

IMPACT



College of
Engineering, Architecture & Technology

OKLAHOMA STATE UNIVERSITY • 2005-'06

A BIG YEAR FOR CEAT

Each time I introduce the latest issue of *Impact*, I find myself saying the College of Engineering, Architecture and Technology has had its best year ever. It's not hyperbole. Each successive year does bring greater achievements for CEAT, and the last is certainly no exception. In every sense, it has been a very big year.

Featured in *Impact* is the \$14.8 million gift from the Donald W. Reynolds Foundation and its transformative effect on the School of Architecture. Not only is it the largest private foundation gift OSU has ever received, this record funding to construct a new architecture building and renovate the current facility will reshape CEAT. The expansion will allow an award-winning architecture program to flourish while providing much needed additional space for the college.

The Donald W. Reynolds Foundation gift includes the stipulation that CEAT raise \$3 million to maintain the new facility. This issue of *Impact* includes a story introducing alumnus Cal Vogt, long-term supporter of CEAT who stepped forward with the lead gift in the maintenance-fund campaign — one of many he has given the college. The strong support CEAT receives from alumni speaks to the success of our graduates as well as their loyalty and commitment to the college programs.

The quality of CEAT graduates is readily apparent in stories about alumni in the military, at preeminent universities and at the top of their professions, such as the CEAT 2005 honorees. Inventor

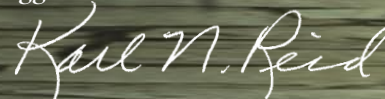
Behrokh "Berok" Khoshnevis, Melvin R. Lohmann Medal recipient, and Hall of Fame inductees James Cummins and Gordon E. Eubanks Jr., appearing inside this issue, demonstrate that CEAT alumni truly are competitive with the best.

Convincing wins in national competitions indicate our current students will follow the lead of the extraordinary engineers, architects and technologists who have preceded them. OSU aerospace engineering teams set new records again in 2006, placing first and second for the third consecutive year at the American Institute of Aeronautics and Astronautics international competition. For the second year in a row, OSU's chemical engineering design team and Cowboy Motorsports claimed first place in national competition, and in a tribute to the stature of its program, OSU was chosen to host the 2006 National Concrete Canoe Competition.

These victories are engendered by a knowledgeable, skilled and highly motivated faculty dedicated to students they mentor as well as innovative research and program development. Many members of the faculty received professional honors during the past year. One professor, Rao Yarlagadda in the School of Electrical and Computer Engineering, was honored by his students, who say he profoundly influenced their careers during his 40-years of committed service to OSU. Another, Jim Smay, assistant professor of chemical engineering, received the U.S. government's highest recognition given to the nation's most promising young scientists and engineers.

Faculty members drive many successful CEAT programs, some of which impact the state's economy, forge partnerships with industry and touch the lives of soldiers on the front lines. The New Product Development Center, the master's of science in engineering and technology management program and mechanical engineering technology programs are examined in this issue of *Impact*.

Even as we celebrate accomplishments of the past year, CEAT is already striving to reach new heights of greatness that will make the next year the biggest one ever. ▲



Karl Reid, Dean
College of Engineering, Architecture and Technology

Karl Reid, left, dean of the College of Engineering, Architecture and Technology stands with Fred W. Smith, chair of the Donald W. Reynolds Foundation during the presentation of the \$14.8 million gift from the Donald W. Reynolds Foundation. The gift — the largest private foundation gift in OSU history — will renovate and expand the School of Architecture, doubling the space for instructional excellence.



IMPACT

2006

ABOUT THE COVER: Thanks to a \$14.8 million gift from the Donald W. Reynolds Foundation, OSU's award-winning architecture program will have space to expand into new and renovated facilities in spring 2009. Many students will benefit from the improvements, including architectural engineering sophomore Rachael Tucker shown in the cover photograph by Phil Shockley. Also pictured is a rendering of the Donald W. Reynolds Architecture Building. Cover design is by Paul Fleming. *The related story is on page 14.*



WHAT'S INSIDE: **5** Three consecutive first- and second-place wins in international competition leave no doubt as to the strength of OSU's aerospace engineering program. **▲ 7** The successes of recent graduates testify to the caliber of CEAT students and the education they've received at OSU. **▲ 11** CEAT alumni are part of the next generation of nuclear engineers. **▲ 14** A generous gift from the Donald W. Reynolds Foundation expands OSU's School of Architecture. **▲ 18** CEAT partnerships with industry prove indispensable in preparing students for success in the real world. **▲ 24** Former students of electrical and computer engineering professor Rao Yarlagadda pay homage to his extraordinary career.

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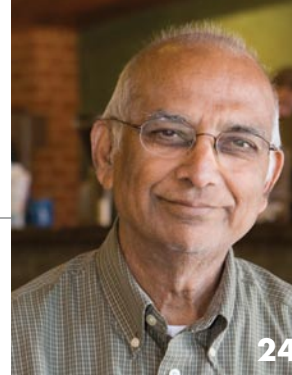
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IMPACT is a publication of the Oklahoma State University College of Engineering, Architecture and Technology and is designed to provide information on college activities and accomplishments while fostering communication among the CEAT family and friends.

VIP INVITATION

The CEAT wants you to have access to up-to-date information on everything from the continuing development of the Advanced Technology Research Center to the establishment of new academic programs on the Stillwater campus and in Tulsa.

We invite you to be our guest for a VIP visit to campus and the CEAT. Contact Dean Karl Reid by phone at 405-744-5140, by FAX at 405-744-7545, or by e-mail at karl.reid@okstate.edu. If a trip to campus is not possible, visit us on the CEAT homepage at <http://www.ceat.okstate.edu>.

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(Sources: "Concrete Design Guide," Scott Rutledge and Ryan McKaskle at <http://members.cox.net/concretecanoe/introduction.htm>; and "A Brief History of Concrete Canoeing," John A. Gilbert, Concrete Canoe Magazine, Spring 2006)

Civil Engineers Launch More Than Canoe

Although they've come close – four times finishing in the top three – OSU's concrete canoe team has never won the national championship.

Yet, the team's record is outstanding, says Karl Reid, dean of the College of Engineering, Architecture and Technology. "They started it all. They were the first CEAT team to compete nationally, and they've done exceptionally well. They have been a model for other teams in the College over the past several years."

OSU civil engineering students began building and racing concrete canoes circa 1970. The group's first concrete canoe competition was on the "Duck Pond" in Norman against the University of Oklahoma – a contest OSU won. A trophy in the civil engineering department's display case reveals a victory over OU in 1971.

The days of local races on the Duck Pond are gone. Regional competitions are now the norm, but no longer the end game for the

OSU team. Qualification for national competition is now the team goal each year.

Civil engineering students devote a huge chunk of personal time to design, build and race their concrete canoes.

For these students, members of the OSU student chapter of the American Society of Civil Engineers (ASCE), the project is a labor of love. "They don't receive credit for their work. They are simply highly motivated," says John Veenstra, interim head of the School of Civil and Environmental Engineering.

"Building a successful concrete canoe requires students to draw on design, testing and construction techniques they've learned in various civil engineering courses, and requires them to work as a team to produce the best product. They must document their results, explain project details and sell their design to judges," he says. "The experience approximates an actual work situation."

Throughout the late 1970s and 1980s, OSU civil engineering students participated in the Mid-Continent Conference Concrete Canoe Competition held at Kansas State University. In 1988, ASCE added a national competition where regional winners could compete for the title, and an industry-leading admixture supplier, Master Builders Inc., now BASF Admixtures Inc., became the founding sponsor.

Records indicate a Cowboy victory at the 1988 regional, and OSU was among the 18 teams competing at the first national at Lake Lansing, Mich.

As for its record, OSU's Concrete Canoe Team has represented the Mid-Continent Region 13 times at the national level and was selected to host the ASCE National Concrete Canoe Competition in 2006.

Recognizing the team's achievements, John A. Gilbert writes in the spring issue of Concrete Canoe Magazine:

"As teams vie for a spot in the 19th NCCC, it seems fitting to also recognize and commend Oklahoma State University, the host of the 2006 NCCC, for their successes and dedication to the sport. Oklahoma was one of the first states to promote concrete canoe racing, and the 1st Great Plains Concrete Canoe Race took place there in 1972, more than 30 years ago." ▲

EILEEN MUSTAIN



Gracious Hosts

For three days, first- and second-place winners of more than 200 regional competitors nationwide, participated in the **2006 National Concrete Canoe Competition** held June 15 – 17 in Stillwater and hosted by OSU.

Although not the national champs, OSU's concrete canoe team earned a respectable 11th place in a field of 23, coming in behind such powerhouses as California Polytechnic State University, Clemson University, the University of California, Berkeley and the University of Wisconsin-Madison, which earned the first-place title for a fourth straight year.

OSU's 2006 concrete canoe team members are Rebecca Ward, Kristi Schroeder, Lan Pham, Melinda Hale, Amanda Benson, Ere Stone, Ross Ward, Jeremy Van Oostrum, Jason Maly, Brooke Shondelmyer, Corey Shondelmyer, Alan Harder and Abby Kinnamon. They stained their canoe to resemble a basketball and named it The Scowl in tribute to former OSU basketball coach Eddie Sutton. ▲



Repeat Performance

For the second year in a row, Cowboy Motorsports claimed the national championship title in the **2005 American Society of Agricultural Engineers 1/4-Scale Tractor Student Design Competition**. The OSU team competed against such teams as Kansas State University, the University of Kentucky, Purdue University and Penn State University, the four other top teams.

The annual ASABE competition requires students to build a small, cost-effective tractor to pull a 5,500-pound sled. Briggs and Stratton provides each competing team an engine, and Firestone provides the tires. The students – a volunteer group of approximately 20 – organize, manage and build the tractor and acquire all other resources, including the time to complete the yearlong extracurricular activity.

The 2005 Cowboy Motorsports team, competing against 24 teams from around the country, performed well in design, fabrication, tractor performance and safety as well as written and oral design reports. John Solie, biosystems and agricultural engineering professor and the team's faculty adviser, says the competition seeks to advance the technical and personal skills engineers and technology students need for success in the workplace.

"The categories are based on the same standards industry faces," he says. "Students get a sense of what engineers in the industry do from developing the concept to manufacturing, testing and redesigning the product to raising money for operating funds."

The 2005 Cowboy Motorsports team includes Joe Biggerstaff, Cheyenne Courtney, David Crossley, Brian Dillard, Kyle Dollins, Andrew Fiegenger, Colby Funk, Adam Gossen, Ryan Haar, Jacob Hamburger, Dustin Holden, Curtis Johnson, Levi Johnson, Buck Melton, Taylor Miller, Jonathan Nunnally, G.L. Slaughter, Kristin Stephens, Justin Street, Frank Thomason and Kristi Thompson. ▲

Erika Contreras



Three in a Row

OSU's School of Mechanical and Aerospace Engineering set a record at the **2005 American Institute of Aeronautics and Astronautics Student Design/Build/Fly Competition** when its teams captured consecutive first- and second-place wins.

In 2006, OSU teams broke their own record placing first and second for the third consecutive year at the AIAA's annual international competition held this spring in Wichita, Kan. The event, sponsored by the AIAA, the Office of Naval Research and Cessna, featured 48 university teams from North America and Europe.

"Simultaneously taking first and second in this contest is an accomplishment no other university can claim, and OSU has now done it three years in a row," says Andy Arena, Maciula Professor of engineering and the teams' faculty adviser. "I am so proud of our students, especially considering the level of competition. This year it only got harder."

The nation's top programs such as MIT, Embry-Riddle, Cal-Poly, USC, Purdue, Rensselaer Polytechnic, the U.S. Military Academy and Notre Dame participate in the competition, and some, like OSU, send multiple teams, Arena says.

The contest requires students to design and fabricate an unmanned, electric-powered, radio-controlled aircraft to accomplish specified flight mission objectives. The challenges change each year, but the goal remains a design that achieves high performance and quality handling and may be manufactured practically and affordably.



Erika Contreras

In addition to entering the lightest planes in the competition and recording the fastest cargo loading and unloading times, OSU teams received the top technical report scores. Both planes carried payloads almost twice their weight, a structural efficiency feat at any level of design.

OSU students completed their entries as semester-long projects in the aerospace engineering capstone design course with the 20-member teams logging upwards of 12,000 hours.

Most students secured employment prior to the contest, but their winning streak only enhances the reputation of OSU's aerospace program, Arena says.

"In addition to those headed to graduate school, students from this year's class are going to work all over the country for companies such as American Airlines, Nordam, L3, Lockheed Martin, Baker Hughes, the Central Intelligence Agency, Raytheon and Mitsubishi Heavy Industries, to name a few," he says.

"I think OSU engineering graduates have always been well regarded by employers, but our students' performance in the competition reinforces that and provides some added visibility for them.

"On more than one occasion I have witnessed company recruiters seek out our students at the contest, and a few companies have also become OSU team sponsors." ▲

ADAM HUFFER

OSU's Black and Orange Aerospace Engineering Capstone Design Teams take first and second at the 2005 International AIAA/ONR Design, Build, Fly Competition.



Erika Contreras

OSU's Black and Orange Aerospace Engineering Capstone Design Teams take first and second at the 2006 International AIAA/ONR Design, Build, Fly Competition. OSU Black earned 301 total points, and OSU Orange earned 298 points while the third place winner scored approximately 250 points.



Records Fall as Dragonfly Takes Flight

A **second world aviation record** has fallen following the latest flight of the Dragonfly, an experimental aircraft designed and built by OSU mechanical and aerospace engineering students.

On June 23 undergraduates Dustin Gamble and Thomas Hays set a new world flight endurance record of 12 hours, 21 minutes and 40 seconds. Observed by an official with the Fédération Aéronautique Internationale, the world air sports federation that maintains all world aviation records, the flight will be

on from the beginning, and it's a really significant achievement."

Weather conditions and topography were ideal for the mission, Arena says. Similar conditions enabled Gamble and Hays to set Dragonfly's first world record June 2 with a distance of 144.42 kilometers to break the existing record of 80.43 kilometers.

