Beam me up!

Better, stronger, cheaper, faster—bridges that is, or more specifically bridge beams and their repair.

This is one focus of research efforts by Robert J. Peterman, associate professor of civil engineering. With funds from the U.S. Department of Transportation, administered by the Kansas Department of Transportation, Peterman tests new materials (labeled) used to strengthen and repair (stronger) bridge beams rather than replace them (cheaper), with much of the process able to be done in situ without closing down roads and tearing down bridges (faster).

"Anything done today that can show a positive effect on the economy is huge," Peterman said. "The state has many bridges in need of repair or upgrading to handle the heavier loads of today's traffic. Instead of tearing these bridges out and building new ones, we're looking at ways of strengthening them on location at one-third the cost."

The repair process currently being tested by Peterman and civil engineering assistant professor Hayden Rashid, as both the Civil Infrastructure Systems Laboratory (CISL) located on the east side of Manhattan and lab space in the basement of Fiedler Hall, involves applying carbon fiber-reinforced polymers directly to a concrete beam. Each carbon fiber sheet can withstand more than 4,000 pounds of force per inch width, and when glued to a beam, that member can become up to twice as strong.

Another plus is that the fiber sheets, by means of a paint roller and epoxy glue, can be applied to beams still part of an existing structure. Such repairs require only a 24-hour closing of the bridge, a huge difference from reconstruction outages of weeks and months, and some pronouncements of the process even say it can be driven on immediately.

"It's space-age technology brought down to bridges," Peterman said.

Application of the product, however, is only the first step. The beams must also then be tested for strength and the ability to withstand repeated loads. Enter the Havens Steel Self-Resisting Load Frame, located outdoors at the CISL facility.

Peterman partnered with Havens Steel Company of Kansas City, Mo., in 1999 to co-design and build the $120,000 full-scale load frame used to test all types of structures, including beams, columns, and joint connections. Adding 22 corporate sponsors along the way who provided additional equipment and facilities, Peterman spearheaded an effort which brought K-State a unique, large-scale infrastructure testing program that few schools in the country can equal.

The testing frame at CISL can handle structural components up to 32 feet in length and apply up to a half-million pounds of testing pressure. A smaller device in the Fiedler lab can handle beams of 20 feet and apply a quarter-million pounds of pressure.

"Eighty percent of my research is experimental in nature," Peterman said, "while the other members of the structures research team—Rashid, Hong-Mi Kim, professor; and Ayad Emam, assistant professor—focus more on the analytical and computational sides. We test products, make recommendations, and present guidelines."

Peterman currently has six ongoing projects—each related to evaluating new materials for more efficient building or repair of bridges. "We're developing guidelines for materials and technology that will be used nationwide," he said.

In addition to his research efforts, Peterman also uses both labs to provide his students with a hands-on grasp of structural design and behavior. He teaches undergraduate courses in reinforced concrete design, prestressed concrete design, concrete bridge design, mechanics and materials, and introduction to structural analysis. At present he supervises six graduate students, three master's degree and three Ph.D.

"I've found the best way to be an effective teacher," Peterman said, "is to bring my research into the classroom and let the students experience for themselves in the laboratory what they're learning about from their textbooks and in class."

Peterman's formal civil engineering education consists of a B.S. from Lafayette College, and an M.S. and Ph.D. from Purdue University. He also spent four years as a pre-stressed concrete design engineer in Indianapolis.

He came to K-State in 1999 and during the past five years has secured more than $1.5 million in research grants. He serves as secretary of the national pre-stressing steel committee of the Prestressed Concrete Institute and has received numerous teaching and research awards.

"I love the Midwest," Peterman, originally from the East Coast, said, "and K-State offered me the opportunity to pursue my two career passions of research and teaching."

—by Mary Rankin
The late Alice Fiedler, whom we recently honored with a tribute program, once remarked, "I believe in our students." She went on to say that because of their dedication, she felt her investment in the College of Engineering was "safe and sound," as those same students would one day "make the world a better place."

Alice's trust is well grounded. We do a really good job in the classroom. Our dedicated faculty participate in activities like the LEAR/RN program to become the best possible facilitators of learning; they continually look for ways to broaden their research and bring it into the classroom for hands-on teaching experience. Our students respond by excelling.

And not just in the classroom. The center pages of this issue, featuring internships from NASA to Volkswagen to the WISE program and the ongoing successes of three of our teams, broadcast the message loud and clear that not all education takes place within the hallowed halls of academia. From extracurricular opportunity comes additional learning.

