NC STATE UNIVERSITY

Volume 1: 2008

Annual Report 2007-2008

The Department of Electrical and Computer Engineering at North Carolina State University

Seeking New Department Head

Applications and nominations are invited for the Head of the Department of Electrical and Computer Engineering (ECE) at North Carolina State University in Raleigh, NC. The successful candidate will foster and expand the strong research and educational programs that currently exist in the department and will provide the leadership and vision to become the leading public ECE department in the nation. He/She will also advance the mission of the College through the support of the interdisciplinary thrusts of the College. The new Head is expected to possess a demonstrated ability for leadership, personnel and fiscal management, administration, and effective communication with all stakeholders.

North Carolina State University was founded in 1887 as the state's first land-grant institution to provide teaching, research and extension services to the people of the state. With eight colleges and a student body of nearly 32,000, nearly two thousand faculty, and research expenditures over $330M, the University is an active and vital part of North Carolina life. The College of Engineering, composed of 910 faculty and staff in 9 academic departments, offers 18 bachelor's, 17 master's and 13 doctoral degree programs. With more than 8,000 undergraduate and graduate students, and research expenditures over $104M, the College is among the top engineering schools in the country. In 1987 the state government transferred over 700 acres of land to the University to become a new Centennial Campus. Named the "top research science park" in 2007 by the AURP, the Centennial Campus houses more than 130 companies, government agencies, and NC State research and academic units, including the Colleges of Engineering, Textiles and Veterinary Medicine.

The ECE Department has 51 tenured/tenure track faculty members, over 900 undergraduate students and over 500 graduate students. It offers programs of study leading to BS, MS and PhD degrees in Electrical Engineering and Computer Engineering. The ECE Department and the Computer Science Department offer a joint MS program in Computer Networking. The Department's graduate programs are nationally and internationally recognized. The EE graduate program is ranked 26th and the CPE graduate program is ranked 30th according to US News and World Report. Faculty in the ECE Department have received 16 NSF Career Awards, and include 20 IEEE fellows and one member of the NAE. Departmental research expenditures are projected to exceed $20M in 2009. The Department consists of seven strong research tracks: Bioelectronics Engineering, Communications and Signal Processing, Computer Architecture and Systems, Microwave, RF, Analog and Digital Circuits, Nanoelectronics and Photonics, Networking, and Power Electronics and Power Systems. The ECE faculty actively participate in strong multi-disciplinary and collaborative research with other disciplines within NC State such as biomedical engineering, textile engineering, genomics, materials science engineering, mathematics and statistics, as well as with other universities, industry, government agencies and laboratories, and with other partners in the Research Triangle area.

Research activities within the ECE Department are supported by both government and industry, including the recently awarded NSF Engineering Research Center for Future Renewable Electric Energy Delivery and Management Systems (http://www.freedm.ncsu.edu/), and other notable Centers (http://www.ece.ncsu.edu/research/centers). The Department is located in a new 210,000 sq. ft building located on Centennial Campus. Extensive shared research facilities within the department include a 9000 sq. ft. semiconductor clean room and over $15M of equipment located in the NCSU Nanofabrication Facility. In addition, ECE faculty and students pursue dynamic and multidisciplinary research activities within numerous research groups and laboratories (http://www.ece.ncsu.edu/research/labs). The Department also offers extensive student instruction laboratory facilities and computing capabilities.

Located in Research Triangle metropolitan area, Raleigh is consistently rated as one of the best places in the country for business and quality of life. It is the capital of North Carolina and is two hours from the coast and four hours from the mountains. The city boasts two opera companies, two ballet companies, two symphony orchestras, many theatrical companies, and it is a major venue for performing arts. Its school system is first rate, with many of its high schools ranked among the nation's best. The area provides for excellent research and development opportunities; it includes the Research Triangle Park (http://www.rtp.org) and is home to three major research universities with renowned medical and veterinary schools. It has one of the most diverse industrial bases in the world, including telecommunications, semiconductor electronics, computer systems and software, networking, pharmaceuticals and medical devices.

Qualifications for the position include an earned doctorate degree in Electrical/Computer Engineering or a relevant discipline; an excellent record of scholarly and educational accomplishments; a demonstrated ability to attract and manage external research funding; and strong leadership experience. The successful candidate is expected to be appointed to the rank of Professor, and to assume the departmental Head position on July 1, 2009. To ensure full consideration, applications should be received by January 1, 2009; however, applications will continue to be accepted until the position is filled. Outstanding candidates may be considered for a Distinguished University Professorship.

Candidates can obtain further information about the department at its website (http://www.ece.ncsu.edu). Specific information about the advertised position can be obtained via e-mail (ECEDeptHeadSearch@ncsu.edu). Applications should be made electronically at http://jobs.ncsu.edu (EPV# 04-29-0815). Nominations should be made via e-mail (ECEDeptHeadSearch@ncsu.edu).

N.C. State University is an equal opportunity and affirmative action employer: all qualified applicants will receive consideration for employment without regard to race, color, national origin, religion, sex, sexual orientation, age, or disability. Women and members of other underrepresented groups are especially encouraged to apply, and we welcome the opportunity to work with candidates to identify suitable employment opportunities for spouses or partners. Individuals with disabilities desiring accommodation in the application process should contact Ms. April Jackson at 919.515.9952

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For the most up-to-date news about what's happening in the ECE Department, visit our website at **http://www.ece.ncsu.edu/**

The Lone Wolf

Meet the Lone Wolf - NC State and Insight Racing's entry into the DARPA 2007 Urban Challenge.

Learn about the history behind Insight Racing, their previous entry into the DARPA Grand Challenge, and their reasons for entering the DARPA Urban Challenge.

How did the Lone Wolf fare against the stiff competition presented by other universities and corporate entrants?

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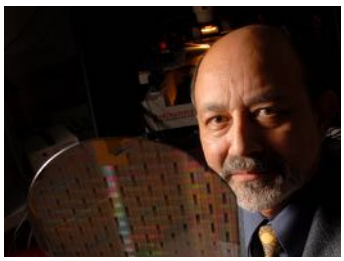

Year of Energy

In 2008, NC State University declared 2008 "The Year of Energy", in order to bring together many resources to focus on energy and the environment.

The Department of Electrical and Computer Engineering has been particularly instrumental in leading the charge during "The Year of Energy".

Key departmental contributors to the field of energy are Dr. Jay Baliga and Dr. Alex Huang.

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ATEC

The Advanced Transportation Energy Center develops fundamental and enabling technologies that will facilitate the electric power industry to actively manage and control large amounts of plug-in hybrid and electric vehicles.

The center, headed by Dr. Alex Huang, is a public-private partnership that draws initial funding from the state, Progress Energy, and Duke Energy.

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PHOTONICS

In 2008, NC State was granted membership into the Carolinas Photonics Consortium, an organization that seeks to advance the study of photonics.

Some major players in the area of photonics at NC State include Dr. Mark Johnson and Dr. Leda Lunardi.

Learn more about NC State's research efforts and university collaboration on photonics and photonic devices.

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By The Numbers

Undergraduate and Graduate Enrollment Numbers

Undergraduate program

Fall 2007

TIME	TOTAL	FR	SO	JR	SR	MR	DR
FULL-TIME	1,266	235	182	180	286	221	162
PART-TIME	263	8	8	31	82	66	68
TOTAL	1,529	243	190	211	368	287	230

Spring 2008

TIME	TOTAL	FR	SO	JR	SR	MR	DR
FULL-TIME	1,032	161	160	149	244	170	148
PART-TIME	244	1	10	30	78	74	51
TOTAL	1,276	162	170	179	322	244	199

Graduate program

Degrees conferred:

The total Graduates for ECE for 2006 = 181

PhD - 49

MS EE - 63

MS CPE - 46

MS CNE - 23

BREAKDOWN AS FOLLOWS:

Degrees Awarded

BS degrees:

EE: 188 + 13 applied for June

CPE: 129 + 6 applied for June

August 2006 (36)

PHD -14

MS EE - 16

MS CPE - 4

MS CNE - 2

December 2006 (72)

PHD - 18

MS EE - 21

MS CPE - 20

MS CNE - 13

May 2007 (73)

PHD - 17

MS EE - 26

MS CPE - 22

MS CNE – 8

College of Engineering Moves Up in U.S. News Rankings

The College of Engineering at North Carolina State University ranked 30th among the nation's engineering schools in annual rankings of graduate programs published in March by U.S. News & World Report. It was the highest ranking for the College since 2002.

