

# MIZZOU ENGINEER

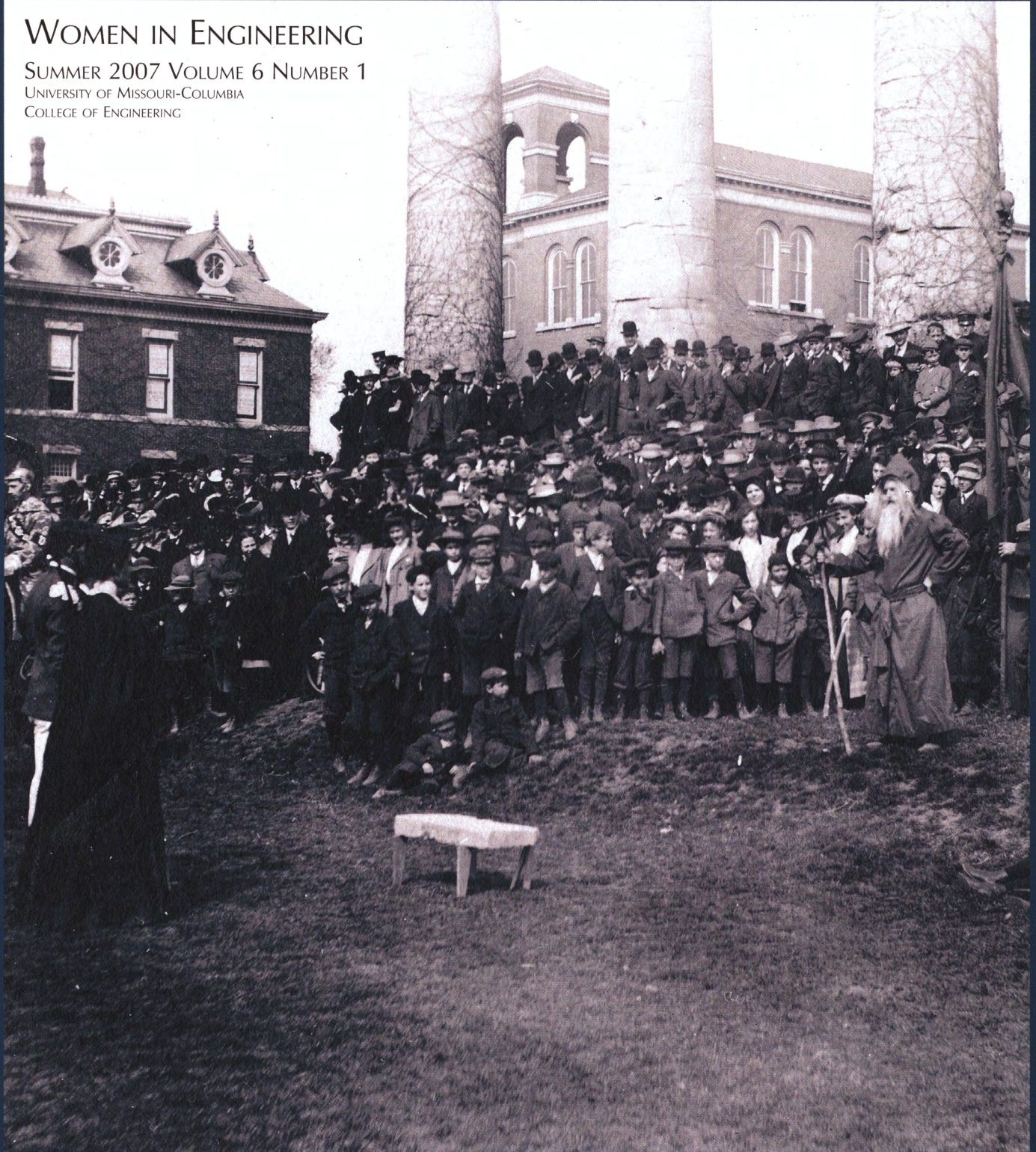
ENGINEERING FOR THE ADVANCEMENT OF HUMANITY

## WOMEN IN ENGINEERING

SUMMER 2007 VOLUME 6 NUMBER 1

UNIVERSITY OF MISSOURI-COLUMBIA

COLLEGE OF ENGINEERING





# MIZZOU ENGINEER

*Engineering for the advancement of humanity*

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Mizzou Engineer is a triennial alumni magazine. It is our intent to capture moments in time that communicate glimpses of the past, present and future of the MU College of Engineering. We hope it also renews old acquaintances and friendships, spawns volunteerism and encourages philanthropy.

Questions, comments and suggestions for future articles are welcome. Please send suggestions and comments to the Engineering Development Office at mucengrdev@missouri.edu.

This magazine is funded by the MU College of Engineering Office of Development.

## Dear Alumni and Friends of Mizzou Engineering,

This year marks the 100th anniversary of the first woman to graduate from the University of Missouri–Columbia College of Engineering. Ada Wilson was ahead of her



time, but with a growing need for engineers in this country and around the world, colleges are stepping up recruitment of women students. Highlighted are some of our recent outstanding young women students, and

our Career Engineer piece spotlights Robin Robinett, one of our extraordinary women alumni.

On April 13, Mizzou Engineering held a well-attended groundbreaking ceremony for a \$21 million renovation of the 1922 civil engineering portion of Lafferre Hall. This renovation is the first phase of a long-term project and will provide upgraded classrooms and an additional 30,000 square feet of research lab area. The new multidisciplinary space will have a direct impact on the way professors teach and how students learn.

In the past, year Mizzou Engineering's International Center for Nano/Micro Systems and Nanotechnology, under the direction of Dr. Shubhra Gangopadhyay, the LaPierre Chair and professor in electrical and computer engineering, has received nearly \$14 million in research contracts for a variety of projects as well as national recognition for the work being done. One of the nanotechnology research projects that members of Gangopadhyay's innovative team is working with would eliminate the fog and steam from glass – everything from the windows of jets to the bathroom mirror.

Research is at an all-time high with many opportunities for undergraduates to participate. A College of Engineering research team was awarded \$100,000 by the National Science

Foundation for a summer REU (Research for Undergraduates) home networking project that is providing students the opportunity to examine technical issues related to emerging technology for consumers. The project was also designed to encourage the students to consider pursuing advanced degrees.

A group of friends who graduated from Mizzou Engineering in 1958 is featured in this issue of the magazine. Their reminiscences of work, fun, friends and the trappings of college life will spark timeless memories for alumni young and old. We invite you to share your favorite stories with Mizzou Engineering.

Jim Thompson  
Dean of the College of Engineering,  
University of Missouri–Columbia

## Letters to the Editor

Editor:

I enjoyed reading the latest issue of THE MIZZOU ENGINEER. I especially identified with the article on Phil Henry, Power Ties. It is a rare occasion for me to be able to relate to anyone from those days. As I recall, A. B. Chance Corp. was a major funder for the Network Analyzer in the early fifties. I recall working “thousands” of problems in Dr. Lago's Transient Circuits class. I am glad that he recognized Dr. Hogan as a mentor, but I wish that he would have mentioned Professor Jim Tudor. They were both my heroes. Dr. Lamb was writing a book on AC Machines in the mid-fifties also. We had mimeographed copies of his notes for a text book. I subsequently lost them and as Murphy's Law would have it, they are the ones that I needed most in my career as a power generation engineer. Please convey my best wishes to Mr. Henry and thanks for the memories.

James I. Meredith BSEE '56



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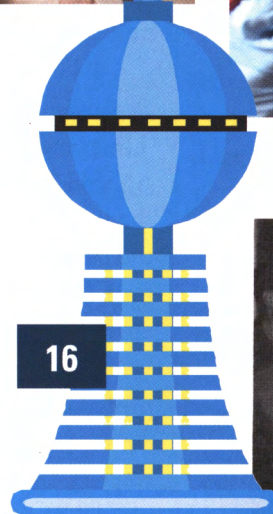
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**Photos top to bottom this page: Dean Jim Thompson speaking at the Mizzou Engineering groundbreaking on April 13** (Photo by Ernie Gutierrez); **Kristin Ehlers, 2006-2007 SWE president** (Photo courtesy Mizzou Publications); **Riberet Almeida and Venumadhav Korampally conduct research using nanoparticles** (Photo by L.G. Patterson); **the future of home networking is here; Don York, 1958 Shamrock Editor Don York, talking to Mary Ann Sheridan** (From the 1958 Savitar, Courtesy of University Archives, University of Missouri at Columbia)

**Cover: Ada Wilson becomes the first "Lady of St. Patrick" in 1907** (Courtesy of University Archives, University of Missouri at Columbia, Collection No.: C:0/47/3 Box 2)

*Special thanks to the staff at University Archives for their friendly help and insight.*

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## New associate dean for research takes the helm

Sam Kiger, a former CoE civil and environmental engineering department chair and an internationally recognized expert in blast resistant structural design, is the college's new associate dean for research.

Former Associate Dean for Research Noah Manring accepted an administrative position at Princeton University. CoE Dean Jim Thompson appointed Kiger to the vacant post on May 22.