The Dragonfly, built from composite material, fiberglass, balsa wood and carbon fiber, weighs 11 pounds with batteries and just 3.7 pounds without. It has a 14-foot wingspan and a

says, noting that FAI sanctions all aviation records, from Boeing's new record for long-range passenger airplanes to the five kilogram category.

Gamble and Hays designed and built the Dragonfly as part of their undergraduate Space Grant Fellowships with Oklahoma's NASA Space Grant Consortium and received sponsorship from the College of Engineering, Architecture and Technology.

The non-credit, enrichment exercise will prepare them for any sector of the aerospace industry, but their entry into the record books will

Good Chemistry

OSU's chemical engineering seniors placed first overall in team competition for the fourth time in the 11-year history of the **National Student Design Team Competition** sponsored by the American Institute of Chemical Engineers (AIChE).

The 2005 team members are Justin Guinn, Tim Plowman and Robert Taylor. Their design challenge, authored and judged by engineers in industry and academe, was to design a process to remove a million metric tons of carbon dioxide, CO₂, from the atmosphere.

Senior design teams from 160 undergraduate engineering programs in the U.S. are eligible to enter the AIChE design competition, which is an application exercise that characterizes the practice of chemical engineering. The team's success indicates the OSU students were able to integrate the industrial practice issues and properly apply the fundamentals.

The students credit chemical design course professors Rob Whiteley and Jan Wagner for their dedication to student growth as well as the entire chemical engineering curriculum for reinforcing excellence in fundamentals, application and team effectiveness. ▲



Aerospace engineering undergraduates Thomas Hays, left, and Dustin Gamble have set two aviation world records with the Dragonfly, an experimental aircraft they designed. Andy Arena is their faculty adviser.

sanctioned pending OSU's submission of a detailed dossier.

Gamble and Hays set the new record in the FAI's F5S category for electric-powered aircraft weighing less than five kilograms. A group in Switzerland set the previous record of 10 hours, 38 minutes and 3 seconds in 1998.

"There are several record flights we plan to go after, but this is the one the plane was designed and optimized for," says Andy Arena, Maciula professor of engineering and the students' faculty adviser. "It's the one the team has focused

fuselage measuring 8 feet, both engineered to reduce weight and drag.

Although it has an autopilot, the plane is piloted remotely during record flight attempts to conserve battery power.

The Dragonfly should not be confused with a model, kit or toy airplane, Arena says, and hobbyists typically don't pursue FAI world records.

"The physics are all the same for this plane or the design of a 737 — to accomplish a certain mission. The governing equations, the things you have to worry about, are all the same, just scaled down," Arena

attract attention from its hottest, Arena says.

"The unmanned air vehicle industry in the U.S. is becoming a multibillion dollar industry with many companies involved in developing and manufacturing drones," he says. "It's going to look pretty good on their résumés for them to come out of college with world aviation records after successfully designing a UAV." ▲

ADAM HUFFER

FOR MORE INFORMATION SEE <http://aerodesign.okstate.edu/projects/Dragonfly%20Page/Dragonfly.htm>.



OSU's chemical design team, from left, Robert Taylor, Justin Guinn and Tim Plowman, won first place in the 2005 National Student Design Team Competition sponsored by the American Institute of Chemical Engineers.



OSU's Newest Goldwater Scholar

Melinda Hale, a mechanical and aerospace engineering senior and W.W. Allen Scholar, is OSU's newest **Goldwater Scholar**, a national honor awarded outstanding undergraduates in mathematics, the natural sciences or engineering and based on academic potential and research acumen.

Hale's application centered on her 2005 summer internship at IBM's Hudson Valley Research Center in Hopewell Junction, N.Y. where her research to determine the cause of malfunctioning computer chips was used to solve a manufacturing problem.

Hale is OSU's 13th Goldwater Scholar, and at age 18, she is also the university's youngest. Home-schooled until she completed high school at age 13, Hale attended Dutchess Community College in Poughkeepsie, N.Y., near her parents' home, before enrolling at OSU at age 16.

"The main reason I waited those three years was that I had to have a driver's license before coming to Stillwater," she says. But the time also gave her the opportunity to take prerequisite math and science courses as well as arts and humanities classes that typically cannot be squeezed into an engineering degree track.

Although recruited by a number of prestigious institutions, Hale opted to maintain a family tradition. Her parents Michael and Patricia Hale, originally from Jenks, Okla., are both OSU alumni.

"My dad studied mechanical engineering here and went on to get his master's and doctorate from MIT, and my mom got her bachelor's in management information systems at OSU and her master's from Boston University," Hale says.

"I had been looking at colleges in the Northeast, but when I came to visit, Dr. [Larry] Hoberock, the head of the mechanical engineering department, gave me a personal tour and showed me around the labs and research facilities," she says. "Even though OSU is a large state school, they still take the time to show individual attention to students, and I appreciated that."

She attributes being selected for the Goldwater Scholarship largely to the quality of education she is receiving at OSU.

"The fact OSU has had so many Goldwater winners shows that it competes on the national level with other engineering schools," she says. "The faculty members here are very dedicated to what they do, and that dedication produces an education that I think rivals more respected, big-name engineering schools." ▲

ADAM HUFFER

A Cool (and Rewarding) Idea

OSU students **Joseph Pruitt** and **Blake Ferrell** won the \$20,000 top prize at the statewide Governor's Cup competition for a concept and business plan that could change the way cold drinks are bottled.

The **Governor's Cup competition**, funded by the Donald W. Reynolds Foundation, a national philanthropic organization, and managed by the private nonprofit i2E Inc., is designed to teach students that innovations leading to new businesses are valued and lucrative.

Pruitt and Ferrell, Stillwater natives, placed first in the undergraduate division with a proposal for an insulated, environmentally-friendly, disposable bottle that keeps beverages cold much longer than existing containers. The "Cold Bottle Designs" technology also allows manufacturers to add thermal insulation to their disposable beverage bottles with no additional equipment or production costs.

"The bottle of Coke you buy at the convenience store will have extra insulation already built in that will keep your beverage cold for up to two times longer," Pruitt says. "The beautiful thing about the bottle is that you don't have to pay any extra for it because no new equipment is needed in making the improved product."

Pruitt, a 2006 mechanical and aerospace engineering graduate, came up with the concept while working as an intern for the Stillwater research

and development firm Strategic Solutions International, LLC. Founded and headed by OSU civil engineering alumnus Steven Trost and affiliated with the Meridian Technology Center for Business Development.

Pruitt conceived the Cold Bottle when researching another of his concepts, a personal purification system for outdoor enthusiasts that uses ultraviolet light to sterilize water from available sources.

SSI filed a provisional patent application on the technology in November 2005 and a Patent Cooperative Treaty application in February 2006.

Pruitt enlisted his one-time roommate Ferrell, an accounting major, to help write the business plan for the Governor's Cup competition. Tom Brown, professor of business administration and marketing in the Spears School of Business served as adviser.

"The feedback has been very positive," Ferrell says. "The Governor's Cup has been a great experience that could possibly help lead to bigger and better things for Cold Bottle Designs in the very near future."

Pruitt has postponed attending graduate school for a year to stay on at SSI and assist the search for marketing possibilities for Cold Bottle Designs.

"We are pursuing licensing agreements and working with i2E to look at potential contacts and our options," he says. "Something we've considered is maybe starting a bottled water brand, but we're keeping our options open."

"Graduate school is on the horizon for me, but this is my number one priority going forward, and the Governor's Cup will definitely help us with financing for business development." ▲

JIM MITCHELL AND ADAM HUFFER

FOR MORE INFORMATION ABOUT THE GOVERNOR'S CUP COMPETITION, GO TO www.okgovernorscup.org.

Joseph Pruitt, left, and Blake Ferrell won \$20,000 in a statewide competition with a business plan for the manufacture of environmentally friendly bottles that keep beverages cool up to two times longer.

Erika Contreras



Hildebrand Named Gates Cambridge Scholar



Bonnie Hildebrand

W.W. Allen Engineering Scholar **Ashleigh N. Hildebrand** added another prestigious honor to her résumé before graduating in May 2005 with an Honors College degree in chemical engineering, the environmental option, and minors in philosophy and chemistry. The 2004 Goldwater Scholar became one of only 35 American students to be named a **2005 Gates Cambridge Scholar**.

A Bill and Melinda Gates Foundation endowment created the Cambridge Trust to award scholarships that would enable the world's brightest young scholar-leaders such as Hildebrand to take graduate work at the United Kingdom's top university. The highly competitive scholarship is a full-cost merit award worth approximately \$32,000 a year.

It's not surprising Hildebrand, a native of Wichita, Kan., rose to the top from a field of 600 national scholars competing for the Gates Cambridge scholarship, says Russ Rhinehart, head of chemical engineering.

"When I talked to her as a freshman, it was obvious she was focused, goal driven, ambitious and organized," he says. "I asked her what her life goal was, and I recall her answer as, 'Please don't take this wrong, but I want your job.' Then it seems she added, 'On the way up.' I was excited by her honesty, ambition, directness and politeness."

In addition to being a student in the Honors program and a W.W. Allen Scholar, Hildebrand participated in research with faculty members throughout her undergraduate career.

Although accepted by both MIT and Berkeley, Hildebrand chose to study international perspectives in environmental issues and began working in the fall on her master's in environmental policy at Trinity College, Cambridge. She studied environmental economics, international environmental law, issues in public policy and economics.

While the subjects of economics and law were new to Hildebrand, she says the study was so interesting it didn't feel much like work. "I worked incredibly hard at OSU, so I was really well prepared."

The diverse international environment also provided learning opportunities. "By getting to know people from all over the world, I got a completely different perspective on lifestyles, politics, the influence and power of American culture and government and the problems that really matter in the world," she says.

"By combining these new perspectives with the mechanisms of change I've learned in my courses, I am seeing more clearly my role in contributing to society."

Hildebrand graduated with a master's in environmental policy in July 2006, earning a high dissertation score, and has begun her doctorate in chemical engineering at MIT. Her

career goal is to bridge the gap between chemical engineering and the environment through teaching and research at a university.

"I hope to introduce more environmental education into chemical engineering, and this degree from Cambridge gives me both the knowledge to do it and the credentials to be allowed to do it. The idea is to make industries more environmentally-friendly from the inside-out by giving the young engineers more knowledge and awareness of their ability to impact the environment," she says.

"Increased familiarity with the realities of how environmental policy, law and regulation work will allow me to tailor my research to what is most useful for society. I also love the idea of advising or consulting for environmental policymakers, such as Congress or the EPA." ▲

JANET VARNUM
AND ADAM HUFFER



courtesy

The Great Adventure

During his senior year at OSU, **Bryan McLaughlin**, a 2003 electrical and computer engineering graduate, won a **Marshall Scholarship** to pursue a master's degree in optical electronics at Cambridge University.

There, he became the principal researcher on a collaborative project between the engineering department and nearby Addenbrooke Hospital to create a liver transplant device to save lives.

McLaughlin, who was also a Goldwater Scholar and a first team *USA Today* Academic All-American, authored a proposal and submitted it to the British Medical Research Council, resulting in an award of more than \$100,000 to continue his work on this medical device at the esteemed university.

"This funding opened the door for me to stay for a Ph.D. and pursue the project further," says McLaughlin, who focuses on biomedical devices, particularly optical and microwave sensing techniques. "I really wanted to bring this work to fruition before leaving Cambridge."

He is thankful for the experience he gained in OSU professor Alan Cheville's optical electronics course. "The requirements in that course were high, and many of us did not see at the time the value of writing pseudo proposals to the instructor. But the long hours spent doing it has paid off."

McLaughlin, who graduated with his doctorate in July, is considering taking post-doctoral studies or working for a startup biomedical device company. One day he would like to open his own research and development company and eventually teach at the college level.

The total immersion in a different culture for two years is the greatest benefit of studying abroad and an experience he recommends for everyone. "It can be thrilling, challenging and sometimes frightening," he says, "but every great adventure is." ▲

JANET VARNUM

A Difference Maker

Cassie Mitchell, a 2004 chemical engineering graduate, continues the scholarship excellence she achieved at OSU as a Goldwater Scholar in 2003 and a member of the first team All-USA College Academic Team her senior year. The *USA Today* designation placed her among the top 20 students in the nation.

Mitchell, a National Science Foundation Graduate Research Fellow and also a National Science Foundation Integrative Graduate Education and Research Traineeship Fellow, is currently a doctoral student in biomedical engineering at the Georgia Institute of Technology and Emory University School of Medicine.

The GT/Emory biomedical engineering program is currently ranked third by the *U.S. News & World Report's* "America's Best Graduate Schools 2007." The program consistently ranks in the top three.

"I knew my degree in chemical engineering from OSU would lay the foundation necessary for a career in which I can make a difference. I'm doing well," she says. Students take 21 hours a semester through the second year and then take qualifying examinations, a requirement before submitting research thesis proposals. Mitchell passed her qualifying exams and thesis proposal in spring 2006.

"Although I don't have the specifics of my research proposal nailed down yet, I'm excited," she says, "and I do have two first-author papers I'll be submitting for publication in the spring."