The College ranked No. 34 last year.

Among public colleges of engineering, the College ranked 19th, up from 20th last year. Dr. Louis A. Martin-Vega, dean of the College of Engineering, told faculty and staff that the jump in the rankings was "the direct result of the efforts of all of you."

"You have believed in the excellence of the College," Martin-Vega said, "and you have worked together to move us closer to achieving our ultimate goal of becoming the top public college of engineering in the nation."

Among Atlantic Coast Conference schools, NC State moved up from fifth to fourth. The College edged Duke University as the top graduate engineering program in North Carolina.

The College of Engineering at NC State is among the largest in the nation with more than 7,500 undergraduate, master's and Ph.D. students enrolled. The College annually ranks among the nation's top ten in bachelor's degrees awarded, total number of engineering degrees awarded, and bachelor's degrees awarded to women and African Americans.

The Massachusetts Institute of Technology claimed the top spot in this year's rankings, followed by Stanford University and the University of California-Berkley.

US News came up with the rankings after gathering data from 192 engineering schools across the country. The magazine ranked schools based on peer and recruiter ratings, GRE scores, acceptance rates, student-to-faculty ratios, research expenditures, and other factors.

Prospective students often consider the rankings as they decide which school to attend.

Insight racing AND THE LONEWOLF

As the blazing California sun catches the shiny, blue paint of the Lotus Elise sports car, dubbed "Lone Wolf", a sense of anticipation is building. A 60-mile race is about to begin. However, this race is unlike any other. Instead of a person driving the car, all competing vehicles are autonomous. Members of the North Carolina State University-sponsored Insight Racing have followed a long path to reach this point at the Defense Advanced Research Project Agency (DARPA) sponsored Urban Challenge race.

Robotic vehicle racing team, Insight Racing is a venture of both NC State and the robotics company, Insight Technologies. Grayson Randall, Insight Racing founder, said, "The technology developed for the Urban Challenge gives us a glimpse of how driving will change in the not-too-distant future. Smart highways will be populated with smart cars, dramatically changing how we get to travel. An outstanding team effort was needed to advance to the next phase and we got it. We have an exceptional team that is comprised of faculty and students from North Carolina State University, Lotus Engineering, Inc., sponsoring companies, members of the technical community and retired business executives who bring a vast array of experience, expertise and enthusiasm to the team."

This is not the first time Insight Racing has been a part of this competition. DARPA, a section of the U.S Department of Defense, has been holding the Urban Challenge since 2004. Designed to help the Department of Defense respond to a congressional mandate to convert one third of military vehicles by 2015 from being people driven to computer-driven, Insight Racing also competed in the 2005 race. Held in the Mojave Desert that year, the team used a car that was polar opposite of the sleek Lotus sports car used today. The boxy 1987 Chevrolet Suburban was named "Desert Rat". Little interest was shown by students and sponsorship was almost non-existent, according to Walt Silva, an adjunct engineering professor in the Department of Electrical and Computer Engineering, who is also Insight's business manager. Despite the lack of interest, the team finished a respectable 12th, among 23 finalists that year.

Flash forward two years to 2007 and the allure of the new sports car has served the team well. Heads turn and people take notice as Amit Bhatia (MS '04), an engineer with Ericsson and part-time Ph.D. student, drives the car from McKimmon Center to Centenial Campus. It's certainly not an every-day sight on Western Boulevard in Raleigh to see a bright blue Lotus Elise decked out in sponsor decals. The connection between NC State and Lotus was formed at an engineering department seminar about advanced vehicles and resulted in the company offering the team a car. "We initially said no," says Silva, "because we knew the size of the [Elise] and knew the Urban Challenge would be significantly more complex."

But deciding to go with the car proved to be an excellent choice, as it attracted significantly more attention and sponsorship than the old "Desert Rat" of 2005. Lotus Engineering was also quite pleased when the partnership was finalized. "As a performance engineering company, Lotus Engineering has a legacy of integrating emerging technology into breakthrough vehicles, which is exactly what this challenge is all about. I believe that Insight Racing has assembled a winning team and Lotus Engineering is proud to be a part of the collaboration," said Don Graunstadt, CEO and president of Lotus Engineering.

The partnership was finalized and the sports car soon began its dramatic transformation from an ordinary two seat Lotus Elise to the high-tech "Lone Wolf". Packed into the tiny trunk is the brainpower of the car, consisting of 9 Apple computers and all the equipment it takes to keep them cool. Turning a black, plastic knob on the left edge of the dashboard activates this brain, and the car, with the typical rumble of a sports car engine, jumps forward as the team tests it on campus. It weaves a bit as it locates the global positioning (GPS) points it will follow. A small Hewlett-Packard laptop is attached to the passenger-side dashboard and the GPS points appear as salmon-colored columns on a map. The car drives itself using the onboard computer system and eight sensors – five on the front bumper and three on the back. More than 50 NC State students, along with alumni and volunteers spent countless hours hard at work to get the vehicle to this point. The project gave many students a chance to incorporate their work with the team into their own research. Says Walt Silva, "Many NC State students have had the opportunity to participate in this challenging problem. It has enriched their educational experience to work on a real-world problem with so many integrated disciplines needed to succeed." Some team members, such as Electrical Engineering Ph. D. student, Shep Pitts ('04, '06 MSE) were involved with the 2005 car as well. Pitts, participating this year for fun, enjoyed the opportunity to be part of such a large scale project. Because, according to him, "if you're a geek, what's more techie and geeky than this?"

Before heading to the Urban Challenge race in California, Insight Racing had the opportunity to test "Lone Wolf" at the Virginia International Raceway, located in Danville, VA. The raceway is known for

hosting a wide range of both professional and amateur racing events and includes a 3.27 mile road racing circuit composed of natural terrain. "We are happy to be able to host the tests of Lone Wolf at VIR" said Raceway General Manager Josh Lief, "but of course we're pulling for the Hokies", he added with a smile. The event was sponsored by Lotus of Durham, NC. "Lone Wolf" completed several laps of the natural terrain course with increasing speed each time. "The top speed in the Urban Challenge is 30 mph, but with a beautiful Lotus Elise at fabulous Virginia International Raceway, we couldn't resist the urge to drive the Lone Wolf fast," said Insight Racing Founder, Grayson Randall. Although the car was driverless, this did not prevent it from making a maneuver common to novice drivers on the Virginia track. Caught on video, the car managed to drive two of its tires into the grass and upon correcting this and returning to the track, promptly spun out. The incident resulted in much amusement, as the team flocked to the video camera to replay the tape.

The special car has not gone without its share of media attention. "Machine Design Magazine" featured a cover story telling the history of Randall and the Insight Racing team and the path they followed to reach the DARPA race. "Lone Wolf" has also been featured on the Discovery Channel's Daily Planet Show and a BBC Special titled "The Future."

The long road to get to the Urban Challenge has been well worth the ride. It's now fifteen minutes before the race and the Insight team has just received a two-gigabyte memory stick which contains all of the information about the route that "Lone Wolf" must complete. Speeds must not exceed 30 mph as the cars attempt to navigate unexpected roadblocks and pass through 6 check points, all while avoiding collisions. "Projects such as this DARPA Urban Challenge allow our students to take what they have learned in classes and labs and apply them to important societal challenges," said Dr. Louis Martin-Vega, dean of the College of Engineering at NC State. "We are excited that our students have this opportunity to work on such an important and relevant project that may one day save the lives of our soldiers. We are proud of this significant achievement."