Kiger, a C.W. LaPierre distinguished professor and director of both the MU Center for Transportation Security and the National Center for Explosion Resistant Design, served as the college's civil and environmental engineering department chair from 1996 to 2005. Kiger also served as West Virginia University's civil and environmental engineering chair, and as a research team leader at the U.S. Army Engineer Research and Development Center in Mississippi for more than 16 years before joining academia.

Kiger plans to draw on his extensive team-leading experience to build research groups capable of tackling projects that cross traditional academic boundaries.

## Technology wins national association backing

A national transportation association plans to showcase Mizzou Engineering technology for stabilizing landslide-prone slopes, paving the way for its widespread use across the country.

The American Association of State Highway and Transportation Officials (AASHTO), a nonprofit group representing U.S. highway and state transportation departments, has decided to feature nationally a slope stabilization method developed by MU civil engineering Professors Erik Loehr and John Bowders. The AASHTO Technology Implementation Group, which annually selects four or five technologies to spotlight, this year selected Mizzou's technology from a field of 40 nominations.

"The research project has already shown benefits in Missouri. The promotion effort provided by AASHTO makes it more likely that the benefits will be seen all around the country," said Mark Virkler, professor and chair of MU's civil and environmental engineering department.

Loehr and Bowders, both professional engineers, in 1998 devised a new way to shore up shaky roadside slopes using pins made of recycled plastic. The pins—inserted every three to six feet, depending on the soil—prevent "nuisance" landslides by intercepting and providing additional resistance in slide-prone soil.

Mizzou's technology stood out in part because it uses long-lasting, recycled materials, said Keith Platte, AASHTO program manager.

Platte said AASHTO plans to produce and distribute information about this technology to department

of transportations across the country within the next three months.

The Missouri Department of Transportation (MoDOT) already has tested the technology on interstate embankments, and found the pins successfully prevented slides at a lower cost than more traditional techniques, a 2005 MoDOT report said.

AASHTO's backing may well persuade other states to take a close look at the technique.

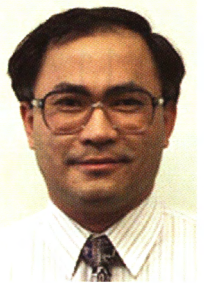
## Pai's work profiled in aviation publication

P. Frank Pai, professor of mechanical and aerospace engineering at MU, received recognition in Aviation International News in April for his work with low-power lasers capable of detecting problems of aging in aircraft.

Pai has developed a portable, inexpensive and fast vibration-based technique he calls boundary effect evaluation method (BEEM). It uses a scanning laser vibrometer that can detect tiny cracks within various materials such as aluminum alloy and composite laminates.

Piezoceramic patches produce small vibrations when electrical voltage is applied. The vibrometer scans the structure and data is relayed to a computer where it is processed by a mathematical theory developed by Pai.

Current technology requires disassembly of the aircraft, but Pai points out that by using his BEEM technology, the entire aircraft, including critical sections near the fuel tank and wing and body junctions can be tested while assembled.







## Student aeronautics team takes off

The College of Engineering's newest design team is entering competition this month with a preliminary victory already under its belt.

Mizzou revived a dormant chapter of the American Institute of Aeronautics and Astronautics (AIAA) last fall, revitalizing a group that had been inactive for about 10 years. The group's members entered a design proposal in an AIAA aircraft propulsion and power system competition and won top honors, earning a berth in the performance leg of the annual model aircraft contest and a boost in the overall competition's scoring.

Each plane—measuring about 60 inches from tip to tail and weighing roughly 15 pounds—must fly laps between 200 and 250 feet in the air for 10 minutes while detecting and sending a live video of targets on the ground. Judges also will measure the amount of power each team can deliver to a power consumption device during the flight.

MU will compete with a remote-

controlled airplane powered by lithium-polymer batteries, which weigh less but nonetheless provide more power than standard nickel-cadmium batteries, said Michael Pocheck, MU's design team chairman. A mechanical engineering senior, he is shown at above, at left, along with Tim Tumulty, a mechanical and aerospace engineering student at the controls as they pre-test their aircraft in the quad.

## Nanotech paper wins 'Nano 50' award

Nanotech Briefs magazine named Shubhra Gangopadhyay, Mizzou Engineering's LaPierre chair of electrical and computer engineering's paper, "Nanoengineered Superthermites for Shock Wave and Energy Generation" as one of the top 50 entries in its "Nano 50" competition.

Judged by a panel of nanotechnology and MEMS experts, the winners



represent the top 50 technologies, products and innovators that have significantly impacted, or are expected to impact, the state of the art in nanotechnology. Winners are considered innovators who will move nanotechnology to key mainstream markets.

Gangopadhyay will accept the award at a dinner in Boston in November at the NASA Tech Briefs National Nano Engineering Conference.

## Likos wins society honor

Mizzou Engineering Assistant Professor William J. Likos, a civil and environmental engineering faculty member, will receive the American Society of Civil Engineering's (ASCE) Norman Medal during the group's annual business meeting on Nov. 3 in Orlando, Fla. The annual award—ASCE's most notable—recognizes papers that make a definitive contribution to the field.

ASCE is honoring Likos for a paper he co-authored with Colorado School of Mines Professor Ning Lu, called "Suction Stress Characteristic Curve for Unsaturated Soil." The paper, published in a February 2006 ASCE geotechnical journal, builds a conceptual framework for quantifying how changes in moisture affect the soil's strength and volume.

Likos also won ASCE's Arthur Casagrande Professional Development Award in 2005, which recognizes outstanding geotechnical engineering accomplishments and seeks to further the professional development of young researchers in the field.

by Vicki Hodder, senior information specialist, and Jan Wiese-Fales, editor.





# Groundbreaking Launches Lafferre Reconstruction Project

A much-anticipated groundbreaking ceremony for the \$21 million reconstruction of the old civil engineering—high bay—portion of Mizzou Engineering's Lafferre Hall was held April 13. Though inclement weather drove the ceremonies into a hallway of the soon-to-be renovated area of the building, spirits were not dampened.

Dean Jim Thompson hosted the festivities, and speakers included Curator Bo Fraser, Provost Brian Foster, Chancellor Emeritus Richard Wallace, Senator Chuck Graham and Columbia Mayor Darwin Hindman. 2007 Engineers' Week royalty escorted St. Patrick in to bless the soil, and Thomas and Nell Lafferre, for whom the building is named, joined speakers in turning a shovelful of soil. A reception was held in one of the high bays areas following the ceremony.

The construction project represents phase one of a long-term plan.

It will add an additional 30,000 square feet of multidisciplinary lab space and classroom area, plus some faculty and graduate student offices, as well as conference areas.

Thompson and others in CoE administration believe the design and versatility of the newly created space will encourage cross-discipline collaborations among the college's research specialties and will have a direct impact on how students learn and professors teach.

Funding for the reconstruction comes from a \$2 million federal grant and a \$19 million loan approved by the University of Missouri Board of Curators last July.

Construction is scheduled to begin in August and should be completed in the fall of 2009. Plans call for six additional phases of renovation—with an estimated price tag of \$120 million—in the decades to come.



**Above, Mizzou Engineering Student Council Vice President of Internal Affairs Emily Baxter, Dean Jim Thompson (obscured), Provost Brian Foster, Chancellor Emeritus Richard Wallace, Tom and Nell Lafferre, Senator Chuck Graham, Columbia Mayor Darwin Hindman and Curator Bo Fraser turn ceremonial spades of soil, breaking ground on phase one of the Lafferre Hall reconstruction project. At right is a commemorative pin designed by CoE's Web Designer, Charlie Triplett. Below, 2007 Engineers' Week King, Geoff Nurrenbern, reads St. Pat's blessing at the groundbreaking proceedings. St. Pat is flanked by Amanda White, the 2006-2007 Engineers' Club president, and Mary Catherine Meriage, E-Week chairwoman.**

## St. Pat's Blessing

Here on this day, I, St. Patrick, Patron Saint of the Engineers, ask blessing over this ground:

- May a solid foundation be poured in this soil to support the educational foundation of the students who will tread upon it.
- May sturdy walls be erected upon this foundation to foster sturdy resolve in the minds of professors and students alike to tackle and solve the problems presented both inside the boundaries of these walls and beyond them.
- May a steadfast roof be secured upon these walls to secure in the hearts of all who find protection beneath it a steadfast commitment to excellence in teaching, learning and research.
- May water flow through the pipes to keep innovation and

creativity flowing through the minds of all who work and learn here.

- May lights be strung through the halls to light the path between research and practice, academia and industry, learning and teaching.
- And may you, me first and me chosen, students of the Engineerium Universitatus Missouriium, remember our call to carry on the proud traditions of your mighty profession, to serve your communities with your knowledge and skill, and to pass on the industrious spirit of the engineer to the future generations who will pass through the hallowed halls that will soon stand in this place.

