville, Tenn.

Michael Roberts (BS/NE '85) received the defense programs award of excellence as part of a team working at the Y-12 National Security Complex in Oak Ridge, Tenn. He lives in Knoxville, Tenn.

Lee Taylor (BS/CE '85) is a Federal Civilian Employee at the Combined Arms Center at Fort Leavenworth, Kansas. He lives in Kansas City, Mo.

David Melchers (MS/ME '86) accepted a Corporate VP and CIO position with AJ Gallagher. He lives in Algonquin, Ill.

1990s

Michael Robertson (BS/ChE '90) is senior process engineer with DSM North America in Augusta, Ga. He lives in Martinez, Ga.

Douglas A. Brock (BS/EE '92) of Roden Electric Supply Co. in Chattanooga has been appointed by the board of directors of the Tennessee Center for Performance Excellence to the 2006 Board of Examiners. He lives in Chattanooga, Tenn.

Jennifer Herrmann (BS/ChE '94) is a judge advocate in Okinawa, Japan for the Marine Corps.

Jeffrey Capili (BS/CE '97) is pursuing an MBA in Institutional Management at Thunderbird Garvin School of International Management. He lives in Salt Lake City, Utah.

2000s

Dr. Zachariah Chambers (PhD/EngrSci '00) was recently promoted to associate professor with tenure at Rose-Hulman Institute of Technology in Terre Haute, Ind. He is also the co-advisor of the Challenge X Team. He lives in Terre Haute, Ind.

Dr. Lindsey M. Clark (BS/ChE '00) earned a Ph.D. in chemical engineering from Vanderbilt University. She lives in Nashville, Tenn.

Jason Shrieves (BS/ME '00) works as an Automotive Powertrain Development Engineer for RLE International in Cologne, Germany, where he lives.

Christopher Shane Pike (BS/CE '02) is a staff professional for oversight of geotechnical and construction materials testing projects. He lives in Ooltewah, Tenn.

J. Will Presson (BS/CE '02) was recently promoted to manager for Land-Design in Charlotte, N.C. He lives in Tega Cay, S.C.

Richard Tucker (BS/AE '05) is a Guidance and Control Propulsion instructor with United Space Alliance. He lives in Seabrook, Texas.

Memorials

Robert Woodson (BS/Engr '41) died January 2, 2007. He lived in LaFollette, Tenn.

William Carter (BS/CE '43) died August 23, 2006. He lived in Fayetteville, Tenn.

James Crawford (BS/Engr '47) died February 14, 2007. He lived in Knoxville, Tenn.

Joseph Adams (BS/ME '48) died May 23, 2006. He lived in Bristol, Va.

James Carson, III (BS/EE '50) died March 14, 2006. He lived in Tullahoma, Tenn.

Charles Gardner (BS/EE '50) died February 26, 2007. He lived in Heiskell, Tenn.

Robert Cavalier (BS/Engr '53) died late December 2006. He lived in Corryton, Tenn.

Fred Jones (BS/ME '57; MS/ME '65) died September 18, 2006. He lived in Farragut, Tenn.

Robert Householder (BS/Engr '59) died December 29, 2006. He lived in Newport, Tenn.

William Walker (BS/EE '60) died September 6, 2006. He lived in Melbourne, Fla.

Matthew Maddin (BS/IE '62) died September 9, 2006. He lived in Nashville, Tenn.

William Marler (BS/ChE '65) died February 9, 2007. He lived in Huntsville, Ala.

Stan Hunley (BS/Engr '66) died January 21, 2007. He lived in Knoxville, Tenn.

COE Fulton Scholarship Donor Dies

Mrs. Jean Talley, who graduated from UT with a B.S. in Home Economics in 1945, died Sunday, January 28, 2007, at age 82. Mrs. Talley was the daughter of the late Weston M. Fulton, industrialist, inventor and philanthropist. In August of 2005, Mrs. Talley and husband James C. Talley II established the COE Weston Miller Fulton Memorial Scholarship to honor Fulton, who died in 1946. Mr. Fulton's accomplishments include patents on more than 200 inventions. Fulton was awarded a master's degree in engineering from UT in 1902.



Mrs. Jean Talley

COE Alums Honored for Achievements



Henry Hartsfield Jr.

Astronaut **Henry "Hank" Hartsfield Jr.** (MS/EngrSci '71) is a recent member of the United States Astronaut Hall of Fame. The induction ceremony took place at Kennedy Space Center's Apollo/Saturn V Center in Cape Canaveral, Fla. Hartsfield flew on the final test flight of Space Shuttle Columbia in 1982, commanded the maiden flight of Space Shuttle Discovery in 1984 and commanded Challenger on a science mission in 1985. He retired from NASA in 1998 and currently serves as vice president of Raytheon.