Out of the 19 competing cars today, 11 teams will be chosen to advance to the finals. The stakes are extremely high, with a $2 million prize awaiting the top finisher. "Lone Wolf" is unique in the group of contenders by being both the smallest vehicle and the only sports car. NC State's team is also the only team from the Carolinas that is eligible to compete. The race begins, and the competing vehicles are off to complete the 60 mile course at the former George Air Force Base in Victorville, CA. The Lotus performs well, but unfortunately, it is not enough to advance the team to the finals.

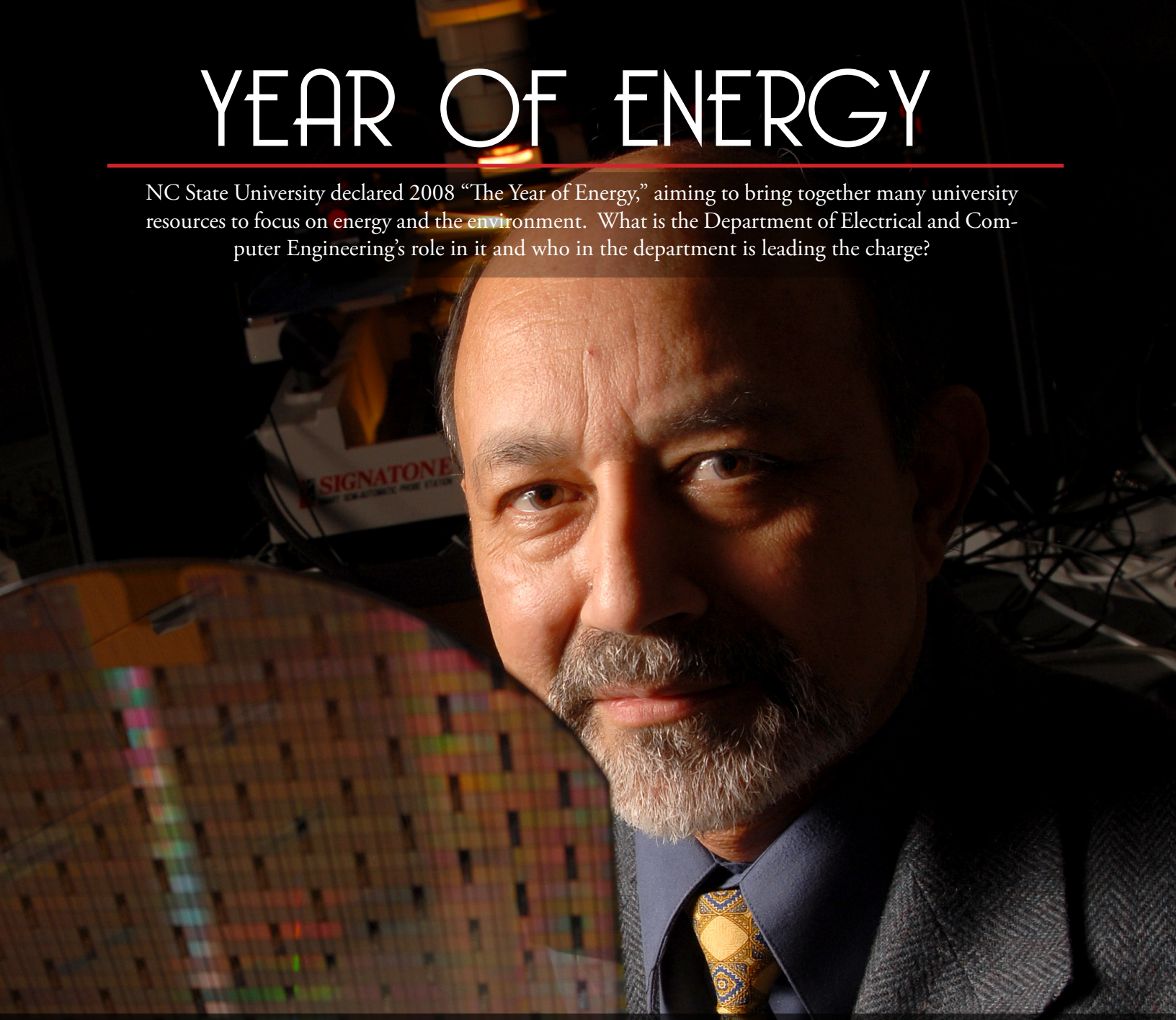
Although Insight Racing may not have come out of the Urban Challenge with a win, they can take great pride in all that they accomplished. According to the team, "The technology advances we made in preparing for the race are a huge leap forward in automotive control and sensor technology and we hope to deploy them to North Carolina's benefit. Thank you to all our sponsors and friends for your support. We couldn't have come as far without you. It has been an honor to represent you in this historic event." No doubt the whole NC State community should be proud as well.

GO PACK!

The Lone Wolf

YEAR OF ENERGY

NC State University declared 2008 "The Year of Energy," aiming to bring together many university resources to focus on energy and the environment. What is the Department of Electrical and Computer Engineering's role in it and who in the department is leading the charge?



The Department of Electrical and Computer Engineering has proven to be a big contributor in making 2008 the "Year of Energy" at North Carolina State University.

The "Year of Energy" aims to bring together many resources to focus on energy and the environment in the four key areas of action, research, education, and outreach. ECE has made particularly large strides in the area of energy research.

Highlighting the need for energy conservation in his State of NC State address in September of 2007, Chancellor James L. Oblinger emphasized, "Our state is an importer of energy at a cost of about 16 billion dollars per year. Reversing that equation—even a little bit—would be a long-term economic driver for the state. If we're going to play a lead role in that effort, we have to start on our own campus. We can provide significant leadership from NC State in this high-priority area."

The Year Begins

Kicking off the beginning of the "Year of Energy" was a celebration held on January 15, 2008, to dedicate the largest grid-tied photovoltaic solar panel array in the state. This project emphasizes NC State's strong commitment to the research and development of renewable and alternative energy sources. The array, located on NC State's property near the RBC Center, is special in that it produces electricity that goes on to Progress Energy's grid. Normally, most solar arrays only produce electricity for a specific light or building. "This array will produce enough electricity for seven or eight typical houses," said NC State professor Dr. Bill Winner, who also coordinates activities for the Energy Council at NCSU. "The value of the array is more than the electricity it produces, and includes NC State's partnerships with financial institutions,

non-profit organizations and contractors that build these kinds of facilities." He continued, "There's a lot of value in taking that first step toward engaging partners and rethinking ways to provide alternative energy sources for people in North Carolina. It's really panned out in an interesting way that's emblematic of all the strengths this university brings forward."

In continuing with inaugural "Year of Energy" festivities, an Energy Fair followed the dedication. Held on The Brickyard on North Campus in front of D.H. Hill Library, the fair was designed to focus student thinking on the "Year of Energy" by making them more aware of the ways in which energy is used. The fair was the first of a semester long series of events focused on raising awareness of issues surrounding energy usage and consumption. "I don't know of other universities that have such an event like the Energy Fair, so we are very proud of it," said Dr. Winner.

Attendees of the fair were given the opportunity to obtain free compact fluorescent light bulbs, which last 10 times longer and use 75% less energy than a traditional incandescent bulb. Encouraging students to swap the incandescent lighting with the compact fluorescent bulbs served as a good reminder that even the most basic steps can help with energy conservation. Down the road, LED lighting should become available, which is even more efficient than fluorescent lighting.

Students passing through the fair also had the opportunity to sign the university's "Contract with the Environment", developed by two student organizations – the Wolfpack Environmental Student Association and the Campus Environmental Sustainability Team. Commenting on the contract, Dr. Winner said "By simply signing the contract, students can make a pledge to live, think and engage others on energy issues while promoting conservation and sustainable energy use on campus."

Finally, with gas prices rising on a consistent basis, several Energy Fair exhibitors highlighted an issue in the front of many people's minds by giving them the chance to get an up-close look at hybrid vehicles. Exhibits included plug-in cars and buses that had been modified to run for long distances almost solely on battery power.

