THE COLLEGE OF ENGINEERING

NC STATE UNIVERSITY

January 2003

engineering FRONTLINE

PREMIER ISSUE

- *Making a Difference*
- *NC State Engineering Foundation, Inc. Annual Report, 2001-02*

letter from the Dean of Engineering

Nino A. Masnari

Welcome to the premier issue of *Engineering Frontline*, a magazine for alumni and friends of the College of Engineering at North Carolina State University.

New developments at NC State make this one of the most exciting times to be a part of this institution, and we are experiencing an unprecedented level of progress and accomplishment.

Thanks to resounding support by voters with the passing of a $3.1 billion educational bond referendum in November 2000, 19 major construction projects are currently in various stages of progress at NC State. One of the larger of those projects is the construction of Engineering Building I, with total project funding of more than $41 million.

The October 25, 2002, groundbreaking for the building will be remembered as a landmark event, placing us one step closer to our goal of moving the entire College of Engineering to NC State's Centennial Campus over the next decade and a half. The new structure will house the departments of Chemical Engineering and Materials Science and Engineering. A second building housing the departments of Computer Science and Electrical and Computer Engineering is currently under design with groundbreaking scheduled for 2003.

NC State will take a great step forward in nanotechnology capability with the new National Lithography Center and the $3 million photolithography tool that will be housed on Centennial Campus. Among other major announcements is NASA's recent contract awarded to six universities, including NC State, with potential funding of $379 million to create a world-class aerospace research institute.

Recently our engineering college began planning with UNC-Chapel Hill to create a joint academic department in biomedical engineering. The combined strengths of our engineering college and Chapel Hill's medical school will provide avenues for the considerable growth of biomedical activities in the Research Triangle area. We look forward to building a strong relationship with UNC-Chapel Hill in developing this new degree program.

With all of these recent developments, there is a sense of excitement on campus. There has never been a better time to partner with us as we strive to achieve excellence across all facets of our programs.

I invite you to keep in touch with us and watch the progress of these new activities and programs and the people who make them happen.

— *Nino A. Masnari*
Dean, College of Engineering
Distinguished Professor of Electrical and Computer Engineering

Engineering Frontline magazine was created for alumni and friends of the College of Engineering at North Carolina State University. The magazine replaces the former *NC State University College of Engineering News* and the NC State Engineering Foundation annual report. *Engineering Frontline* will appear annually in hard copy, with updates coming throughout the year as *Engineering Frontline–Online*. Keep up with all the latest activities of the College of Engineering at **www.engr.ncsu.edu**.

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upcoming events

College of Engineering Career Fair
McKimmon Center, February 12, 2003

College of Engineering Endowed Scholarship Dinner
March 21, 2003

Engineering Open House
March 29, 2003

Entrepreneurs' Lecture Series with invited speaker Thomas R. McPherson Jr. (BSEE '76 & MSEE '77)
April 3, 2003

NC State Engineering Foundation Board Meeting
April 4, 2003

Alumni Weekend
May 16-17, 2003

College of Engineering's 80th anniversary
May 28, 2003

change of address?

Alumni, send address corrections to

Alumni Records
NC State University
Advancement Services
Campus Box 7501
Raleigh NC 27695-7501

or call

(800) NCS-ALUM
(800) 627-2586

or update your contact information online at *www.alumni.ncsu.edu/update.html*

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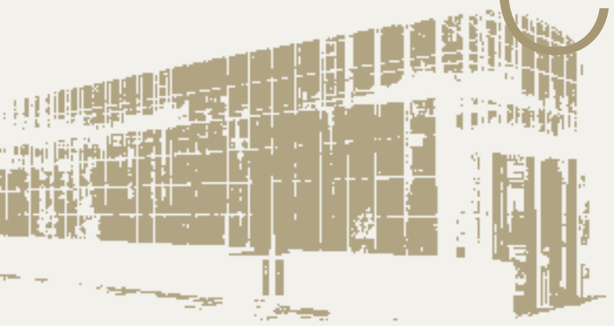

ABOVE: The Constructed Facilities Laboratory (CFL) is a unique 20,000 ft² research complex with modern offices and state-of-the-art laboratories and equipment to satisfy the research and testing needs of a wide variety of infrastructure materials and systems in areas such as geotechnical, geoenvironmental, asphalt, concrete, steel and fiber-reinforced composites. The CFL is distinguished for its capacity to test large structural systems and the ability to research the structural behavior of structural systems and materials under a wide variety of environmental conditions.
(Photo: Herman Lankford)

ON THE COVER: Walt Disney Imagineer Elena Page (BSEE '97, BSCPE '98) programmed the award-winning Soarin' Over California ride, a three-dimensional, sensory experience that carries visitors 45 feet in the air over an inverted IMAX 80-foot dome.
(Photo: Gary Kruger. Copyright Disney. All Rights Reserved.)

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NC State University to share NASA contract, potential $379M

North Carolina State University is one of six universities that recently landed a NASA contract, potentially worth $379 million over 15 years, to create a world-class aerospace research institute — the National Institute of Aerospace (NIA). The institute, to be located near NASA's Langley Research Center in Hampton, Virginia, will support research, educational and outreach activities and programs on the Hampton site as well as on the campuses of the participating universities. Additional funding is possible as other government agencies and industries collaborate with the institute in its programs.

Dr. Mohammed Noori, professor and head of mechanical and aerospace engineering at NC State University, will serve on the NIA board of directors. Noori notes that the NASA contract will have a major impact on NC State University and will spawn growth of the aerospace industry and economic development in North Carolina.

The new institute will have an equally big impact on students, says Dean of Engineering Nino Masnari. "The economic and educational benefits will extend far beyond our campus borders," he said. Master's and doctoral degrees will be offered by NC State and its NIA partners through distance education and on-site instruction, giving students unparalleled access to cutting-edge research and instruction at NASA and the member institutions.

Partnering with NC State to form the NIA are North Carolina A&T State University, University of Maryland, University of Virginia, Virginia Tech and Georgia Tech, along with the nonprofit American Institute of Aeronautics and Astronautics Foundation. The seven partners have formed a nonprofit consortium, the National Institute of Aerospace Associates, to run the institute.

The innovative center will allow researchers from government, academia and industry to collaborate on aerospace research, develop new technologies and educate and inspire the next generation of scientists and engineers.

Competition for the contract was intense, involving the nation's best universities.

"It is gratifying but not surprising that NASA selected our proposal," said NC State's Chancellor Marye Anne Fox. "When you think of innovative partnerships and world-class science and engineering programs, you naturally think of NC State and these six partners."

NIA funding will be used to support research, teaching and technology transfer activities in numerous fields important to aerospace technology, including aerothermodynamics and acoustics; atmospheric and vehicle sensors systems technology; structures and materials; and atmospheric chemistry and radiation systems. NC State is the lead institution on these latter two.

The research could also have a big impact on supersonic and hypersonic aircraft design and technology; air traffic safety; and emerging fields like biologically inspired, nanostructured, adaptive-controlled materials and morphed concepts.

The seven-member consortium running NIA will encourage participation by other universities and research laboratories. Several corporations have already signed on as industry partners, including Goodrich, Lockheed, Ball, Pratt & Whitney, Phoenix, Orbital Sciences, Gulfstream, Horne, Swales and Atlantic Research Corp., and NIA officials expect more.

NC State moves ahead in nanoscience, National Lithography Center created

NC State University took a major leap forward in nanoscience with the announcement of its plans to buy a $3 million photo-lithography tool, used to make computer circuitry on microchips, and install it in a clean room on NC State's Centennial Campus. The tool will be the star attraction of the new Triangle National Lithography Center, which will attract new industry collaborators and scientists in the field of nanotechnology.

The announcement of this investment marks a major coup for both NC State University and UNC-Chapel Hill, where researcher Joseph DeSimone holds joint appointments. Heavily wooed with offers from other universities, DeSimone chose to stay in North Carolina because, he said, "I've got great chemistry colleagues ... great chemical engineering colleagues ... great students ... and we like living here."

Joseph M. DeSimone and Ruben G. Carbonell, director of the Kenan Institute for Engineering, Technology and Science, serve as co-directors of the National Science Foundation Science and Technology Center for Environmentally Responsible Solvents and Processes, the leading center in the world of its kind, with potential funding of $40M over a ten-year period.

NC State, UNC-Chapel Hill join forces in biomedical engineering degree program

NC State and UNC-Chapel Hill are looking at creating a joint academic department in biomedical engineering. UNC-Chapel Hill has a medical school and a graduate program in biomedical engineering. NC State University has an engineering school and has established a bachelor of science degree in biomedical engineering. The two institutions will make a powerful team, and the newly created department would have degree programs for both undergraduates and graduates. The universities hope to have a proposal put together by spring 2003.

Biomedical engineering is projected to have considerable growth in employment in the next decade. As of April 1998, North Carolina ranked eighth nationally in bioscience business as assessed by state and national trade measures. The number of biomedical engineering-related companies in North Carolina, and specifically in Research Triangle Park, provides a positive outlook for graduates.

Thanks to the joint efforts of Ola Harrysson and Denis Cormier of industrial engineering and Denis Marcellin-Little of the vet school, Bailey the German shepherd is all smiles after her successful operations.

Bailey
(Photo: Dr. Denis J. Marcellin-Little)

no bones about it –
engineering and medicine build a better bone

A visit to the doctor helped determine the career course for Ola L. A. Harrysson. His mother was living with the pain of osteoarthritis in her knee. "I went to the hospital with my mother for one of her checkups," Harrysson said, "and I asked the orthopedic surgeon what it would take for him to do a total knee replacement on my mom. He answered, 'I would need better implant components that last longer.' That was when I decided to dedicate my PhD dissertation to developing custom designed knee implants."

Harrysson, assistant professor of industrial engineering at NC State University since January 2002, has made good progress toward this goal. After receiving his bachelor's degree in mechanical engineering from Dala University in Sweden, he left his native country in 1995 to continue his education in the U.S., initially with a very different goal in mind. "My university in Sweden had an exchange program with the University of Central Florida that enabled us to go to Orlando to get our master's in industrial engineering. A few classmates and I liked the idea of sunny Florida for two years," he said. "We also wanted to learn better English."

The experience with his mother changed Harrysson's direction. He decided to remain in Florida to earn a doctorate with a focus on medical applications of a technique called rapid prototyping. Developed about 15 years ago, rapid prototyping has opened a world of possibilities for creating models of body parts, which can eventually lead to the development of better implants.

In rapid prototyping a computer image of an object is transferred into two-dimensional cross-sections; then machines build a three-dimensional model layer by layer. One machine owned by NC State is a stereolithography machine, which uses a laser to solidify liquid plastic poured in successive layers using a computer image as a template. The computer image is generated from a CAT scan of a body part. "The beauty of this machine is that it can create a computer model of the bones and filter out other tissues," said Harrysson. Because CAT scans are already in layers they translate well into three-dimensional images for the stereolithography machine. The ability to "see into" the body gives researchers and physicians a host of possible applications for the technology.