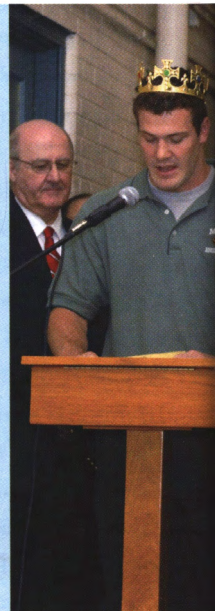






Photo by Ernie Gutierrez



Photo by L.C. Patterson

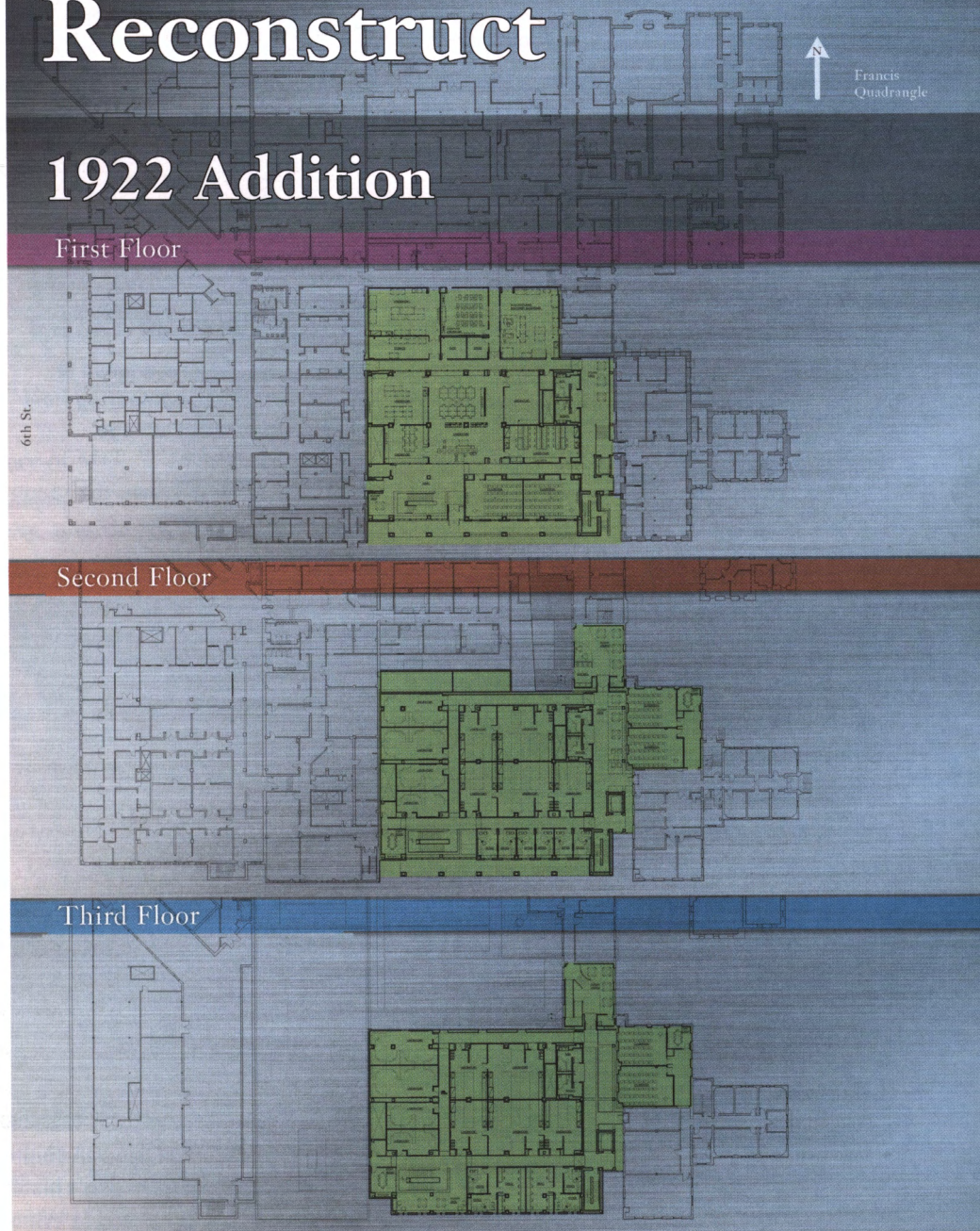


Photo by Ernie Gutierrez



# Lafferre Hall Reconstruct

## 1922 Addition



Graphics by Charlie Triplett • Architectural rendering by The Clark Enerson Partners



# Women in Engineering

by Jan Wiese-Fales

In 1907, Ada Wilson of Olathe, Kan., was the first woman to graduate from the University of Missouri's College of Engineering. Now, 100 years later, Mizzou Engineering has awarded its first doctoral degree to a black woman, Rosalynn Manor Smith. The first event placed the college over the progressive edge of the times and the other represents a troubling reality that has plagued the profession since its earliest days: There are significantly fewer women in engineering than men.

Nationally, women earn nearly half of all bachelor's degrees awarded in the physical sciences, mathematics and earth sciences, and over half of the undergraduate degrees in the fields of social and biological science. But in 2005, fewer than 20 percent of the bachelor's degrees in engineering awarded in the United States went to women. In the past academic year, women made up 14 percent of students enrolled in Mizzou Engineering.

Research shows that men who are good with their hands are drawn to engineering and women who excel in math and science are more likely to choose it as a career path. Historically this distinction carried over into the profession. As Ruth Oldenziel observed in "Crossing Boundaries, Building Bridges," the conventional attitude in the field of engineering has been that while women might be competent in drafting, calculation, research and analysis, sweat, dirt and calluses were the traditional hallmarks of an engineer. It's a socialization message that has played well for years, and women have not been drawn to pursue engineering as a career except for those who have relatives working in the profession, a trend coined "patrimonial patronage."

These days the number of men signing up for engineering careers is shrinking at the same time as the national demand for trained engineers is increasing. Women are being encouraged to fill the void. College recruiters across the nation are racking their brains to come up with ways to entice young women to give engineering a whirl.

In a 1962 interview, Wilson, 80 years old at the time, told a reporter for the Olathe Daily News that she always enjoyed math so she enrolled in civil engineering, first at the University of Kansas – because her mother didn't want her far from home – and then at MU in her sophomore year. In addition to engineering, Wilson received degrees in physics and chemistry. She shared with the reporter that though her education prepared her to teach high school, she didn't really like teaching.

By the time she graduated, her parents were too elderly to run the family dairy farm, so Wilson, who never married, managed the farm until 1943 with her sister. She apparently had no regrets and expressed only warm words for her college experience.

It was 36 years before June Danzer Hearn, the second woman to earn her engineering degree from Mizzou, graduated in 1943 in civil engineering.



Savitar 1907. Image courtesy of University Archives, University of Missouri at Columbia.

**Ada Wilson, the first woman to earn a degree in engineering from MU one hundred years ago.**



Photo: Melinda Sheffler

**Two women chaired the annual E-Week events for the first time in the college's history. Mary Catherine Meriage was the E-Week chair and Amanda White served as the Engineers' Club president.**



# Making History and Making It Look Easy

"It's been wonderful," said Rosalynn Manor Smith when asked about her experience as an MU biological engineering doctoral candidate. "I have worked in the most wonderful atmosphere here. I have been able to work with multidisciplinary teams in labs across campus."

Smith is the first black woman to earn a doctoral degree from Mizzou Engineering.

A native of Austin, Tex., she earned her bachelor's and master's degrees in electrical engineering at Texas Tech University. "Electrical engineering is a male-dominated field and being in West Texas made it even more vigorous," said Smith. "Some of the guys were not too happy with the idea of a woman — especially a minority woman — taking their place in industry."

"I had to work twice as hard some days," she said, adding that things went better once her male classmates figured out that, just like them, she was just there to get an education. Smith was the first black president, male or female, of the campus chapter of the Institute of Electrical and Electronic Engineers (IEEE) at Texas Tech.

Smith and her husband, former MU football quarterback Brad Smith, now playing for the New York Jets, are living on Long Island. Smith plans to develop a consulting business in which she will serve as a freelance scientific advisor, writing patents for lawyers. "It's very exciting," she explained. "You get to learn everything about a subject — new science every day — and can concentrate on something else the next day."

Smith admits that she will miss the research that has played such a dominant role in her life for the past few years. Her work in the field of nanotechnology involved the development of a small biosensor that through the use of light would instantaneously detect HIV in a blood sample. Its immediacy and portability would eliminate the need for lab work and would lend itself to use in remote corners of the world.

"To know that the work you are doing can potentially help millions of people at very little cost, that alone is so wonderful," Smith said. "Someday soon I'll go back into research, back to teaching and collaboration. It's really invigorating."