David Campbell (MA/NE '78), **Myron Casada** (BS/NE '74; MS/EngrAd '76), **Vernon Guthrie** (MA/NE '79), **Matt Mowrer** (BS/NE '97), **James Rooney** (MA/NE '78; MBA '83) and **David Walker** (BS/ME '89; MS/ME '90) received the Joel Magnussen Innovation Award for their development of a risk analysis model for the U.S. Coast Guard. The honorees work for ABS Consulting in Knoxville.

EVENTS

& awards

Gunn Selected for Student Leadership Award

Julius Gunn, a senior mechanical engineering major, was recently selected by the Black Engineer of the Year selection panel to receive a Student Leadership Award during the 21st Annual Black Engineer of the Year Awards Conference. The event took place February 17, 2007, in Baltimore, Md. Gunn is currently enrolled in



Award winner Julius Gunn (center) is congratulated by his Rolls-Royce co-op manager James Dabner (left) and Rolls-Royce's engineering manager Norm Egbert (right).

the Diversity Engineering Scholarship Program (DESP) and co-ops with the Rolls-Royce Corporation in Indianapolis, Ind.

Chinese Government Honors MSE's Liu

Dr. C.T. Liu, COE Distinguished Research Professor and ORNL joint faculty member in the Department of Materials Science and Engineering, was recently honored with the National Friendship Award, sponsored by the Office of Foreign Exports Affairs of the State Council in Beijing, China. This award is given to a select number of foreign experts for their outstanding contributions toward building a modern China and is the highest honor a foreign expert can receive from the Chinese government. Hui Liangyr, Vice Premier of the State Council, presented Liu with a gold medal at a state dinner that took place at the People's Hall during the event.



Dr. C.T. Liu

Byerley Appointed New SMRP Chair



Tom Byerley (right) accepts congratulations for being named SMRP Chair.

Tom Byerley, director of the COE's Maintenance and Reliability Center (MRC), was named as the new Chair of the Society of Maintenance and Reliability Professionals (SMRP) at the organization's 14th Annual Conference in Birmingham, Ala., December 15, 2006. SMRP, formed and chartered in 1992, promotes information exchange through a network of maintenance and reliability professionals and seeks to advance innovative reliability practices. For more information, visit www.smrp.org.

Check out the College of Engineering's online newsletter



<http://www.engr.utk.edu/TNengr>

Administration Strengthens Relationship with Thailand's Kasetsart University

A group of representatives from **Kasetsart University (KU)**, a state university in Thailand, visited the COE as part of a joint meeting with UT faculty and administrators to discuss areas of common interest October 26, 2006. KU's main campus, located in Bangkok, emphasizes strong programs in agricultural science and engineering. The relationship between Kasetsart and UT was initiated in 1993 with a series of faculty study tours. The interaction between the two universities has since expanded to include a joint student program, with graduate students from KU attending UT for advanced degrees; cooperation in mutual areas of research; and continued faculty/administrative visits between campuses for information exchange. COE Dean Dr. Way Kuo and associate deans Dr. Masood Parang, Dr. Alberto Garcia and Dr. Luther Wilhelm hosted the Kasetsart visitors.



Representatives from Thailand's Kasetsart University met with several College of Engineering faculty and administrators during their October 2006 visit. COE Dean Way Kuo (far right) donned a Kasetsart cap presented by the visitors.

Student Papers Recognized in IIE Competition

Two student groups from the college's Department of Industrial and Information Engineering won second and third place in the Institute of Industrial Engineers (IIE) Lean Student Paper Competition. The undergraduate group received second place for their paper, "Lean Function Deployment (LFD): Determining the Lean Implementation Point Using a Customer Perspective." The graduate team was honored with third place for their paper, "Developing a Maintenance Value Stream Map." The papers were judged according to technical merit, contributions to the field, originality and clarity. Dr. Rupy Sawhney teaches the undergraduate student winners' IE 401 class and serves as faculty advisor for the graduate group. In May, the students will receive a national award at the IIE Annual Conference in Nashville, Tenn.



Graduate and undergraduate IIE Lean Student Paper Competition Winners—(top, left to right) Naveed Ahmed, Themios Roosis, Allen Wu, Scott Wilson, Chase Henley, Zeid El-Akkad, (bottom, left to right) Rachel Trumph, Reid Garret, Sarah Yoder, Clark Brooks and Amy Basham.