At NC State University in May 2002, groundbreaking surgery was the result of teamwork in industrial engineering and veterinary medicine. Rapid prototyping computer images and 3D polyurethane replicas of a German shepherd's deformed legs by engineers Harrysson (right) and Cormier enabled veterinarian Marcellin-Little (left) to practice the surgery ahead of time.
(Photo: Linda Rudd)

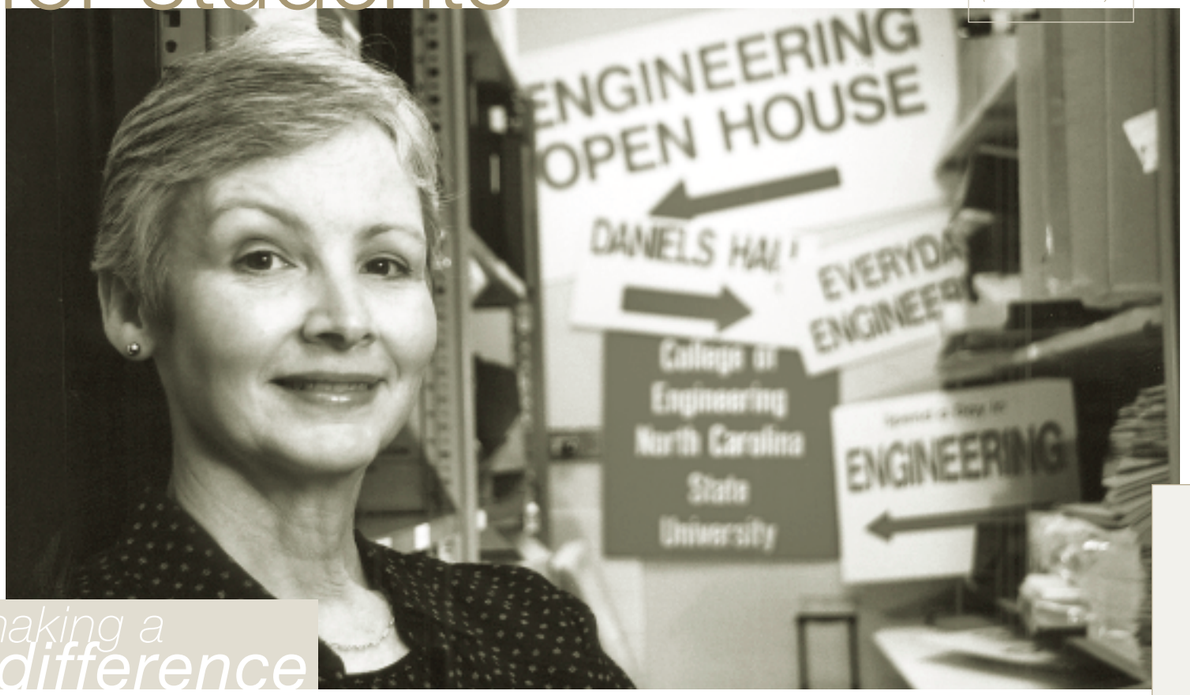
Dr. Denis J. Marcellin-Little, associate professor at NC State's College of Veterinary Medicine, uses the technique to plan surgical correction of bone deformities in dogs. In one recent case, he used models of the deformed rear legs of a German shepherd named Bailey to practice the surgery and make decisions about how to manipulate the bones to correct the deformity. Marcellin-Little worked with Harrysson and Dr. Denis R. Cormier, associate professor of industrial engineering, to build 3-D replicas of Bailey's deformed legs, allowing him to practice the surgery before performing it on the dog. A similar technique was used recently by surgeons in Los Angeles to practice before separating Guatemalan twins joined at the top of the skull.

With his colleague Cormier, Harrysson hopes to someday establish a special unit in the Department of Industrial Engineering to develop and improve this technology. According to Cormier, "In the long run the objective is to establish a biomedical modeling fabrication center that would involve both human and animal medical applications."

Harrysson is pleased with the opportunities at NC State. "I think NC State is an excellent place for me to conduct my research," he said. "We have a great vet school on campus and two good medical schools around the corner. I have met many people here that are interested in my research and that I collaborate with on different projects. The most rewarding aspect of this job is that you are able to work on research that really interests you." And the most rewarding aspect for Bailey is being able to walk again.

Harrysson, who calls himself an "outdoor person," enjoys mountain biking, scuba diving, sailing, fishing, hiking, camping and skiing. In Sweden he played clarinet, bassoon and the drums in several different groups. "Nowadays I mostly play the guitar at home when I am alone," he says. "I like to play and sing, but I am not sure if my neighbors like it!"

making a home for students



Kay Leager finds working with talented students highly rewarding.
(Photo: Sherri Thomas)

making a **difference**

Kay Leager's Personal Touch Draws the Best and Brightest to NC State

Becoming a new member of the College of Engineering family can be daunting. It's a big family, and it's easy for the youngest members to get lost. Making each new student feel welcome is Kay Leager's job.

As director of enrollment management for the College of Engineering at NC State University, Leager identifies talented students who think they have an interest in engineering and provides them with information and opportunities to help them further refine those interests. But it's the warmth and personal touch Leager brings to the job that make a big difference in the student experience at NC State.

"It starts when students are still in high school," she said. "We provide them with opportunities to visit campus, whether for a summer program, information session or open house."

Leager coordinates all of the College's recruitment activities while trying to incorporate a personal touch into what can only be described as a massive organizational effort. For example, each fall, the NC State Engineering Foundation and the College of Engineering Office of Academic Affairs hold receptions for prospective students across the state. "These events provide a way for us to make our otherwise large and possibly intimidating college become more real and more personal for students," Leager said. "Our goal is for prospective students and their parents to be not just satisfied but delighted with the kind of personal attention they receive."

Leager came to NC State in 1983 with a master's in counseling and psychology from Appalachian State University and a background in social work. She worked for 13 years in the university's admissions office, where she developed contacts with high school guidance counselors around the state. That's where she discovered she had a genuine interest in helping students make their college career choices by presenting them with an array of options.

Kay Leager lives in Raleigh with her husband, Andrew. Her daughter, Austin, goes to NC State, and her son, Travis, attends Appalachian State University. Kay enjoys step aerobics, cooking, reading (especially NC authors) and outreach ministries through her church. She is vice president for communications for her neighborhood's homeowner's association.

In 1996 she accepted the position of director of recruitment for the College of Engineering, where she finds she has more of an opportunity to develop personal relationships with many students. "What I find most rewarding about the job is having the opportunity to know students over a longer period of time than I did in the admissions office, sometimes for as long as five or six years," she said. "I enjoy just watching them grow up and blossom and figure out who they are and what they want to do. In many ways it's the ultimate mothering experience!" And indeed Leager fills the role of the mother figure as she is constantly surrounded by the young students during the engineering summer programs that she leads.

Leager begins interacting with students the summer before their senior or even junior year in high school — many of them away from home for the very first time — as she guides them through tours and summer sessions. She also greets the high schoolers who come to meet current engineering students, alumni, faculty and staff through the recruiting receptions held in their home towns. According to Leager, "Our goal, by the time someone actually enrolls here as a freshman in engineering, is for that student to have been on campus and have had some meaningful interaction with faculty, students and folks from the Dean's Office. We know from experience that this makes such a difference in someone's freshman year. It certainly increases the student's comfort level."

THE COLLEGE OF ENGINEERING AT NC STATE IS BEING CALLED ON INCREASINGLY TO PROVIDE TECHNICALLY TRAINED PROFESSIONAL ENGINEERS WITH A WIDE RANGE OF SKILLS AND EXPERIENCES. INCREASING ENROLLMENT OF GIFTED STUDENTS WHO ARE PREPARED TO FILL THIS DEMAND IS ONE OF THE TOP GOALS OF THE COLLEGE. KAY LEAGER HELPS THE COLLEGE MEET THIS CHALLENGING GOAL.

Leager stays in touch with her recruits beyond their freshman year. She combs the College for upperclass students to help her run NC State's summer camps. She and her team also coordinate the "Spend a Day in Engineering" program, in which admitted students come to campus and follow a day in the life of a current NC State engineering major. Many of the programs Leager's office is involved with use the talents of NC State engineering students as well as alumni volunteers and friends of the College.

Because Leager loves her work, she brings a dedication and personal touch to everything she does for the College of Engineering. A mother of college-age students herself, she cares deeply about the students and wants them to succeed. "To me, for students to go to a school where they can really grow and develop into the adult they want to become and to end up in a profession that they really enjoy and for which they are well suited — that's the key. I really don't know what more anybody could ask than to get paid for doing something they love. Everybody deserves that."

best and brightest students come to NC State's College of Engineering — freshmen entering fall 2002 have highest GPA yet

North Carolina State University continues to recruit the best and brightest students from across the nation and around the world. For fall 2002, NC State's Engineering freshmen have a high school grade point average (GPA) of 4.2. Their SAT scores are also outstanding, with an average score for all freshmen Engineering students of 1,260.

engineering a safer life for others

making a **difference**

Roberto A. Nuñez, lecturer and senior construction extension specialist of civil engineering and construction, is involved in the programs to assist Spanish-speaking workers in North Carolina's construction industry.
(Photo: Roger Winstead)

CIVIL ENGINEER ROBERTO NUÑEZ GUIDES HISPANIC CONSTRUCTION WORKERS IN U.S. SAFETY PRACTICES

As a boy in Ecuador, Roberto A. Nuñez watched his civil engineer father work at a profession that involved a start-to-finish approach to building. In Ecuador, civil engineers fill the role of designers, developers, architects and construction workers during a project. After following his father into the profession, Nuñez came to NC State University in 1985 to obtain a master's degree in civil engineering. Here he found that U.S. engineers are specialized, and he chose as his specialty learning and applying new techniques and systems to construction.

Nuñez, a registered professional engineer and a lecturer and senior construction extension specialist of civil engineering and construction at NC State, soon discovered that construction procedures in this country include an emphasis on safety not present in his home country. "For me, coming from Ecuador where I know that safety is not highly regarded, I realized that Hispanic construction workers coming to North Carolina have very little training and concern for safety," he said. With support from NC State, Nunez is determined to change that situation.

In recent years the number of Hispanic residents of North Carolina has increased substantially. According to the 2000 census, Hispanics now make up 4.7 percent of the state's population. Many of these new residents are employed in the construction industry. They bring with them a strong work ethic and practical construction experience, but many would like to improve and refine their skills, as well as learn about American construction regulations. And they should be aware of and follow U.S. safety practices.

Unfortunately, these workers may lack a basic education. According to Nuñez, many do not read either Spanish or English and they do not speak English fluently, which creates challenges as they seek employment and/or advancement opportunities through training, education and certification.

Nuñez wanted to find a way to help these workers succeed in their new home. He started small, holding classes on Sunday after services at Avent Ferry United Methodist Church, where a dual ministry in English and Spanish exists. The ten workers who attended that initial six-month training program were the first group to earn an Occupational Safety and Health Administration (OSHA) certificate stating that they were trained under OSHA and U.S. safety guidelines.

From that first group grew an innovative program for Hispanic construction workers, supported by NC State's Department of Civil Engineering. The construction safety training program is the first offered in North Carolina in compliance with OSHA aimed at Hispanic construction workers. Now other organizations, such as the North Carolina Associated General Contractors (AGC), have recognized this need and also offer safety classes in Spanish to their membership.

Eligible workers take a 10-hour, seminar-style course given in Spanish that focuses on the four causes of 90 percent of the fatalities in construction identified by OSHA: falls (e.g., floors, platforms, roofs), being struck (e.g. falling objects, vehicles), being caught in/between (e.g. cave-ins in excavations and trenching, unguarded machinery) and electrical hazards (e.g., overhead power lines, power tools). Upon successful completion of the course, the workers earn an OSHA course completion card in construction safety and health that can help them achieve better supervisory status and wages through their knowledge of safe work practices.

Two special challenges for these courses have been the need to rely heavily on nonwritten communication and the need to establish trust among the workers. Nuñez has had to design visual aids that don't rely on written language. The tougher problem, though, is the trust issue. "Many Spanish-speaking workers don't distinguish between OSHA and the immigration service," Nuñez said. "It takes time for them to gain trust that this program is really something that is going to help them rather than something that is going to expose them to surveillance by immigration."

Nuñez is involved with another program sponsored by the American Concrete Institute (ACI) and the first of its kind in North and South America. Nuñez is one of two course developers that allowed ACI to offer training classes in Spanish at NC State University for North Carolinian concrete/flatwork finishers, 50 to 80 percent of whom are believed to be Hispanic. The exam given at the end of the course is also in Spanish. This ACI certification program is now being implemented in several states in North America and in at least three countries in Central and South America.

> "THE POWER OF THE UNIVERSITY TO MAKE A DIFFERENCE IS AN ATTRACTIVE FEATURE OF BEING HERE."

According to Nuñez, these programs give Hispanic workers unique opportunities to improve their job skills in a competitive market. As they build their skills with courses like these, these newly certified craftsmen find better jobs and fill a growing niche in the workforce. In turn these highly skilled workers create high-quality buildings for communities — a winning situation for everyone.

Nuñez and Edwin C. Weaver, also an extension specialist in civil engineering at NC State, are involved in other innovative programs that help not just Hispanic workers but the construction industry in general. "We have a unique agreement between the North Carolina Department of Transportation (NCDOT) and NC State University in the area of training in which we offer a certification for any company that has workers involved in any concrete infrastructure project for the NCDOT," he said. "This is the first time that the university has been directly involved with the NCDOT in certification."

Another project, which he works on with Dr. Sami H. Rizkalla, Distinguished Professor of Civil Engineering and Construction and director of the Constructed Facilities Laboratory (CFL) at NC State, will help companies develop products in compliance with the stringent International Conference of Building Officials (ICBO). According to Nuñez, "NC State will have one of the few labs in the country that can help small- and medium-sized companies test any construction product/system to get approval under ICBO building code requirements."

making a difference

In addition to his involvement in applied research, industry certification projects and continuing education, Nuñez teaches classes at NC State. He likes the challenge of teaching and sharing his experiences with young people who will later take that knowledge into the field. "I enjoy my association with the university and the people that opened a once-in-a-lifetime opportunity to a foreign engineer. Also, I have the opportunity to link our unique university resources with domestic and international industry and organizations and thereby make a contribution to their economic development," he said. "The power of the university to make a difference is an attractive feature of being here. Last year, for instance, I was able to generate the first international agreement between NC State and my home country university (the Escula Politechica National or EPN). We have small goals such as setting up a civil engineering library at the EPN by shipping used books donated by NC State faculty as well as larger goals such as helping set up Ecuadorian government guidelines, processes and structures for a new program focused on competitiveness and quality systems for the entire country."