Yet these things don't just happen. They require commitment and support, not only from administration and faculty within the college, but an outside advocacy and patronage from our alumni and friends, from industry, and from national labs and programs.

Multicultural Study Room relocates to Fiedler

Members of the Multicultural Engineering Program (MEP) Advisory Council were on hand in Fiedler Hall this fall for the opening of the newly relocated Multicultural Study Room previously housed in Sexton Hall. The purpose of the room is to provide a place for underrepresented minorities in engineering—Black, Hispanic, and Native American—to study and meet together. Pictured above from left to right: Terry King, dean of the College of Engineering; Ruth Manzall, KDOTE MEP Advisory Council; Thrissell Howard, MEP director; and Charles Poleh, FEA, careesa Foreman, GM, and Benjamin Torres, Exxon Mobil, all members of the MEP Advisory Council.

Minarcini Plaza—an outdoor gathering spot

Engineering students enjoy a warm fall day on the newly added furnishings in the Minarcini Plaza, located just outside the south doors of Fiedler Hall. The plaza was named with a gift from Ron and Joanne Minarcini, Marco Island, Fla. Ron earned his B.S. in civil engineering from Kansas State in 1960 and an M.S. in 1961. Having recently retired, he enjoyed a 30-year career in executive management, project management, and engineering on heavy, marine, and industrial construction projects in domestic and international locations.

2003 teaching/research awards

Steven J. Eickels, NNE James L. Holman Memorial Award for Excellence in Undergraduate Teaching

Larry E. Erickson, ChE Engineering Research Excellence Award

Richard R. Gallagher, EECE Robert R. and Lila L. Snell Award for Excellence in Undergraduate Teaching

Medhat M. Morsos, EECE Myers-Allford Memorial Teaching Award
From the red carpet entrance, complete with valet parking, to the close of an event-packed evening of dinner, dancing, and award presentations, the 2003 Seaton Society Dinner and Dance was a huge success. Nearly 300 Seaton Society members, and K-State engineering faculty, staff, and students attended the gala held Nov. 8 at the K-State Alumni Center. Syndicated radio host Bill Miller was master of ceremonies and music was provided by the Vaughan Bolton Orchestra. A surprise visit by Kansas State mascot Willie the Wildcat delighted guests as he arrived in the ballroom midis the strains of “Wabash Cannonball.”

Special honorees of the evening were the five new members inducted into the College of Engineering Hall of Fame in recognition of lifetime professional and public service, as well as involvement and support of the college and Kansas State University. This is the most prestigious award bestowed by the college, acknowledging the highest levels of achievement. Nine alumni were also recognized with Professional Progress Awards, marking significant success and accomplishment midway through their professional careers.

Left to right, Terry Weaver, EE ’73, entrepreneur; G.P. “Bud” Peterson, ME ’75, ’80, provost, Rochester Polytechnic Institute; Larry Fouke, ME ’60, ’61, principal, Naval Nuclear Propulsion Fellowship Program; Robert Davis, IE ’69, senior director, Anheuser-Busch-retired; and Carl Norman, AgE ’53, consultant/hydrologist.

Page top, left, Bud and Valerie Peterson take to the dance floor; right, Travis Rogers, sophomore in CE and Vaughan Bolton Orchestra member, exhibits his talent on the saxophone.

Above, scenes from the evening: students display ballroom dancing skills; Dick and Barb Hoyer share a light moment with Kevin and Binnie Honomich.
B Ranching out into new areas of study, living in a different part of the country, gaining professional workplace experience — this was the reality for Andrea Muraco, senior in industrial engineering, and Andrew Newton, senior in electrical engineering, who both spent their summers as research interns.

Muraco received a Langley Aerospace Research Summer Scholarship, which allowed her to intern at the NASA Langley Research Center in Hampton, Va. She was one of fewer than 50 students in the U.S. chosen to intern with NASA.

Last spring, Muraco was approached by David Ben-Arie, associate professor of industrial and manufacturing systems engineering at K-State. Ben-Arie was involved in a research project at NASA and encouraged Muraco to apply for an internship. The project, part of the Model Systems Branch, was designed to build reduced-scale air and space experimental vehicles used for advanced flight testing and analysis.

Ben-Arie served as Muraco's contact throughout the project. “Although he was in Manhattan during my internship, Dr. Ben-Arie served as my advisor and outside mentor during the project. It was his project, and I was fortunate to get to join in,” Muraco said.

“This was a great opportunity that offered me real world experience,” Muraco said. “I enjoyed working with the helpful staff, and just being at NASA was an awesome experience.”

The internship wasn’t without its difficulties though.