Calendar

2007

Spring Recess Day	Apr. 6
Classes End	Apr. 27
Spring Commencement	May 10
Classes Begin	Aug. 22
Labor Day Holiday	Sept. 3
Fall Break	Oct. 11-12
Engineers Day	Oct. 18
Homecoming	Nov. 3
Thanksgiving	Nov. 22-23
Classes End	Dec. 4
Fall Commencement	Dec. 15

Contact Information

Senior Administration

Dr. Way Kuo, Dean of Engineering and University Distinguished Professor

Dr. Alberto Garcia, Associate Dean for Academic Affairs

Dr. Masood Parang, Associate Dean for Student Affairs

Dr. Wayne T. Davis, Associate Dean for Research & Technology

Administration & Programs

Communications	974-0533
Dean's Office	974-5321
Development	974-2779
Engineering Academic Affairs	974-6092
Engineering Advising Services	974-4008
Engineering Diversity Programs	974-1956
Engineering Fundamentals	974-9810
Engineering Research	974-8360
Engineering Student Affairs	974-2454
Finance & Admin. Affairs	974-5279
Office of Professional Practice	974-5323

Departments

Chemical	974-2421
Civil & Environmental	974-2503
Electrical & Computer	974-3461
Industrial & Information	974-3333
Materials Science	974-5336
Mechanical, Aerospace & Biomedical	974-5117
Nuclear	974-2525

Research Centers

Materials Processing	974-0816
Maintenance & Reliability	974-9625
Scintillation Materials	974-0267
Transportation Research	974-5255

Nuclear Engineering Department Celebrates 50th Anniversary

The University of Tennessee Nuclear Engineering (UTNE) Department, founded in 1957, celebrated its 50th anniversary March 3, 2007, at the new Knoxville Convention Center.

Approximately 270 people, including NE alumni, faculty, staff and friends of the department as well as UT and COE administrators, attended the gala event.

The evening began with a reception and slide show depicting the history of the department, followed by a formal banquet, program and dancing to music provided by the "Atomic Horns," a nine-piece band.

Dr. Tony Buhl, a three-time graduate of the department, served as Master of Ceremonies for the event, which included an overview of the history of the department by Dr. John Prados, UT Vice President Emeritus, and a special tribute to Dr. Pete Pasqua, department founder and NE department head for 31 years, by Dr. Bill Snyder, UT Chancellor Emeritus. Dr. Snyder also presented a special plaque to the Pasqua family in honor of Dr. Pasqua and a bouquet of roses to Mrs. Pasqua.



Enjoying the reception (right to left) are COE Dean Way Kuo, Associate Dean for Research Dr. Wayne Davis, UTNE Department Head Dr. Lee Dodds, and Dr. Dodds' guest, Ms. Maureen Dunn.



Among the many distinguished guests in attendance were Dr. Hall Roland (left), the first UTNE faculty member hired by Dr. Pete Pasqua in 1957 and Dr. Jim Humphreys (right), a member of the first NE graduating class in 1960.

Dr. Way Kuo, dean of engineering, presented service recognition plaques to Dr. Tom Kerlin (department head, 1988-1996) and Dr. Lee Dodds (department head, 1997-present).

Sponsors for the celebration included EnergX (Tony Buhl); HLD Associates (Lee Dodds); Mel Buckner; SAIC; Spectra Tech; Kenneth Piety; Douglas Selby; the Washington Group; Safety Analysis Engineering—Engineering Division; the Y-12 National Security Complex; and Oak Ridge National Laboratory. Opportunities for sponsorships are still available, for more information visit <http://www.engr.utk.edu/nuclear>.

Revenue generated by celebration sponsorships will be used for undergraduate scholarships, graduate fellowships, faculty development and general infrastructure support for the department.

The evening was also recorded on video, which will be available on the NE Department's website, along with a slide show of photographs depicting the history of the department.

The University of Tennessee does not discriminate on the basis of race, sex, color, religion, national origin, age, disability or veteran status in provision of educational programs and services or employment opportunities and benefits. This policy extends to both employment by and admission to the University.

The University does not discriminate on the basis of race, sex or disability in its education programs and activities pursuant to the requirements of Title VI of the Civil Rights Act of 1964, Title IX of the Education Amendments of 1972, Section 504 of the Rehabilitation Act of 1973, and the Americans with Disabilities Act (ADA) of 1990.

Inquiries and charges of violation concerning Title VI, Title IX, Section 504, ADA or the Age Discrimination in Employment Act (ADEA) or any of the other above referenced policies should be directed to the Office of Equity and Diversity (OED), 1840 Melrose Avenue, Knoxville, TN 37996-3560, telephone (865) 974-2498 (VTTY available) or 974-2440. Requests for accommodation of a disability should be directed to the ADA Coordinator at the UTK Office of Human Resources, 600 Henley Street, Knoxville, TN 37996-4125.



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