Making a difference is what Nuñez, along with his civil engineering colleagues, set out to do, and he has indeed made a difference at NC State. Through his determination to change things for the better — whether he is making a better professional life for construction workers, helping the construction industry or inspiring students — his work benefits us all.

Nuñez lives in Durham with his wife, alumna Melanie Mann (BSCE '88; MSCE '95) and his son Jonathan. Roberto enjoys golf, swimming and travel. A dedicated "soccer dad," he is a team coach for his son's neighborhood soccer league. He has lived in the Research Triangle area since 1985.

BOB DAVIS SEES SIX PHDS GRADUATE AT ONCE

New PhDs and advisor celebrate graduation (left to right): Peter Quinn Miraglia, Hyunmin Shin, Darren B. Thomson, Dr. Robert F. Davis, Edward A. Preble and Timothy P. Smith. (Not pictured: Amy M. Roskowski)
(Photo: Sue Choi)

Having even one PhD student graduate in a given semester is a big event for a professor, but in December 2001 Dr. Robert F. Davis saw six of his students receive their PhDs — a remarkable accomplishment.

Despite the daunting workload, Davis, who is the Kobe Steel Ltd. Distinguished Professor of Materials Science and Engineering, a Distinguished University Professor and a member of the National Academy of Engineering, accepted the challenge and guided each of the six students — as well as two master's students — to completion of their studies.

Hyunmin Shin noted, "I always felt honored to work for Dr. Davis. I learned from him how to plan and conduct a research program with humanity and humor as well."

Edward Preble summed it up, "Dr. Davis deserves a purple heart for reading all of those dissertations!"

IT'S A FACT —

ACCORDING TO *US NEWS AND WORLD REPORT*, NC STATE UNIVERSITY HAS A HIGHER PERCENTAGE OF FACULTY IN THE NATIONAL ACADEMY OF ENGINEERING (NAE) THAN THE UNIVERSITY OF ILLINOIS, UNIVERSITY OF MARYLAND, UNIVERSITY OF MICHIGAN, OHIO STATE, PENN STATE, PURDUE, VIRGINIA TECH OR UNIVERSITY OF WISCONSIN–MADISON.

JOIN US IN CONGRATULATING OUR LATEST NATIONAL SCIENCE FOUNDATION FACULTY EARLY CAREER DEVELOPMENT (CAREER) AWARD RECIPIENTS.

Many universities are pleased to receive 2 or 3 Career awards in one year. NC State faculty members earned 12 Career awards in 2001.

Special congratulations go to Veena Misra, who was awarded NSF's Presidential Early Career Award for Scientists and Engineers (PECASE).


Gregory Buckner


Alexander Dean


Joel Ducoste


Jason Haugh


Christopher Healey


Gianluca Lazzi


Veena Misra


Francis De Los Reyes III


Eric Rotenberg


Stefan Seelecke


Peter Wurman


Michael Young

service – a way of life for Tomás Carbonell

Tomás Carbonell
(Photo: Chethan Pandarinath)

FOR MANY FOLKS, "SERVICE" MEANS DONATING A DAY OR TWO A MONTH TO A CIVIC ACTIVITY. FOR TOMÁS E. CARBONELL, THOUGH, THE DESIRE TO SERVE THE PUBLIC RUNS DEEPER. IT INFLUENCES ALL ASPECTS OF HIS LIFE – FROM HIS CHOICE OF CAREER TO HOW HE SPENDS HIS SPARE TIME.

Carbonell is a senior at NC State University double majoring in chemical engineering and a self-constructed, multidisciplinary major called "international political economy and the environment." This intriguing combination of majors reflects Carbonell's broad range of interests and talents. He participates in the Benjamin Franklin Scholars program, a unique blend of engineering and humanities in a five-year, dual-degree program. Initially interested in chemical engineering because of its link to environmental issues, he hopes to use his combined major to connect engineering with policy and economics on an international level. "I've always been interested in international affairs, so I wanted to find a major in that field," he said.

The past four summers have found Carbonell trying out different aspects of his career choice. He worked at NC State the summer after his freshman year, doing informational research in the Department of Business Management. To explore the laboratory aspect of chemical engineering, he worked at Sandia National Laboratories in California. He has spent two summers working in Washington, D.C., for government agencies. Most rewarding was last summer's work with the Center for International Environmental Law. "I wanted to get a taste of what working in environmental law might be like, and I really liked it," he said.

Carbonell's philosophy of finding "win-win" solutions to problems, coupled with his desire to help others, leads him to take a highly pragmatic approach to environmental challenges facing our society. "Realistically speaking," he said, "that's the only way we're going to make progress on these issues; you can't favor one side or the other. Where possible, you have to find those areas where people can agree. I think that's what really works."

Working to find these areas of agreement within the legal system is the direction Carbonell would like his career to take. In fact, he plans to attend law school on a 2002 Truman scholarship after completing his education at NC State, and he is looking at Yale, Harvard, Columbia and Berkeley. "My first choice is Berkeley, because of its strong focus on international applications and environmental law," he said.

In addition to his plan to serve the public good in his profession, Carbonell's commitment to helping others spills over into his many volunteer activities. He puts his fluency in Spanish to good advantage as an English tutor and a general studies tutor with elementary school children in Raleigh and as a volunteer at a senior citizens' day care center in San Sebastian, Spain, during a study-abroad year. He volunteers at the YMCA with Hispanic children, giving them an opportunity to practice their English as well as receive homework help from Carbonell. For these efforts he was awarded the Deborah S. Moore Service Award given by the NC State Center for Student Leadership, Ethics and Public Service in 2002.

Carbonell's interest in international affairs has taken him to Guatemala, Morocco, the Dominican Republic and Spain on his scholarly and service tours. In Central America he helped build homes through Habitat for Humanity, again allowing him to combine public service with international experience.

International travel has become something of a hobby for Carbonell. "I love exploring other cultures and trying new things," he explained. He would like to explore Latin America more, and he would like to visit India. Another hobby is reading, primarily nonfiction books about economics and world affairs. One of his recent reads was a book about civic engagement in America: *Bowling Alone: The Collapse and Revival of American Community* by Robert D. Putnam. Carbonell enjoys writing as well as reading; he was one of the founding members of *Americana: A Journal of Ideas*, which is an online periodical published by NC State students. Carbonell rounds out his interests by keeping fit through swimming and running and has competed in several half-marathons.

For Tomás Carbonell, the future promises to be extraordinary. He's sure to live in interesting times, for he creates them through his cosmopolitan interests and his creative ways to apply those interests to the environment and the community around him — wherever he is.

students drawn to NC State for wide array of interdisciplinary programs

NC State draws a great number of interdisciplinary students because of its advantage as a large, comprehensive university. Besides offering almost every conceivable engineering discipline, NC State offers a wide array of programs, affording students a wealth of choices. Students can major in engineering or computer science and double major or minor in other kinds of disciplines — pre-law, management, life sciences, textiles, design, foreign languages, veterinary medicine, forestry, math, physical sciences and many more.

Unlike most other institutions, NC State has it all right here. The Benjamin Franklin scholars program is a classic example of an opportunity for students to partner engineering with humanities or social sciences. Students approach their education with a multidisciplinary view, putting together a program that allows them to have two diverse majors. They leave here well-rounded and highly sought-after.

making a ***difference***

Engineering, Science and Mathematics Come Alive for Young Students

college of engineering partners with centennial campus middle school

Centennial Campus Middle School draws on NC State University as a resource, from professors teaching at CCMS to NC State students volunteering as tutors. *(Photo: Kathi McBlief)*

Marshmallows and catapults? Throwing flour in the air? How do these things relate to science? Quite a bit, it seems, according to Dr. Laura J. Bottomley, director of the Women in Engineering and Outreach Programs in the College of Engineering at North Carolina State University.

The College of Engineering started up the Women in Engineering and Outreach Programs four years ago. Bottomley first looked for ways to improve recruitment of women into engineering by visiting high schools. She discovered that girls in high school already know what they are going to do, and most have decided they are *not* going into engineering. Next she went into the middle schools but was disappointed to find that many girls in middle schools do not like math or do not believe they are good in math. Bottomley and Elizabeth Parry, assistant to the director of the Women in Engineering and Outreach Programs, quickly realized that it was actually in elementary school that the process begins of routing girls out of science, technology, engineering and math careers. "We really believe the time for arresting that process begins in the fourth or fifth grade," Bottomley said.

NC STATE UNIVERSITY HAS EMBRACED CENTENNIAL CAMPUS MIDDLE SCHOOL SINCE IT OPENED.

Bottomley and Parry also discovered that there were mechanisms present during the elementary school years that were turning not only girls but also boys away from science. For example, Bottomley explained, "Science is typically taught from a textbook. Really teaching science requires hands-on, minds-on experiences." As a result, Bottomley and Parry began a new endeavor — the Hands-On Engineering Program — which they take to boys and girls in grades kindergarten through twelve (GK–12), offering everything from career fairs to hands-on demonstrations.

After Bottomley and Parry started the Hands-On Engineering Program, they received a National Science Foundation (NSF) grant for the GK–12 Engineering Teaching Fellows Program. Bottomley said, "The grant allows for undergraduate and graduate engineering students to go into classrooms and act as science, mathematics and technology resources." The GK–12 program began in 1999 with Teaching Fellows placed in two Raleigh schools: A. B. Combs Leadership Magnet Elementary School and Washington Gifted and Talented Magnet Elementary School. The following year Bottomley expanded the GK–12 Program to include Centennial Campus Middle School (CCMS), a model magnet middle school on NC State's Centennial Campus that would be based on the most current middle school educational research and that would draw on the University as a resource.

CCMS Outreach Coordinator Cynthia S. Privette, who facilitates NC State and CCMS interactions, believes that CCMS demonstrates many of the characteristics that research says makes middle schools successful — flexible schedules, a nurturing environment (the school has a 600-student cap) and proven methods for delivering instruction, including curriculum mapping. Also helpful is the school's innovative physical structure, with grades divided into "houses" connected by a central assembly room, cathedral-high windows, light-filled common areas such as a cafeteria, gymnasium and media center, an "exploratory house" for electives, and wall-sized, inspirational paintings emphasizing such character traits as respect, honesty, courage and self-discipline.

(clockwise) Megan Telfer, Kellie Martin, Ashton Privette, Bobby Cassell and Michael Gearon enjoyed their engineering camp experience. *(Photo: Kathi McBlief)*

Before CCMS, a modified year-round school, even opened its doors in 1999, Bottomley and Parry contacted Kenneth A. Branch, principal of CCMS, and Cynthia Privette about interactive programs.

Bottomley said, "We contacted Centennial because, given their focus on curriculum mapping, we thought that it would be a really good partnership." The Fellows, one per grade level, spend ten hours a week at CCMS in the classroom, collaborating with teachers, designing hands-on lessons and working with math groups.

"Laura Bottomley and Liz Parry have helped cement our partnership with the College of Engineering," said Branch.

The Fellows are not the only ones who go into the CCMS classrooms and work with teachers; Bottomley and Parry do the same, focusing on inquiry-based, hands-on demonstrations.

They also have organized engineering camps for students and teachers during the past two summers at the middle school. One purpose of the teachers' camp is to demonstrate how engineering is a natural fit for delivering a math and science curriculum.

Bottomley and Parry meet with the teachers and decide on a curriculum for "Kids' Week," in which students receive an overview of engineering, learn about various engineering disciplines and design and build projects for a competition. The engineering camp features learning by trial and error. Parry said, "One of the biggest things I think we teach them is that engineers can make mistakes and that we learn from our mistakes."

Dr. Laura Bottomley (left) and Liz Parry believe teaching science requires hands-on, minds-on experience. *(Photo: Kathi McBlief)*

The first summer camp stirred up so much enthusiasm that calls started coming in as early as December about the second summer camp. One of the students' favorite projects was a mock mystery in which they collected fingerprints and tested mysterious white powder. They also enjoyed an experiment involving shooting off water rockets.

"We started the morning off by talking about 'lift' in a general sense," Parry said. "Then we gave the kids supplies and told them to build water rockets and shoot them off. Some went up, but there were no real success stories. Then we gave them information on center of mass and center of gravity and sent them back out to try again. It was amazing the second time. You could see the excitement in their faces!"