## Mizzou Engineering Today

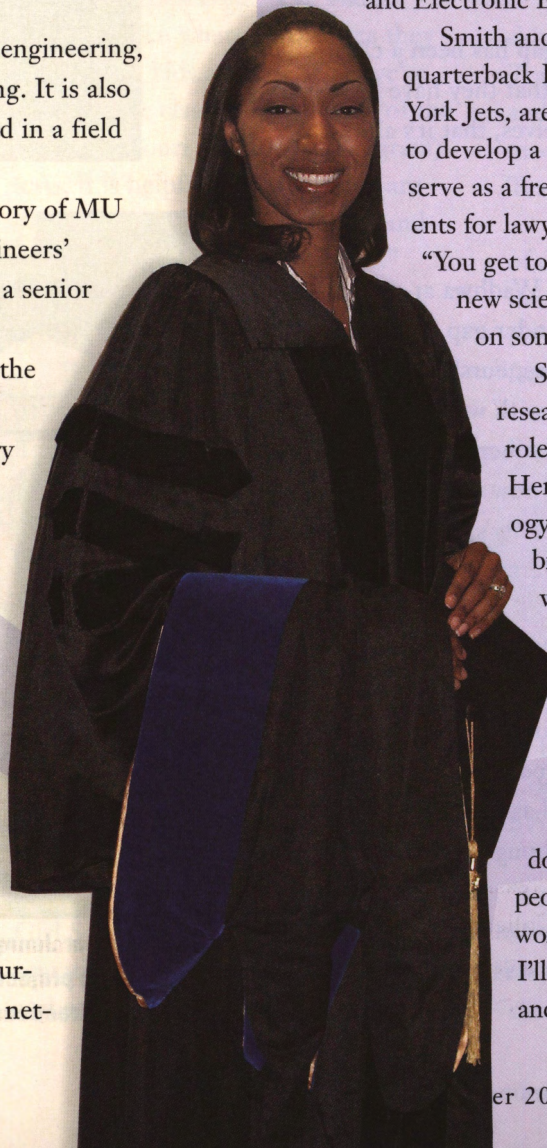
A half dozen of the 47 women that were members of the 2007 graduating class responded to an e-mail query about their experiences at MU. All gave Mizzou Engineering high marks, insisting that their gender had no impact on their experiences. The young women believe that the school is ahead of the curve on encouraging women students to achieve their potential.

"Mizzou gets many looks as being the school with the most girls on the concrete canoe team, or when we bring the most girls to Engineering Student Council Conferences," said Amanda White, who graduated in biomedical engineering last spring. "I believe most women would be surprised by how much they understand and enjoy engineering."

Jennifer Lyon, a new graduate in civil engineering, said, "It is a tough field, but very interesting. It is also rewarding to know that you have succeeded in a field that is not typical for women."

This year, for the first time in the history of MU Engineering, two women chaired the Engineers' Week activities. Mary Catherine Meriage, a senior in industrial engineering, served as the E-Week chair, and Amanda White served as the Engineer's Club president.

In recognition of the 100th anniversary of the college's first woman graduate, the student chapter of the Society of Women Engineers (SWE) hosted the first Ada Wilson lecture at its annual Green Tea during E-Week. The speaker, Vicki Panhuse, earned both her master's and doctorate degrees in nuclear engineering from Mizzou Engineering in 1976 and 1979 respectively. Panhuse, who has had a distinguished career with Honeywell Aerospace in Phoenix, Ariz., and currently serves as Vice President of commercial and military helicopters, encouraged the young women in the audience to net-





work with others for professional success.

Alumna Josephine Emerick, who earned her bachelor's degree in civil engineering in 1978, received a College of Engineering 2007 Missouri Honor Award for her career accomplishments. Emerick serves as the transportation department manager for URS Corporation in St. Louis. "When I first entered the work force, being the only female at meetings was noticeable, which provided networking advantages," said Emerick, adding that she didn't experience any gender-related difficulties in her work. "After I had my second child, I worked out a four-day work schedule, which was a relatively new concept to local consulting engineering companies. I had some long days at the office, but it was worth it to have an extra day at home." The flexible schedule is common for women in her current workplace. "It's probably much easier today with laptops and cell phones," she said. Unfortunately, many women engineers have experienced a few more bumps along the way as they've traveled their career paths.

For some women, the gender gap has been a chasm. Women have so often commented that they have had to work twice as hard to prove themselves, that it's almost a cliché.

## Gender Gap

A "Viewpoint" article by Vivek Wadhwa at Businessweek.com examined the gender gap in engineering and women's attitudes about entrepreneurship. The article profiled the results of focus groups with women students conducted by Kimberly Jenkins, a former president of Microsoft's education division, who now serves as an entrepreneur in residence at Duke University's Pratt School of Engineering. The results echo conversations that professional women have had for years.

A lack of role models and female mentors was mentioned by women in the groups as being a great deterrent in women's career choices. Discrimination was also a top issue, even though it often manifested itself in seemingly small ways. One woman was quoted as saying, "Women get asked to be the secretary even though they aren't any good at taking notes."

Balancing work and family was seen as much more of a career obstacle for women than it is for men because

*Continued on page 12*

## SWE Chapter Spreads Its Engineering Wings

A low hum of voices grows in volume as Judy Robert's fifth-grade math class mulls over a written objective and instructions placed on their tables by Jenny Boughton and Annie Walsh, biological and industrial Mizzou Engineering students, respectively.

The two young women are introducing engineering concepts in the Hallsville classroom as part of a Society of Women Engineers (SWE) middle school engineering project. Like the national organization, MU's student chapter promotes engineering as a career aspiration, especially for young women. Exposing young



**SWE member Jenny Boughton discusses a middle school engineering project objective with Hallsville fifth graders: To design and write directions on how to build a paper boat with a sail.**



people to the sorts of problem-solving activities engineers participate in daily is intended to plant the possibility in their minds.

Each group of four middle-schoolers has 20 minutes to build a designated paper object: a boat with a sail, an airplane, or a bird. Instructions further direct them to document the process in enough detail to allow another group to construct an identical object using the directions they've recorded. The instructions note that the words parallel and perpendicular could be helpful. The groups quickly dive into the paper, tape, scissors and staplers on their tables.

Boonville and Harrisburg Middle Schools are also participating in the SWE initiative, launched in the winter of 2005. SWE President Kristin Ehlers, an industrial engineering major, developed and implemented the project with the help of Heather Chaffin, a chemi-

cal engineering major, in an effort to expose youngsters to engineering.

"I love it," Ehlers says of the middle school project. "It's challenging at times, but you can see that you sparked interest in some of the kids and that engineering might be something they want to do."

As the paper projects shape up in the hands of the rookie engineers, Boughton and Walsh move easily between the tables, answering questions and giving advice as Roberts looks on, obviously pleased with the activity. "The girls that come here are so professional," the teacher observed. "I've asked them to make whatever projects they do with the kids apply to what we're doing in the classroom. Because of the MAP (Missouri Assessment Program) tests, it is helpful that what they are doing stresses geometric figures and the importance of being specific." SWE members designed the paper project with this goal in mind.

Boughton says she has enjoyed participating in the program because it has gotten her involved in SWE as well as getting her out into the community. A highlight of her experience was when a teacher pointed to an excited and involved student and told her that she normally struggled to get the young man to participate. "It was great to see that what we were doing was really having an impact," Boughton said.

Mizzou Engineering's SWE chapter hosted a Girl Scout Day in February. Two hundred mid-Missouri Girl Scouts worked on projects representative of several engineering fields and earned a technology badge for



**Hallsville fifth grade math teacher and SWE member Annie Walsh share a light moment while the middle school class works on assigned objectives.**

their efforts. "I think they're more aware of some of the lesser-known fields in engineering and the different options available," Ehlers said of the participants in the event.

Under the new faculty sponsorship of Mizzou Engineering's Kate Trauth, an associate professor in civil and environmental engineering, SWE made a splash with its historical Green Tea event during Engineers' Week.

In honor of the 100th anniversary of the first woman to graduate from the College of Engineering, the group invited all past members to an event featuring the first Ada Wilson lecture.

Distinguished alumna Vicki Panhuise, who earned both a master's and a doctorate in nuclear engineering from MU, spoke on challenges and models for success for young women entering the field of engineering. Panhuise now serves as the vice president of commercial and military helicopters for Honeywell Aerospace in Phoenix, Ariz., and co-chairs the Corporate Partnership Council for SWE nationally.

"They're inspirational," said Trauth about the members of Mizzou Engineering's SWE chapter. "All of the work they do is amazing. It's an exceptional group of young women."





employers assume that women will need extra time off for child-rearing activities. Not only does this result in fewer opportunities to land jobs, but it also means that once hired, women are not given key responsibilities within businesses.

Finally, the participants observed that men are socialized to be self-promoting but it is not socially acceptable for women to highlight their accomplishments.

In many documented instances, discrimination exists in salary and promotion equity based on gender. Professional women's organizations have organized both to protest the disparity and to work for change – equal pay for equal work.

In her book, "The Grounding of Modern Feminism," N.F. Cott wrote: "The professional credo that individual merit would be judged according to objective and verifiable standards, made a promise so potent to women professionals that they upheld the ideal even when they saw it travestied in practice." She noted that there has been a trend among some women professionals not to set themselves apart as "feminists."

## Action at Mizzou

Preparing more women for careers as engineers means enticing more of them to Mizzou. In response to the need, the Mizzou Engineering Alumni Organization (MUEAO) scheduled a recruitment dinner at the St. Louis Engineers' Club on June 28 for young high school women. With the help of the College of Engineering's events planner Nicole Theberge, MUEAO President Gregg Dougan, BS EE '83, and board members Jamie Rana, BS CE '00; and Jo Emerick staged the event to present potential recruits with positive role models and to highlight the achievements of women in engineering. Successful women career engineering alumnae from the area and St. Louis SWE members were also on hand.

Kate Trauth, an associate professor in civil and environmental engineering at Mizzou served as the guest speaker.