Last summer an internship at Medtronic Neurological in Minneapolis, Minn., helped Mitchell determine her direction, which has helped her better plan her course, she says. "I would love to work at Medtronic after I graduate; it's a

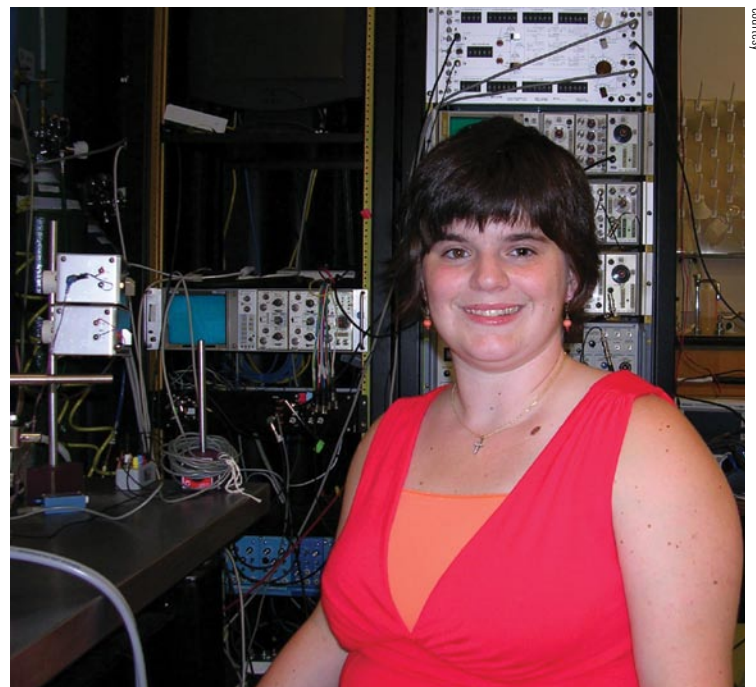
great company with great people. They flew me back in October to give a presentation, and they offered me an internship for the summer. I had to turn down the offer to work on my proposal."

Mitchell is a computer modeler. "I use my engineering skills to mathematically model biological systems, namely in the spine and brain, to help aid in the design and development of drugs and other neuro-implanted equipment," she says.

"My biggest motivation is that I want to make a difference in the lives of others. Despite a common stereotype, physical disability does not equate to academic or intellectual inability," Mitchell says.

"My career goal as a biomedical engineer is to work in the medical industry to design new and innovative treatments for patients suffering from various neurological injuries and/or disorders." ▲

Cassie Mitchell works in the lab of Robert Lee, Laboratory for Neuroengineering, Georgia Institute of Technology and Emory University School of Medicine.



Asajuno

Realizing His Goals

Ask **Tom Jenkins** about his dream job, and he'll say, "I have it!"

Working as deputy fire chief in Sand Springs, Okla., is only one of the goals this 2004 graduate of the School of Fire Protection and Safety Technology set for himself, and he's on track to achieve the others.

A volunteer firefighter at 16, Jenkins can't remember if he played fireman as a child, but he does remember those toy fire trucks every boy seems to have. "I'm one of the few who never grew out of it," he says. "The desire to pursue that line of work led me to OSU.

"I had a lot of questions, but I walked out with a lot of answers thanks to OSU faculty and staff. I came out knowing I could do what I want to do and how to get my goals and priorities in line to do this," he says.

He was particularly influenced by Pat Brock, instructor in the fire protection program who taught him attention to detail, and Bob Graalman, director of scholarship development, whose efforts helped Jenkins shape his dreams. "Bringing Dreams to Life was a campaign, but it wasn't a cliché for me. I wasn't sure what my dreams were when I arrived," he says.

By graduation Jenkins' dreams had crystallized, and as a 2003 Truman Scholar he had the means as well as the determination to meet those goals. Awarded to those who seek careers in public service, the \$30,000 scholarship, which funds the final year of undergraduate study and two years of graduate study, will help Jenkins earn a master's in public administration. He began the program at the University of Oklahoma in August 2006.

"I always wanted to pursue a graduate level degree, but I wasn't sure where I wanted to go. I looked all around, including Ivy League schools," says Jenkins, who plans to eventually seek elected public

office, "but it didn't make sense to leave a job I love and the state where I live."

Because the graduate program is designed around the schedules of working adults, Jenkins will not have to give up his dream job and the education he's receiving from it.

"As the number two guy, I'm responsible for training and day-to-day operations. Sand Springs is an old town with a rich history; and

every published document on federal disaster management states that federal government is there to support local government and can't be anticipated until at least 2-3 days into an event, but the public thinks FEMA should have been on site within minutes like normal police and firefighters."

Disasters are a local problem and must be dealt with on a local level, which makes the coordination — or lack thereof — between federal

"Government has a fundamental obligation to provide for the protection and security of its citizens and should invest time, effort, energy and treasure toward reducing those potential disasters that have the highest impact," he says.

Jenkins, who already knows where he would invest resources, thinks about these issues on a daily basis. His goal is to learn everything possible about emergency management and then run for public office.



ASUMURA

that brings challenges. I have a big interest in other aspects as well — planning, budget and economic development. It's different from day to day and is always challenging and always interesting," he says.

"I've been able to see the differences in how local, state and federal funding is used to address public problems. I have seen the problems and what works well," he says. "I can't learn that in a classroom."

He says the lessons of Katrina offer a large scale illustration. "Nearly

and state and local levels a critical factor, Jenkins says.

"Federal funding to the fire and emergency response community is another major issue because FEMA has no rescue teams of its own. Its teams are local metropolitan fire departments hired by FEMA for disasters," he says. "By comparison, would it be acceptable for the law enforcement community if the FBI were composed of cross-trained cops from Saint Louis, Chicago, etc., who were just 'borrowed' during big events?"

"If I had it my way, I'd be a firefighter the rest of my life because firefighters have the ability to really help people," he says, "But it's not just about me. At some point I have a duty to try to make the world a better place. I don't think being a house or senate member would be more fun than firefighting, but hopefully I can influence things for the better at the state or federal level."

As for his timetable, Jenkins says, "About a decade. There's something to be said for life experience." ▲

EILEEN MUSTAIN

Seawolf Engineering Officer Recognized as “New Face of Engineering”

Submarine engineers are usually so busy with their shipboard responsibilities, most do not have time to read newspapers regularly. For **Lt. J.G. Gabriel Alvillar** of **USS Seawolf**, it was worth the effort last month to make an exception. “My XO [executive officer] said to me that I might want to buy a copy of [the Feb. 21 edition of] *USA Today*,” Alvillar said. “I asked him why and he said, ‘because you’re in it.’”



The Lawton, Okla., native’s photo and biography were featured on the pages of the national publication with 13 other young engineers as the National Engineering Week Foundation’s “2005 New Faces of Engineering.”

“New Faces of Engineering” highlights the interesting and unique work of young engineers who have been in this field between two and five years and the resulting impact on society, according to the Engineers Week website, www.eweek.org.

When the Naval Nuclear Propulsion Program (NNPP) sent out a message last year looking for nominees for the National Engineering Week Foundation’s “New Faces of Engineering” recognition program, Alvillar wasn’t exactly confident about being picked. In fact, it took some prodding from his command to submit a package.

“[Being selected] was a humbling experience,” said Alvillar. “It was one of those things where you apply for it, but like playing the lottery, you’re not too sure of what your real chances are.”

Although being honored for his skills as an engineer is a welcome achievement, such recognition was not his goal. For Alvillar, engineering is a labor of love that began when he graduated from Douglas MacArthur Senior High School in Lawton, Okla., and enrolled at Oklahoma State University. He received a bachelor’s degree in electrical engineering from OSU in 2001.

“I enjoy creating new things. Engineers aren’t necessarily trying to reinvent the wheel; we’re trying to improve things and make them better. That’s what drew me into engineering.”

While many of Alvillar’s classmates at OSU had the daunting task of looking for employment while finishing up their degrees, Alvillar made up his mind about working for the Navy during a trip to Norfolk, Va., his sophomore year of college.

At OSU, Alvillar was in the College of Engineering, Architecture and Technology Scholars Program. Part of that program includes a tour of various East Coast engineering firms during the sophomore year and an international tour to Japan during the junior year.

“Part of the 1999 tour to the East Coast was a day and a half at Naval Station Norfolk,” said Alvillar.

“We got to tour a submarine and carrier while we were there. At the end of the tour, the officer recruiter from Oklahoma talked about the NNPP and told us what submarine or carrier life would be like. Six weeks later, I was at NNPP interviewing for their program.”

Alvillar knew his biggest challenge would be convincing the NNPP to invite him into its officer candidate program.

“It was nerve-racking and exciting at the same time. Everyone applying for the program has two one-hour interviews to pass. The first is general science, and the second is more based on what your major is,” said Alvillar. “At the very end of the process was my interview with the NNPP Director [Adm. Frank L. “Skip” Bowman]. At the end, he stood up and said, ‘Welcome to my Navy.’”

Alvillar spent the last two years working on *Seawolf* as the chemical and radiological controls assistant and damage control assistant. Currently, he is enrolled at Prospective Nuclear Engineering Officer School. While he has much to gain, and much to give, Alvillar has his sights on much larger prizes.

“In May, I’m going back to NNPP to get my final qualification as an engineering officer,” he said. “Then I’d like to return to sea as an engineering department head. Of course, I’d like to command my own submarine, but that’s many years down the line and a lot of work between here and there.” ▲

JO3 STEVEN FELLER
PUBLIC AFFAIRS OFFICE
COMMANDER,
SUBMARINE FORCE,
U.S. ATLANTIC FLEET
MARCH 31, 2005



United States Navy

The Life (and Love) Aquatic

Enthralled with nuclear energy, the military and each other, **Cory Schneberger** and **Meredith Rose** made the only logical decision. They got married and joined the Navy.

"The military application of nuclear power is what drew me to the industry," says Cory, a mechanical engineering graduate. "I was already considering military service after spending time in the Army ROTC at OSU, and this seemed a natural fit."

Thirteen weeks after he graduated summa cum laude in December 2003, he was a commissioned naval officer headed for the U.S. Navy Nuclear Power School in Charleston, S.C.

The military also attracted Meredith, who graduated with her bachelor's in mechanical engineering in May 2004. "Thermodynamics was probably my favorite class in college. As I learned more and more details about the opportunities available through the nuclear Navy, I decided it was something I could not pass up," she says.

Married one week after she graduated and two months before she reported to officer candidate school, Meredith was commissioned in October 2004 and ordered to the USS Cleveland, an amphibious warship stationed in San Diego, Calif.

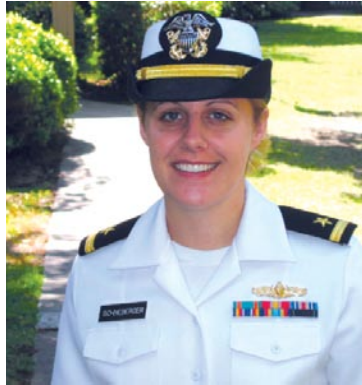
Although theirs is not the traditional newlywed lifestyle, the Schnebergers have no regrets. They say the Navy is a career-builder for nuclear engineers.

"It's the only branch of the military that uses nuclear power for propulsion. Although other branches have tried different applications, the Navy's use in sea-going vessels has been the most long-lived," Cory says, noting the majority of operational submarines and nine of the currently active aircraft carriers are nuclear powered.

"The Navy's nuclear training pipeline is one-of-a-kind," Meredith says. "The training is very intense and can be considered fairly specialized. Future nuclear officers as well as government-contracted civilians must complete the program before being qualified to operate the Navy's reactor plants."

Cory graduated from power school in November 2004, trained another six months on a nuclear prototype and graduated in May 2005 as a qualified nuclear reactor plant

supervisor. After that he attended submarine school in Groton, Conn., for a final three months of training before reporting aboard his first submarine, the USS Scranton, a fast-attack submarine home ported out of Norfolk, Va.



In the meantime, Meredith entered the pipeline.

Onboard the Cleveland, Meredith worked as a division officer in the combat systems department and trained to qualify for various watch stations. The USS Cleveland deployed for seven months in July 2005 to participate in delivering marines to Iraq and humanitarian relief to Pakistan.

By the time she returned, Meredith had qualified as a surface warfare officer and received orders to begin Nuclear Power School in Charleston in March 2006.

She hopes to complete the shore component in April 2007. Following her qualification as a nuclear reactor plant supervisor, Meredith says she'll report for a two-year sea tour on an aircraft carrier for the remainder of her commitment to the Navy.

Since reporting aboard the Scranton, Cory has been working on qualifications to stand duty as engineering officer of the watch and engineering duty officer. In that position, he'll coordinate maintenance and operations in the engine room and reactor plant to provide propulsion for the vessel.

"The reactor and core are used as a heat source, and the energy produced is used to create steam for the generation of electricity and propulsion," Cory says. "The self-contained system allows submarines to spend long periods submerged without having to bring in oxygen to supply a combustion process. In addition to providing the same essential services to

aircraft carriers, nuclear energy also operates the steam-powered catapults that launch aircraft from their flight decks.

Cory will spend several months at sea aboard the Scranton during the next three years.

The couple's opportunities to see each other depend on their command schedules, but generally the frequency of their visits ranges from every other week to every three or four months, Meredith says. "We talk on the phone several times a day when we're both in port. Otherwise, there are lots and lots of emails. It's best to take one day at a time," she says, acknowledging that separation is not easy.

The native Oklahomans plan to evaluate the needs of their family and their Navy careers when their tours are finished, Meredith says. "Though we feel privileged to have the opportunity to serve our country, we both look forward to returning to the Midwest."

The Schnebergers are confident their training in the nuclear Navy assures military and civilian career opportunities.

"We'll be responsible for overseeing the operations in a very complex, technically demanding environment. From administrative to operational, our responsibilities will vary," Meredith says. "This can translate to a wide variety of different civilian job fields from technical nuclear power plants to more general management positions that do not necessarily have to be in any energy industry." ▲

EILEEN MUSTAIN



photos courtesy

Hall of Fame Inducts Entrepreneurial Icons

THE CEAT HALL OF FAME RECOGNIZES OSU GRADUATES AS WELL AS INDIVIDUALS WHO HAVE ENHANCED THE REPUTATION OF THE COLLEGE THROUGH THEIR CAREERS IN EDUCATION, INDUSTRY AND THE PUBLIC SECTOR. "ALL ARE LEGENDS IN THEIR FIELDS AND SHARE A COMMON SET OF QUALITIES INCLUDING MODESTY AND INTEGRITY, DIGNITY AND QUIET LEADERSHIP, ASPIRATION AND PERSEVERANCE AND SOUND JUDGMENT AND VISION," SAYS KARL REID, DEAN OF THE COLLEGE.



JAMES CUMMINS



GORDON E. EUBANKS JR.