Unfortunately, Bottomley is not sure they will be able to offer the summer camp for a third time. Through Alcoa's generosity, the project got off to a highly successful start, but now the program needs additional funding in order to continue. Currently, Bottomley is looking for other funding sources.

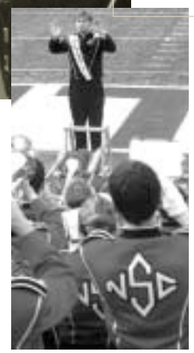
Successes with the engineering camp and with the GK–12 Program led Bottomley and Parry to initiate the Wake Integrating Science Excellence (WISE) project. Interested in the reform of science education, they partnered with the Wake County science coordinator, others from Wake County Schools, businesses, parents and NC State University to promote inquiry-based, hands-on science education. The proposed project calls for teachers to receive NSF-approved science kits and appropriate training to use the kits.

The WISE pilot project has been completed, and WISE team members have written an NSF grant to expand the project throughout Wake county. The grant would pay for training teachers, including making related courses available to teachers through the College of Engineering, and pay engineering students to help teachers implement the new science curriculum. "Getting the funding is the hard part," Bottomley noted, but she remains optimistic for the future of the GK-12 programs and the promise they hold for increasing the number of women who go into engineering and science.

STUDENT

spotlight

a leader on and off the football field – Brandon White



NC State's Brandon White (MSE'02) displays leadership wherever he goes — in the marching band, in school or helping to host Engineering summer programs, and that translated well into management skills as he headed to the world of work.

A native of Greenville and recent graduate with a major in materials science and engineering, White enjoyed his role as head drum major of the marching band for the past two years. The role presented not only rich rewards but also its share of challenges.

"My freshman year we were playing instruments older than we were," he said. "All the instruments dated from the 1960s, and our uniforms were old as well."

White and a group of students worked very hard to raise funds to replace the uniforms and instruments, resulting in improvement of morale and recruiting among students.

"We want to see the band supported more fully because we represent the university at both home and away games," said White. "We're proud of our university. I have so many wonderful memories of conducting "The Star Spangled Banner" and *alma mater* before each game. I will never forget the roar of the crowd as the players took the field and we played the fight song! A special memory for me was last fall at the Carolina game — I will never forget the feeling of unity and NC State pride when the UNC marching band joined us on the field at half-time to play God Bless America just after September 11."

LEFT: Left to right: Stephen C. Price, Lauren N. Collins and Brandon L. White were the three drum majors for the NC State marching band in 2001-02.
BELOW: Brandon White (MSE '02) was head drum major for the NC State marching band.
(Photos: Katherine White)

White's leadership activities spilled over into his academic life at NC State. For the past two years he has been head Student Engineering Leader (SEL). In this position he led the other SEL mentors, who guide undergraduate students, especially freshmen in E 101, Introduction to Engineering and Problem Solving, by bringing an upperclass student perspective into the classroom. "In this way we help students get off to a good start," he said. "We tell them 'This is what I should have done my freshman year.'"

White's good start at NC State paid off over the four years he was there. A well-rounded graduate, he won awards for his undergraduate research projects, including one of only three awards given at the undergraduate research symposium last year and the multidisciplinary chemical engineering/materials science senior design project awards this year.

White was also involved in conducting campus tours as a student ambassador, especially during Engineering Open House for prospective students. He was very active in planning and leading the summer programs in the College of Engineering at NC State. In this role he organized programs, hired counselors and coordinated student activities.

"This is a rare opportunity to bring in top-notch high school students, and we try to focus on not just the academic environment, but also the university's extracurricular life." White's management responsibilities in this program didn't remove him from personal contact with prospective students, however. "It's really fun spending time with these bright, motivated, intellectual students," he said. "I find this work very rewarding."

The university aspect of White's life ended with his graduation in May. As rewarding as his leadership roles at NC State have been, he's ready to move on to the next phase of his life: a new job at Northrop Grumman near Baltimore, Maryland. There his leadership skills will help, for he has been selected to participate in Northrop Grumman's Professional Development Program. "If students have been successful as leaders in school," he explained, "they are chosen for this special program that makes use of their management potential." New engineers rotate through departments for the first 18 months of employment, and at the end of that time they are placed permanently in an area of their choice.

White is mainly interested in the manufacturing side of materials engineering. He enjoys troubleshooting and the opportunity to see the whole product. He would like one of his rotations to be in testing. "It's very interesting work," he said. "In the defense industry, everything must be very accurate. I enjoy that challenge."

White has risen to the challenge of leadership, with positive results in all aspects of his life — from the marching band to the engineering summer orientation to his studies — and soon he will take these experiences out into the world of work.

LONG ROAD ENDS IN GRADUATION

You're hired for this position . . . as an engineer.

"I never thought the words 'as an engineer' could sound so sweet!" said Janie N. Sutton, who graduated May 18 from NC State with a bachelor's in mechanical engineering. Sutton has worked long and hard to hear those three words.

She started nearly 20 years ago, going to school part time while raising her son as a single parent. Sutton interviewed a number of people in several possible professions before deciding what field to go into. She got a diploma from Piedmont Community College in mechanical drafting and went to work for Progress Energy (CP&L). Her instructors at technical school encouraged her to consider pursuing a degree in engineering.

"I always wanted to get my degree," she said. "I felt that a part of me wasn't complete if I didn't get my bachelor's. I tried to go back in 1986, when my son was 14, but working full time, being a good parent and trying to do well in courses was just too much."

After 20 years of effort, Janie N. Sutton received her engineering degree. Son Stephen Norman-Scott congratulates his mom.
(Photo: Heather Norman-Scott)

It wasn't until her son went to college himself and Sutton remarried that her dream could become a reality. When she started taking classes, her husband made her promise two things — don't do it for the money and don't stop until she was done. "I had to think about it," she laughed. "But I agreed."

Starting with transfer classes at Wake Technical Community College in 1996, she continued to work full time, but by 1999 she became tired of the one-course-at-a-time approach. So Sutton quit her job, with her husband's blessing, to go to school full time at NC State. She formed strong relationships with other students, who found her life experience useful.

Degree in hand, Sutton headed to a new job with engineering consulting firm Clark, Richardson and Biskup — and the best part — as an engineer.

off to a good start

LEGENDS RACE CAR DRIVER LAMBERT LOVES THE SPORT

LUKE A. LAMBERT, A SOPHOMORE IN MECHANICAL ENGINEERING AT NC STATE UNIVERSITY, HAS ALWAYS LOVED RACE CAR DRIVING. HE STARTED OUT RACING GO-KARTS AT AGE 14; FROM THERE HE HAS MOVED INTO A UNIQUE POSITION AT NC STATE: HE IS THE DRIVER OF THE LEGENDS RACE CAR,

a brainchild of the Department of Mechanical and Aerospace Engineering.

Lambert has been driving the Legends car since fall 2001, when he began his freshman year at NC State. His father, Jim Lambert (BSCE '81), attends many of the races and photographs the events for the Wolfpack Motorsports program. "I had always considered NC State because of my dad, plus it is close to home and has an excellent reputation as a engineering school," he said. He enjoyed participating in the Student Introduction to Engineering (SITE) summer program in summer 2000, where he heard about the Wolfpack Motorsports program, an activity that helped clinch Lambert's decision to attend NC State. "The Motorsports program played an enormous role in my decision to come here," he said.

PHOTOS, FROM LEFT: Luke Lambert sits behind the wheel of the Wolfpack Motorsports Legends race car at Lowe's Motor Speedway in Charlotte; Luke Lambert, sophomore in mechanical engineering at NC State; the Wolfpack Motorsports Legends race car team, composed of NC State engineering students; the Wolfpack Motorsports Legends car competes at Lowe's Motor Speedway in a June 2002 race.
(Photos: Jim Lambert)

Wolfpack Motorsports is a program that gives mechanical engineering students an opportunity to put their classroom learning to practical use. They learn teamwork, project management and the ability to set goals and meet deadlines as well as experience hands-on application of their skills. The race car competes on speedway tracks with other university teams.

According to Lambert, there are three facets to Wolfpack Motorsports: the formula car, the Mini-Baja car and the Legends race car. The formula car is a small, high-performance vehicle designed and built by NC State students. The Mini-Baja car is also student produced and is intended for off-road competitions. While the Legends race car is not designed or built by students, the adjustments to the car and ongoing research in vehicle dynamics are done by the students. Although the Legends race car activities will not be offered after 2002, the Wolfpack Motorsports program will continue with students designing, building and competing with the Formula car and the Mini-Baja car.

NC State Legends race cars have seen a lot of action since the maiden run in April 1992 at Lowe's Motor Speedway in Charlotte. This summer Lambert has driven the car in races in Charlotte and Orange County. Unfortunately the car was damaged in June during a race in Charlotte. "We got a bad starting position, toward the back," said Lambert. "Then there was a spin and pile-up in front of me that I couldn't avoid." Lambert wasn't hurt in the wreck, thankfully, because the car performed properly and absorbed all the impact. However, the car sustained significant chassis damage and destruction of the suspension components. It took a week of intensive work on the part of the Wolfpack Motorsports team, which consisted of NC State and high school SITE students, to put the car back together in time for another race.

Lambert hopes to keep driving the Legends car during his years at NC State. "I'd love to keep driving the car," he said. "But I always want to do what's best for the team." Indeed, teamwork is a significant component of the Motorsports program. The team members function as a pit crew during races; back at NC State they work together to learn how to prepare the car and tune the engine for maximum performance. The car is an excellent learning tool for prospective automotive engineers.

Lambert may go into automotive engineering, but his dream is to drive a race car professionally or to work for a race team in a crew chief or team manager role. "Any of these jobs would use my engineering skills," he says. "I'm taking the opportunity at college to learn as much about racing and automobiles as I can." He's off to a strong start at NC State.

Luke Lambert, a sophomore in mechanical engineering, hails from Mount Airy. His high school graduating class contained 89 students. Besides auto racing, he enjoys mountain biking, water sports and church activities.

athletics and academics—a natural pairing for Wolfpack place kicker Adam Kiker

ADAM P. KIKER CHALLENGES THE NOTION THAT ATHLETICS AND ACADEMICS DO NOT MIX. A SENIOR IN AEROSPACE ENGINEERING, KIKER NOT ONLY IS A SUCCESSFUL PLACE KICKER FOR THE WOLFPACK, BUT HIS GPA OF 3.94 IS THE HIGHEST ON THE TEAM.

To most people, Kiker's ability to juggle the demands of football and the rigorous studies of aerospace engineering is remarkable. This summer, in addition to hours of training for the upcoming football season, Kiker helped design and build a remotely piloted airplane. He faces a tough senior year as he devotes many hours per week on his senior aerospace project, takes demanding classes, spends 20 hours of football practice per week and dresses out for 13 games. His diligence and energy have earned him honors, including ACC all-academic team two years running and the offer of scholarships for graduate work.

What is remarkable for most of us, however, is natural for Kiker. "I've always been a math and science kind of guy," he said. "I participated in a number of science competitions as a child. In fact, I was part of an elementary school team that won an Odyssey of the Mind World Finals competition in 1992, which involved five small cars with different propulsion systems that had to go 20 feet and pop a balloon."

Kiker acknowledged that his great uncle John Kiker (BS MAS '51) influenced his decision to come to NC State and major in aerospace engineering. John Kiker was a NASA engineer who first suggested that the space shuttle could be transported on the back of a Boeing 747 after a space flight.

Kiker has received most of his support from his parents, Paul Kiker (BS FOR '70) and Gail Kiker, and gives special credit to his mother for supporting his academic pursuits. According to Kiker, his mother, a former teacher who now owns her own organizational consulting business, has always encouraged him to excel in the classroom. "She's been the main influence in my academic life," he said.

In addition to his love for math and science, Kiker has an equal love for athletics. He played soccer as a child and was an avid golfer in high school. His enthusiasm for both football and his football coach Chuck Amato is obvious.

Although Kiker would not turn down an opportunity to play professional football, he plans to get a Ph.D. An academic senior and redshirt junior, he plans to take graduate courses next fall and return to the team next season. As a math tutor in high school, Kiker enjoyed teaching. He said, "I like to be the one with the marker in my hand in front of the board. I would love to be a professor. It's very fulfilling to help others learn."