Trauth, the new SWE faculty advisor, has taken on the issue of the enrollment and recruitment of women at MU Engineering as a personal mission. A graduate of an all-girls school in Cincinnati, Ohio, she believes that the young women attending the nine girls-only schools in St. Louis represent a great potential pool of recruits, and has begun making visits to those high schools. "In that environment, the atmosphere for girls is different," said Trauth.

"All of the leadership positions are held by young women. Expectations for the students are high and most of them go to college, but they don't know about engineering." She is using a book produced by the American Society of Civil Engineers (ASCE) titled "Changing Our World: True Stories of Women Engineers," by Sybil E. Hatch to make her point, leaving a copy behind after she speaks.

In fall 2006, the University of Missouri-Columbia received a three-year, \$500,000 National Science Foundation grant for a program that is aimed at improving the academic environment for women faculty members in science, technology, engineering and mathematics (STEM). One of the goals of the program is to develop and strengthen leadership qualities in women, which will have the reciprocal effect of providing mentors and role models for women students.

In the mid-1920s, Alice Park, writing about the gender gap in science-related fields, said, "The time will come, when the human race will become so human that we shall not need women's separate organizations." On the day when the gender gap closes with a snap, women engineers' accomplishments will become everyday extraordinary engineering accomplishments, and women engineers can move on to the math and science at hand, exactly what they've had in mind all along.



Women wield paddles along with the men as MU concrete canoe team members Cole Shippy, Misty Fletcher, Amanda White and Kyle Schmutzler coast to the finish line during this year's competition. Mizzou Engineering's concrete canoe team finished third in this year's American Society of Civil Engineers regional competition.

Photo by Melissa Shimm





## Mizzou Engineering Trains Women for 'War Work'

In January 1943, the University of Missouri announced a United States Office of Education "under engineer" trainee program to train women for "war work." One of the programs, aircraft radio, began on February 8 of that year. Women were offered \$120 per month for the twenty-four week program, after which they would be employed by the Aircraft Radio Laboratories at Wright Field in Dayton, Ohio, at annual salaries of \$1,620.

Classes were taught eight hours per day Monday through Saturday. The first eight-week course included algebra, trigonometry, slide rule, measuring devices, drafting and shop practice. In the second eight-week session, the women were taught electronics and principles of alternating currents. They attended an electronics lab and also had shop practice. The final eight weeks were dedicated to AC/DC machinery, radio principles and practice, anten-

nas and wave propagation, electrical transmission, radio servicing, measuring devices and materials of engineering. Additionally, women attended a radio lab.

Women applying for the program were required to have had two years of higher education and a minimum of three science or math credits in high school.

Also offered were programs called junior engineer-supplemental; technical assistant; engineering drawing, topographic or map drafting; surveying; and engineering computations.

Students had to furnish their own textbooks and supplies.

A January 20, 1943, MU news release stated, "The courses are concentrated and designed to give the necessary background without waste of time and to give women a chance to try themselves out in new fields, which serve the needs of peace as well as of war."

Said Engineering Dean Henry Curtis in the 1943 *Savitar*: "Women are now being acknowledged as capable of partially taking over fields in the past belonging wholly to men, and show promise of making up a large part of the proteges of Saint Patrick of Mizzou in coming years."

(Document courtesy University Archives, University of Missouri, Columbia. Collection No. C:0/45/1 Box 9.)

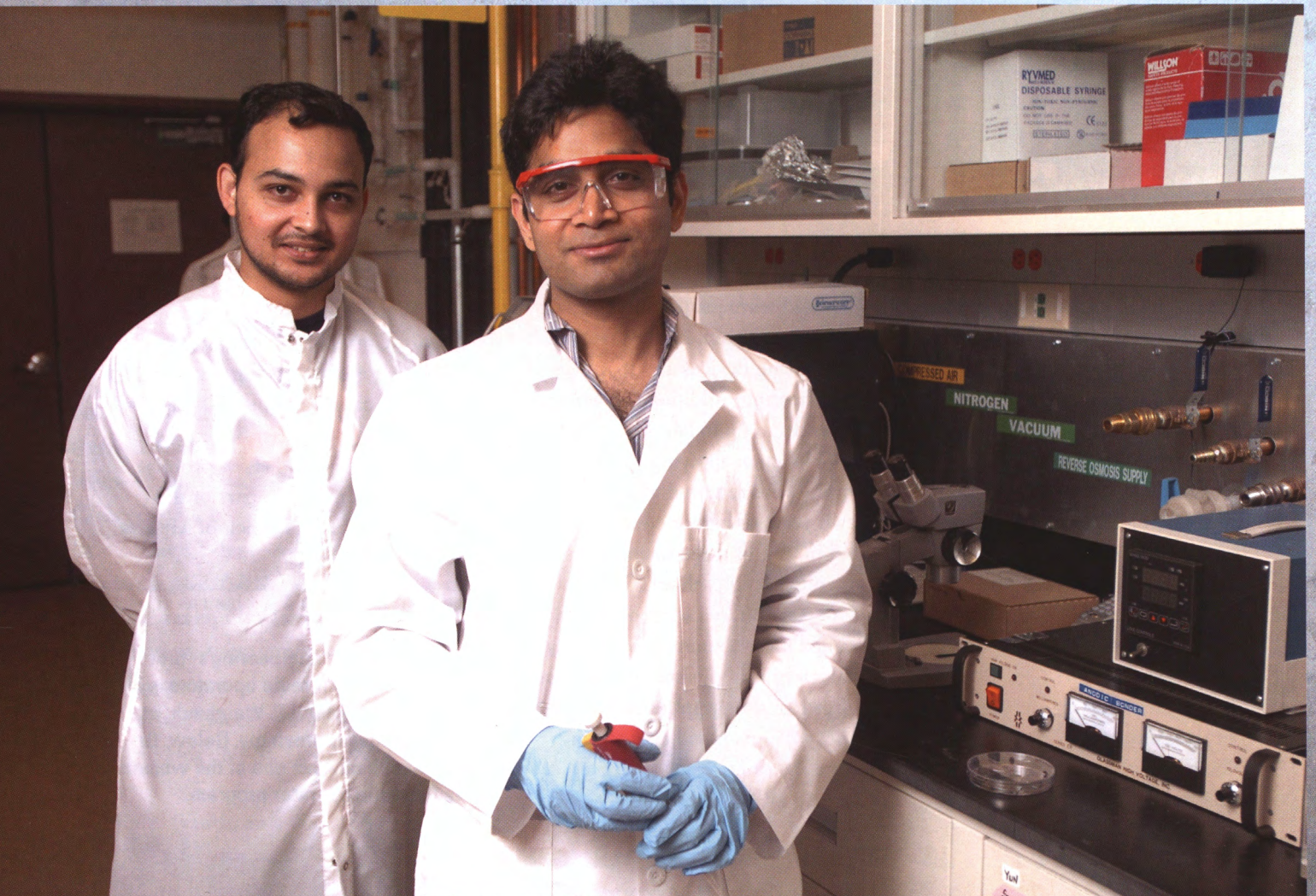
**Above, Mizzou Engineering's first class of aircraft radio operators with Professor Mendell P. Weinbach, at left, smiling approvingly. Below, Dr. Weinbach advises one of the women in the radio operator program.**





# Nano Research to Clear Away the Fog

by Jan Wiese-Fales  
Photos by L.G. Patterson



Riberet Almeida and Venumadhav Korampally are working with nanoparticles to create a coating for glass and plastics that will be moisture resistant.



**W**hen warm glass meets cold air, or vice versa, condensation occurs — a nuisance in cold weather for those who wear eyeglasses, and also annoying when trying to use the bathroom mirror after a hot, steamy shower. Automobile and aircraft windows that become fogged over can be potentially hazardous.

The latter complication is what drives Mizzou Engineering's electrical engineering nanoparticle research team of doctoral candidates, Riberet Almeida and his mentor Venumadhav Korampally, to look for a solution to clear the fog. The other applications are every bit as valid, not to mention marketable on a consumer level.

Research in the emerging field of nanotechnology is linked to incredible promise in areas that include drug delivery, disease detection, national defense and environmental policy. In addition to these big-ticket scientific applications, the ability to manipulate matter at the atomic level has an almost endless array of additional practical applications.

"We are developing nanoporous films that are super-hydrophilic," said Korampally, explaining that such a film causes water to spread across surfaces while still maintaining transparency.

"We want it to be scratch-resistant and durable. Once it's applied to a surface, it will have to last a lifetime," Almeida adds.

Funding for this Phase One National Science Foundation project comes from a Small Business Technology Transfer subaward from InnoSense LLC, a technology firm based in Torrance, Calif.

When reduced to its molecular level and added to a solution, organosilicate nanoparticles will self-assemble on a surface. Once polymers are removed, what is left is a nanoporous coating similar to a sponge that will instantaneously spread the moisture evenly across the entire sur-

face. "We have gotten good results with high temperatures, but we are working to get it to respond with low temperatures as well," said Korampally.

"We'll also make the film anti-reflective by controlling the thickness," Almeida adds.