The College of Engineering, Architecture and Technology Hall of Fame welcomes a pair of entrepreneurial icons, Oklahoma construction magnate James Cummins and Silicon Valley pioneer and software industry guru Gordon E. Eubanks Jr.

Cummins and Eubanks, inducted in October 2005, bring to 76 the number of distinguished professionals CEAT has recognized since establishing its Hall of Fame in 1954.

The CEAT Hall of Fame recognizes distinguished OSU graduates and individuals who have enhanced the reputation of the college through association. Inductees are legends in engineering, architecture and technology education, industry and policy formation. According to Karl Reid, dean of the college, they share a common set of qualities, including modesty, integrity, dignity, leadership, aspiration, perseverance, sound judgment and vision.

JAMES CUMMINS

H.E. Cummins and Sons Construction Co., originally a commercial, industrial and public building firm in Enid, became a reputable heavy contractor during the post-war era. Their monumental projects include Tulsa's Keystone expressway, the Robert S. Kerr Lock and Dam on the Arkansas River, the overhead I-40 expressway and the Arrowhead Dam southeast of Wichita Falls, Texas, the largest, earth-filled dam in the Southwest when built in 1965-66.

With James Cummins, the oldest of the brothers, as its president, H.E. Cummins and Sons developed subsidiary concrete and asphalt plant operations throughout Oklahoma and a steel fabrication facility on the Arkansas River near Muskogee to support its projects.

The Muskogee terminal became the site for a family investment in the storage and marketing of residual oil, an involvement that led to Cummins' ongoing interests in the manufacture and marketing of residual oil-based products.

Cummins has been owner, president and founding or controlling shareholder in 15 different companies. At 83, he currently heads Northern Equipment Co., Keystone Equipment Co., Cummins Investment Corporation and CIC Frontier Corporation.

Cummins completed a bachelor's degree in arts and sciences at OSU in 1943 before joining the U.S. Marine Corps. He returned to Stillwater and completed his bachelor's degree in architectural engineering in 1947.

GORDON E. EUBANKS JR.

Eubanks authored C-Basic, one of the first successful languages for personal computers, after completing his master's degree in computer science at the Naval Postgraduate School in Monterey, Calif. His graduate adviser was Gary Kildall, a founding father of desktop computing and author of the first mainstream desktop operating system.

Eubanks founded his first company, Compiler Systems, in 1976 to market C-Basic while still an officer in the U.S. Navy. His mother ran the company out of her home in Sierra Madre, Calif.

Later, as president and CEO of Symantec Corporation, Eubanks oversaw the development of the popular productivity packages Timeline and Q & A Write. He also initiated an aggressive policy of mergers and acquisitions as a strategic engine for growth, making Symantec the first software company to do so.

The company acquired Norton in 1990 to gain a foothold in security and utility software and is now recognized as a leader in the business. During Eubanks' tenure from 1984 to 1999, the company grew from fewer than 20 employees to more than 5,000 with net revenues in excess of \$500 million. Today, it employs 14,000 people in 40 countries.

He joined Oblix Inc. as president and CEO in 1999. *Upside* named the electronic identity management and secure web access software provider among the "Hot 100 Companies of 2000" and *PC Week* included it among the "21st Century Infrastructure Companies for 2000." Oracle acquired Oblix in 2005.

Eubanks completed a bachelor's degree in electrical engineering at OSU in 1968, completed one year of graduate school at OSU and spent six months working for IBM's branch office in Tulsa before his draft induction into the Navy. ▲

ADAM HUFFER



Khoshnevis Receives CEAT's Highest Honor

The College of Engineering, Architecture and Technology's 2005 Melvin R. Lohmann Medal recipient is Behrokh "Berok" Khoshnevis, an inventor whose autonomous, robotic process for building structures may enable the world to house its poor and NASA to build on the moon and Mars.

Khoshnevis, a professor of industrial and systems engineering at the University of Southern California, completed a master's and doctoral degree at OSU in 1974 and 1979.

He dispels any misconception that industrial engineers only optimize and improve systems and processes others design, says CEAT Dean Karl Reid.

"Berok has invented numerous medical devices and pioneered developments in robotics, automation and computer controlled manufacturing," Reid says. "He has made contributions in the fields of construction, manufacturing, electrical, biomedical, mechanical, industrial and environmental engineering."

The automated fabrication process Khoshnevis invented, "contour crafting," works like a multi-dimensional printer that extrudes material layer by layer to make ceramic parts, Piezo electric actuators, polymer parts and, potentially, entire houses. At least 10 patents are pending or have been awarded based on its components and applications.

Contour crafting's robotic gantry supports the rapid fabrication of large-scale parts. Conceivably, a builder will be able in one day to upload a set of blueprints and construct an entire house complete with conduits for electrical and building systems. NASA has invested in the technology's development with hopes to use it to erect dwellings on the moon or on Mars for space pioneers. The process could also be used to rebuild homes quickly and inexpensively for disaster victims.

Khoshnevis and contour crafting have been spotlighted on the *NBC Nightly News* and in *The New York Times*, *Los Angeles Times*, *Popular Science*, *Building Magazine*, *Business Week*, *Discover Magazine* and *London's Daily Telegraph* among other international publications.

Selective Inhibition Sintering, another process Khoshnevis invented that USC has licensed to a German company, is expected to cause a quantum leap in solid free-form fabrication.

Khoshnevis' development of new supervision, sensing, control and intelligence systems enables robots to carry out low precision manufacturing assemblies, including the Space Reconfigurable Robotics Assembly System that uses cable-connected robotic modules to assemble solar panels in space.

His inventions in the medical field include a waste collection device for people confined to wheelchairs, which he donated to a company that has marketed it worldwide since 1987. He also created the Omnigrasp, a computer-controlled machine and process to improve the custom construction of dental restorations, and a haptics breast examination system for use in training medical practitioners.

Khoshnevis also invented a digital binocular for Stereovision Inc.; a CAD/CAM system Mattel uses to make toys; a machine to transfer digital camera images onto plexiglass; and the FS-450 computer numerical control system manufactured by Expertech.

Reid says Khoshnevis is unique among great inventors in that he enjoys taking the time to share his knowledge of the inventing process. In addition to mentoring countless students, he speaks frequently to professional and student groups, including the CEAT Student Council.

His work to advance entrepreneurial education and innovation at USC includes the development of a manufacturing systems laboratory and a rapid prototyping laboratory used in engineering courses. However, the multidisciplinary nature of his work unites USC faculty in computer science, material science, mechanical and electrical engineering, architecture, real estate planning, fine arts, medicine and dentistry.

Born in Iran, Khoshnevis initially studied at Sharif University of Technology in Tehran. While completing his bachelor's in industrial engineering, he read books written by professors in OSU's School of Industrial Engineering and Management. Faculty members such as Joe Mize, who remains one of 13 Oklahoma engineers in the National Academy of Engineers, and OSU's international reputation were the reasons he applied. ▲

ADAM HUFFER



CEAT established the Lohmann Medal presentation in 1991 in honor of Melvin R. "Pete" Lohmann, who served at OSU for 36 years. While dean from 1955 until 1977, he led the college to national prominence while providing national leadership in the movement to adopt the professional school concept in engineering education.

Largely as a result of his service as national president of the Engineers Council for Professional Development and the American Society for Engineering Education, Lohmann became a national advocate for the Professional School Model for engineering education, a model with many characteristics of law and medical schools. The engineering programs at OSU today include many of the elements of the model espoused by Lohmann.

Behrokh Khoshnevis is pictured with a gantry used in contour crafting, a robotic extrusion process he invented for the fabrication of parts and structures.



Shown from left are Josh Ray, fifth-year architecture student; Jeff Williams, architecture professor; Scott Goodner, fourth-year student; Brad Bailey, fourth-year student; Randy Seitsinger, head of the architecture school; and Jason Coates, fifth-year student.

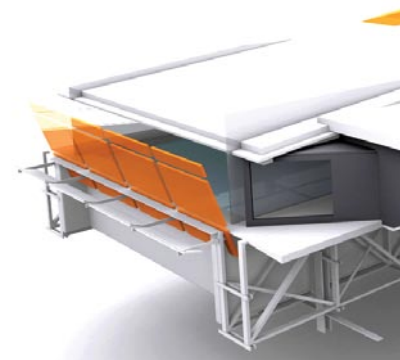
The OSU School of Architecture, founded in 1909, offers fully accredited academic programs in both architecture and architectural engineering. No other architecture program in the nation offers degree programs in both of these related fields where the programs are as strongly interrelated as at OSU.



Erika Contreras

“We are pleased to be able to reward the excellence of the architecture and architectural engineering programs at OSU. These award-winning students will have a facility that matches their academic programs.” – Donald W. Reynolds Foundation Chairman, Fred W. Smith

A Home to Match the Reputation



A \$14.8 million gift from the Donald W. Reynolds Foundation will have more effect on the college than any other single event in its history, says Karl Reid, dean of the College of Engineering, Architecture and Technology.

"This historic gift will impact the college and the campus at many levels – not the least of which is to give our nationally known architecture program the facilities to equal its reputation," he says.

"The success of our students in national and international competition demonstrates our program is already one of the nation's best. This renovation and expansion will allow OSU to step up recruitment and enlarge its reputation as a premier teaching and research architecture school."

THE PLAN

The Reynolds Foundation gift, the largest OSU has ever received from a private foundation, will renovate the current architecture building, formerly the Gymnasium and Armory built in 1918 and remodeled for the architecture school in 1976. In addition to the 37,000 square feet of renovated space, the expansion will create 45,000 square feet of new space.

The new building, to be named the Donald W. Reynolds School of Architecture Building, will provide new campus amenities including a 300-seat auditorium, multimedia classrooms, a visualization/computer lab, gallery space and an expanded architectural library. Other new and renovated spaces include design studio space, a model shop and expanded administrative areas to accommodate current and new faculty.

"The facility will provide new opportunities for collaboration between CEAT and other colleges on campus. The state-of-the-art auditorium and connecting gallery will also serve the broad needs of the campus and many other academic units," says Reid, who believes the new building will stand as a symbol of OSU's educational excellence.

The gift is transformational, says Randy Seitsinger, professor and head of the School of Architecture. "The new building will provide faculty and student spaces that will facilitate innovative study and exploration and will allow the school to develop new graduate programs in architecture and architectural engineering."

Architecture professor Jeff Williams believes the school will significantly impact both faculty and students.

"This additional space will allow us to grow both the faculty and the graduate student population. In addition to providing additional research opportunities and opportunities for recognition for the university, this will also provide the school with a larger group of mentors that will further stimulate the activities of the undergraduate program," Williams says.

THE PROCESS

The seeds for CEAT's proposal were planted more than 10 years ago, but the development really gained momentum over the last several years, Reid says.

"Thanks to the efforts of numerous people at the university and the OSU Foundation, President David Schmidly, Regent Burns Hargis and Randy Seitsinger were able to present a comprehensive proposal outlining the project and its place in the academic fabric of the campus."

continues →

AWARD-WINNING PROGRAM

→ The School of Architecture has a **longstanding award-winning heritage**. Recently, OSU architecture students have received 3 firsts, 1 second, 1 third, and 7 honorable mentions in **international design competitions** and 8 firsts, 2 seconds, 5 thirds, and 15 honorable mentions in **national design competitions**.

→ **Over the past 15 years, 116 architecture students have placed in national and international design competitions.**

→ The school received the 2004 NCARB Prize for the **best professionally-oriented architecture course in the nation**, and one of the school's faculty members (Moh Bilbeisi) was named the 2004 American Institute of Architectural Students (AIAS) Educator Honor Award winner as the **outstanding architectural educator in the nation**.

→ In 2002, students in the school's AIAS organization received the national chapter honor award as the **outstanding student organization in the nation**.

→ In 2001 they received **national recognition** for a program they developed to provide architectural education to fifth-grade students in the Stillwater school system.

Donald W. Reynolds School of Architecture



The Donald W. Reynolds Foundation, a national philanthropic organization headquartered in Las Vegas, Nev., is one of the largest private foundations in the U.S. and a leader in supporting education.

Reid attributes the foundation's funding approval to OSU's strong architecture program and the integration of the project as a component of the university's strategic plan and campus master plan.

"I believe the decision made by the Donald W. Reynolds Foundation to support our project was a response to a clear vision of something much greater than a simple expansion of infrastructure," Reid says.

OSU received the gift in November 2005, but the design process for the future building began in April 2004 with a comprehensive four-day design charrette, derived from the French term meaning "a last push toward completing a long-designed project."

The event brought together architecture faculty, students and alumni from across the country to kick-off the design process with a combined effort of more than 1,000 work hours. Participants explored a variety of creative ideas that led to the initial concept for the new and renovated building.

During the forum's initial phase, participants explored an assortment of factors to determine the most efficient, well-designed approach that would address the needs of the School of Architecture, the OSU campus and the Stillwater community.

"We really evaluated how this project could ultimately impact everything around us while still maintaining the integrity of our campus," Seitsinger says. "For example, teams addressed ways to make the building more energy-efficient and more accessible to the public and ways to provide a mutually beneficial facility for both university and community."

The Donald W. Reynolds Architecture Building will be one of 11 academic facility projects to begin on OSU's main campus within the next five years.

Erika Contreras

An outstanding team has been assembled to participate in the design and construction of the facility. Seitsinger and Williams are working with Studio Architecture in Oklahoma City on the design of the facility. Wallace Engineering in Tulsa is providing structural and civil consultation and Phillips and Bacon from Tulsa is helping with MEP issues. Boldt construction from Tulsa is serving as the construction manager.