Kiker sees nothing unusual about excelling in both athletics and academic studies. In fact, he believes athletics has complemented his academic endeavors. "I think athletics teaches you to overcome adversity," Kiker said. "It teaches you to have goals and to achieve those goals. It has taught me as a kicker to perform under pressure, and being in the spotlight has given me confidence to express my ideas to professors. The coupling of athletics and scholarship has been great for me." ST

ABOVE & RIGHT: Balancing rigorous aerospace engineering studies and football, Kiker excels at both. His 3.94 GPA is the highest on the team.
(Photos: Department of Athletics)

Elena Page has put her degrees in electrical engineering ('97) and computer engineering ('98) to good use. The first woman show programmer at Imagineering, Page programmed the Soarin' ride, which won the 2002 Themed Entertainment Association award for Best Attraction. The Thea is considered the Oscar of the themed entertainment industry.
(Photo: Jess Allen. Copyright Disney. All Rights Reserved.)

imagine the ride of a lifetime

Feet dangling and listening to music, you soar over California. As you dip in and out of clouds, you pass over Lake Tahoe, San Diego, Yosemite, Disneyland and more. Fragrances from pines and orange groves fill your nostrils and wind tosses your hair. Imagine such a ride.

That's just what Elena M. Page

(BSEE '97, BSCPE '98) and her team members did when they created the awarding-winning ride, Soarin' Over California, in Disney's California Adventure Park, part of Disneyland Resort in Anaheim, California. Page — known as "E" to her friends — is an associate show programmer at Walt Disney Imagineering, the division of Walt Disney Company that designs and produces all attractions for the Disney theme parks. The first woman show programmer at Imagineering, Page programs the motion of vehicles, props and special effects in the parks. She programmed the Soarin' ride, for which Walt Disney Imagineering won the prestigious 2002 Themed Entertainment Association (Thea) award in the category of Best Attraction. "I really felt as if we had won the equivalent of the Oscar for theme parks," Page said. "I felt my peers had recognized my contributions as a programmer as well as our whole team's contributions to a great project." Indeed, the Thea Awards, established in 1994, are considered the Oscars of the themed entertainment industry.

Elena Page grew up in Wilmington. As a child she loved to tinker — "to see how things work." She remembers a trip to Disney World when she was 10 years old. While on the Pirates of the Caribbean ride, she recalls noticing the hair on a pirate's leg and pointing this out to her mother. "It's in the details," Page said. "The details make the ride."

Page first learned of the nomination from Alec J. Scribner, show producer of Soarin' at Imagineering. She also learned that another attraction she had programmed for Tokyo DisneySea called StormRider — "the largest simulator in an entertainment venue" — was also up for the same award. Describing Soarin', Page said, "It is such a unique attraction because no one has ever combined this type of mechanics, technology and ingenuity with the high caliber of a film (created by Disney) in the IMAX format."

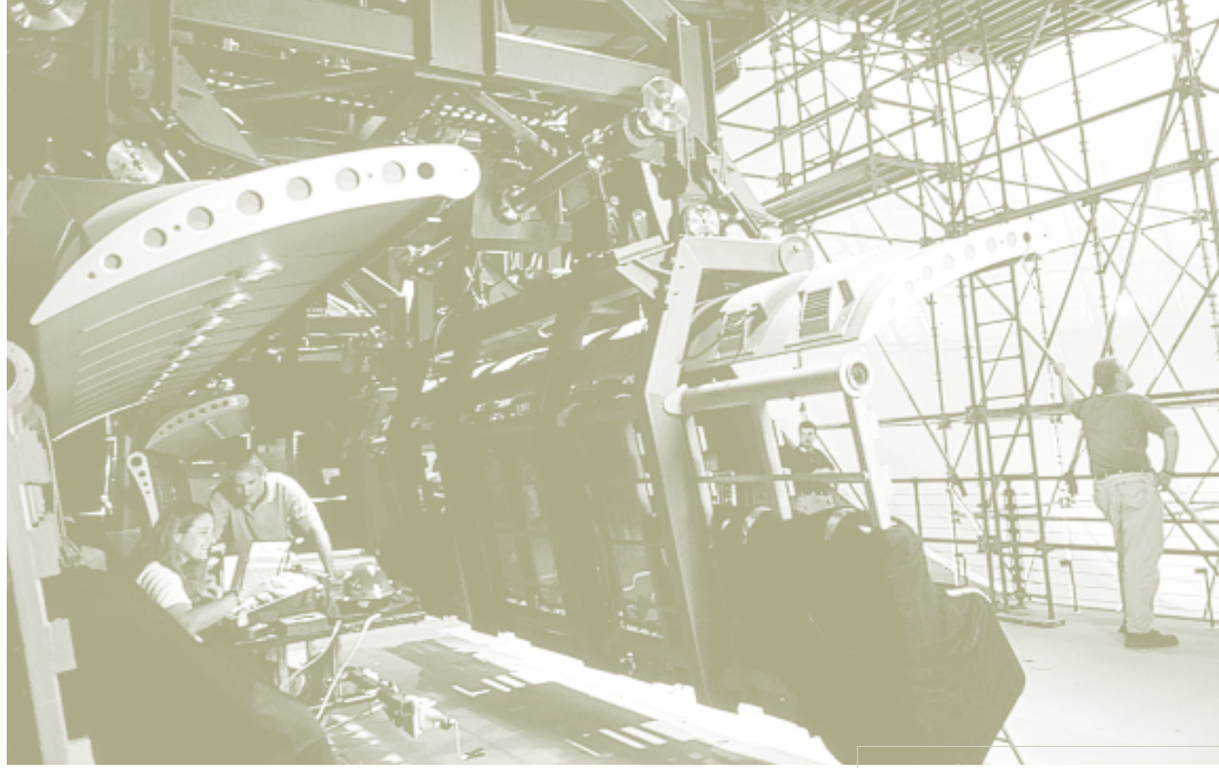
Unveiled February 8, 2001, the attraction is a three-dimensional experience that celebrates the contributions of California to the world. Disney parks are composed of "lands," and Soarin' is in the land of Condor Flats. To take the ride, visitors first enter a huge hangar housing an aviator "hall of fame" and view a brief history of aviation in California. Cast members in flight suits lead visitors to three loading stations and help them into a vehicle that seats up to 87 people. The vehicle is made up of three carriages — three rows per carriage. Once the visitors are buckled in, the take-off lights cue up, music begins, canopies lower and the carriages rise — up to 40 to 45 feet in the air. Below the carriages is an inverted IMAX 80-foot dome.

There is no narration during the ride, only the visual experience of the film, the sound of composer Jerry Goldsmith's music and the sensations of special effects. Page programmed those sensations. To create what Page referred to as "the reality of the attraction — the experience," she worked closely with senior vice president executive show director Rick A. Rothschild, senior show producer Alec Scribner and other members of the creative team that included the lighting designer and art director. She also worked with the show ride engineers who designed the mechanics of the vehicle. Her job was to integrate the vision of the creative team with the engineering of the vehicle.

Page's association with Imagineering began in 1996, when she became an intern by winning an Imagi-Nations University Design Competition. She came across a flyer for the competition while she was an engineering and computer science student at NC State University. With a background in robotics, controls, animation and art, she found the competition interesting and decided to enter. "I never realized this world existed until I entered the competition," she said.

Page described her entry as a "partial immersion-virtual reality attraction." She named it the "Lion King's African Adventure," and her presentation included a story, vehicle design, facility planning and music. She even sang. In Page's design, riders climb onto kneeling elephants, sit on the backs (in hatches) and explore the territory with King Simba.

Page values her six-month experience as an intern in show design. "When you are an intern, you learn a number of skills that are remarkable," she said. "You learn about operating in the entertainment industry, pitching ideas, working with diverse teams, being a good team member and maintaining professionalism and excellence." When she returned to NC State, Page knew she wanted to become a permanent member of Imagineering. She also knew that getting the job was highly competitive and that it was up to her to earn a place as an Imagineer. She kept in touch with several people at Imagineering while she completed her studies, and in 1999, Page became an associate show programmer. Today, she is known for programming big vehicles, the "E" tickets — a classification of tickets denoting the most exciting rides and, consequently, a play on her name among her friends.



Elena Page and Alec Scriber work together in the Soarin' hangar during production.

(Photo: Gary Kruger. Copyright Disney. All Rights Reserved.)

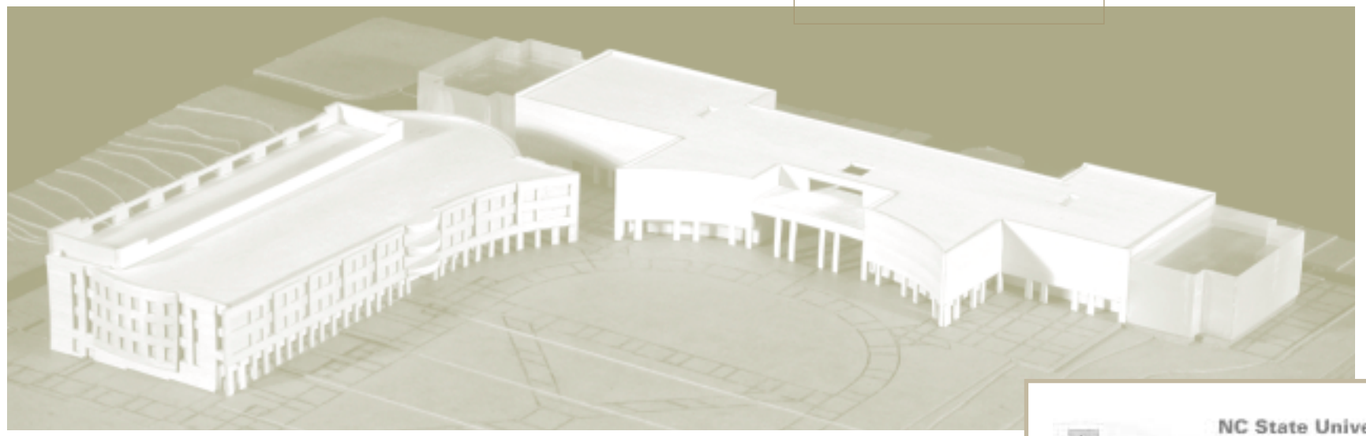
As former winner of the Imagi-Nations University Design Competition, Page is on the advisory board for the competition. As a board member and as an Imagineering enthusiast, Page wants to draw more diverse and talented newcomers to her company. In fall 2001 Page and Monica M. Griffin, a member of Imagineering's college relations team, worked with the Society of Women Engineers and the National Society of Black Engineers to make a presentation to NC State engineering students about the Imagi-Nations annual competition. They also worked with professors Chandra D. Cox, associate professor of art and design, and Patrick Fitzgerald, assistant professor of art and design, to make a presentation to College of Design students at NC State.

When design students Jackson Floyd Brown III, Nick Hobson and Gabriela Ferro became finalists, Page returned to NC State to advise them on their projects. This mentoring aspect of the competition was not available to her when she had competed. The three NC State students swept the competition in June 2002. "The level of quality of the students at NC State is phenomenal," Page said.

Page offered words of guidance for other students who are interested in the themed entertainment industry: "My advice to any student would be if you have a passion, just explore it. And when you are developing those passions, you will find what you are interested in, and that will lead you to what you will do. There is no way I could have envisioned this career." According to Page, all her experiences, from the time she was a child to the present, made her an Imagineer.

When asked about her next challenge, Page quickly responded, "Program the next E ticket!"

Just imagine . . .



Model shows Engineering Buildings I and II.
(Perkins and Will)

College of Engineering Moving to Centennial Campus

If you haven't seen Centennial Campus lately, you may be surprised. The once pastoral setting is rapidly evolving to a gleaming high-tech mecca and helping the College of Engineering leave a giant footprint on the new millennium.

NC State University has awarded the construction contract for the first building, which has been designed for use by two departments — Chemical Engineering and Materials Science and Engineering. Currently known as "Engineering Building One," it will have over 90,000 square feet of classrooms, laboratories and offices for the departments.

Construction of Engineering Building One began in fall 2002 with a goal of occupancy by summer 2004.

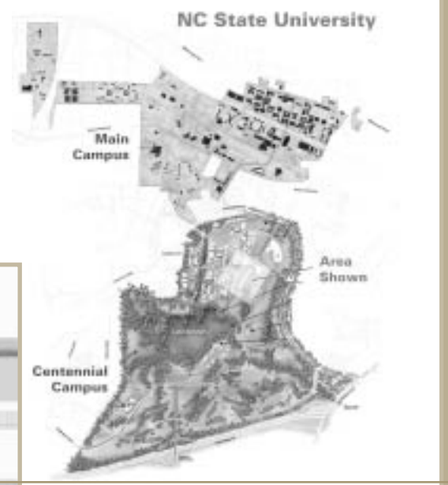
The second College of Engineering academic building on Centennial Campus is being designed for two departments as well — Computer Science and Electrical and Computer Engineering. When completed, Engineering Building Two will consist of approximately 110,000 square feet of space for classrooms, labs and offices.