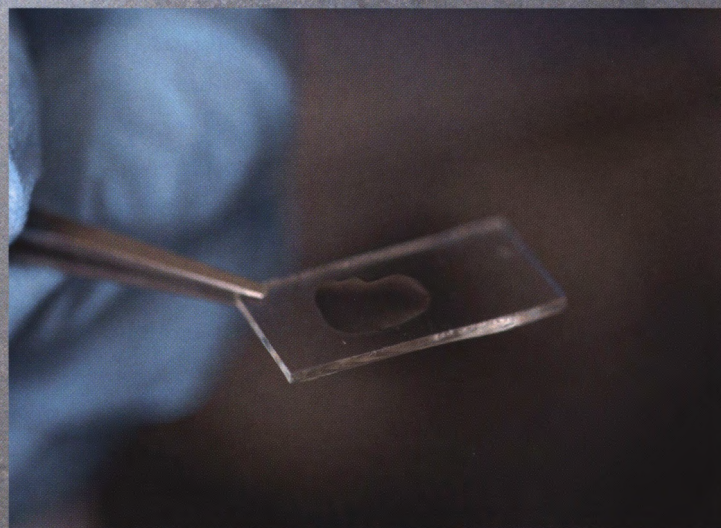
The pair of researchers works on the anti-fog coating project under the supervision of Shubhra Gangopadhyay, Mizzou Engineering's LaPierre chair of electrical and computer engineering.

"We have a lot of freedom," Korampally said. "If we have an idea, we can try it."

"We have a really large research group," Almeida adds. "We can sit down and have discussions with our colleagues based on their experience. It helps a lot."

Bright, motivated student researchers, backed by skilled, innovative research faculty in a supportive environment, working on a cutting edge project that has potential applications in the lives of each and every one of us — there's nothing hazy about that.

"We can't wait to get it to work and have these coatings on our car windshields," said Korampally.





# Undergraduate Research Project the Future of Home Networking

by Jan Wiese-Fales

**IN THE EARLY 1960s**, "The Jetsons," a prime time cartoon show set in the late 21st century, depicted a space-age lifestyle where household tasks were automated and controlled at the touch of a button. The cartoonists' perceptions of life in the future fueled the electronic imagination of every child and adult who watched the show.

Though too young to remember the Jetsons, or to appreciate how playfully prophetic the series was, this summer a selected group of undergraduate students will have the chance to investigate futuristic issues in home networking technologies through fellowships funded by the National Science Foundation (NSF) at Mizzou Engineering.

NSF has funded a three-year "Research Experience for Undergraduates" (REU) home networking program proposal from Haibin Lu, an assistant professor in computer science. He and associate professor Wenjun Zeng, along with some help from Xinhau Zhuang, the C.W. LaPierre professor in computer science, will work closely with a team of 10 students for the next three summers to investigate some of the challenging issues inherent in home networking.

Though he has worked with multi-media net-

working issues for over a decade, Zeng, who has in the past couple of years been playing a lead role in establishing the first Institute of Electrical and Electronics Engineers (IEEE) conference dedicated to consumer communications and networking, points out that the home networking field is in its early stages. "It has really advanced in the last five or six years," he said. "One of the unique problems that will need to be addressed," he added, "is that everything will need to be easy to use." Zeng was alluding to something that most of us have experienced firsthand. Just because the technology is broadly available, using it is not an intuitive act for consumers.

An especially challenging issue that faces researchers is that each electronic device within a home will soon have its own unique internet protocol (IP) address, radically changing communication issues. The result is that each homeowner will have to serve as his or her own network system administrator.

"The team will assemble a number of electronic devices to simulate a wireless home network," said Zeng, explaining how students will approach the project. "They will investigate performance and quality. Bandwidth will be a big issue."

He pointed out that besides devising ways to



# Explores

make interconnectivity easy to understand and simple to use, security will also be a focus of the research. Wireless networks are ripe for misuse and people with integrated home systems will also have to understand how to make their networks secure.

Digital rights management and copyright issues are also something the undergrads will look at.

Encryption — data scrambling — and the use of digital watermarks whereby information can be embedded into audio and video recordings, making them retraceable, are options that will be examined.

Distance learning to the home and advanced systems for video conferencing are also on the table as issues for undergraduate researchers to tackle.

“I’ve been doing my own networking to learn new stuff,” said Michael Henderson, a Mizzou Engineering junior in information technology who is earning a minor in computer science. Henderson is one of the students chosen to work on the project this summer. “The whole network opportunity appeals to me,” he added. “There are always more efficient ways to do the same things.”

Henderson is excited about the program and the fact that it just might give him the leg up he needs when he starts looking for a job. “It’s what every junior and senior is looking for,” Henderson said. “If you graduate without experience, all you have is a degree, but employers prefer experience over just grades.”

Though part of the motivation behind the funding of the program by NSF is to involve undergraduates in research projects to get them interested in attending graduate school, Henderson is leaving his options open. “Addressing common issues that are part of this will give me a practical hands-on experience. If it’s something I really enjoy,” he said, “I can start my own business.”

Topical lectures, a session with a professional from the MU graduate school about the job market and advanced degrees, and sessions on writing research papers are all included in the project, as well as opportunities for students to present research.

Henderson is excited about being chosen and is pleased to have the research opportunity, but what is his bottom line? “I know it will be fun,” he said.

“One of the unique problems that will need to be addressed is that everything will need to be easy to use.”



In 1958, postage stamps were three cents, “The Bridge on the River Kwai” won the Academy Award for best picture, Nikita Khrushchev became premier of the Soviet Union, Jack Kerouac published “The Dharma Bums” and NASA initiated Project Mercury with the goal of putting a man in space.

Huber O. Croft was the dean of engineering, and a close-knit group of six electrical and mechanical engineering students either finished or were nearing the end of their class work at Mizzou: Fred Alexander, BS EE '59; Jim Buell, BS EE '58; George Huber, BS ME '58; Alan Skouby, BS EE '58; Jim Teegarden BS ME '58; and Don York, BS ME '58.

## Campus Life

“All of the dorms were south,” Jim Buell recalled. “In DeFoe Hall, we had our own cafeteria,” he added, noting students from the other three dorms had quite a hike to dine in Crowder Hall, which Alan Skouby remembers by its nickname “Chowder Hall.” Jim Teegarden roomed with both Fred Alexander and Don York at different times in DeFoe. York claims that it helped him in his studies because only a short break was necessary for a meal. George Huber was also lucky enough to be assigned to DeFoe.

Though there was no charge for tuition at the land-grant university at that time, Skouby remembered that in his freshman year his curator scholarship paid the \$67.50 per semester to pay for library, hospital and incidental fees.

York recalled spending less than \$1,500 for everything, including food, clothing, books, travel, laundry and a \$32 slide rule – an enormous sum at that time. Paying for college presented a challenge. “It was not easy,” he said. “I started out not knowing how I would pay

for it. Dad was working two jobs, because I was living his dream.”

“Alan and I worked in the chemical engineering lab together as a part-time job,” recalled Alexander. “I made 50 cents an hour. I got a raise to 65 cents an hour when I took a job in the cafeteria in DeFoe Hall.”

Teegarden worked part time for the city engineer as a draftsman/inspector to make ends meet.

Skouby had planned to join the Air Force and use the G.I. Bill to pay for his tuition, but the program was discontinued between Christmas and New Year’s of his freshman year. He didn’t see much hope of continuing without it. “I didn’t pre-register, but the dean’s office was paying attention,” he said.

Croft, academic dean from 1949 to 1962, contacted him and questioned him about it. “He got me a job at the Ag Engineering Farm,” said Skouby, “but that wasn’t enough money, so he got me another job at night in the student union soda fountain.” Once he moved out of the dorms, Skouby budgeted \$40 per month for groceries but never had to spend it all.

## Classwork

“I remember being impressed with how well-rounded the curriculum was,” said Alexander. “I took a business entrepreneurship class taught in the College of Engineering by Dr. Harry Ruby that really proved to be good for my career.”

Skouby has high praise for a number of his professors. He singled out Lloyd Benningfield, who taught electrical engineering, as being particularly good. “He was a jewel,” said Skouby.

All three mechanical engineers in the

group have fond memories of the chair of the department, Professor Ralph Scorah.

“Doc Scorah’s actions reflected the kind of standards that he held us to,” Huber remembered. “In our senior course we had to design a steam power plant. Half of the design was due at the middle of the semester and the final design was due at semester’s end.”

“I was an academic hot shot and thought my design was right on target,” Huber continued, “but Scorah gave me a ‘C’ for a mid-semester grade. When I asked him about it, he said he gave me

the grade because I did exactly what was required. So for the final paper, I derived and used some original heat transfer formulas and typed them using a red ribbon so that he couldn’t miss them.” Huber received an ‘A’ for the course.

“I learned a valuable lesson from that experience that I’ve never forgotten,” said Huber.

“We had a pop quiz in Doc Scorah’s thermodynamics class every day,” remembered Teegarden. “Things were generally expressed in pounds on the quizzes. One day we came in and every problem on the pop quiz was based on gallons of water. Most of us couldn’t remember how many pounds were in a gallon. ‘You guys,’ he said, ‘A pint’s a pound the world around.’ I’ve never forgotten that.”