The facility is slated for completion in spring 2009 – just in time for the OSU School of Architecture's centennial anniversary. ▲

ADAM HUFFER

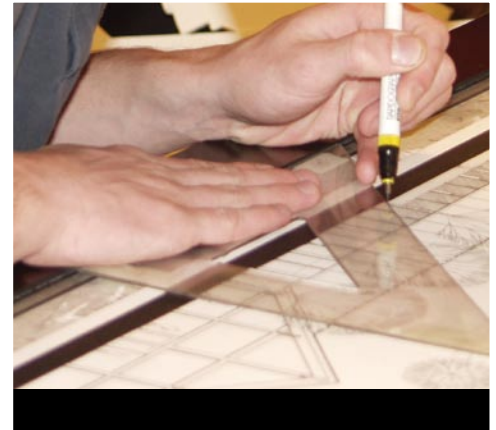
From left are Karl Reid, dean of the College of Engineering, Architecture and Technology; Randy Seitsinger, professor and head of the School of Architecture; Fred W. Smith, chair of the Donald W. Reynolds Foundation; Steve Anderson, president of the Donald W. Reynolds Foundation; Bob Slater, Oklahoma representative for the Donald W. Reynolds Foundation; David Schmidly, OSU System CEO and president; and Burns Hargis, chair of the OSU/AGM Board of Regents.



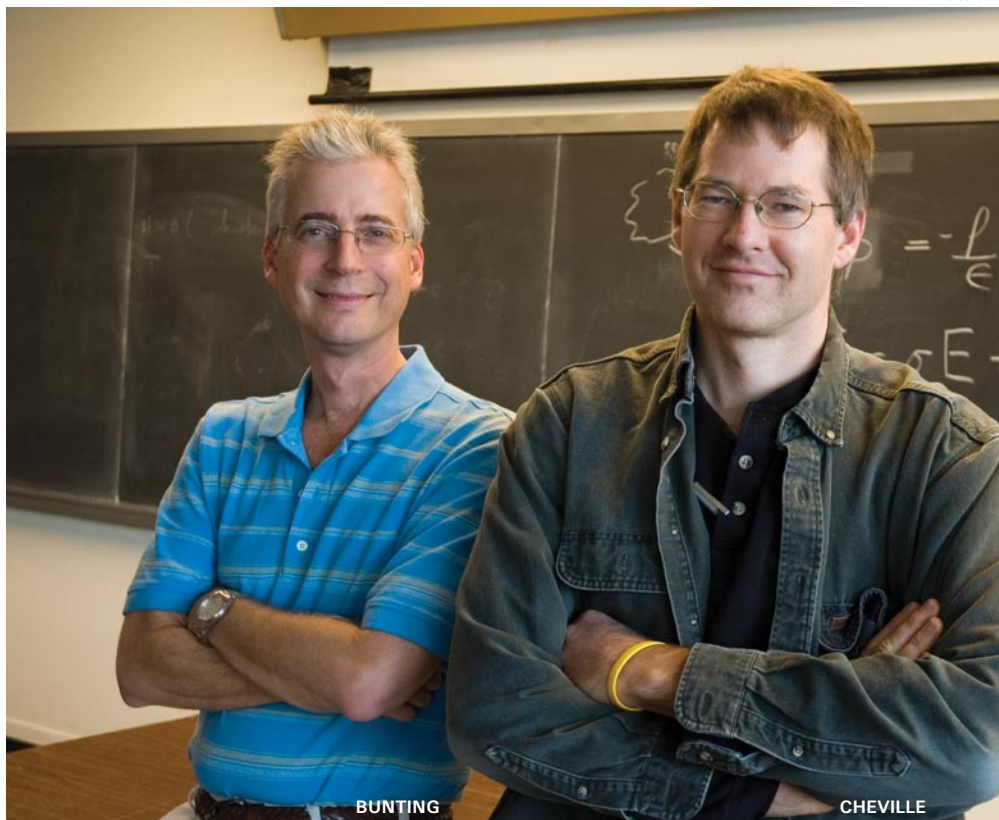
"The new building will provide faculty and student spaces that will facilitate innovative study and exploration and will allow the school to develop new graduate programs in architecture and architectural engineering." – Randy Seitsinger, school head



Aaron Jones



Erika Contreras



BUNTING

CHEVILLE

Graduating Engineers for the 21st Century

"One of the critical challenges for the United States is creating enough engineers to support our economy, infrastructure and national defense, all of which rely heavily on technology," says **Alan Cheville**, associate professor of electrical and computer engineering (ECEN).

Several factors make meeting the challenge a daunting task, he says, pointing to some startling statistics. The number of students obtaining a bachelor's degree in electrical and computer engineering dropped 40 percent from 1987 to 1998, and the fraction of engineering degrees as a fraction of all college degrees fell 12 percent from 1998 to 2001.

And there's more. Only about half of the students who start off in engineering will graduate, and nationally, 56 percent of all graduate engineering degrees are to foreign citizens. Since 1982 the cost of a college degree has risen 220 percent more than inflation.

"For some time now, dedicated ECEN faculty members have been systematically examining the causes and possible solutions to how universities can accomplish reform that is cost-effective and sustainable," Cheville says.

Their efforts paid off this year when ECEN won a prestigious and competitive **National Science Foundation award** to redefine the process by which students become engineers. This \$1 million grant, which supports the reform program **Engineering Students for the 21st Century**, will enable ECEN to begin redesigning curriculum to prepare tomorrow's engineers.

Project leaders Cheville and **Charles Bunting**, associate professor of electrical and computer engineering, are working with other ECEN faculty members, the College of Education and the OSU Library as well as collaborators from Michigan State University, the University of Washington and the State University of New York at Buffalo to reform the ECEN curriculum.

They plan to move from a predominately knowledge-based undergraduate curriculum, which

focuses on learning a set of concepts, to a development-based one, which focuses on teaching students how to solve engineering problems.

"One inherent assumption in a knowledge-based program, such as ours, is that by learning a certain set of concepts students will be able to function as engineers. But experience indicates otherwise," Cheville says. Another assumption, made questionable by the Internet, is that this specialized knowledge can be learned only at the university.

In development-based learning, students at all levels will be taught how engineers tackle design problems, how to monitor their own development and how to find, evaluate and communicate information. The program will develop the skills students need to understand a problem in depth through research and design projects.

This approach redefines the role of both faculty and the university and represents a fundamental shift in the focus of an engineering degree, he says. "The role of faculty changes from lecturers to mentors and scholars, guiding academic

development toward complex problem-solving tied to real-world problems."

Engineering Students for the 21st Century involves faculty in engineering, physical science, education, and library science as well as ECEN faculty and students. The undergraduate students will help guide project development and engage in education research projects to improve the courses they have taken. Graduate students will take part by apprenticing under faculty, developing course material from their research and teaching.

During the next three years, the reform project will restructure 10 courses in the ECEN program using a new developmental model that integrates scholarship into teaching. Cheville says the ECEN faculty will base the curriculum changes on established educational techniques that are proven to attract and retain students, including under-represented groups and women.

"The odds a female or minority student will complete an engineering degree is one in three. Nationally, only 13 percent of engineering students are women, and less than 16 percent are African American, Hispanic or Native American," Cheville says.

The overall goal is that this reform effort will contribute to and guide the sweeping realignment of engineering programs in U.S. universities called for by the National Academy of Engineering, the National Science Foundation and the National Research Council.

"Two decades of investment in engineering education has yielded little change, and OSU is both conservative and tradition-bound," he says. "We will need help from our alumni to support change as well as to forge long-term partnerships with industry that will support the facilities and equipment needed by our students." ▲

EILEEN MUSTAIN

Seagate Donation Expands Application Opportunities

Warren Lewis' dream of giving students real projects with real companies has come true, largely due to a \$750,000 equipment donation from **Seagate Technologies'** manufacturing facility in Oklahoma City.

The donated equipment, which includes computer numerical-controlled (CNC) mills, lathes and other up-to-date machinery and replacement parts, forms the core of CEAT's new Manufacturing Development Laboratory, formerly the petroleum laboratory on OSU Stillwater's north campus.

Newly refurbished with a controlled environment, the 3,000-square-foot

industrial precision machining and fabrication lab gives OSU's mechanical engineering technology and industrial engineering and management students hands-on training in an environment comparable to the industries that will employ them.

Lewis, assistant professor of mechanical engineering technology, says training machinists isn't the goal for MET students who apply technical and engineering knowledge in activities ranging from design to manufacturing to sales.

"We want our students to step into a job knowing all aspects of the manufacturing process from concept to production. They will be better designers if they know the time, the steps and the cost to

make a part," he says. "We want them to know the fundamentals, so they can effectively collaborate with machinists and engineers to manufacture efficiently in an industrial setting."

"Our students need to understand what it takes to be competitive," says William Kolarik, professor and head of industrial engineering and management.

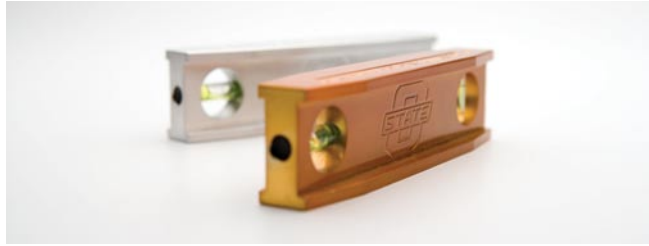
"We can't be competitive the old way. Industry has replaced skills with machines that can do more than a skilled machinist. All movement can be programmed in the machines, and they can do what a person does in 10 percent of the time. Now machines compete with other machines.

"In today's global economy, industries can go anywhere in the world to find part suppliers," he says. "The creative way machines are used makes all the difference in being a viable competitor and having a stake in the line of supply. We have to teach our students how they can provide value and produce better than someone somewhere else in the world."

Training students on the modern world-class computer-operated equipment from Seagate is essential to giving our students and the U.S. economy a competitive advantage, Kolarik says. "Having well-trained, innovative technologists will help keep and create new manufacturing jobs in this country."

Warren Lewis, assistant professor of mechanical engineering technology, center, and students, Justin Estus and Aaron Bookout, stand in CEAT's pristine new Manufacturing Development Lab. "A clean facility is Warren's trademark signature," says William Kolarik, professor and head of industrial engineering and management. "If you're not a clean shop, no one will talk to you about applied research."





Phil Stuckley

“Our motto is ‘Bringing Real-World Engineering to Students and Technology Resources to Oklahoma,’” Lewis says. “While we want our graduates to be a top choice for companies world-wide, many of our students are Oklahomans who plan to work in Oklahoma companies. One of our goals is to provide direct training and assistance to the state’s industry.”

The MET program can help Oklahoma companies modernize through the development and use of technology. Efficiency assessments, design, materials testing and selection, equipment analysis and prototype production are just a few of the new lab’s services, Lewis says.

“Industrial companies submit project requests that we review and assign to students. Although the students work under faculty supervision, they work closely with the companies to complete the projects. The companies benefit, and our students benefit from the training and the networking opportunities,” he says. “Both increase their career opportunities.”

Sample projects might include helping an inventor make a product; providing a seminar to introduce an organization’s a new product to industries; making a company’s part for research and development;

or providing cost analysis and purchasing options for a small manufacturing company that wants to know if buying a new machine would be cost effective.

Industry partnerships are crucial for the hands-on MET training program. While some support comes from OSU and lab fees, donations from industrial groups such as Seagate, Charles Machine Works and Edgecam covered most of the original costs. Lewis says continued support for operations will come from industrial sponsorships and donations. ▲

EILEEN MUSTAIN

A ‘Sunny’ Start

Completed this spring, the CEAT’s new Manufacturing Development Lab did not wait long for its first major production project, one that exemplifies the program’s goal of multi-disciplinary interaction.

Mechanical engineering technology collaborated with aerospace engineering, the College of Education NASA’s Aerospace Education Services Program, the OSU Teaching from Space Office at Johnson Space Center, and the Lockheed Martin Corporation to design and manufacture solar panels for the NASA Explorer Schools.

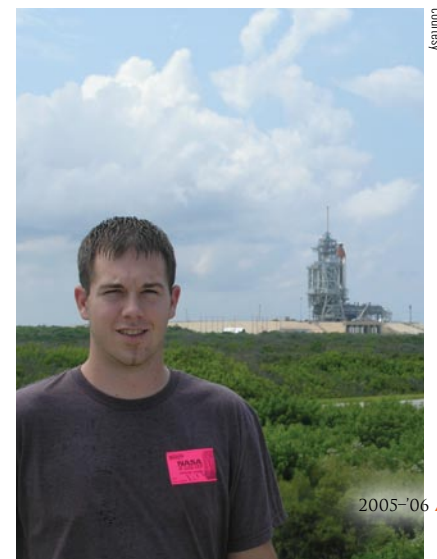
They also produced the solar panel astronaut Chris Ferguson carried aboard the Atlantis on NASA mission STS-115, which added solar panels that doubled the International Space Station’s power capacity. These solar panels allowed students throughout the nation to perform experiments alongside Ferguson when he used his solar panel to broadcast demonstrations back to earth for NASA Explorer Schools.

MET students, who began the project in May under the supervision of Lewis, manufactured more than 200 solar panels for the NASA education program. **Aaron Bookout**, mechanical engineering technology student, designed and manufactured Ferguson’s solar panel, assembled by aviation and space education graduate **Dan Hern**. To produce the panels, the students used parametric molding software to model, program and set up production on a CNC mill donated by Seagate. ▲

Mechanical engineering junior Aaron Bookout visits the launch pad where solar cells he helped develop for NASA traveled with the Atlantis space shuttle to the International Space Station.



Phil Stuckley



COURTESY

TAKING CARE OF BUSINESS

Meeting the Needs of Small Manufacturers

Since opening in 2002, OSU's New Product Development Center has already garnered two prestigious awards for its success with small- and medium-sized manufacturers in Oklahoma.

In 2006, the *Oklahoma Journal Record* presented the New Product Development Center (NPDC) with the **Innovator of the Year Award** for work with Klutts Equipment Co. of Muskogee on the Gon-topper, a machine to help load and unload railroad gondola cars.

In 2005, the University Economic Development Association presented the NPDC with its **Award for Excellence in Technology Commercialization**

for developing the Gon-topper prototype for Klutts.

Sponsored by the College of Engineering, Architecture and Technology, the Division of Agricultural Sciences and Natural Resources and the OSU Center for Innovation and Economic Development, the NPDC brings faculty and students from various engineering and agricultural departments together with Oklahoma manufacturers to provide prototyping assistance. Only existing companies with a new product concept and the potential to generate annual

revenues of at least \$1 million and create at least 20 new jobs are eligible.