"Over the next 50 years, the issues of energy are going to become more complex and more difficult to solve," Dr. Winner said. "We must step up our efforts to expose students, staff and faculty members to the pressing need to rethink the way energy is produced, distributed and used." The Energy Fair served as a perfect start to do just that.

ECE Makes a Difference

Two notable professors in the Department of Electrical and Computer Engineering have made great advances in the work of energy conservation and alternative energy. They are Dr. Jayant Baliga and Dr. Alex Huang.

Dr. Baliga's first major discovery came in 1980, when he invented the insulated-gate bipolar transistor (IGBT). This semiconductor device, which controls the flow of power from the source of energy to the device needing the energy, launched a revolution by improving the energy efficiency by more than 40% in a wide variety of products including cars, refrigerators, cardiac defibrillators, and light bulbs. The use of IGBTs has saved an estimated total 100 gigawatts of power. This translates to a huge reduction in carbon dioxide emissions equaling almost 1 trillion pounds per year.

Statistically speaking, this is enormous. Carbon Footprint, a group based in the United Kingdom, estimates that the average American either directly or indirectly releases 44,000 pounds of carbon dioxide per year into the atmosphere. Dr. Baliga's power saving invention offsets the impact of more than 22 ½ million Americans each year.

Now the director of NC State's Power Semiconductor Research Center, Dr. Baliga has one-upped his original invention. He has created a semiconductor made of silicon carbide that is significantly more efficient than the IGBT. The concept for his new invention came to him shortly after inventing the IGBT, but due to limitations in materials science at the time, he was prevented from adequate experimentation.

This ultimately led Dr. Baliga to join the faculty at NCSU in 1988. By 1991, he had proved his new concept could work, which led to a significant boost in research funding in this area throughout the world. "The worldwide acknowledgement of the importance of the idea was apparent from the initiation of major research programs in the US, Europe and Japan in the 1990s," said Dr. Baliga. "I am very pleased to see that many companies have launched products within the last five years making the technology available to consumers." This semiconductor is now starting to gain extensive acceptance in many consumer products.

In addition to his two other inventions, in 2004, Dr. Baliga created a silicon semiconductor which makes the power supply to computer microprocessors more efficient. This product is now seeing commercial success and has been embraced by many computer manufactures.

Dr. Alex Huang, the Progress Energy Distinguished Professor in ECE, is another faculty member who is accomplishing much in the areas of research and development. Huang directs the Semiconductor Power Electronics Center (SPEC), which is a research group studying ways to boost the capacity of existing power grids and how to integrate them

with renewable energy sources including wind and solar power. "For a university to do experimental research in this area is not easy, and NC State is a leader in this area," said Huang.

Dr. Huang's work focuses mainly on power electronics, which is the technology that converts electricity into a form that consumers can use or that can be integrated into the power grid. The technology has the ability to help grids to carry more power so that utility companies can get the most out of their existing infrastructure.

The work that Dr. Huang and the researchers at SPEC are doing prompted a visit from United States Secretary of Energy, Samuel Bodman in October of 2007. SPEC was established as an NC State center of excellence with vertically integrated research programs in several major areas that relate to energy and power. Programs include research on technologies to extend battery life and ways to power next generation microprocessors, as well as research on technologies to prevent the next major blackout. The center also studies new renewable energy sources including wind, wave, and solar power and their integration into the power grid as well as fundamental technologies that will enable faster power electronics systems based on new processes and materials. In addition, innovative methods to distribute power and protect power systems from damage and failure are being investigated.

During his visit, Secretary Bodman toured the SPEC lab where he was given an introduction to some of the important technologies the center is working to develop. These include the Emitter Turn-off (ETO) thyristor, triggered by light, and SiC high voltage devices. Most of the funding for these developments was provided by the Department of Energy's "Energy Storage Program." He also participated in a roundtable that featured state and industry leaders in addition to making a presentation to students about U.S. energy programs and policy.

While on campus, Secretary Bodman also had a chance to learn about the photovoltaic solar panel that was dedicated to kick off the "Year of Energy". Commenting on the array he said, "The project has brought together university researchers with local businesses and utilities and is supported by federal funds. I hope it will serve as a model for future renewable energy projects."

In addition to his activities with SPEC, Dr. Huang is also involved with the new Advanced Transportation Energy Center, which will be opened in February 2009 on Centennial Campus. Governor Mike Easley announced the creation of the center, which will conduct research on advancing more widespread use of plug-in hybrid vehicles. Huang and his team are looking to develop electronics for vehicles that operate at higher temperatures and investigating ways to manage power grids that are currently not accustomed to volumes of charging and discharging cars. "This is a totally new challenge and new opportunity," Huang said. "And you need power electronics and information technology to manage it."

Overall, NC State's "Year of Energy" has proven very successful in raising awareness on campus of critical issues regarding the consumption and usage of energy. Great strides are continually being made by devoted students and faculty members who spend countless hours working in areas related to energy conservation and preservation. In the words of Dr. Bill Winner, "NC State as a community is raising the bar and engaging the issues of energy and the critical need we have as an institution to connect our activities with those off campus to care out a brighter future for North Carolina. The Year of Energy highlights that commitment." Without a doubt, the research which is being done and the new technologies that ECE is working to develop will have a far-reaching impact down the road, not only for the state of North Carolina, but for the rest of the world as well.

For more information on NC State's Year of Energy, please visit:

http://energy.ncsu.edu/

Dr. Huang (2nd from left); Bodman (Center)

ATEC Advanced Transportation Energy Center

A new facility will be opened on Centennial Campus thanks to funding from Duke Energy, Progress Energy and the state of North Carolina. Governor Mike Easley announced that NCSU will soon be home to the Advanced Transportation Energy Center (ATEC). The university was chosen due to its tradition of excellence in electrical engineering. Initially, the center will focus on ways to improve the performance of electric cars that contain plug-in batteries. This is a challenge that researchers are eager to meet.

Dr. Alex Huang, ECE professor and director of the university's Semiconductor Power Electronics Center, says that a main component of cell phones proves to be a good example of one of the major difficulties of alternative-energy cars. The typical cell phone of today runs on a rechargeable lithium ion (often called Li-ion) battery. These batteries are based on lithium ions that move between an anode and a cathode when in use. While charging, this process is reversed. These types of batteries are a fairly clean source of power, so some supporters of alternative-energy vehicles have suggested using them. Since lithium ion batteries are used primarily in small electronic devices, the power they produce is in proportion to their size, points out Dr. Huang. This translates to an immense car, with almost no room for cargo or passengers. A large battery size means a cost in excess of $100,000. While lithium-ion technology proves to be an interesting idea for alternative power sources for cars, current Li-ion batteries are too weak and too expensive to become a feasible option. Perhaps in the future, ATEC will develop new innovations that make this a viable option for powering "green" cars.

ATEC
ADVANCED TRANSPORTATION ENERGY CENTER

Dr. Huang will work very closely with ATEC once it opens. Among the first plans for the new center will be work on an affordable battery for electric cars, which would recharge from ordinary electrical outlets found in all homes. At present time, the batteries cost over $10,000. This makes it very difficult for the average American driver to afford. If the cost could be brought down, and the efficiency up, this would allow the batteries to become more widely available, helping to lessen US dependence on oil. Within the next five years, the center hopes to develop a prototype that will go up to 40 miles before needing to be recharged. They will then work to increase the range to 100 miles.

Dr. Huang views this center as a wonderful opportunity to combine the many talents of leaders in the car and utility industries as well as researchers at the university. The center will also be funded by grants that NC State has applied for from the Department of Energy. Combined with the other funding from Duke Energy and Progress Energy, the grants will allow the center to begin their important work for the future of "green" cars and our environment.