“Doc Scorah’s steam power plant course was a three-credit-hour class,” recalled York. “But we put so much time in on that class that it was more like ten hours. After I graduated, I had a job interview in Kansas City and they asked me if I had taken a class from Doc Scorah. When I said ‘yes,’ they asked me if I had passed it. I answered, ‘yes,’ again, and they said, ‘If you’re good enough for Scorah, you’re good enough for us.’ He had that kind of reputation. He taught us

# Class of '58



Image courtesy of University Archives, University of Missouri at Columbia. Collection No. C.9/13/1

Professor Ralph “Doc” Scorah



a lot,” added York, “things that I’ll never forget.”

## Extracurricular Activities

“There was an outstanding social environment at MU. Dating was relatively easy. The ratio of males to females was good. Dates were not a problem,” said Alexander—an opinion shared by York who said that he originally considered attending Rolla until he learned that men outnumbered women on that campus 17 to 1.

“There were curfews,” recalled Alexander. “Women had to be in the dorm by 10 p.m. on weeknights, and midnight on the weekends.”

Engineers’ Week was as much a part of student life then as now, though Buell recalled that the knighting ceremony involved more mystique. “St. Pat and the Blarney Stone appeared and disappeared secretly from behind a curtain of steam, rather than being brought out openly, as in recent years,” he said.

“The rivalry with the Aggies was alive and well,” said Alexander. He also remembered the beard-growing contest during E-Week. “The students would line up and one of the professors would measure the beards,” he said.

Three of the ’58 grads recalled the fun they had at the traditional E-Week party where green beer is the beverage of choice. “It was held off campus, outdoors in a rural area and the weather was miserable,” reminisced Huber. “Doc Scorch took it upon himself to be one of the chaperones. I think it’s neat that the department chair cared enough to watch over us. He could have delegated it to anyone. I can still see him sitting on an upside-down bucket, smoking his pipe, watching us all make fools of ourselves.”

“The Shack was the favorite place to go,” said Buell, a sentiment echoed by both Teegarden and Alexander.

“You didn’t have to be of legal age to buy beer at the Shack – all you needed was a student I.D.,” said Teegarden. “A

glass of beer was a dime.”

Alexander recalled how worn the place was and remembered another student hangout called Andy’s Corner, just south of Stadium, that was both a bar and service station. “If you could peek over the bar, you could buy beer,” he said. “The place had a jukebox and at that time the song ‘Drink, Drink, Drink’ by Mario Lanza was popular. We would get enormously loud when that song came on.”

Everyone in the group emphasized that they didn’t have the time or the resources to go out often. Instead, they spent their spare time becoming involved in Mizzou Engineering-related activities. All six were members of the Engineer’s Club, which was an active organization with more than 400 members that held regular meetings, with speakers from industry. Alexander and Buell both served as president during their senior years. York served as editor of *The Shamrock*, Mizzou Engineering’s magazine, his senior year, and Teegarden was the busi-

ness manager.

“We were running the show,” said Huber of their involvement. “I have fond memories of it all,” he added. “We were a close-knit group – close knit as friends.”

The group of friends met back at their alma mater in March 2006 for a pre-50th reunion, and has plans to return in the fall of 2008 for the actual event. They’d like to invite anyone who cares to join them to be in touch.

“One thing that is particularly interesting having come back,” said Skouby who serves as an adjunct assistant professor in the MU School of Business, “is that the place was drab then. There was no color. It’s beautiful now — like the Wizard of Oz.”

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*If you’d like information about the Class of ’58 reunion, or would like to help arrange for a “Class Feature” on your graduating class, e-mail [mucengrdev@missouri.edu](mailto:mucengrdev@missouri.edu) or call 573-882-7834.*

Image courtesy of University Archives, University of Missouri at Columbia • Photos courtesy of Don York



**At top are Jim Buell and Alan Skouby, and George Huber and Fred Alexander at MU last year, taken by Don York. At bottom the executive council of the Engineers’ Club from the 1958 Savitar, l. to r. are Larry Bennett, Charles E. Jones, John Pugh, David G. Snider, Robert Pape, Fred Alexander, G.P. Kretschmar, Don A. York, Gordon C. Brunkhorst, Donald E. Pepper and Alan Skouby.**



## 1940s

**Leon Andrew Golfin**, BS ChE '44, retired from NL Industries, Inc. after 30 years of service. He followed his retirement with 14 years in St. Louis County government as an elected alderman in Brentwood, Missouri, for seven terms. He is now fully retired. Besides traveling, he is spending time with his grandchildren, one of whom is currently a Mizzou Engineering ChE major. Leon would like to hear from classmates. Please send your contact information to [umcengrdev@missouri.edu](mailto:umcengrdev@missouri.edu) and Mizzou Engineer will forward it on to him.

## 1950s

**Ernest T. Smerdon**, BS AgE '51, MS E '56, PhD Philosophy '59, was named one of three Vector De Oro award winners by the Union of Pan American Engineering Societies. The award recognizes engineers for teaching and research that leads to improvements in engineering education. He is a professor emeritus and former dean of the University of Arizona College of Engineering.

## 1960s

**Michael A. Fajen**, BS MAE '69, MBA '63, is enjoying retirement after 35 years in oil refining. He and his wife have three children.

## 1970s

**Dale E. Klein**, BS ME '70, MS ME '71, PhD ME '77, is chairman of the U.S. Nuclear Regulatory Commission (NRC), which was named the No. 1 large government agency to work for. Employees gave the agency high marks in effective leadership, training and development, teamwork and support for diversity. The NRC has 3,400 employees.

**Edward Shyloski**, P.E. MS ChE '70, joined the Shaw Group Stone & Webster Nuclear Services as vice president of nuclear construction in Charlotte,

N.C. He is responsible for the nuclear construction program deployment of the Westinghouse AP1000 power plant including module assembly management, site development and power plant island construction execution planning.

**Dan Slagel**, BS ChE '78, is a project manager in the corporate engineering department for E. & J. Gallo Winery in Modesto, California.

## 1980s

**David Petty**, BS ChE '80, worked as a chemical engineer for 19 years before doing a formal apprenticeship in organ building. He now works in his own shop, building pipe organs by hand.

**Carol Stuckey**, BS CiE '82, lives in the Seattle, Wash., area with her husband and daughter and works for the Washington State Department of Health Office of Drinking Water. She sends greetings to her fellow 1982 Civil Engineering grads on the occasion of the classes' 25th anniversary.

**Daniel M. Lorts**, BS ECE '83, and Teresa Leigh Gerdes BS Educ. '82, of Rowlett, Tex., were married in a sunset service September 7 on the beach in Montego Bay, Jamaica.

**Virginia Kremer Brandt**, BS ChE '84, of Avon Lake, Ohio, received the 2006-2007 Outstanding MBA Award from the Graduate School of Management at Kent State University. She is a general manager of technology for Energizer.

## 1990s

**Christopher J. Culp**, BS ME '92, of Olathe, Kan., was recently promoted to vice president at Henderson Engineers, Inc. in Lenexa, Kan.

**Brad Pollock**, CiE '93, and his wife, Amanda, announced the birth of their first child, Emily Clair, born August 30. Brad is director of operations for Giroux Energy. The couple lives in St. Louis.

**Paula Day Gough**, BS CiE '95, of Shelbina, Missouri, has been tapped to head up the Missouri Department of Transportation's northeast district.

## 2000s

**Joshua Michael Seidel**, BS MAE '02, is working for Gundaker Commercial Group in Chesterfield, Missouri, as a project manager in its construction division.

**Craig George**, BS CiE '06, of St. Charles, Missouri, has joined Burns & McDonnell in St. Louis as an assistant civil engineer, specializing in highway design.

**Erin Leer**, BS ChE '06, has joined Burns & McDonnell in St. Louis as a process engineer, specializing in pharmaceutical process and bioprocess design.

## In Memoriam

**Gary Evans Martinette**, BS ME '63, of Grandview, Missouri, died on April 5. He worked for the Bendix Corporations for 30 years, retiring from Allied Signal in 1993. He then joined George Butler Assoc., Inc. as a marketing consultant. He served as mayor of Grandview from 1973 to 1976 and was the youngest mayor in the entire state. He was a member of the University of Missouri civil and mechanical and aerospace engineering boards, and also served on the board of the MU Engineering Alumni Organization. Martinette is survived by his wife, Janice Wilson Martinette, BA EDUC '59.

**Laura Sherman Laughlin**, BS ChE '02 died last February 20 as a result of injuries suffered in an automobile accident on July 15, 2005. She married Jeff Laughlin in August of 2004. The couple was living in St. Louis where Laura was working as a sales engineer for Emerson Process Management Refining & Chemical Industry Center at the time of her accident.





## Scholarship Established

**1st Lt. Mark Gelina**, BS IE '05, died on November 4, 2006, while serving as a 2nd Lt. on active duty with the U.S. Marine Corps in Anbar, Iraq. He was meritoriously promoted to 1st Lt. and laid to rest at the Missouri Veterans Cemetery in Jacksonville, Missouri. His wife, Stacey, and four children survive him.