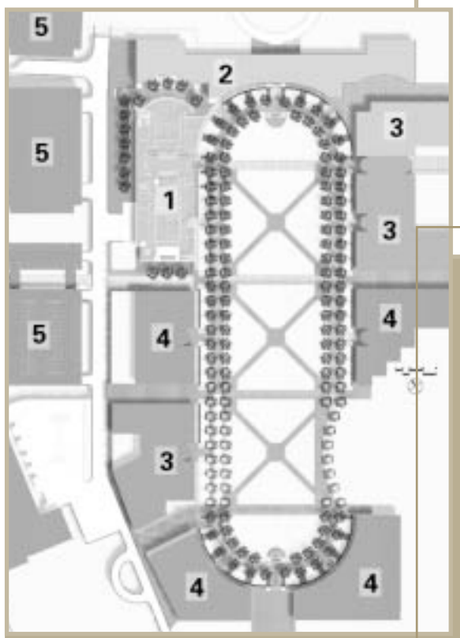
The construction of Engineering Building Two should begin in 2003 with a completion goal date of early 2005. The approximate cost for both of these buildings is projected to be $90 million.

In addition to the two academic buildings, the University has contracted for the construction of a new energy plant on Centennial Campus. This first phase of the energy plant will provide steam and chilled water to heat and cool the new College of Engineering buildings. The plant will expand in future phases to support other buildings on Centennial Campus.

Back on Main (North) Campus, the College is now working on a master plan for a two-phased renovation of Daniels Hall, currently the home of Electrical and Computer Engineering. The first phase will cost approximately $7 million and will begin the process of relocating College of Engineering lower-division academic programs to Daniels Hall.

The College is able to undertake this much-needed expansion because North Carolina voters passed a $3.1 billion higher education bond referendum in 2001.





KEY

1 **Building 1**
Chemical Engineering
Materials Science & Engineering

2 **Building 2**
Computer Science
Electrical & Computer Engineering

3 **Future Engineering Buildings**

4 **Future NC State University Buildings**

5 **Future Parking**

business, government & NC State join forces in unique campus setting

Centennial Campus at North Carolina State University is the campus of the future — a unique technopolis of university, corporate and government R&D facilities and business incubators in a highly interactive environment that is drawing attention from across the globe.

Adjacent to NC State's main campus, the 1,334-acre site, which includes a town center, executive conference center and hotel, lakeside housing, recreation, and even a middle school, is the Research Triangle area's fastest-growing development. There is no other campus or research park like it in the entire country.

Centennial Campus is the ideal location for businesses and government agencies requiring R&D facilities near research faculty and graduate students who can supplement their project teams. The campus is already home to more than 100 companies, government agencies and NC State units, where faculty, students, industry researchers and government scientists collaborate to produce scientific and technical innovations that will change the way we live and work.

Gilligan named vice chancellor for research and graduate studies

Dr. John G. Gilligan has been named the new vice chancellor for research and graduate studies for the university. A member of the NC State nuclear engineering faculty since 1983, Gilligan has served as associate dean for research and graduate programs in the College of Engineering since 1996. A specialist in fusion-energy technology, fusion fuel cycles, plasma-material surface interaction, low-temperature plasmas and electric plasma guns, Gilligan received his bachelor's degree in engineering sciences from Purdue University in 1971, and his master's and Ph.D. degrees in nuclear engineering from the University of Michigan in 1973 and 1977, respectively.

Don Bitzer doubly honored

Donald L. Bitzer, Distinguished University Research Professor of Computer Science and a member of the National Academy of Engineering, was designated as a 2002 National Associate by the National Academies — a group comprising the National Academy of Sciences, the National Academy of Engineering, the Institute of Medicine and the National Research Council — for extraordinary contributions of service and leadership.

In addition, Bitzer received an Emmy on October 2 from the National Academy of Television Arts and Sciences for his efforts in advancing television technology. Bitzer co-invented the flat plasma display panel in 1964.

Tony Mitchell and Dean Nino Masnari display the plaque.
(Photo: Linda Rudd)

NC State minority freshman engineering students honored

Minority freshman students from the College of Engineering at NC State received an Outstanding College Performance Award at the 2002 Multicultural Student Affairs Freshman Honors Convocation. The award was presented to each college with fifty percent or more minority freshman students with a grade point average (GPA) of 3.0 or higher. The College of Engineering is the only one honored for the second year in a row.

Dr. Tony L. Mitchell, assistant dean of engineering and director of Minority Engineering Programs, attributes the success of minority engineering students in part to the well-developed support system that has been in place for several years, including a summer high-school-to-college bridge program, a mentoring program that pairs students with an engineering major, and two courses that teach survival skills for students bridging the gap between full-time scholar and professional engineer.

Christine Grant, here with head of chemical engineering Peter Kilpatrick, inspires students across the globe in their educational and career decisions.
(Photo: Kwame Yeboah)

Christine Grant represents best of NC State faculty

Dr. Christine S. Grant, associate professor of chemical engineering, was the first (and currently still is the only) African-American woman faculty member in the College of Engineering and in the Department of Chemical Engineering at NC State. Since her arrival in 1989, she has received numerous professional honors including the National Technical Association's Top Women in Science and Engineering Award, Outstanding Young Engineering Alumni of Georgia Tech, Exxon Engineering Foundation Research Award, 3M Company Young Faculty Award, Dow Chemical Company Young Faculty Award, Distinguished Service Award by the American Institute of Chemical Engineers and many more.

Her research focuses on surface and interfacial science, mass transfer, tribology and environmental engineering; currently she is working on an evaluation of the fundamental mechanisms that control decontamination processes and stiction issues in MEMS processing. In June 2002 she celebrated the grand opening of her new research laboratory.

Grant has served as a research mentor to students in NASA's Undergraduate Researchers program and NSF's Research Experience for Undergraduates program. She has given numerous invited lectures across the globe, inspiring students on professional development and the merits of attending graduate school. She serves as mentor to engineering students at the University of Science and Technology in Ghana, West Africa, where they named a library in her honor.

James K. Ferrell, 78

Dr. James K. Ferrell, an outstanding member of the NC State University community, died November 27, 2001, in Raleigh. He was 78. In 1954 he became the first person to receive a doctorate in chemical engineering from NC State. He received his bachelor's degree in 1948 and his master's in 1949, both from the University of Missouri in chemical engineering.

Ferrell made significant contributions to the course of engineering technology through his teaching, research, extension and administration. He was head of the Department of Chemical Engineering from 1966 to 1980. Between 1980 and 1991, he served a number of administrative roles, including associate dean for research and interim dean of engineering. He officially retired in 1991 but continued to serve the College over the next decade.

Ferrell received numerous awards in his lifetime and was named Distinguished Engineering Alumnus in 1992. In 1967 he was named Alcoa Professor of Chemical Engineering, and he was a fellow of the American Institute of Chemical Engineering.

His research interests included energy conservation and pollution control, areas in which he made significant professional contributions. His work focused specifically on heat transfer, transport processes in porous media, coal gasification and gas cleaning, hazardous waste treatment and disposal and process control.

Over the course of 50 years, this beloved alumnus, professor, researcher, department head and dean was a key player in the history of the College of Engineering at NC State, and he will be long remembered for his dedication and service to his *alma mater*.

Vivian T. Stannett, 85

Dr. Vivian Thomas Stannett, Camille Dreyfus Professor Emeritus of Chemical Engineering and Dean Emeritus of the Graduate School at NC State University, died October 1, 2002. Born September 1, 1917, in Langley, England, Stannett received his bachelor's degree in chemistry from London Polytechnic University in 1939 and his doctorate from Polytechnic Institute of Brooklyn in 1950.

An internationally renowned polymer chemist, Stannett was a pioneer in the use of high-energy radiation to form new polymers or alter existing ones. He was a recognized leader in the study and application of membrane science and technology, and his research led to the development of a wide range of beneficial products. Stannett joined the NC State faculty in 1967 as professor of chemical engineering and served as vice provost and dean of the Graduate School from 1975-82.

During his career Stannett published more than 400 papers and reviews on polymer science and technology. He was a member of the National Academy of Engineering and a fellow of the Royal Institute of Chemistry, the New York Academy of Sciences, the American Chemical Society and the Society of Plastics Engineers. He received the American Chemical Society Award in Polymer Chemistry, the Silver Medal of the Technical Association of the Pulp and Paper Industry, the Society of Plastics Engineers International Award and Gold Medal and many other awards and honors.

Stannett's reputation drew many top-notch scientists to NC State and helped the university establish the nation's first doctoral program in textile chemistry. His contributions made a tremendous impact on the university, and he will be greatly missed by friends, colleagues and the many students he inspired.

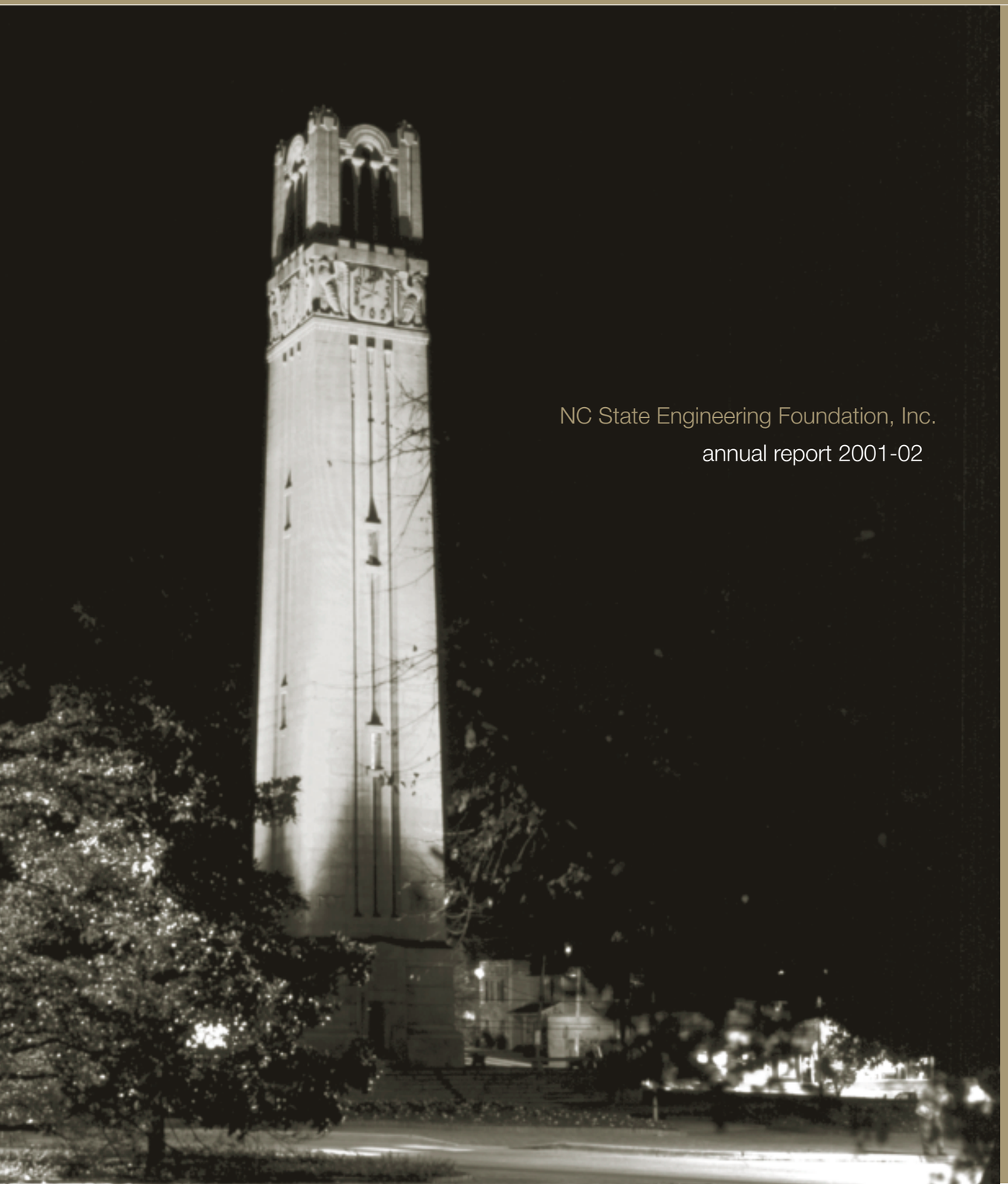
Terri Helmlinger named NSPE president-elect

Teresa A. Helmlinger (BSEO '78), P.E., assistant vice chancellor for extension and engagement and executive director of the Industrial Extension Service, has been elected by the National Society of Professional Engineers (NSPE) to be president-elect for 2002-03.