"Every NPDC project is an investment in the future of Oklahoma," says **Larry Hoberock**, NPDC co-director and professor and head of OSU's School of Mechanical and Aerospace Engineering. "The NPDC has the potential to bring thousands of new jobs and billions of dollars to our state as small manufacturers look to the center's resources to solve problems and create new opportunities."

However, no matter how innovative its product development, a business must be equally innovative in financing and marketing, says Bill Barfield, NPDC co-director and emeritus professor of OSU's Department of Biosystems and Agricultural Engineering.

To assist in these areas, the NPDC launched the Business Analysis Program and the Marketing Communications Program. The programs combine OSU resources in communications, marketing, finance and management to help propel participating companies to the next level.

Through the Business and Market Analysis Program, agricultural economics students prepare in-depth reviews of the current business environment and develop business plans for participating companies.

"In the class that **Rodney Holcomb** and I teach, our students produce financial impact and market

research reports as part of business plans for companies," says Dan Tilley, professor of agricultural economics.

"Our goal is to teach students how to help small manufacturers better organize, finance, manage and market their companies in the competitive global marketplace."

Graduate student Erich Wehrenberg was part of a team last spring that created a business marketing plan for Stillwater-based Terraverde Technologies. The students' 40-page business plan referenced company documents and interviews with the owners.

"This was a superior course," Wehrenberg says. "Sitting across the table from our clients and realizing their livelihood could depend on our effort and ingenuity leaves no doubt about our responsibility to them."

After the business plans are presented, students in the Marketing Communications Program directed by Cindy Blackwell, assistant professor of agricultural communications, create marketing tools such as websites, logos, brochures, advertisements, stationery and in-store and trade show displays.

"A lot of times, small companies have lots of marketing starts and stops," Blackwell says. "Even when they have a plan, they often have to implement it in a piecemeal fashion as funding becomes available."

"Every NPDC project is an investment in the future of Oklahoma."

The business analysis and marketing communications components of OSU's New Product Development Center, benefit Oklahoma businesses. Below, at left, are Pepper Jo's Farms owners JoVita and Randy Black, senior Jennifer Nance and Dan Tilley. At right are senior Sally Bauer, Tilley, Craig Zuege of Texoma Tack, Cindy Blackwell and Larry Hoberock.



Erika Contreras



Working with clients, students develop a consistent communications package reflective of the company's image while also offering low-cost, high-quality marketing materials and products in a print-ready format.

Besides interacting with clients, students get to add samples and awards to their portfolios. One student group from the fall 2005 campaigns class recently won first place in a national student communications competition for its marketing campaign for Tonkawa Foundry.

Since 2005, when former NPDC staff members Cristen Leimer and Autumn Hood started the marketing communications component, some 100 students from several Oklahoma universities have completed 24 projects.

"Working on a communications campaign for a real-life client was one of the most valuable experiences I had at OSU," says Dustin Mielke, a 2006 agricultural communications graduate. "Our team learned to work together while assembling materials and communicating with our client. The class really allowed us to integrate the skills we learn as agricultural communications students."

Craig Zuege, vice president of Texoma Tack Co. Inc. of Durant, Okla., says the website, ads and other products created by senior Sally Bauer during her summer internship with the



NPDC would have cost his company thousands of dollars if done by a professional firm. "I would value this service at \$25,000 to \$75,000," Zuege says.

Similarly, the financial reports and strategies resulting from agricultural economics class projects are invaluable to small business owners. "You would not believe how helpful they are," Zuege adds. "I'm working on a federal grant and loan application using the business plan developed by the students."

When Encompass Tool & Machine of Ponca City, Okla., closed, Kansas business owner Paul Maples and Galaxy Tool Corporation bought the company and rehired the employees.

"I wanted a new look for the company," says Maples, president. "But if it hadn't been for this program I wouldn't have new brochures or a new website because I've been so busy with sales and getting the business up and running. This gave us the time we needed to grow and focus on various areas of the business."

Janet Herren, a 2006 agricultural communications graduate, says working with clients through the class project was an eye-opening experience.

"It made me want to work harder because I knew that my work was affecting more than just my GPA. The campaigns class is truly a hands-on experience that extends beyond the classroom and gives students the opportunity to make a real impact." ▲

JANET VARNUM

FOR MORE INFORMATION, VISIT
npdc.okstate.edu

courtesy



OSU Named Nation's Top Fire Service Organization

The Congressional Fire Services Institute ((CFSI), a non-profit, non-partisan policy think tank that advises Congress on fire and life safety issues, named the **International Fire Service Training Association (IFSTA)/OSU Fire Protection Publications** the **2005 Fire Service Organization of the Year**.

IFSTA began in 1934 as a regional association of fire-training directors in Oklahoma, Kansas, Missouri and Arkansas to develop and validate high-quality training materials for the fire service. Since then it has expanded to include fire-service professionals from throughout Europe, including the former Soviet bloc nations, Israel and a number of countries on the Arabian Peninsula.

From its inception, the association has partnered with OSU to produce and distribute fire protection materials. OSU FPP is the world's leading publisher of fire and emergency services training materials and the headquarters for its publishing partner IFSTA. Its materials have been translated in 13 different languages.

The first publication, the IFSTA manuals, written by firefighters for firefighters, was released in 1937. The IFSTA manuals include *The Essentials of Fire Fighting*, considered the bible of firefighting textbooks.

All OSU-FPP operations, including the development of new products, capital improvements and research, are funded solely by revenues generated through the sales of its materials. Its customers include Department of Defense agencies and the fire academies throughout the U.S. and 35 other countries.

"For fire service organizations, the CFSI award is our Heisman," says Chris Neal, executive director of IFSTA and director of OSU-FPP. "What an honor for the thousands who have played active roles in IFSTA over so many years, and equally a tribute to both the incredible staff at FPP and the unwavering support of OSU leadership." ▲

ADAM HUFFER



Maj. Danielle Willis completed a master's degree in engineering and technology management last year despite frequent moves with the Air Force throughout the U.S., Asia, Europe and the Middle East.

A Far-Reaching Program

In between Air Force missions over Iraq and Afghanistan, **Maj. Danielle Willis** found time to complete a master's degree in engineering and technology management from OSU's master's of science in engineering and technology management program (MSETM) at OSU.

Similarly, **Lt. Anton Raneses** of Alexandria, Va., hasn't missed a single class since he's been stationed at Camp Arifjan, Kuwait, as a supply corps officer with the Navy Reserve.

"OSU's MSETM program allows me to build core competencies in IT, management, supply chain, quality and reliability engineering analysis, and, more importantly, cost-benefit analysis that are all transparent in both my Reserve and civilian jobs," says Raneses, a contracting officer for the Department of Defense in Washington, D.C., when he's not on active duty.

Like 25 percent of the MSETM participants, Raneses discovered OSU's program while surfing the Web. He says he chose OSU because other top engineering

programs required residencies and were more expensive.

Willis and Raneses are among approximately 200 students who enroll each semester in OSU's master's of science in engineering and technology management program or certificate program in engineering management.

courtesy



Lt. Anton Raneses, right, enjoys R&R in Qatar in between serving as a supply corps officer with the Navy Reserve at Camp Arifjan, Kuwait, and participating in OSU's MSETM distance education program.

Designed specifically for fast-track engineers and scientists, the program teaches managers how to integrate rapidly changing technology and cost-effective product and process design, says **Paul Rossler**, director and associate professor of industrial engineering and management.

"The program exists for technical professionals whose career paths and responsibilities include project management, selection and supervision of people, and executive and strategic leadership," Rossler says. It is a program within CEAT with participation by the Spears School of Business and the College of Arts and Sciences.

Students from Alaska to Afghanistan receive weekly packages of CDs with OSU class lectures and use the Internet to contact instructors, participate in online discussions and check grades.

"We always try to get CDs to our students before the weekend," says **Laura Gann**, manager of CEAT distance education. "Our students really like CDs, but

they also can go on the Internet and access lectures before their CD arrives."

With so many students enrolled in 50 to 60 classes each semester, Gann says it takes an experienced team of technicians, clerical staff and student employees to record all the material and organize, label and ship it as quickly as possible.

Special encoding computers in Cordell Hall and Engineering North record lectures that are transferred to CD along with any slides, handouts or other material presented by the instructor.

In the past, CEAT distance-learning classes used a network connection to provide videoconferences to onsite classrooms at Oklahoma companies such as Halliburton, ConocoPhillips and even Tinker Air Force Base.

"Today it doesn't matter where a student is located," Gann says. "All they need is Internet access to take these OSU classes."

Phil Shockley



OSU's distance education program is attractive to working professionals who don't have time to commute and don't want to uproot their families to return to school.

Eric Silverman of Boston, Mass., says the program enables him to preserve family time while increasing his management skills as a senior control systems engineer for CDM, an international consulting, engineering, construction and operations firm.

"There simply aren't enough hours in the day for me to travel to a campus, so without a learning option I probably would not be pursuing a degree right now," Silverman says.

Assistant director **Brenda Johnson** and her assistant **Amanda Lowe** ensure students enroll in the right classes and adhere to their degree plan. "We try to make them comfortable enough to pick up the phone and call us anytime," Johnson says.

They also smooth out any problem that might arise. "We have to be these students' legs and voices on

campus," Johnson says. "If they have a problem, we take care of it. They don't have the luxury of dropping everything to go take care of paperwork. They rely on us."

Even though most students don't visit campus except for graduation, the MSETM staff gets to know many of them and can recognize them by voice.

"Each spring we host a reception for the graduates, and it's really fun to see them and their families," Johnson says. "That's usually the first time we've met them in person."

Students overwhelmingly express and it to others.

"Our students are more mature," Johnson says. "They're here for the knowledge and the personal enrichment. The degree is just a bonus." ▲

JANET VARNUM

FOR MORE INFO, VISIT
www.msetm.com

'Lead the Way' Preps Future Engineering Students

The country is short of engineers, and Oklahoma is not graduating its share.



"Oklahoma is graduating fewer engineers on a per capita basis than the country as a whole," says **David Thompson**,

associate dean of Instruction and Outreach. "And, nationally, we're not producing enough engineers and engineering technologists to meet the needs of employers seeking to be competitive in the global market," says Thompson.

Last October, Karl Reid, dean of the College of Engineering, Architecture and Technology, announced that OSU had agreed to be the university affiliate in Oklahoma for **Project Lead the Way (PLTW)**.

PLTW is a national program designed to increase the numbers of young people choosing to study engineering and engineering technology. The PLTW curriculum involves a sequence of courses, which combined with college preparatory mathematics and science courses, introduces high school students to the disciplines of engineering and technology prior to entering college. PLTW in Oklahoma is a partnership between Oklahoma high schools, the Oklahoma Department of Career and Technology Education, and OSU.

At a recent OSU engineering and engineering technology career fair, there were 145 employers hunting for future Bachelor of Science graduates in these disciplines. "Some of them were looking for more than 100 new engineers for their company," says Thompson. "The demand far exceeds the number of students we are going to graduate this year."

Project Lead the Way helps address the problem by getting students interested in engineering at the high school level and then preparing them for success in college and the workforce. More than 660 Oklahoma high school students from more than 60 different high schools are enrolled in the programs (termed "pre-engineering academies") at seven technology centers across the state. They spend half day in the technology center and half day in their high school.

"A great many students are in high schools that don't offer enough advanced level math and science coursework to prepare them for entry into a

challenging engineering curriculum in the university," says Thompson.

"The Career Tech centers have hired outstanding teachers to teach the math and science courses as well as the pre-engineering hands-on courses. In most states, PLTW is done in the high school. Our high schools don't have the resources for the required laboratories, but the Career Tech centers already have the needed laboratories in place."

OSU's role focuses on training teachers to teach the pre-engineering courses. "OSU is delighted that the College of Engineering, Architecture and Technology and the College of Education are partnering to ensure that teachers are well-prepared, and that the preparation occurs in Oklahoma," Reid says.

"We expect that the **Oklahoma pre-engineering academies will greatly increase the numbers and diversity of qualified students entering engineering and engineering technology programs in Oklahoma,**" says Reid.

The pre-engineering academies are located at Central Tech, Drumright; Francis Tuttle and Metro Technology Centers, Oklahoma City; Gordon Cooper, Shawnee; Great Plains, Lawton; Moore Norman; and Tulsa Technology Center.

Nationally, Project Lead the Way serves more than 175,000 students in more than 13,000 schools across 45 states and the District of Columbia. ▲

CORY CHENEY



From left are Amanda Lowe, Laura Gann, Paul Rossler and Brenda Johnson.

Phil Shockley



Dr. Yarlagadda Has His Day

When Rao Yarlagadda's former students heard about his impending retirement from the School of Electrical and Computer Engineering, they surprised their beloved professor with a lasting tribute in his honor.

Twenty-one of his 30 doctoral advisees attended the celebration and announced the establishment of a fellowship in his name to support graduate study in signal processing at OSU.

Former student Joseph Campbell, now senior member of the technical staff at MIT's Lincoln Laboratory who completed his Ph.D. in 1992, provided the inspiration for the surprise event.

And Sherry Teague, whose husband Keith Teague is an associate professor and head of electrical and computer engineering and another of Yarlagadda's doctoral students, spearheaded the scholarship effort and the reception planning.

Legand Burge Jr., dean of the College of Engineering, Architecture and Physical Sciences at Tuskegee University, was one of the first to offer assistance.

"I thought it was a great idea," says Burge, who in 1979 was one of the first few African-Americans to complete a Ph.D. in engineering at OSU.

"Not only does the fellowship recognize Dr. Yarlagadda in a way that will continue in perpetuity," Burge says, "it also gives encouragement and provides financial assistance to graduate students in the area of signal processing."

A native of India, Yarlagadda and his wife, Marceil, came to OSU in 1966 soon after his friend Charles Bacon accepted a job at OSU. The two had become acquainted as doctoral students at Michigan State University. "Charlie later became department head at OSU and was very helpful in building the consortium of oil companies so instrumental in my work."