For more information please visit:
http://www.atec.ncsu.edu

Photonics

North Carolina Universities Work Together to Advance Photonics Research

North Carolina State University recently became a member of the Carolinas Photonics Consortium (CPC), a group of North and South Carolina schools working together to advance the study of photonics. NC State joined UNC Charlotte, Western Carolina University, Clemson University and Duke University in the signing of the CPC Inter-Institutional Agreement in June of 2007. The consortium hopes to turn the state of North Carolina into one of the premier locations for photonics technologies. With over $300M invested from both state and federal funds, CPC is now the largest concentration of photonics-based resources in the country and is primarily focused on providing funding for research projects and business startups in the region.

"There is a classic gap between transformative research and realization of the commercial opportunity. CPC provides a bridge to move technology to the marketplace by engaging world class collaboration of universities and providing some important seed money to get the commercialization process started," said Jeff Conley, Interim Director for CPC.

The five consortium members were chosen due to their nationally respected programs in photonics. Located at UNC Charlotte, The Center for Optoelectronics and Optical Communications has core competence in micro-optics and modeling of optical systems. The Center for Rapid Product Realization at Western Carolina University provides prototyping, testing and design expertise for new products. At Duke, The Fitzpatrick Institute for Photonics researches biophotonics, nano and micro systems, nanophotonics, and quantum optics and information. Clemson's Center for Optical Materials Science and Engineering Technologies focuses on the development of novel optical materials. NC State's strong contribution comes in the form of programs that study photonic devices, optoelectronic and semiconductor materials, and information technology.

"The Carolinas Photonics Consortium has been very active in involving researchers across the five campuses and has moved quickly in establishing a strong collaboration. The region will see significant new business creation as a result of CPC," notes Sarah Smith, Director of Sponsored Programs for the University of North Carolina General Administration.

Used in a wide variety of everyday products including: medical and dental surgeries, dash board lighting, missile guidance, long distance communication, DVD players, and garage door sensors, photonics-based technologies improve the everyday lives of many people. Many recent advances have been made, including high intensity lighting, biochemical detection, high powered lasers for manufacturing needs, and early cancer detection.

In an effort to continue these advances, in August of 2007, a project proposal program was started in order to provide seed funding for one photonics-based project on each of the five campuses. The goal of the program is to identify top commercial prospects and provide initial funding to help to move the concepts towards commercialization. Each award consists of $10,000 as well as business and market development support from the Technology, Entrepreneurship and Commercialization at NC State's College of Management. A total of twenty-eight proposals were submitted.

Lunardi

"The Carolinas Photonics Consortium has the largest concentration of photonics-based resources in the country, so we all knew that there were ideas ready for market consideration. However, the receipt of 28 proposals for early stage money was unexpected," said Conley. "Not only do we have great researchers and great capabilities, but we have lots of opportunities for company creation in our region," he said. "Very few people outside of the industry understand how broadly photonics (light-based) technologies are used to improve our lives. These proposals were outstanding examples of how light can be used to solve problems and create opportunities for the Carolinas."

Project proposals spanned a wide variety of technologies and markets. Market needs in medical, imaging, textile, lighting, biotech, chemical/biological detection, wireless and telecommunications, customized products for an aging population, food quality and infant care were addressed in the broad range of proposals. The technologies that were described were in a variety of stages, ranging from early stage discoveries to later stage applications which were already utilizing existing patents and capital equipment.

"By mutual collaboration amongst the five campuses, our strategy intends to serve as a conduit from research to commercializing photonics technologies. Usually academic researchers spend too much time trying to find the right opportunity for funding ideas that have already proven to work.", says Dr. Leda Lunardi, Professor of Electrical and Computer Engineering and NC State's Campus Director for the photonics initiative. "The proposal program helps to eliminate the work to find the funding."

The 28 proposals were narrowed down to five by the CPC Advisory Committee, which met on November 12, 2007. The ten member committee consists of one member from each of the five schools in the consortium, as well as five regional or national members representing early stage investments, regional economic development and photonics technologies.

NC State's winning proposal was submitted by Dr. Mark Johnson and titled "Integrated Cooling Device for High-Power Semiconductor Lasers." It deals with removing heat from semiconductors, which is a major issue that causes inefficiencies and additional cost in existing light emitting devices which are used in numerous markets.

According to Dr. Lunardi, "NC State has internationally recognized research in photonic devices, optoelectronic and semiconductor materials and information technology as well. In addition, the Technology Entrepreneurship and Commercialization (TEC) program has been supporting commercialization to domestic and international markets for the last 13 years. At least one proposal from NC State will be funded in Phase I. In fact, NC State is the only campus being represented twofold: by the submitted proposals from different departments and through the TEC program, which will be training all campuses' researchers with the technology migration."

The leaders of the Consortium believe that the proposal funding will bring 2 to 4 new businesses each year to North Carolina, helping to create new high-tech jobs. In addition to the focus on research and development, CPC is also working to bring leading experts in the field of photonics to conduct workshops and seminars for the member universities as well as for industry leaders.

An effort is also being made to bend a portion of the research toward educational applications. CPC continues to expand as well, with Eastern Carolina University joining the group in 2008. Through the efforts that CPC is making in these important areas, they are helping to position the state of North Carolina as a global leader in the photonics field for many years to come.

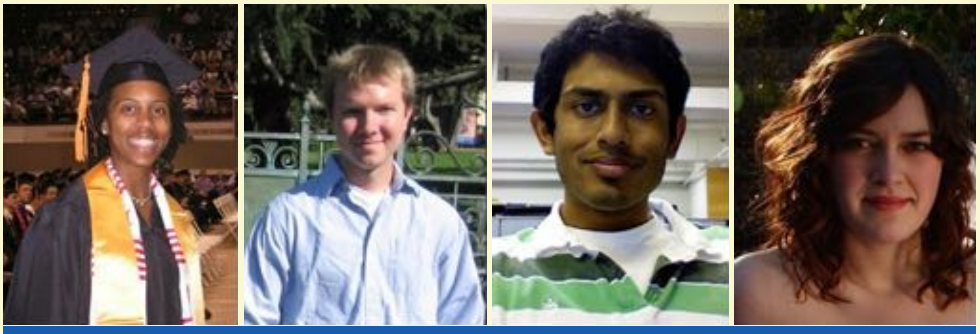
Undergraduate News

ECE Students Win Graduate Research Fellowship

Joy Johnson, Amit Lakhani, and Erin Summers, students of the Department of Electrical and Computer Engineering, were selected as recipients of the National Science Foundation's Graduate Research Fellowship. In total, 18 NC State students received the award.

ECE student Frank Myers received Honorable Mention recognition.

The National Science Foundation's Graduate Research Fellowship pays for a graduate education for students that demonstrate exceptional potential in the fields of science and engineering. The three-year award includes a $30,000/year stipend and covers all associated student fees such as tuition, fees, and health insurance.



Joy Johnson | Frank Myers | Amit Lakhani | Erin Summers

Ryan Going Receives Award from Astronaut Scholarship Foundation

Ryan Going, a senior in the Electrical and Computer Engineering department, was presented a $10,000 scholarship award from Robert Crippen - an astronaut who piloted the first space shuttle flight in 1981 - on behalf of the Astronaut Scholarship Foundation.

Crippen presented Going, a dual major in electrical engineering and applied mathematics, and Adam Young, a biomedical engineering major, the scholarships during a ceremony on October 4th, 2007.

"These scholarships are a way for me and my fellow astronauts to give back to a country that provided us with an extraordinary opportunity," Crippen said. "Adam and Ryan will both be leading the United States at the edge of breakthrough technology and I consider it an honor to be presenting them with these checks."

The Astronaut Scholarship Foundation's goal is to aid the United States in retaining its world leadership in science and technology by providing scholarships for exceptional college students pursuing degrees in engineering and the natural and applied sciences. The foundation annually funds 19 scholarships and has awarded nearly $2.5 million in scholarships to 226 students nationwide.

Schinke to Receive Collier Scholarship for 2008-2009

Daniel Schinke, a student athlete in Electrical and Computer Engineering since August 2006, received the Jerry Collier Scholarship for the 2008-2009 school year.