New distance education degrees established

Several new individual-access distance learning master's degree programs were established in the past year. The master of civil engineering (MCE) degree program, implemented January 2002, is a non-thesis degree program offering courses online and on videotape. A total of 28 graduate courses will be offered. Established in August 2002 were the master of science in mechanical engineering and master of science in aerospace engineering. These non-thesis, 30-credit-hour degree programs offer graduate-level courses on CD-ROM and online on the Web.

These new courses are offered through Engineering Online (formerly VBEE). For more information about these and other distance learning degrees, visit http://engineeringonline.ncsu.edu .



NC State Engineering Foundation, Inc.

annual report 2001-02

letter from the executive director

Ben Hughes

The 2001-02 year was truly remarkable in almost every facet of institutional life: from the energizing and important work and recommendations of the NC State Engineering Foundation Board to discussions of curriculum expansion, from high achievement by faculty and students in teaching and research to community outreach and service, and from the continued development of Centennial Campus to record enrollments and record private giving.

It is my privilege to express the College's gratitude to the alumni and other friends who have contributed to making the College of Engineering at NC State the dynamic institution that it is today. Our alumni and friends can take rightful pride in the continuing development and progress of the College. Last year, the 32 members of the NC State Engineering Foundation Board, along with many other supporters, provided countless hours of vital service to the College. In addition, the thousands of donors listed on the following pages provided the College with $11.2 million in current financial support and committed another $10 million in pledges, deferred gifts and gifts-in-kind, despite challenging economic conditions.

My many, many thanks go to all who helped make the 2001-02 academic year such a remarkable one in the history of the College of Engineering at NC State!

— Ben Hughes
Executive Director
Development and College Relations

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unrestricted gifts are vital to college's success

Many people who donate money to a university have a good idea of what they want their money used for. However, undesignated gifts are an important category that is sometimes overlooked. There are some very good reasons to give an unrestricted donation to a university such as NC State.

One example of such a gift is the posthumous donation by Kemp Reece (CE '25) to the College of Engineering. This gift is unusual not only because it is unrestricted but also because of its size — $1 million.

This gift will be used for scholarships for freshmen, fellowships for graduate students, as well as supplemental pay and relocation expenses for top faculty recruits. "Unrestricted giving is clearly vital to the future of the college and university because it fills in gaps between state funds and gifts restricted to a particular program," said Dean Nino Masnari. "Having discretionary funds at our disposal gives us more leverage when competing with other schools for the most talented freshmen, graduate students and faculty, all of whom are integral to the success of our college."

Besides funding scholarships and fellowships, unrestricted gifts help support vital programs such as the Women in Engineering Program, student societies (the National Society of Black Engineers, the American Indian Science and Engineering Society, the Society of Women Engineers, the Engineers' Council, the American Society of Mechanical Engineers and more), Nuclear Engineering Summer Programs, Student Introduction to Engineering (SITE) and Minority Programs.

In the College of Engineering at NC State, the Dean's Circle is the giving society that recognizes donors who give $1,000 or more in unrestricted funds. This society, which increased its membership 11 percent last year, especially helps deserving engineering freshmen who might not otherwise be able to attend NC State. The gifts are distributed through the NC State Engineering Foundation Inc.

Traditionally, unrestricted gifts account for only a small percentage of funds raised by the university, but donors are coming to understand more and more the benefits of unrestricted giving. They realize that the College knows best what its needs are and can apply the gift to the areas that will have the most impact. Many gifts are allocated over time, and the needs of the school cannot always be predicted. That's where an unrestricted gift is particularly useful.

donors 2001-02

R. STANHOPE PULLEN SOCIETY

The R. Stanhope Pullen Society, named after the Raleigh philanthropist who donated the original 62 acres of land for the site now known as North Carolina State University, recognizes donors who have included NC State University in their estate plans. Here, the College of Engineering at NC State recognizes individuals who have planned gifts for the College, either in their wills or through a life income gift such as a charitable remainder trust that provides income for the donor(s) or a beneficiary for life or a term of years and passes the remainder to the College. These gifts are typically funded with cash, bonds, stock, real estate or other real property. They often result in a named endowment fund that benefits the College in perpetuity.

The names listed for the Pullen Society include donors who announced planned gifts prior to June 30, 2002. For information about including the College of Engineering in your estate plans — or if you have already done so and would like to become a member of the Pullen Society — contact David Nolan, Director of Development, NC State Engineering Foundation, (919) 515-7458, (866) 316-4057 toll free, or david_nolan@ncsu.edu or Joan DeBruin, Director of Gift Planning, Campus Box 7501, NC State University, Raleigh, NC 27695-7501, (919) 515-9076, or joan_debruin@ncsu.edu.

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annual giving

Dean Nino Masnari greets Dean Circle members John and Deb Simmons. *(Photo: Herman Lankford)*

Gifts listed in Annual Giving were received July 1, 2001, through June 30, 2002.
Years of Consecutive Giving: (*) = 5+, (**) = 10+

DEAN'S CIRCLE

Gifts made directly to the NC State Engineering Foundation, Inc. are utilized exclusively for the benefit of the College of Engineering. The Dean's Circle was created to recognize the vital support that annual, unrestricted gifts provide.

Lampe Society

The Lampe Society, named for John Harold Lampe, Dean of Engineering 1945-1962, recognizes donors of annual, unrestricted gifts of $10,000 or more directly to the Engineering Leadership Fund.

Rex T. Willard, EE '49 • Robert G. Wright, CEC '68

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The Fadum Society, named for Ralph Eigil Fadum, Dean of Engineering 1962-1978, recognizes donors of annual, unrestricted gifts of $5,000 to $9,999 directly to the Engineering Leadership Fund.

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(Left to right) Robert and Peggy Meares and Julia and Ken Stevens attended the Dean's Circle social at the Capital City Club in Raleigh. *(Photo: Herman Lankford)*

alumni and friends contributors 2001-02

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The art of engineering

This wolf is one of more than twenty 400-pound, fiberglass wolves that make up the Red Wolf Ramble, a Raleigh Arts Commission project in which artists from around the city were commissioned to decorate the statues.

The College of Engineering commissioned Design students Carson Mataxis and Summer Hill to create "Alloy," whose internal organs made of gears and gizmos are visible behind a plexiglass cutout.

Alloy has a permanent home in the Engineering quad area between Riddick Labs and Mann Hall. Some of the other wolves from the art project were auctioned in April 2002.

"Alloy" the Wolf, part of the Red Wolf Ramble art project, was sponsored by the NC State Engineering Foundation, Inc. and the College of Engineering. *(Photo: Sherri Thomas)*

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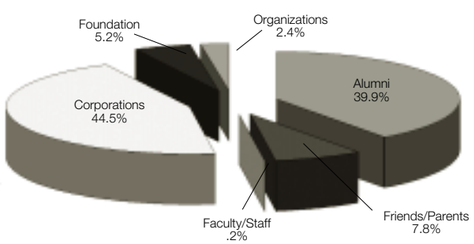

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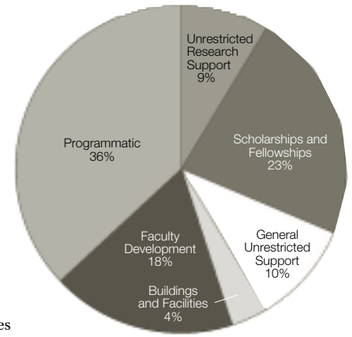

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Tischer scholarship established

Dr. Frederick Joseph Tischer died August 14, 2002, at the age of 89. He was professor emeritus of electrical engineering and an internationally recognized pioneer in space communications.

A native of Plan, Austria, he joined the NC State faculty in 1964. He retired in 1978 but continued to contribute to teaching and research programs for many years.

Although he left no immediate survivors, he will be remembered by colleagues and the countless students he inspired. Dr. Tischer's estate provided funds to endow the Frederick J. Tischer Electrical Engineering Scholarship, and anyone who would like to honor Dr. Tischer's memory may make a contribution to this scholarship through the NC State Engineering Foundation, Inc.

George B. Hoadley (center) and William J. Barclay (right) welcome Frederick J. Tischer to the NC State campus. Barclay is holding an attenuator for microwaves. *(Photo: January 22, 1965, NCSU Archives)*

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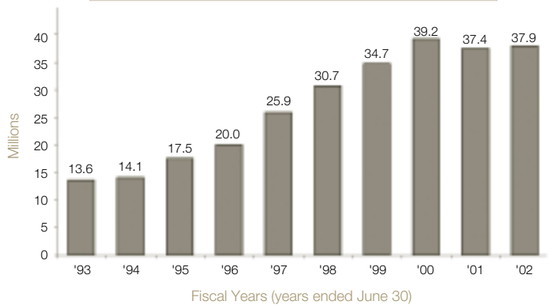

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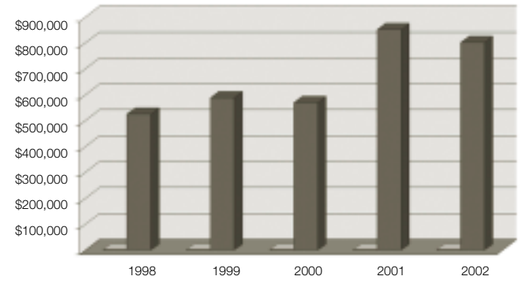

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memorial gifts

Gifts to the NC State Engineering Foundation have been made in memory of the following individuals: E. James Angelo Jr., EE '39 • William E. Bolton • John B. Bowden • Joseph W. David • Hugh Dodd Dorsey, CEC '36 • James K. Ferrell, PHD CHE '54 • Brad E. Hatcher • William B. Kincaid, ME '55 • Mary Ellen Lewis, ME '87 • Harry C. Rudd Jr., EE '60 • Katharine Stinson, ME '41

Culberson endows $50,000 to chemical engineering

S. Frank Culberson, president and CEO of Rimkus Consulting Group in Houston, Texas, has pledged $50,000 to endow a discretionary fund for the Department of Chemical Engineering.

An alumnus of NC State, Culberson earned his bachelor's degree in chemical engineering in 1960. He received an MBA from University of Houston in 1966. His company, Rimkus Consulting Group, is a forensic consulting company that performs engineering and business assessments concerning accidents; injuries; structural and mechanical failures; fires and explosions; energy, chemical, and mining problems; and hazards to human health posed by molds and environmental releases.

Culberson is a member of the NC State Engineering Foundation Board of Directors and a 2002 Distinguished Engineering Alumnus.

tributes

Gifts to the NC State Engineering Foundation have been made in honor of the following individuals: J. D. Love • Robert F. Stoops

estate gifts

Gifts or bequests have been made to the NC State Engineering Foundation from the estates of the following individuals: E. James Angelo Jr., EE '39 • Marshall Jennette, CEC '32 • Kemp W. Reece, CE '25

endowments

An endowment is created through the establishment of a permanent fund that is invested and managed. A portion of annual income generated is used to carry out the donor's designated purpose. Income earned in excess of the annual amount spent is added back into the endowment so that it continues to grow and maintain its purchasing power for future generations. The following permanent endowments benefit the College of Engineering at NC State:

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fellowships bring top students to NC State — Bond chose NC State for academic excellence

Ryan B. Bond came to NC State from Mississippi State University, his *alma mater.* "I wanted to find a place where I could get a high quality graduate education in aerospace engineering," he said. He feels fortunate to be the recipient of the Frank C. Ziglar Jr. Memorial Graduate Fellowship. Verdie S. and Donald E. Moreland created this endowed fellowship to honor Ziglar, who earned his B.S. in physics from NC State in 1965 and had an outstanding career with the National Aeronautics and Space Administration (NASA).

"The fellowship provides a much more stable source of income than being on an assistantship funded by a research grant," said Bond. "Also, the fellowship pays all student fees, whereas most assistantships do not." This reliable source of support allows Bond to focus on his research in computational fluid dynamics (CFD) without having to worry about paying for school.

Tom Miller works with Engineering Entrepreneur Kevin Runyan.
(Photo: Jennifer M. Gilbert)

entrepreneurs program offers unique twist on engineering traditions

In 1993 Dr. Tom Miller initiated the Engineering Entrepreneurs Program (EEP) as a way to encourage creative, ambitious students looking for ways to put their innovative ideas to work. Today more than 250 students have completed his course in which they work in teams to turn creative concepts into marketable products. Miller, who is vice provost for distance education and learning technology at NC State, has many success stories to tell.

One former student, Donald (Donnie) J. Barnes (CSC '95), retired from Red Hat as a millionaire at age 27. Engineering student entrepreneurs Bill Nussey (EE '87) and Chris Evans created DaVinci Systems — one of the world's leading email products — at a time when NC State was emerging as a power in information technology. They later sold the company for $6.65 million. Evans sold Accipter, which he founded, for more than $50 million. Scot Wingo (MS CPE '92) credits his success to Miller's Entrepreneurs Program. He cofounded and sold Stingray Software then cofounded AuctionRover.com, which sold for $166 million.