Yarlagadda's impact on signal processing includes co-founding *Digital Signal Processing Journal* and chairing one of the initial international conferences on acoustics, speech and signal processing to be held outside of the East Coast. He also united faculty from electrical engineering, physics and geology with Bacon's support, and helped improve underground exploration of oil and gas by developing techniques for the modeling of acoustic and other responses in down-hole tools.

This endeavor led to the establishment of laboratory facilities and a productive research program at OSU

that enjoyed the support of a 12-member consortium of the world's leading oil and well service companies for more than a decade.

Work to improve the integrity of digital image processing involved Sandia National Laboratories. Yarlagadda's collaboration with John Hershey, who completed his Ph.D. in 1981 and subsequently received the Melvin R. Lohmann Medal from OSU, resulted in the development at OSU of the encoding technique, Naturalness Preserving Transform, or NPT.

Yarlagadda's legacy at OSU is exemplified by the School of Electrical and Computer Engineering's assistance to the National Security Agency in the development of techniques for speech coding and recognition, and data transmission and compression.

Campbell, who did his undergraduate and master's work at the Rensselaer Polytechnic Institute and John Hopkins University, respectively, won a fellowship to pursue a doctoral degree at any school he wanted. And because of Yarlagadda's professional reputation, he chose OSU.

"A lot of people asked, 'Why are you not going to MIT? What are you doing?'" Campbell remembers. "I mentioned to one of the guys headed to MIT that I was going to Oklahoma State, and he said, 'Where is that?' and I said, 'Well, it's with Dr. Yarlagadda.' And even he had heard of Dr. Yarlagadda.

"It's really all about what an amazing person he is and why he's attracted so many really top people to OSU," Campbell says.

Yarlagadda's students describe him as a teacher, mentor and friend as willing to compile award nomination materials for them as to help secure housing or unpack U-hauls.

"One of the things I did was recruit older graduate students," Yarlagadda says, "and many of them I had known for years. They were professionals and had degrees from top schools all over the country.

"They wanted to come to OSU because we had the kind of Ph.D. program that allowed them to work on projects related to their jobs and the kind of people at the university who accepted them," says Yarlagadda, professor emeritus who continues working from his campus office.

Yarlagadda says his students are extremely committed to their work. "I think almost all of my students are brighter than me, and I think they are very serious people. In lectures, I name individuals and point out what my students have done. All of them have done remarkably well and are very proud of OSU." ▲

ADAM HUFFER

RAO YARLAGADDA'S PH.D. STUDENTS

- Eddie Fowler** ('69) - professor emeritus, electrical and computer engineering, Kansas State University
- Lewis Minor** ('69) - engineer, Lockheed Martin
- Fun Ye** ('72) - professor and dean emeritus, electrical engineering, Tamkang University, Taiwan
- Kal Massad** ('75) - Devry, Houston, Texas
- B. Suresh Babu** ('78) - Mitre Corporation, Boston, Mass.
- Lee Burge** ('79) - Retired U.S. Air Force colonel; dean, College of Engineering, Architecture and Physical Sciences at Tuskegee University
- James Ledbetter** ('79) - Retired U.S. Air Force colonel, Albuquerque, N.M.
- John Hershey** ('81) - technical staff, General Electric Global Research, Schenectady, N.Y.
- Meemong Lee** ('81) - senior engineer, Jet Propulsion Laboratory, California Institutes of Technology, Pasadena, Calif.
- Ahmad Milyani** ('81) - K.A. University, Jeddah, Saudi Arabia
- Rob Preuss** ('83) - BBN Technologies, Boston, Mass.
- Keith Teague** ('84) - associate professor and head, electrical and computer engineering, OSU
- Steve Patton** ('85) - engineer, Lockheed Martin, Littleton, Colo.
- Jim Shroeder** ('85) - professor, electrical engineering, University of Adelaide, DSpace, Australia
- Jack Cartinhour** ('87) - professor, electrical engineering technology, OSU
- Dwight Day** ('87) - associate professor, electrical and computer engineering, Kansas State University
- Chuck Kriel** ('88) - consultant, Boeing, Wichita, Kan.
- Jim Lansford** ('88) - chief technology officer, Alereon, Austin, Texas
- Robert Hayes** ('89) - Retired, dean, Electronics, Devry University; currently, visiting professor, engineering technology, University of North Texas
- Antone Kusmanoff** ('89) - L-3 Communications, Dallas, Texas
- Rich Dean** ('90) - Retired, Executive Service, National Security Agency; currently, lecturer, Morgan State University, electrical and computer engineering
- John Endsley** ('90) - Sandia National Laboratory, Albuquerque, N.M.
- Scott King** ('91) - Freescale, Austin, Texas
- Larry Paden** ('91) - Electrical Engineering, Engineering & Transmission Headquarters, Grand River Dam Authority, Broken Arrow, Okla.
- Matt Perry** ('91) - former president and CEO, Transmeta Corp., San Jose, Calif.
- Joe Campbell** ('92) - senior staff, MIT Lincoln Laboratory
- Alan Higgins** ('96) - Voice Vault, San Diego, Calif.
- Nikki Bruner Ibarra** ('98) - Seagate, Longmont, Colo.
- Charlotte Fore** ('99) - Sciperio, Stillwater, Okla.
- Tina Kohler** ('00) - National Security Agency, Md.



Phil Shockley



Shaking hands with President George W. Bush, Karalyn Eyster, CEAT's 2006 Outstanding Student in Engineering, is among the top students in each college selected to greet President Bush as he arrives to give the 2006 commencement address.

A Memorable Day

Karalyn Eyster, the College of Engineering, Architecture and Technology's **2006 Outstanding Student in Engineering**, achieved an impressive list of accomplishments during her undergraduate years.

The aerospace engineering graduate was a CEAT scholar, a CEAT Ambassador and chief engineer of the OSU-Orange team that took second place in the annual American Institute of Aeronautics and Astronautics International Student Design/Build/Fly Competition.

But one day is particularly memorable for Eyster, who now works as an aerospace weapons analyst for the federal government. She says she will never forget who spoke at her commencement and her conversation with President George W. Bush as they walked from his helicopter to Gallagher-Iba Arena, where President Bush addressed the 2006 graduates and their families and friends. ▲

Smay Receives Presidential Award

Jim Smay, assistant professor of chemical engineering, is one of only 20 nominated by the National Science Foundation to receive the **Presidential Early Career Award for Scientists and Engineers (PECASE)**. This award is the U.S. government's highest recognition of the nation's most promising young scientists and engineers.

Awardees are chosen from the 350 to 400 assistant professors who have received grants from the National Science Foundation's Faculty Early Career Program (CAREER).

Smay, one of six engineers among the PECASE winners, received a five-year, \$400,000 NSF-CAREER grant in 2005. He is using it to fund the development of an innovative technology as well as an outreach program for Native American high school students in Tahlequah, Okla.

The technology, a solid freeform fabrication process, may best be described as three-dimensional printing.

"This technology allows us to build things you can't make with traditional machining and molding processes," Smay says. "We also call it rapid prototyping because it allows you to design something on a computer and simply hit 'print' rather than send it off to a machinist."

The colloidal inks have a paste-like consistency and are formulated by suspending materials such as polymers, ceramics and metals in water with some processing aids. Next, the inks are extruded through fine tips resembling a hypodermic needle to draw lines in a layer pattern. Multiple layers are printed atop one another to build up three-dimensional structures used for things like dental crowns, electro-ceramics, and photonic materials. Some of the ceramic and polymer structures are even being investigated for use as artificial tissue scaffolds

"We are working to implement a video camera system for web casting the process to Sequoyah High School physics, chemistry or math classrooms," Smay says. "By the end of this year, students there will be able to design something in their classroom, hit 'print' and see it print out in Stillwater on a three-dimensional printer."

Through the process, Smay hopes to inspire students to learn about applied science, mathematics, fluid and solid mechanics and robotics that enabled his lab to develop the printer. "It's cutting-edge research that's a little above the high school level," he says, "but I hope working with a fun tool such as this will encourage them to work hard in high school and eventually pursue science and engineering careers." ▲

ADAM HUFFER



Phil Shockley

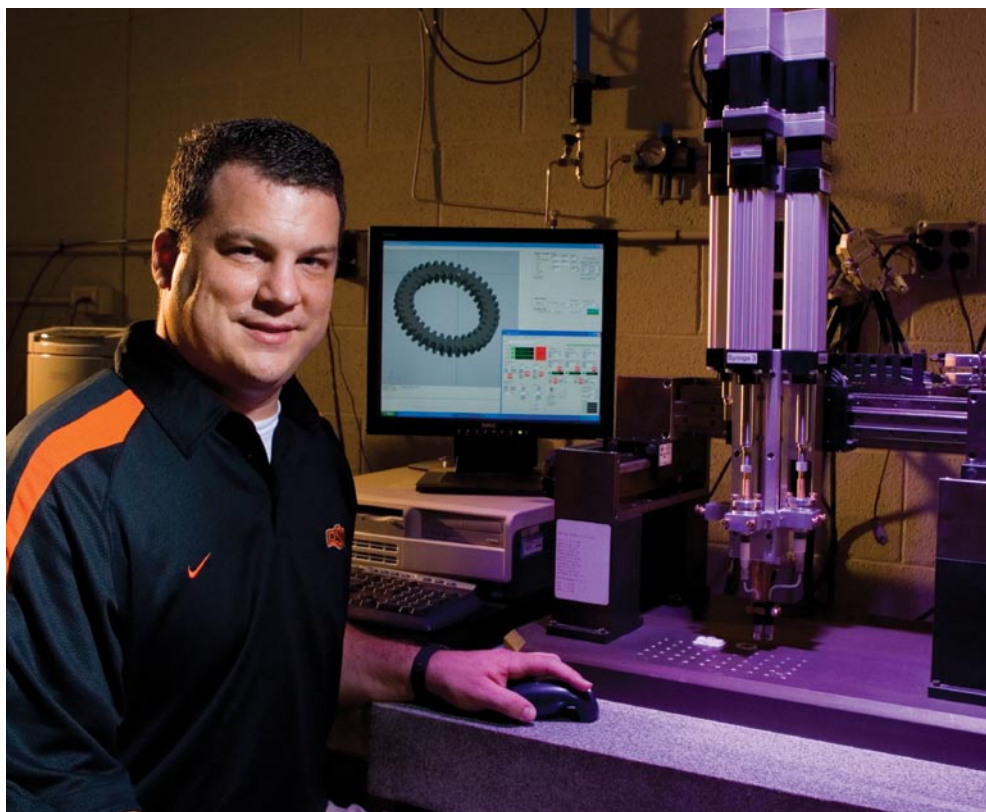
Stone Receives Highest Distinction

Marvin Stone, Regents professor in biosystems and agricultural engineering, was awarded OSU's **2005 Eminent Faculty Award**, the highest distinction a faculty member can receive from the university.

The award, a commemorative plaque and a \$10,000 cash prize, is given to one faculty member per year to recognize excellence in scholarly-creative activities, teaching and service. OSU System CEO and President David Schmidly presented the award to Stone at the 2005 Fall Convocation.

Stone, who joined the OSU faculty as an assistant professor in 1982, teaches courses in automatic controls and sensor systems and conducts research in the area of sensor systems, electronic communication systems and control systems.

The GreenSeeker, an optical sensor and controller system, is one of Stone's most prominent research accomplishments. ▲





Excellence Rewarded

Ken Case, Regents professor emeritus in the School of Industrial Engineering and Management, capped his 35-year career with the **2005 Medal of Excellence in College/University Teaching** from the Oklahoma Foundation for Excellence.

The foundation is a nonprofit, charitable organization created in 1985 to recognize and encourage academic excellence in Oklahoma's public schools. It awards six medals each year, one for an educator at each level from elementary school through university as well as a school administrator, an alternative education program and an education foundation.

Case is the first engineer to receive the Medal of Excellence in College/University Teaching since its inception 18 years ago.

Karl Reid, dean of the CEAT, and Camille DeYong, associate professor of industrial engineering and management, nominated Case for the award.

Case is founding director of OSU's Master of Science in Engineering and Technology Management and is one of 13 Oklahomans elected to the National Academy of Engineering. He is also the only person to serve as president of the Institute of Industrial Engineers and the American Society for Quality. ▲



'Awarding' Experiences

Satish Bukkapatnam received the **2005 Robert A. Dougherty Outstanding Young Manufacturing Engineer Award**

from the Society of Manufacturing Engineers, the world's leading professional society supporting manufacturing education. SME honored Bukkapatnam, associate professor in the School of Industrial Engineering and Management and director of the Sensor Networks and Complex Systems Monitoring Research Lab, for his significant achievement and leadership in manufacturing engineering.



Ranga Komanduri,

Regents professor and A.H. Nelson Jr. endowed chair in the School of Mechanical and Aerospace Engineering, received the **2005 Albert M. Sargent Progress Award** from the Society of Manufacturing Engineers. Komanduri

was selected to receive this prestigious award, one of seven major international honor awards the society presents annually, for significant accomplishments in the field of manufacturing processes, methods or systems.

Don A. Lucca, Regents professor and Tom J. Cunningham chair in the School of Mechanical and Aerospace Engineering, has been elected **Fellow in the American Society of Mechanical Engineers**. In addition

to being named Fellow by the ASME, Lucca is a Fellow in the Society of Manufacturing Engineers and the International Academy for Production Engineering. ▲



Rhinehart Inducted into Hall of Fame

Russ Rhinehart, Bartlett professor and head of the chemical engineering school, was one of three inducted into the **Automation Hall of Fame** in 2005 by *CONTROL* magazine (www.controlmagazine.com). *CONTROL* inducts only a few people into the elite group each year through a rigorous nomination and selection process primarily comprised of practicing engineers within the process control community.

Rhinehart was cited for bringing practical experience into education and research and theoretical contributions to the practice. He is well-versed in both realms. Before returning to complete his doctorate, Rhinehart worked as a process engineer for Celanese in Charlotte, N.C., for 13 years.