Schinke

Daniel has managed to strike a balance between his coursework and physical activities, excelling as a member of the NCSU men's tennis team and being named on the ACC Honor Roll for his efforts in the classroom.

The Jerry J. Collier Scholarship provides funding to an entering graduate student who was a varsity undergraduate athlete at NC State University. Schinke will receive a $6000 annual stipend for an academic year, with the potential of renewal for one additional year.

Energy organization becomes a bright light for minority students

An organization of black energy professionals is reaching out to increase minorities in the fields of science and math.

The N.C. American Association of Blacks in Energy keeps in touch with young scholars beyond the ceremonial grasp-shake-grin snapshots of plaque and scholarship awards.

Of the group's six 2007 NCAABE scholarship winners, two went on to win regional and national honors. Four winners were among the 100 young scholars who attended the third annual NCAABE Youth-Day, "Powering Your Future," at the Progress Energy building in downtown Raleigh.

"Energy is a very unique industry," said Pamela Hoyles, NCAABE vice president and a PSNC Energy operations assistant. "This is a way to keep the pipeline going because we're drying up. We don't have that many blacks in key positions in the energy field, from engineers to executive vice presidents. It is important for us to have a seat at the policy-making table when energy issues are being discussed."

Hoyles believes the NCAABE "hit a home run last year" when local scholarship winner James Hill won a regional award, and Lamar Hill (no relation to James Hill) won national honors.

Lamar Hill, of Efland, said the NCAABE initiatives "bull's-eyed" his passion for engineering and energy. The conference boosts chances for success, he said, with insightful discussions and presenters whose expertise enhances textbook education. "It's a good networking opportunity, too," said Hill, a computer engineering major at N.C. State.

Guidance counselor Sharon Peele considers the NCAABE's outreach a godsend for students at Weldon High in Weldon, N.C.

"We have such limited opportunities in our area for students to enrich themselves," she said. "This is an opportunity no one should pass up."

Jessica Rogers of Greensboro and William "Zack" Credle of Windsor, N.C., seized the opportunity, and each won a $1,500 NCAABE scholarship. They attend NCSU. "It's always good to have an organization of minorities working to get more minorities into their field," said Rogers, 18, who is majoring in paper science and engineering, and chemical engineering. "It's a good way to mentor someone; to show us the way to a career or show us what to do in different professional situations."

Credle, 18, notes a mutual benefit of sitting alongside other black students with similar academic interests, soaking in tools gleaned from the experiences and the advice of professionals who also look like them.

"They're helping us and, at the same time, we're helping them," said Credle, a freshman majoring in electrical and computer engineering. "We see them, we see ourselves."

NC State's Eta Kappa Nu Chapter recipient of HKN Outstanding Chapter Award

The Beta Eta Chapter of Eta Kappa Nu at NC

HKN received award from Dr. Trew

State University received the Eta Kappa Nu Outstanding Chapter Award for 2006-2007. This coveted award is a mark of great distinction for a college chapter. Chapters are judged on their activities of service to others, and all chapters with exemplary programs have an equal chance to win.

Because of the great significance associated with the OCA, the award plaque for Beta Eta Chapter was formally announced and presented at the ECE Department Head Association Annual Meeting Award banquet.

Centennial Campus

AURP Names Centennial Campus 2007 Top Research Science Park

Centennial CampusThe Association of University Research Parks (AURP) named Centennial Campus at North Carolina State University as the year's Outstanding Research Science Park at the recent AURP 2007 Annual Awards Luncheon in St. Louis. Centennial Campus was selected from among finalists that included bwtech@UMBC Research and Technology Park in Baltimore, Maryland, and Sandia Science and Technology Park in Albuquerque, New Mexico. The Awards Luncheon was sponsored by Alexandria Real Estate Equities, Inc.

AURP cited Centennial Campus for their accomplishments in innovation and technology partnership creation for economic development.

Over 250 executives representing leading research science parks from around the world were in attendance at the annual conference and awards presentation. The conference was addressed by Sandy Baruah, the Assistant Secretary of the U.S. Department of Commerce, Economic Development Administration, and by Dr. Walt Plosila and Marianne Clarke of the Battelle Technology Partnership Practice, among others. Plosila and Clarke outlined AURP-Battelle's recent study quantifying the contribution made by research science parks to economic competitiveness.

"We are very honored to be the recipient of the AURP 2007 Outstanding Science Research Park Award. Centennial Campus is based on a "knowledge enterprise zone, which creates synergy leading to innovation and transfer, and improved quality of life for North Carolina and beyond," said Dr. David Winwood, Associate Vice Chancellor, North Carolina State University, in accepting the award for Centennial Campus.

"I congratulate Centennial Campus on their meaningful work on fostering innovation and partnership creation," said AURP President Mike Bowman. "Centennial Campus exemplifies the new model of research science parks, in which strategically planned mixed-use campus expansions create innovation, partnerships, and a high quality of life for their community and the nation," he added.

The Association of University Research Parks (AURP) exists to foster the development of research science parks. Science parks create innovation, commercialization and economic competitiveness through collaboration among universities, industry and government.

Graduate Awards

ECE student receives multiple IEEE Globecom awards

Ioannis Papapanagiotou, a PhD student working with Dr. Michael Devetsikiotis, received the Best Paper Award, the IEEE Travel Grant Award, and also won the Trivia Contest for the 50th anniversary of the IEEE Communication Society, all at IEEE's flagship telecom conference, IEEE Globecom 2007.


Papapanagiotou

A joint research work of Dr. Michael Devetsikiotis and Ioannis Papapanagiotou of the ECE Department, together with VTT National Research Institute of Finland and the University of Patras, Greece, won the Performance Modeling QoS and Reliability Symposium Best Paper Award for their paper entitled "Extensions and Comparison of QoS Enabled WiFi Models in the Presence of Errors". In a separate competition, Ioannis also received the IEEE Travel Grant, an award won only by the 20% of the students applying for it. And on the last day of the conference, he received news that he had also won thed 50th anniversary Trivia Contest.

The IEEE Communications Society has marked the 50th Anniversary of its annual IEEE Global Telecommunications Conference (IEEE GLOBECOM 2007) in Washington, DC, from 26 to 30 November. The flagship conference has spanned the entire range of communications technologies, offering in-depth information on the latest developments in voice, data, image, and multimedia.

President George Bush extended his personal congratulations to IEEE GLOBECOM 2007 on its upcoming 50th anniversary celebration, citing the conference for its international achievement in the "development and advancement of global communications" as well as "promoting achievement and innovation in technology and engineering." President Bush declared the week of 26 November 2007 the IEEE Global Communications Week.

Hongyuan Zhang awarded Graduate School Dissertation Award

Hongyuan Zhang of the ECE Department was awarded the 2007 North Carolina State University Graduate School Dissertation Award. This prestigious award is sponsored by the NC State Graduate School and is designed to reward outstanding scholarly research that has a positive impact on both the North Carolina economy and the quality of life for all its citizens. There is only one university-level Dissertation Award.

The award program was established in honor of the late Nancy G. Pollock, who served as Thesis Editor for the NC State Graduate School for over 30 years. During her long career in the Graduate School, Ms. Pollock reviewed over 18,000 theses and dissertations to ensure that they met the high standards set by the graduate faculty at NC State.

As the university-level winner, an award check in the amount of $1000 was presented to Zhang and he was recognized at the Annual North Carolina State University Fellowship Recognition Dinner.

Best Student Paper Award in ACM MobiCom 2007

Han Cai, a PhD Student working with Dr. Do Young Eun (Assistant Professor in the Dept. of ECE), received the Best Student Paper Award in ACM MobiCom 2007, the Thirteenth Annual International Conference on Mobile Computing and Networking, held in Montreal, Canada, between Sept. 9 -- Sept. 14. ACM MobiCom is the premier conference in the area of mobile networking and highly selective; this year only 26 regular papers were accepted out of 233 submissions.