“It was very different from the classroom. Everyone worked independently and that definitely took some getting used to,” she said.

While Muraco was at NASA, Newton spent his summer at Cornell University in Ithaca, N.Y. His research at Cornell was part of the National Nanofabrication Users Network (NNUN), a network of five universities that provides users with some of the most sophisticated nanofabrication facilities in the world.

Unlike Muraco, Newton found his internship through K-State’s Career and Employment Services. While enrolled in the CES program, he came across NNUN’s Research Experience for Undergraduates.

“I had to go through a lengthy application process. From there, I sat back and waited to hear the news...luckily it was good,” Newton said.

Newton was one of 12 students chosen to intern with Cornell’s NNUN program. His work focused on a project titled “Ultrastructurally Driven Microneedle Arrays.” He spent the majority of his summer fabricating microneedles under the supervision of his principle investigator, Professor Amit Lal. With research, microneedles will be potentially painless, minimally invasive needles that can be used for transdermal drug delivery and sampling of organic matter.

“My goal for the summer was to take the process of microneedle fabrication from the initial design to a testable product,” said Newton. “I was very fortunate that I succeeded!”

Newton wasn’t without his fair share of obstacles either.

“Learning to communicate with other researchers and professors that didn’t continue on page 6

And now the number is 34 — more than the College of Engineering claim to fame — competing in the competitive and prestigious NASA WISE program.

Each summer 14 to 16 outstanding engineering students spend 10 weeks in Washington, D.C., learning about technological and policy issues and developing a research paper issue. Interns are expected to go beyond simple talking with individuals who are experts in the topic.

This year’s students from Kansas State were Lauren Hagen and Julie Quackenbush, senior in industrial American Nuclear Society and wrote her research paper on the topic: “Preparedness & Response: The Role of the Professional Engineer in Development and Implementation of Critical Infrastructures.”

While not a nuclear engineering major, Bierholtz’s science, and after her experience this summer is “to establish engineering knowledge to the nuclear industry and its applications.”

“It turns out my topic,” she said, “has been a hot topic for a decade. There are established programs for recruiting recommendations primarily consisted of suggestions Department of Energy programs to entice students.”

“Homeland security is a topic of interest to even engineers pledge the Engineer’s Creed, they are securing infrastructure to protect the public from terrorism that all types of engineering students need to focus more on securing our infrastructure to protect the public from terrorism.”

Her experiences also served as a graduate research and future career path for her, she said. “After reviewing career paths in public and private for learning about engineering cooperation, but they came from government agencies or other civil service agencies, like fellowships with government membership in the National Academy of Engineering have become a goal, while developing IE techniques to intern I earn my master’s degree.”

And how did two young K-State students find life in the nation’s capital?

“I understand now that a team that much 1 knows 1 always works for,” Quackenbush said. “One day I was warned about the Transportation, where we spoke and continued the conversation.”

What I did

Education outside the classroom

Pulling into the winner’s circle

Competing May 20–June 1 at the 2005 American Society of Agricultural Engineers International Quarter-Scale Tractor Student Design Competition in Moline, Ill., the 18-member Powercat Pullers team from K-State outscored 20 other teams to capture first place.

2005 Powercat Pullers team members: Jim Kopriva, John Katsenberg, Patrick Haberman, Ryan Zecha, Jason Seeger, and Nathan Olen; seniors, BAE; Will Hasse, Derek Sandmann, Justin Sommerfeld, Joshua Morton, and Benjamin Hesse; seniors, ATM; Sean Tolle, junior, BAE; Christopher Bierholtz; Ross Bunchick, juniors, ATM; Jace Chipperfield, Kyle Biebel, Amy Good, and Andrew Sigle; sophomores, BAE. Team driver for performance category: Kevin Simmelink, senior, IMSE; faculty advisor: Mark Schrock.

Strong performance

Members of the Kansas State University aerospace design team Automotive Engineers Aero Design West competition, June 2005. The K-State team took eighth place competing against 18 teams from the United States, Canada, Brazil, and the United Kingdom.
Rogelio Zarate was not the only international student at Kansas State University this summer. But he was the first and only student to be employed by the university as a part of the International Association for the Exchange of Students for Technical Experience, IAESTE. And during that same time period, David Jeter, senior in mechanical engineering, became the first K-State to participate in an international internship as part of the same program.

Founded in 1948 at the Imperial College in London, England, the International Association for the Exchange of Students for Technical Experience has grown to become a global organization with more than 80 member countries. Each year 30,000 top engineering and science students worldwide apply for the work-based internship program.