TO HONOR GELINA'S LEADERSHIP AND CHARACTER, his family and friends have established a scholarship in his honor. Donations may be sent to:

**University of Missouri-Columbia, Office of Gift Planning and Endowments, 1st Lt. Mark Gelina Memorial Scholarship, 302 Reynolds Alumni Center, Columbia, MO, 65211-2100. Contact (573) 882-3866 for more information.**



## Erin Go Bragh!

The Mizzou Engineering Alumni Organization (MUEAO) is pleased to recognize the exceptional leadership skills of the 2007 St. Patrick's king and queen candidates. In appreciation of their hard work, perseverance, and charm in the face of many deadlines, and a heavy academic load the Engineering Alumni Board of Directors will be funding their MUEAO memberships for the upcoming year. Please join us in congratulating these exceptional students and leaders:

Front Row (L-R): Kristine Malotte of St. Joseph, Mo., Biological Engineering; Misty Fletcher of Jefferson City, Mo., Electrical Engineering; Queen Katie Pfeffercorn of Chaffee, Mo., Chemical Engineering; Jennifer McClelland of Kirkwood, Mo., Industrial Engineering; and Emily Gogel of St. Louis, Mo., Industrial Engineering

Back Row (L-R): Emerson Rapp of Peoria, Ill., Industrial Engineering; King Geoff Nurrenbern of Fulton, Mo., Mechanical Engineering; Nick Harvey of New Franklin, Mo., Civil Engineering; Chance Baragary of Boonville, Mo., Civil Engineering; and Ryan Goetz of Chaffee, Mo., Civil Engineering

– Jamie Rana, BS CE '00, MUEAO Communications Chair

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*Get connected and at the same time support students, campus programs and faculty.*

Make checks payable to the MU Alumni Association.

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- \$40 Individual     
  \$30 Recent Grads     
  \$30-65 and older or MU Faculty/Staff  
 \$20 Current Student     
  \$1,000 Endowed Life

**For more options, or to join as a couple at a discounted rate, go to [www.mizzou.com](http://www.mizzou.com).**



## An Industry '50,000 Foot View'

### Robin Robinett's diverse background has driven her career

In the 22 years since she graduated from Mizzou Engineering, Robin Robinett has had five distinct engineering careers. She has worked in diagnostics, as an analytical chemist, in pharmaceuticals, as a writer and in regulatory affairs. And now she is about to embark on a sixth as an independent consultant where every piece of her career puzzle will come into play.

"Because of my diverse background, I can make links and connections that very few people can understand," Robinett said, explaining how each skill set she added to her diverse background opened another career door.

In 1985 Robinett earned simultaneous bachelor's degrees in chemical engineering from the University of Missouri College of Engineering in Columbia, and in biochemistry from the MU College of Agriculture.

Her undergraduate research in analytical chemistry turned into a full-time job when she joined Merck pharmaceutical company in 1987. She worked her way up through the ranks as a chemist in the development and validation of various types of assays; as a chemical engineer working with vaccines; and finally as a research fellow, writing and editing regulatory documents. She also earned both her master's and doctorate degrees while working full time, and delivered her daughter two weeks after defending her PhD.

Her dedication to her work and the zeal that she exhibits in everything she does, earned her Merck's Most Amazing Woman Award.

Robinett left Merck last year and added to her skill set when she moved to the Australian firm, CSL Biotherapies, where she worked directly with the FDA as the company's biologic regulatory affairs manager. The job also added some policy and public relations experience to her background.

"My timing moving into the regulatory area was perfect," she said. "It was just after the FDA started to require a common technical document (CTD) format for marketing applications. I converted the first vaccine submission for Merck and since then have written more marketing applications in CTD format than

most people in the world."

Robinett gave training lectures on working with the CTD format and became familiar with the consulting field through people she met at the events.

"The more you know — the more you can connect the dots — the better off you are," Robinett said.

After taking the summer off to spend with her husband and seven-year-old daughter, she plans to take all of the dots that she's connected into a "50,000-foot view of the industry" and will work as a consultant.

What does Robinett feel will be her biggest challenge in her new endeavor?

"Over committing," she says firmly. Imagine.



## CAREER ENGINEER PROFILE

### ■ What is your fondest memory of your days as a student in Mizzou Engineering?

My fondest memory is the feeling I had when my design class was over — ammonia plant design was definitely not one of my favorite areas — and the knowledge that I would get that chemical engineering degree after all!

### ■ Who was your favorite professor and why?

The professor who influenced my career the most was Dr. George Preckshot. He was the chemical engineering department chairman when I was a sophomore. My initial major when I started at Mizzou was biochemistry in the Agriculture College. My sophomore year, a friend suggested that I think about switching my undergraduate major to chemical engineering and do my doctoral research in biochemistry. Dr. Preckshot told me about a new field called biochemical engineering. At that time there was no formal program so he suggested that I double major in chemical engineering and biochemistry. It sounded like a reasonable idea at the time. Would I recommend double majoring in those two areas simultaneously? Probably not. However, studying the two fields together did give me a unique perspective. My training has allowed me to freely talk to either field and in many cases act as an interpreter between fields. Surviving the double major also gave me confidence that I could make my own path and not have to follow traditional or typical career paths.

### ■ What do you consider the greatest achievement of your career so far?

While working at Merck, I was the lead writer/editor for the chemistry, manufacturing and controls (CMC) sections of the marketing applications for three of Merck's recently launched vaccines. ProQuad® is a vaccine that prevents measles, mumps, rubella, and chickenpox; Zostavax® is a vaccine that prevents shingles in older adults; and RotaTeq® is a vaccine that prevents



diarrhea in babies that is caused by rotavirus. The latter two are currently the only vaccines in their class.

My unique background in science and engineering gave me a detailed understanding of all CMC sections, which I leveraged to create coherent, consistent and accurate dossiers that all received FDA and European approval. By helping bring these vaccines to the market, the suffering and/or death of hundreds of thousands of people will be prevented. That's important to me.

■ **What do you do for fun when you're not working?**

Currently, most of my fun activities are of an educational nature and fall into two main categories – Girl Scouts and history. I am the co-leader/activities director for a first-grade Brownie troop. On the historical side, I give tours at a local museum – a concrete castle named Fonthill in Doylestown, Pa., portray a civilian with my daughter at Civil War re-enactments, teach tatting and even occasionally can be found at a Revolutionary war re-enactment. I also hook and braid rugs, sew, and study all sorts of subjects including karate, ancient civilizations, ancient technologies, ancient manuscripts and feng shui.

■ **As someone who has had a distinguished career in engineering, what is your best piece of advice for today's engineering students?**

Be self motivated, persistent and flexible. Set a goal that truly resonates with you, find a path and go for it. If the path doesn't work, look for another one but keep moving forward. Persistence is the key to achieving anything, but flexibility will open opportunities that you never dreamed were possible. And finally, always remember that the journey is just as important as the destination.

## News from Mizzou Engineers

Share your personal and professional news with us. Mail this form to:

**Jan Wiese-Fales, Editor**  
**Mizzou Engineering**  
**University of Missouri–Columbia**  
**W1006 Lafferre Hall**  
**Columbia, MO 65211**

or e-mail: [umcengrdev@missouri.edu](mailto:umcengrdev@missouri.edu)

Name \_\_\_\_\_

Maiden Name \_\_\_\_\_

Spouse's Name \_\_\_\_\_

Class Year \_\_\_\_\_ Spouse Class Year (i/a) \_\_\_\_\_

Discipline (BE, ChE, CEE, CS, ECE, EE, IE, IMSE, MAE) \_\_\_\_\_

Home Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_ Zip \_\_\_\_\_

E-mail \_\_\_\_\_

Here's my news: \_\_\_\_\_

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### RECRUITMENT

Please send information about Mizzou College of Engineering to:

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_ Zip \_\_\_\_\_

Currently Attending: \_\_\_\_\_

\_\_\_\_\_ Year in School: \_\_\_\_\_

**MU Engineering Alumni Organization Golf Tournament**

**September 14, 2007**

**Eagle Knoll Golf Course, Columbia**

**4-person Scramble**

**18 Holes • Shotgun Start at Noon**

**Registration begins at 11 a.m.**

**Registration fee includes green fees, golf cart, shirt, box lunch, dinner and auction ticket.**

*Sponsored by Anheuser Busch and the MU Engineering Alumni Organization.*

For more information contact Special Events Coordinator, Nicole Theberge at (573) 884-3426 or e-mail [ThebergeN@missouri.edu](mailto:ThebergeN@missouri.edu).



*Get in touch with your college pals  
and mark your alumni calendars  
for these events.*

July 20 Boston Engineering Alumni Event  
The Harvard Club of Boston  
6 p.m. - Social Hour • 6:45 p.m. - Dinner

September 14 MUEAO Golf Tournament  
Eagle Knoll Golf Course, Columbia

October 5 Dean's Engineering Advisory  
Council Meeting  
Stoney Creek Inn, Columbia

October 5 St. Patrick's Society Gala  
Upper Crust Ballroom, Columbia

For more information or to register for these events, please  
contact Special Events Coordinator, Nicole Theberge at  
(573) 884-3426 or e-mail [ThebergeN@missouri.edu](mailto:ThebergeN@missouri.edu).



## Mizzou Engineering

University of Missouri-Columbia

Engineering Development Office

W1006 Thomas and Nell Lafferre Hall

Columbia, MO 65211-2200

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