The selection of the best student paper was done in two stages. First, a TPC sub-committee consisting of Farooq Anjum, Suman Banerjee, Sneha Kasera, Ben Liang and Mehul Motani short-listed candidate papers from among all full papers whose primary author was a student. These papers were reviewed in more detail, and discussed, after which consensus was reached on the winning paper, "Crossing Over the Bounded Domain: From Exponential To Power-law Inter-meeting Time in MANET," by Han Cai and Do Young Eun from North Carolina State University.

ECE Students Recipients of University Fellowships

Eric Wyers, a doctoral student in Electrical Engineering at NC State, was selected to be the recipient of a 2008-2009 NC State University Provost Fellowship. Jim Simpson, also a doctoral student in Electrical Engineering at NC State, has been selected to be the recipient of a 2008-2009 NC State University Graduate Research Fellowship.

Provost's Fellowships and University Graduate Research Fellowships are one-year awards that provide competitive recruiting supplements for outstanding new doctoral students. In addition to the financial award, Fellows will be supported and nurtured through interdisciplinary learning and leadership development opportunities. Prospective students cannot apply directly for these fellowships, but are nominated by their respective graduate programs.

Each doctoral program has been allocated two $4,000 Provost's Fellowships, as well as one $5,000 University Graduate Research Fellowship.


Wyers

The $4,000 supplements are used to recruit new doctoral students who will enroll beginning in the upcoming academic year. These awards must are used as a supplement to a standard departmental/ program Teaching Assistantship, Research Assistantship, or Fellowship/Traineeship.

The $5,000 supplement is used to recruit a new doctoral

student who will enroll beginning in the upcoming academic year, and who will be appointed to a Research Assistantship.

ECE Doctorate Student Carlos Cela to meet with Nobel Laureates

This July, forty-nine graduate research students from across the world attended the 57th Lindau Meeting of the Nobel Laureates and Students in Lindau, Germany. Among these students was Carlos Cela, a doctoral student in NC State's ECE department, who had been selected by the Department of Energy Office of Science (DOE-SC) to attend the meeting.

Started in 1951 by Count Lennart Bernadotte, the Lindau Meeting of the Nobel Laureates was established to allow for informal forums and meetings between the laureates and hundreds of young researchers and students from around the world.

Cela

At the meeting, the laureates lectured on topics of their choice during the mornings as well as participate in informal discussions with small groups of students during the afternoons and evenings.

Mr. Cela was a member of a delegation that included students supported by the Mathematical and Physical Sciences Directorate of the National Science Foundation, the Office of Science of the Department of Energy, the Oak Ridge Associated Universities, Mars, Incorporated, and the Graduate Partnerships Program of the National Institutes of Health.

Doctorate students Brandon Cochenour and William Cox awarded American Society for Engineering Education Fellowships.

Brandon Cochenour was awarded the Science, Mathematics, and Research for Transformation (SMART) Scholarship.

Brandon is currently an Electrical Engineer with the Department of Defense, and has been employed by the Navy at the Patuxent River Naval Air Station since 2004. There, he has been involved in the research and development of next generation laser-radar systems using novel RF-photonic techniques for laser imaging and communication systems underwater. In 2006, he was awarded first place in the graduate student poster/paper competition at the IEEE Ocean Engineering Society conference for his work in underwater optical communications. He was awarded as a Top Navy Scientist and Engineer of the Year in the Emerging Investigator category, which was presented by the Assistant Secretary of the Navy for R&D in 2007.

Cochenour

Under the SMART fellowship, Brandon will pursue PhD studies in Electrical Engineering this Fall at North Carolina State University, where he plans to focus on optical communications and RF-photonics. He received his B.S. in Electrical Engineering from Lafayette College in Easton, PA (2003), and an M.S. in Electrical Engineering from Johns Hopkins University in Baltimore, MD (2008).

Cox

The SMART fellowship is a highly competitive program established by the Department of Defense (DoD) to support undergraduate and graduate studies in the Science and Engineering disciplines in return for future service in a DoD laboratory. This year, approximately 200 scientists and engineers received the SMART award out of over 2,000 applicants.

William Cox was awarded the National Defense Science and Engineering Graduate (NDSEG) Fellowship.

William earned his BS and MS degree in Electrical Engineering from North Carolina State University in 2006 and 2007 respectively. He is currently pursuing his PhD in Electrical Engineering at NC State University under the direction of Dr. John Muth, in the area of underwater freespace optical communications. He is a founding member of the Underwater Robotics Club and writes about robotics at GoRobotics.net.

The NDSEG fellowship was created as a means of increasing the number of U.S. citizens and nationals trained in science and engineering disciplines of military importance. The Department of Defense (DoD) plans to award approximately 200 new three-year graduate fellowships in April 2009. The DoD will offer these fellowships to individuals who have demonstrated ability and special aptitude for advanced training in science and engineering.

Founded in 1893, the American Society for Engineering Education is a nonprofit organization of individuals and institutions committed to furthering education in engineering and engineering technology.

Jason Poovey Receives Outstanding TA Award

Jason Poovey, a Graduate Student in the ECE Department, won a University GSA Outstanding TA Award. Poovey was one of five winners of the award, competing with 98 other teaching assistants campus-wide. The ECE department had a total of six TAs nominated for the award.

Teaching assistants are evaluated for the University GSA Outstanding TA Award based on their assignments, responsibilities, performance, and student interaction.

Poovey has been a member of the University Honors Governing Board and the TINKER Research Group, as well as a recipient of a Outstanding Electrical and Computer Engineering Senior Award.

For up-to-date ECE news, please visit:

http://www.ece.ncsu.edu/news/

Faculty News and Awards

Huang named Progress Energy Distinguished Professor

Dr. Alex Huang was named the new Progress Energy Distinguished Professor in Electrical and Computer Engineering at North Carolina State University.


Huang

The endowed professorship was established as part of Progress Energy's $1.2 million gift to the College of Engineering. The gift, announced in 2006, is the largest in the history of the Progress Energy Foundation.

"This is a wonderful and well-deserved honor for an outstanding member of our faculty," said Dr. Louis A. Martin-Vega, dean of the College of Engineering. "We are grateful to Progress Energy for their generous gift and their longstanding interest in engineering education and research at NC State."

Lazzi Elected Editor-in-Chief of IEEE Journal

Dr. Gianluca Lazzi, professor of electrical and computer engineering at North Carolina State University, has been elected editor-in-chief of the journal, IEEE Antennas and Wireless Propagation Letters. His three-year term begins in January 2008. The journal features new research results and technical developments in the areas of antennas and wireless propagation.

Lazzi is internationally known for his groundbreaking work in bioelectromagnetics and retinal prosthetics. He received his Ph.D. in electrical engineering from the University of Utah in 1998. He joined the NC State faculty in 1999.

Devetsikiotis named IEEE Distinguished Lecturer

Dr. Michael Devetsikiotis has recently been named a ComSoc Distinguished Lecturer for 2008-2009 by the IEEE Communication Society. Dr. Devetsikiotis was chosen based on the strength of his references, his oratorical reputation, and his expert knowledge of the subject matter. He will cooperate in the planning phase of Distinguished Lecturer tours and may be asked to participate in as many as two tours per year.


Lazzi

The Distinguished Lecturer Program provides ComSoc chapters around the world talks with experts on topics of interest and importance to the ComSoc community. All distinguished lecturers are outstanding in their fields of specialty. Collectively, the Distinguished Lecturers possess a broad range of expertise within the area of Communications.

Ozturk Receives Undergraduate Advising Award

Dr. Hatice Ozturk was selected to receive NC State's George H. Blessis Undergraduate Advising Award. News of this award was conveyed to Dr. Ozturk by Dr. Richard F. Keltie, Associate Dean for Academic Affairs.


Devetsikiotis

Dean Keltie reported that the selection committee consisted of faculty colleagues as well as students and all were impressed with her dedication to student success as demonstrated through her advising activities.