Zarate arrived in Kansas in mid-June and spent five weeks working out of the northeast regional office of the Mid-America Manufacturing Technology Center, housed at the K-State College of Engineering Advanced Manufacturing Institute. Jeter left for Wolfsburg, Germany, four days after finals ended in the spring and returned from his 12-week internship with Volkswagen two days before the start of the fall semester.

Listing Leon Guanajuato, a city of 1.2 million in central Mexico, as his hometown, Zarate attends school there at Tec de Monterrey and will graduate in December 2003 with a degree in industrial engineering systems. At Tec, he serves as president of FEITSEM Leon, a position equivalent to that of K-State student body president. Though he had been to the U.S. before as a tourist, this was his first time in Kansas and his first time at an American university.

"I wanted to come for two reasons," he said, "to practice my English and to work on a real enterprise and not just a school project."

Jeter had the choice of two internships in Germany—Volkswagen or Dusseldorf and Hauser. The latter choice would have been English-speaking. "Since one of my reasons for working in Germany was to improve my German," he said, "I decided for Volkswagen. At first the language was a struggle as I didn't know the technical words for all the machinery I was dealing with, but I soon became accustomed to the new vocabulary."

"Zarate's work projects at K-State included helping a Juncton City firm find a recycling use for by-products from sheet rock components; researching and recommending, for a mill in Abilene, a substitute for methyl bromide that must be phased out of all pesticides by 2005; and improving the design of a materials handling cart for a firm in Topketa.

"My internship was a really good experience," Zarate said. "I met people from all over the world while living in Moore Hall, and was most impressed with the facilities of the College of Engineering. I would seriously consider applying here for graduate school some day."

Jeter's internship was in presswork where he built dies and jigs for many different presses and developed a system in the technical information department to be used by other departments to access information about each press or die. This allowed him to interact with many facets of the Volkswagen plant.

"I would definitely recommend an international internship to anyone," he said.
IER celebrates 40th year of operation

The 40th anniversary of the Institute for Environmental Research (IER) was celebrated June 28 at Union Station in Kansas City, Mo. The event was a part of the 2003 Annual Meeting of ASHRAE—the American Society of Heating, Refrigerating, and Air-Conditioning Engineers. The institute was established as a part of the College of Engineering on the K-State campus in 1963 following the gift of an environmental chamber from ASHRAE. Today it occupies 6,500 square feet of laboratory and office space, including eight computer-controlled environmental chambers able to simulate any indoor thermal conditions.

In attendance at the luncheon were three former directors of the institute: Frederick Rohles (1973-1986), emeritus professor, departments of mechanical engineering and psychology; Byron Jones (1986-1993), director of the Engineering Experiment Station and associate dean for research and graduate programs; and Mohammed Hossni (1993-2001), professor and head of the mechanical and nuclear engineering department.

K-State Institute of Environmental Research, past and present, left to right: Frederick Rohles, Byron Jones, Steve Eckles, and Mohammed Hossni.

A matter of security

Issues of homeland security were at the forefront when Ruth A. David, president and CEO of ANSER—Advancing National Strategies and Enabling Results, delivered the second address of the Eyestone Distinguished Lecture Series, sponsored by the College of Engineering May 15 in Frederick Hall Auditorium.

“Our strategic challenge is to secure our nation against unconventional threats without bankrupting our economy or disrupting our society,” David said. “Sustainable solutions (against terrorism) will be embedded into the fabric of our daily lives with benefits that extend beyond the homeland security mission.”

David earned a B.S. in electrical engineering from Wichita State University, and both an M.S. and Ph.D. in electrical engineering from Stanford University. She began her professional career at Sandia National Laboratories where she became director of advanced information technologies. From 1995 through 1998, she was deputy director for science and technology at the Central Intelligence Agency. Upon her departure, David was awarded the CIA’s Distinguished Intelligence Medal, the CIA Director’s Award, and the National Reconnaissance Officer’s Award for Distinguished Service, among other citations.

Progress on West Seaton project

Department heads Jim Zoeller, biological and agricultural engineering (left), and Dave Fritschen, architectural engineering and construction science (right), check over blueprints of the planned renovation of West Seaton Hall. More than $1.3 million of the $1.7 million to be raised has been committed to the project, which is to be completed by fall 2004. The renovated space will include laboratories, classrooms, and offices, providing state-of-the-art facilities for more than 1300 engineering students.

Speak English as a first language was tough, and learning about nanotechnology is kind of mind blowing at first,” said Newton. “And on average, I spent about 15 hours a day in the laboratory, so having essentially no summer was very tough, but I wouldn’t have given it up for anything.”