He returned to academe to coach new engineers and to investigate automation possibilities full time. "And, partly," he says, "I returned with a mission to bridge the gap in both instruction and knowledge discovery.

"Academic curiosity and industrial practicality often go in independent directions. To maximize benefit from technology discovery and use and to shape education to prepare engineers, academe and industry must find better ways to interact."

After 20 years in academe, Rhinehart continues working to bridge the gap. His teaching and research retain the industrial values of practicality, and he has remained active in the control community, maintaining leadership roles in professional organizations and technical advisory roles to both private and federal organizations. ▲

Phil Shockley





Meet George Wendt

George Wendt, whose career in development spans almost 30 years, joined the OSU Foundation in December 2005 as the **associate vice president for development** at the College of Engineering, Architecture and Technology (CEAT).

Wendt is a graduate of Northern Michigan University in speech pathology and audiology with a minor in psychology. He entered the development field raising funds for public radio at his alma mater and has held development positions at Rockford College, Northwestern University, the University of Michigan and the University of Nebraska.

In his position with CEAT, Wendt is responsible for increasing financial support for the college goals and initiatives from

alumni, friends, corporations and private foundations. He will visit with alumni and friends to increase support for faculty chairs and professorships, student fellowships and scholarships, and educational programs.

"I am delighted to join an organization with the stature of the OSU Foundation and support the educational initiatives of OSU and CEAT," Wendt says.

"Dean Karl Reid has developed a strong and committed alumni base that has already provided significant support to enrich the educational experiences at the college. It is a privilege to work with Dean Reid, the associate deans, department heads, faculty and alumni of one of the premier engineering, architecture and technology schools in the country." ▲

Japan Study Abroad Reaches 12th Anniversary

The College of Engineering, Architecture and Technology offers **CEAT and W.W. Allen Scholars** a unique opportunity to learn firsthand about engineering in Japan, and has done so for 12 years through a unique academic course.

The course, "**Technology and Society: Japan Study and Tour**," begins with a semester-long preparatory course and culminates in May with a two-week trip to Japan.

During the preparation course, the scholars meet Japanese students at OSU and are introduced to aspects of Japan's history, culture, politics and economy as well as the characteristics of Japanese industry.

Karl Reid, dean and the course instructor, says that the goals are to give students an appreciation for the role these aspects have played in shaping Japan's educational system and for the unique contributions Japan has made to the global economy. Emphasis is on contrast with the United States. "In that way, we get below the surface in understanding," Reid says.

Highlights of the trip are VIP visits to 8 major industrial firms (e.g., Mitsubishi, Sony, Toyota) and a world leading university, a cultural day in Kyoto, an historical day at Peace Memorial Park in Hiroshima, and a dinner with OSU alumni living in Japan.

He also hopes the experience will give students a perspective on Japan's current engineering practice and emerging technologies and an understanding of the factors that contribute to the success of the country's engineering professionals and economy.

"The trip is not intended to be simply a tourist tour," Reid says. "It is an international study abroad experience for 15-20 of our very best engineering scholars. Many of these students are likely to be top managers in major international firms one day."

The students who enroll in the course will be competitive with the best engineering graduates in the U.S., he says, and some will go on to graduate school at the country's best universities.

"There is no greater joy for a professor than to see the maturing that takes place in young people from the time they enter the study of engineering to the time they graduate and return after four or five years of industry experience," Reid says.

"If we can have an impact on their intellectual and leadership development and their global awareness, we will have had an important impact." ▲

EILEEN MUSTAIN

On the second day of their visit to Japan, the 2006 CEAT and W.W. Allen Scholars visit Nippon Steel, the largest steel company in the world, where they observed steel making and hot rolling of steel into sheets.



Thank You

Thank You, Halliburton

The College of Engineering, Architecture and Technology recognized the professional achievements of four professors with the presentation of the 2005 Halliburton Faculty Awards. The Halliburton annual faculty recognition program for OSU began in 1960 and is the only such program in the nation supported by Halliburton.

The Excellent Teacher and Excellent Young Teacher are selected by a group of student and faculty representatives. A committee comprised entirely of faculty determines the Outstanding Faculty Member and Outstanding Young Faculty Member for distinction beyond the classroom. Honorees in both categories, however, typically excel in all facets of instruction, research, mentoring and professional and volunteer service, according to David Thompson, CEAT associate dean for instruction.

CEAT Presents Halliburton Faculty Honors

Jong-Moon Chung, Sundar Madihally, Mark Pruitt and **Camille DeYong** are the 2005 recipients of the awards that acknowledge extraordinary contributions in instruction, outreach and research.

Chung, the **Outstanding Young Faculty Member Award** recipient, is an associate professor in the School of Electrical and Computer Engineering as well as OSU's 2005 recipient of the Regents Distinguished Research Award. In addition to creating new courses to bolster the school's wireless communications curriculum, he founded its Advanced Communications System Engineering Laboratory and the Oklahoma Communication Laboratory for Networking and Bioengineering.

Since Chung joined the faculty in 1999, he has helped secure more than \$2.5 million in research funding, including competitive contracts to develop with collaborators at Nomadics Inc. a wireless communications badge for U.S. Navy sailors.

Chung recently left Oklahoma State University to be with his family in Korea. He currently serves as an associate professor in the School of Electrical and Electronic Engineering at Yonsei University in Seoul, Republic of Korea.

In less than three years at OSU, Madihally has taught six different courses including chemical reactor design, unit operations and introduction to biomedical engineering. The **Excellent Young Teacher Award** winner also serves as faculty adviser to two different student organizations, including OSU's Indian Student Association – for which he has been named a 2005 President's Leadership Award winner – and the university's American Institute of Chemical Engineers student chapter, which perennially ranks among the 10 best in the nation.

In April 2005, OSU chemical engineering students placed first, second and third among teams vying to represent AIChE's Mid-American Regional Competition in the National Chem-E Car Competition. Since only the top three Mid-American teams are sent to the national finals, OSU's unprecedented success under Madihally has compelled contest organizers to reevaluate national qualifying. Two OSU teams were able to go to the National Competition where they placed second and sixth in the 2005 National Competition.

In the laboratory, the assistant professor in the School of Chemical Engineering is developing new bioengineering techniques to grow heart valves, blood vessels and other tissues from umbilical stem cells.

Pruitt, an associate professor in the Department of Construction Management Technology, received the **Outstanding Faculty Award**. Students acknowledge not only the rigor of the courses he instructs but also his use of the latest technologies to teach about contract documents, computer-aided drafting, computer estimating, construction law and timber and form design.

Since he joined the faculty in 1992, Pruitt has coached construction management scholars to numerous regional titles in design/build competitions against their peers from other schools. Pruitt has also overseen students who have been building the CMT department's laboratory in the entrepreneurial engineering park northwest of campus.

Pruitt holds advanced degrees in both architecture and construction management and enjoys high demand in the private sector as a professional consultant.

DeYong, who received the **Excellent Teacher Award**, instructs five different courses in quality management and engineering ergonomics, continuing the quality tradition established in the oldest industrial engineering and management program west of the Mississippi River. The associate professor's honors for teaching include the Advancia Excellence in Distance Learning Award and repeated Outstanding Instructor ratings by National Technological University students.

Outside the classroom, DeYong helped spearhead the reinstatement at OSU of the Reaching Engineering and Architecture Career Heights (REACH) program, a summer academy in which young women are introduced to careers in high-tech fields. The 2003 President's Service Award recipient has been faculty adviser for OSU's student chapter of the Institute of Industrial Engineers and received the outstanding IIE adviser award for Region 5 in 2004.

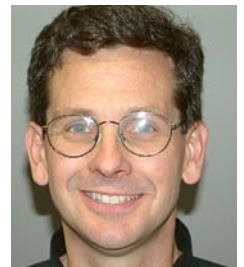
DeYong holds the rank of senior examiner for the Malcolm Baldrige National Quality Awards, the standard in organizational and business honors for customer satisfaction and performance excellence. She also served two years as faculty coordinator of the Aging Systems Sustainment and Enabling Technologies (ASSET) program, the government-academic-business partnership initiated at OSU to address Department of Defense procurement problems. ▲



Jong-Moon Chung



Sundar Madihally



Mark Pruitt



Camille DeYong

photos: Adam Huffer

'Hats Off' to a Savvy Engineer

Cal Vogt couldn't wait to leave Oklahoma when he graduated from OSU with his bachelor's in electrical engineering. He joined the prestigious Bell Telephone Laboratories in New York City. Three years later the young man who grew up in small Oklahoma towns couldn't wait to return.

"We didn't want to raise our family on the East Coast," he says. Once back "home" he earned his master's from OSU, worked up to engineering and sales manager at Century Electronics in Tulsa and with entrepreneurial savoir-faire turned one company into several.

"My wife, Marilyn, and I fell in love with Tulsa," Vogt says. So naturally when he left Century after 14 years, he decided to stay in Tulsa by purchasing a small manufacturing company, Southern Specialties Corp. At Southern he developed a parking fee collection box for unattended off street lots that dominated the market – an electronic multispace parking meter is one of Vogt's patents.

He also purchased the international Geophysical Research Corp, which designs and manufactures oil well measurement and recording instruments; and Indel-Davis Inc., another international company that sells and services imaging supplies to the geoseismic industry. He founded another company with his four sons called C BASS Products, a manufacturer of sailboat products.

His businesses frequently took him abroad, 25 or more times to China alone where he entered into a joint venture. But his heart belongs to Oklahoma, and his investments in the College of Engineering, Architecture and Technology reflect his commitment.

"Cal and his wife, Marilyn, made the lead gift in our campaign to raise \$3 million to maintain the new Donald W. Reynolds School of Architecture," says Karl Reid, dean of CEAT. The maintenance fund is a stipulation of the Reynolds Foundation's \$14.8 million gift to build the new facility.

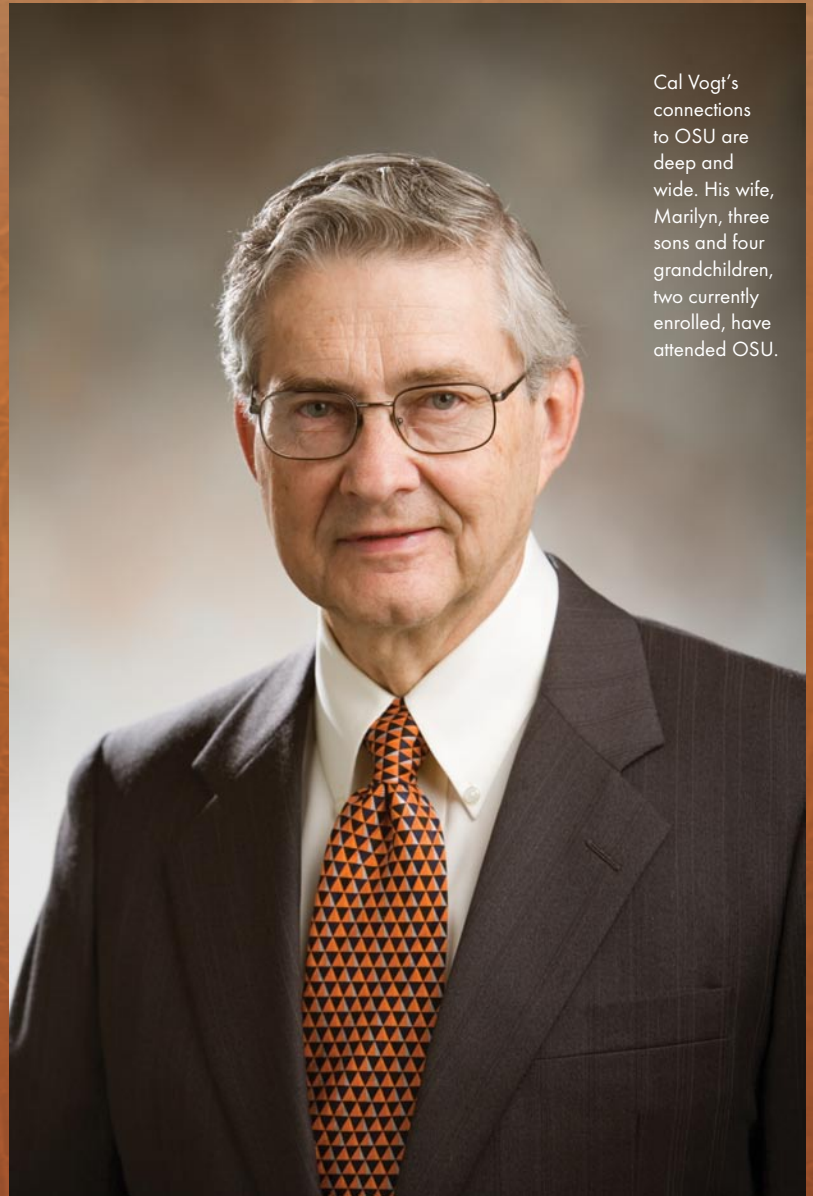
"It's not their first," Reid says. "They have contributed several significant gifts over the years to meet critical needs, and Cal also serves as a leader in CEAT Associates. His knowledge, experience, dedication, leadership and support are valuable assets for the college."

"I've tried to work with Karl and the school of engineering," Vogt says. "If it helps OSU out, I'm all for it." For Vogt, it's just what engineers do. "An engineer sees a need and comes up with a way to meet it."

Also a shrewd businessman, Vogt understands an investment in CEAT is an investment in the state's economy.

"Oklahoma needs to retain industry and people. Part of CEAT's entrepreneurial program is to get people to look at Oklahoma. Tulsa's new Advanced Technology Research Center is an outgrowth of that effort," he says.

"We must invest in the College of Engineering, Architecture and Technology if we are to achieve the visibility and national prominence we'd like. Really, it's an investment in the future." ▲



Cal Vogt's connections to OSU are deep and wide. His wife, Marilyn, three sons and four grandchildren, two currently enrolled, have attended OSU.

"Cal and his wife, Marilyn, made the lead gift in our campaign to raise \$3 million to maintain the new Donald W. Reynolds School of Architecture.

... It's not their first."