These success stories are hard to beat, but the latest group of students to complete the program has been called one of the most stellar ever to come along. They have been selected to demonstrate their product, IIPSys (Intelligent Internet Photo Systems), a digital photo manager that they are marketing as a turnkey solution for organizing collections of digital photos, at InfoTech 2002, an annual conference sponsored by the Council for Entrepreneurial Development (CED) that draws more than 800 attendees.

Engineering Entrepreneurs (left to right) Aaron Allsbrook, Josh Christie and Brett Warner were the only students invited to participate in the Council for Entrepreneurial Development InfoTech 2002 demonstration.
(Photo: Tom Miller)

Competition to demo at this year's conference was intense — just 20 of the more than 60 applicants were accepted. CED chose participants based on innovation in the technology and its current and potential market applications. The NC State team received a perfect score in the competition, something achieved by only a few of the applicants. But what is so remarkable is that all of the other competitors are established businesses — the IIPSys team was the only student group invited to attend.

These entrepreneurs, all computer engineering majors, are Aaron Allsbrook, Joseph D. (Josh) Christie and Brett Warner. According to Christie, "I learned more in that one course than in any other course at State. It was the highlight of my undergraduate work because the course is all up to you — it's what you make of it." Christie enjoyed guest speakers and the hands-on experiences that gave his team a taste of the real world of organizing documents and setting goals and milestones. "From the course I got a sales/product marketing perspective that you don't get in any other course," he said.

Miller and Dr. Stephen Walsh, visiting assistant professor of electrical and computer engineering, lead the program. According to Walsh, students who "think outside the box" are naturals for EEP. Walsh stated, "We make the students do everything from lining up small business clients, to stock option grants, to market research and calling investment bankers."

The Engineering Entrepreneurs Program demonstrates one of the many ways that private support makes an impact on the educational programs offered and the success of the students in those programs. For example, Donnie and Ashley Barnes have shared their Red Hat success with NC State by donating $500,000 to endow the EEP.

Programs such as EEP have a strong impact on students. According to Miller, "Most EEP graduates decide to go into entrepreneurial careers rather than traditional engineering areas. Former students come back and say that their experiences in EEP defined their whole career because it brought out leadership qualities that let them realize their potential in a protected environment."

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gifts

Praxair Inc. has made a gift to NC State University and UNC-Chapel Hill of patented technology to produce reduced-fat snack foods. Praxair representatives Mark Seymour, Ken Spall and Jeff Wallace visited the NC State campus in January 2002 to tour the CO2 Dyeing Consortium in the College of Textiles at NC State and the Kenan Center for the Utilization of Carbon Dioxide in Manufacturing.

Duke Energy Corporation has donated $246,000 to the College of Engineering. Sabrina Austin, manager of corporate contributions for Duke Energy Foundation, presented the gift. Duke Energy has shown strong support to NC State and the Department of Nuclear Engineering over the years. This year the Duke Energy Foundation funded eleven programs in engineering, six of which were focused in nuclear engineering.

TogetherSoft Corporation donated to Computer Science 150 licenses for Together ControlCenter (TCC) software, including support services valued at $1,079,100. TogetherSoft Corp. headquarters are located on NC State's Centennial Campus.

engineering a fascination for donor Craig Wardlaw

Craig Wardlaw's fascination with engineering began many years ago, when he was a high school student at Christ School in Arden, near Asheville. His mentor, headmaster David Page Harris, who had attended NC State, was a civil engineer. Harris instilled in his students a respect for the power of engineering by involving them in construction projects around the school. For Wardlaw that early exposure developed into a lifelong interest in engineering as an avocation. His vocation was banking, a profession he learned from his mother.

Philanthropy was another value instilled early in Wardlaw. "I've always been taught through both my mother and my headmaster that when you have good fortune you want to return parts of it to other, less fortunate people," he said.

Much of Wardlaw's philanthropy has been focused toward education, and NC State has been a recipient because of his engineering interest. For Wardlaw, "There's nothing more exciting than to see young people earn a scholarship and go to school, when they might not be able to attain an education otherwise," he said. "For those students who work really hard and deserve it to be able to have some help, succeed and acquire a great education like you can find at NC State is so important."

To honor his mentor and help deserving students, Wardlaw established the David Page Harris Sr. Scholarship, a general scholarship for the College, in 1997. "Headmaster Harris was such a wonderful man, and he gave me such good guidance. I wanted to establish a scholarship in his name," said Wardlaw.

Craig Wardlaw worked with Bank of America in Charlotte for 30 years. In retirement, along with his partners, he manages Rice Hope Plantation in South Carolina, where he experiments with historical engineering irrigation techniques.

the impact of endowed giving is immeasurable

top faculty are key to students' success — and professorships are crucial to recruiting, retaining top faculty

Dr. Thom J. Hodgson is not your typical professor. His exceptional professional accomplishments were recognized in 2001 by the National Academy of Engineering (NAE) when he was elected to membership. Election to the NAE is one of the engineering profession's highest honors. Also in 2001 he was named Distinguished University Professor of Industrial Engineering. These and other honors set him apart from the crowd. But one thing he does typify is the level of excellence that we have come to associate with named professorships. Hodgson holds the James T. Ryan Professorship of Industrial Engineering and Furniture Manufacturing at NC State University, established in 1949 to honor James T. Ryan, who was the executive director of the Southern Furniture Manufacturer's Association.

For Dean Nino Masnari, making a commitment to recruiting and retaining top faculty is an investment in our students' future. "Perhaps the most influential factor in the success of our students is our faculty," Masnari explained. "We are fortunate to have faculty members who are highly effective classroom teachers and advisors with genuine interest in their students and enthusiasm about the subject. The impression faculty make on their students affects them throughout their lives." Recruiting and retaining top faculty is one of the College of Engineering's top priorities, and increasing the number of endowed professorships is one of the most promising ways to reach this goal.

Hodgson is a professor and researcher nationally known for his contributions to the field of industrial engineering; founding and current director of the Integrated Manufacturing Systems Engineering Institute (IMSEI); and advisor/mentor to his many students, who hold him in high esteem. He treats his graduate students as colleagues in research and publication, and he demonstrates his trademark wit through a unique method of motivation for his undergraduates, promising an "A" to any student who can beat him at handball. (This has yet to happen.)

Hodgson represents the best of NC State faculty, and the James T. Ryan Professorship supports this distinguished academic with the freedom to pursue his professional activities and lead thirty years of students into the field of industrial engineering with distinction.

Fitts endows professorship in industrial engineering — $1 million supports one of the college's top priorities

For many alumni, memories of NC State include recollections of wonderful professors who went out of their way to give them time, inspiration or advice. Supporting such professors so they have time to devote to teaching and research is one important way alumni can make their gifts fill a critical need at NC State.

Edward P. Fitts (CE '61), chairman and chief executive officer of Dopaco and a Distinguished Engineering Alumnus, understands the importance of attracting the very best professors to NC State and the impact those professors have on our students. He has helped the College fill this critical need by donating $666,000 to endow the Edward P. Fitts Industrial Engineering Professorship at NC State. Matching funds of $334,000 from the Distinguished Professorship Endowment Trust Fund bring the total value of the endowment to $1 million.

The professorship will support a tenured faculty position, which will be awarded to an internationally known authority in the field of information technology, with near-term emphasis on the application of this technology to logistics and supply-chain engineering.

This commitment by Ed Fitts is of tremendous importance to one of the College's top priorities — the recruitment of the very best faculty to our college. Through North Carolina's Distinguished Professors Endowment program, individuals committed to the future of higher education are able to make contributions necessary to endow distinguished professorships.

The College is grateful to Ed for his long-time support of NC State. In addition to the recent professorship, Ed supported one of the College's other top priorities by creating an endowed scholarship in 1999 as part of the Campaign for NC State Students. The Edward P. Fitts Scholarship is one of the largest scholarships in the Department of Industrial Engineering.

footnotes
FOUNDATION

progress energy lecture hall dedicated

Thanks to generous donations by Progress Energy, the Burlington Nuclear Engineering Laboratories building now has a new lecture hall. The Progress Energy Foundation presented an additional grant of $385,000 to NC State University at the dedication ceremony held May 1, 2002, during which Chancellor Marye Anne Fox dedicated the renovated room as the Progress Energy Lecture Hall.

William Cavanaugh, chairman, president and CEO of Progress Energy, presented the check. William "Skip" Orser, group president for energy supply at Progress Energy, delivered a lecture, "Rediscovering Nuclear Power," the inaugural presentation in the Nuclear Engineering Executive Lecture series. Other Progress Energy attendees included Fred Day, executive vice president for energy delivery, and NC State alumnus Buddy Cline, vice president of distribution engineering and operations.

(Left to right) William "Skip" Orser, group president for energy supply at Progress Energy; Chancellor Marye Anne Fox; William Cavanaugh, chairman, president and CEO of Progress Energy; and Fred Day, executive vice president for energy delivery of Progress Energy, were present at the dedication of the Progress Energy Lecture Hall.
(Photo: Linda Rudd)

Welch made honorary alumnus

Edwin L. Welch Jr., president of I.L. Long Construction Company in Winston-Salem, was made an honorary alumnus of the College of Engineering at NC State at the spring scholarship banquet in April 2002. This is the first time anyone has been honored in this way by the College of Engineering.

Welch is a long-time supporter of the College of Engineering. He devotes his time to the College as an Engineering Foundation Board member. In 1996 he endowed a scholarship in memory of his father, Edwin L. Welch Sr., and over the years he has made generous donations to the College in support of scholarships and in unrestricted funds.

distinguished engineering alumni named

The College salutes its Distinguished Engineering Alumni for 2001 and 2002. The award recognizes those outstanding alumni whose accomplishments have furthered their field and who have brought honor to their *alma mater*.

Distinguished Engineering Alumni for 2002
(left to right): S. Frank Culberson, Ross Warren Lampe Sr., Jerry S. Lee.
(Photos: courtesy of recipients)

Distinguished Engineering Alumni for 2001
(left to right): Edward Fitts, Joe Colson, Dade Moeller.
(Photo: Herman Lankford)

about the Engineering Foundation

The NC State Engineering Foundation, Inc. (NCSEF) was organized in 1944 as the North Carolina Engineering Foundation, Inc. by area industrial and business leaders. The purpose of the Foundation was to form a tax-exempt, non-profit organization to promote and receive monies to support the College of Engineering at North Carolina State University. The NCSEF is governed by a 32-member Board of Directors, which oversees the nearly $40 million in assets. The Board, along with the Foundation staff, also works to enhance the image and presence of NC State's College of Engineering.

Still the primary recipient of private support for the College of Engineering, the NC State Engineering Foundation, Inc. continues the original mission developed by its founders and received over $14.5 million in support of the College of Engineering in fiscal 2001-02.

Monies raised by the Foundation go to support scholarships, fellowships, professorships, academic programs, faculty research and areas that cannot be supported from state appropriations.

Ben H. Hughes
Executive Director
Development and College Relations

David T. Nolan
Director of Development

Nahid Bozorgi
Director of College
Corporate and Foundation Relations

Christine Cerny
Director of Development
Electrical and Computer Engineering

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Civil Engineering

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Kenneth M. Tate
Director of ePartners
Computer Science

Gwen H. Bell
Assistant to the Executive Director

Lynn C. Brearley
Accounting Clerk

Joseph E. Claprood Jr.
Administrative Secretary

make a gift to the college of engineering

Your gift to the College of Engineering at North Carolina State University can support a variety of funds, programs and academic endeavors. These many opportunities to give can be tailored to your needs and interests.

You are in control of how your contributions are allocated. Unrestricted gifts provide resources for a variety of funding priorities in the college. Gifts to the College of Engineering can also be designated to specific departments, academic programs and other funding outlets.

Giving to the college is the best way to support scholarships, fellowships, professorships, academic programs, faculty research, and areas that are not supported with state funds. These gifts make a huge impact on all facets of university life.

The College of Engineering appreciates your interest in its giving programs. If you would like more information, you can either visit our website at http://www.engr.ncsu.edu/ncef/giving/gifts.html or you can contact us at:

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Thank you!

Every attempt has been made to ensure the accuracy of the information presented in this report. However, we admit mistakes sometimes occur inadvertently. Please notify our office of any corrections or suggestions you have. Likewise, we welcome inquiries regarding your support of the College of Engineering at NC State. This document was produced by the NC State Engineering Foundation, Inc. No state funds were used; 50,000 copies were printed at a cost of $40,630, or 81¢ per copy.

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