After their experiences, both Muraco and Newton would recommend internships to future engineering students.

“Internships really help to make you marketable when looking for a job. It’s really important to get involved so you stand out from everyone else in the job market,” Muraco said.

“This internship taught me so much about myself, and the concepts of research, development, and design,” Newton said. “Not only does an internship look great on a resume, but it truly is a great way to see what you know and how much more you can learn.”

What I did last summer

—by Needy Holland

—by Mary Rankin

—by Mary Rankin

said, "I think I learned the most about the German work ethic, which is quite different from America. About twenty years ago, the 30-hour work week was instated at Volkswagen and also in its 58 years of productions, it has never had layoffs. "Of course, I was glad to come home," he added. "Some things you just can’t find in Germany—like a good steak or Cheez-it.

"Participating in the IAESE program was certainly a positive experience for both the College of Engineering and Kansas State," said Richard Hayter, associate dean of engineering for external affairs. "We were able to have a top-notch engineering student from another culture bring both diversity and a taste of international expertise to our college, while at the same time offer one of our students a positive learning experience in another culture as well.”
**Keep Connected**

Take a few minutes to jot down job changes, births, deaths, professional or other activities, your retirement, or memories you'd like to share. Send your news to Impact by mail, e-mail, or fax, as listed below.

Want your classmates to contact you? Check the appropriate box below and we will include your address with your news. You must indicate that you want this information printed.

Please select and list only one type of contact information for publication.

- [ ] Mail
- [ ] Phone
- [ ] E-mail

**Deaths**

**1942**

Glenn O. Schwab (AGE) died March 12, 2003. Schwab was professor emeritus of agricultural engineering at Ohio State University and was recognized worldwide as an expert in soil and water conservation drainage. He is survived by his wife, Edith, two sons, one daughter, and two grandchildren.

**1962**

Don P. Padden (NE) died Oct. 24, 2002. He is survived by his wife, Marie.

**A tribute to K-State's sweetheart**

Thank you, Alice, thank you.
This was the prevailing theme as the late Alice Fiedler was honored with a tribute in Fiedler Hall Auditorium Nov. 7. She and her late husband George, a 1926 K-State graduate in electrical engineering, are Kansas State University's largest benefactors to date, having contributed more than $7.5 million. Included in these gifts was $5.3 million, given by Alice in George's memory, towards the construction and completion of Fiedler Hall and Library, part of the College of Engineering Complex. Alice, who passed away on July 1, 2003, had last visited K-State at the dedication of Fiedler Hall in September 2000. Dean Terry King served as master of ceremonies for the tribute with additional comments by dean emeritus Don Rathbone; emeritus professor, Ken Gowdy; and K-State President Jon Wefald. Father James Roth, Busken, Kan., a family friend and one-time pastor to the Fiedlers, gave the invocation, reminding the nearly 100 in attendance that Alice Fiedler had three great loves—her church and her God, her husband George, and Kansas State University.

**Lori Vander Linden VanderLeest (CE) and her husband, Rob, announce the arrival of their first daughter, Megan Ann, born April 30, 2003.**

**Brad Eisenbarth (IE) and wife, Amy (Hoppe) Eisenbarth (IE, '95), announce the birth of their son, Wyatt Matthew, born May 20, 2003. He joins a sister, Megan.**

**Saleh Mohammed Karsou (ME) is currently working for Ford Motor Company as a reliability engineer. Karsou would love to catch up with former classmates, saleh.karsou@yahnco.com**

**Jona T. McBride (ARE) was promoted to vice president of Smith-Seekman- Reid, Inc. in Houston, Texas.**

**William Thomas Keeth II (ME) announces the birth of a daughter, Violet Lauren, born Oct. 18, 2002. 22144 Karlov Ave., Richard Park, IL, 60471**

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**Be a mentor**

K-State graduates interested in becoming a volunteer mentor to current students are invited to do so through K-State's Career and Employment Services Wildcat Mentor Network. The program connects students with alumni willing to offer advice and information on internships, job opportunities, resumes, interviewing skills, and relocation.

The Mentor Network is accessible online to students registered with Career and Employment Services. It is password protected so the mentor contact information is provided only to registered K-State alumni and students. Mentors may indicate their preferred method of contact (e-mail, business phone, etc.) and which advising areas they are interested in. They may also control the number of students they will work with each month.

To sign up to be a Wildcat Mentor, go to http://www.ksu.edu/ces/mentor_form.htm, or contact Marcia Schaeley, Career and Employment Services, at mресe@ksu.edu or 785-532-1605, for further information.