The George H. Blessis Outstanding Undergraduate Advisor Award recognizes faculty members who consistently and willingly give their time and efforts to advising, counseling, and mentoring students and assisting student groups. The students they have reached have, to a large extent, helped establish the reputation of NC State as a major university and a center of excellence in teaching and research. This award is also a continuing memorial to George H. Blessis, whose interest in undergraduate education and advising serves as an example to many faculty members. Candidates are nominated by departments and selected by the COE Teaching and Advising Awards Committee. The award is made in the amount of $1000.


Ozturk

Cecilia Townsend, coordinator of Undergrad, won the award in 2006 for her undergraduate advising efforts in the ECE Department.

Krim, Lazzi Honored by IEEE

Two NC State University engineering professors in the ECE Department have been named IEEE Fellows, honors bestowed on researchers with "an extraordinary record of accomplishments."

Those receiving this honor are Dr. Hamid Krim and Dr. Gianluca Lazzi.

The IEEE is a professional association for the advancement of technology that was formed in 1963 after the merger of the American Institute of Electrical Engineers and the Institute of Radio Engineers. Its name was originally an acronym for the Institute of Electrical and Electronics Engineers, but its scope has expanded into so many related fields that it is simply known as "IEEE."

Krim was honored for his contributions to "statistical signal processing, multiscale analysis, estimation and detection, and image analysis." He is known for his studies in communication and signal processing, including adaptive signal processing, image analysis, computer vision, digital communications, digital signal processing and multidimensional signal processing. He was an original contributor to, and is now an affiliate of, the Center for Imaging Science sponsored by the US Army. His current research through

VISSTA involves statistical signal and image analysis and mathematical modeling with a keen emphasis on applied problems.

Krim received his PhD in electrical engineering from Northeastern University in 1991. In 1998, he joined the faculty at NC State. He serves as an associate editor of IEEE Transactions on Signal Processing and was a lead organizer of several IEEE conferences and workshops.

Lazzi was honored for his contributions to "bioelectromagnetics and implantable devices." He is known for his research in implantable microantennas, neural stimulation, biomedical electromagnetics, antennas for wireless, and multiple and vector antenna systems. He is also a collaborator on a national research project that aims to create a "safe and efficient artificial retina" which would restore partial vision to millions affected by blindness caused by disorders of the retina. His current research focuses on bioelectromagnetics, wireless microsystems, wireless electromagnetics and computational electromagnetics.


Krim

Lazzi received his PhD in electrical engineering from the University of Utah in 1998. He joined the faculty of NC State in 1999 and was honored with the 2006 IEEE Wheeler Award.

ECE Professor Seeks Google Lunar X Prize

Dr. William Edmonson, Associate Professor of Electrical and Computer Engineering at NC State University, along with other members of Team STELLAR are taking aim at Google's Lunar X Prize by landing a privately-owned spacecraft on the moon.


Edmonson

Team STELLAR, which stands for Space Technology for Exploration, Lunar Landing, and Roving, was formed in October of 2007 by the leadership of several organizations that have been working together on various other projects for over two years. These organizations included Insight Technologies, The Advanced Vehicle Research Center, several key NC State University faculty members, as well as the NCSU Mechanical Aerospace and Engineering Department.

The X Prize Foundation, the organization that is offering the $30 million prize for the competition, imagines a time when the moon would be used to collect solar energy via solar panels and power the cities of Earth.

They also see the potential for a launch pad being established on the moon that would be used as a central location of exploration into the further reaches of space.

The Rover they will create for the competition will utilize a proprietary design. It will be fitted into a Landing vehicle, which will be fitted into a transfer vehicle, to be integrated into the payload of a launch vehicle. In addition, one of the partners in Team STELLAR, an NSF I/UCRC called the Advanced Space Technology for Research and Engineering Center (ASTREC) is interested in supporting the establishment of a communication satellite network in lunar orbit to support this and other missions. NCSU students will also be given to opportunity to give a hand with this big project, however there are other tasks that will require outsourcing to private companies.

The idea of a prize for reaching air and space travel breakthroughs is hardly new. A prime example of such a contest is the first nonstop flight from New York to Paris in 1927 by Charles Lindbergh. Lindbergh was incited by a $25,000 prize that was offered by Raymond Ortieg, a French businessman. Because of his effort and and the efforts of others like him, the air travel industry became the huge business that it is today.

Aviation experts are unsure what effect the first successful moon launch will have. Nevertheless they are certain that the advanced mathematics behind space travel are soon to change. Returning to the moon has certainly been in the plans for the United States and other countries, yet it could take as long as a decade from now.

The deadline for the private competition is set at 2012. Competitors of the competition will be first in line when the government seeks subcontractors for its own efforts in returning to the moon.

Other members of the team include Richard Dell Sr., Richard Dell Jr., Gordon Jeans, Jeff Krukin, Dr. Andre Mazzoleni, and Grayson Randall. The team is a project of the North Carolina non-profit Advanced Aerospace Resource Center.

Miller Honored with National Distance Learning Award

Dr. Tom Miller, North Carolina State University Vice Provost for Distance Education and Learning Technology Applications (DELTA), was honored by the United States Distance Learning Association (USDLA) with its award for Outstanding Leadership by an Individual in the field of Distance Learning.

The award was presented in conjunction with the USDLA 2008 National Conference in St. Louis, Mo. Miller had previously received the state award from the North Carolina Distance Learning Association.

"As a premier leader for the entire distance learning profession, we are honoring Dr. Tom Miller," said Dr. John G. Flores, CEO of USDLA. "He has raised the bar of excellence and we are truly honored by Dr. Miller's contributions to the distance learning profession."

Since 1982, Miller has been with the Department of Electrical and Computer Engineering at NC State, where he holds the rank of Professor of Electrical and Computer Engineering. In his role as vice provost for DELTA, Miller is responsible for strategy, deployment, and implementation of the university's learning technologies and distance education programs. DELTA coordinates the funding and production of all distance-based credit programs and courses for the University, and promotes high-quality education by extending the reach of the faculty and collaboratively applying expertise in technology

Miller (center)

and pedagogy in an efficient, effective, and service-oriented environment.

Miller has taught courses in digital systems, computer architecture, microprocessor systems design, and C and C++ programming. He instituted and directs the NC State University Engineering Entrepreneurs Program. He is a member of the Academy of Outstanding Teachers at NC State, and the recipient of the 1995 Joseph M. Biedenbach Outstanding Engineering Educator award from the IEEE. He earned his doctoral degree from UNC-Chapel Hill in 1982.

The USDLA Awards were created to acknowledge major accomplishments in distance learning and to highlight those distance learning instructors, programs, and professionals who have achieved and demonstrated extraordinary results through the use of online, videoconferencing, satellite and blended learning delivery technologies. Winners will be recognized in an edition of USDLA's Distance Learning Today quarterly supplement during National Distance Learning Week, which begins Nov. 10.

USDLA is a non-profit association located in Boston, Mass. It promotes the development and application of distance learning for education and training and serves the needs of the distance learning community by providing advocacy, information, networking and opportunity.

Professors Strive to Meet Moore's Law

Moore's Law - which states that the number of transistors that can fit on an integrated circuit should double every two years, has long been the standard the semiconductor industry strives for. Lately though, that goal has been getting harder and harder to meet.

Kim

According to Larry Sumney, president of the Semiconductor Research Corporation (SRC), the world's leading university-research consortium for semiconductors, "Transistors are already so small you can't see them. Eventually we will reach the point where they won't work because there is only room to move one electron, which is not reliable. You will need a different way to move information."

NC State Professors Veena Misra and Ki Wook Kim are researching two such ways. Dr. Misra and graduate student Steven Novak are working on domain wall logic, which uses the spin and charge of electrons for logic and memory operations, via magnetic fields. Dr. Kim is researching alternative substrates such as graphene, which can conduct electricity up to 100 times faster than silicon.

Recently Misra spoke on NPR about semiconductor research currently underway here in the triangle. Along with guests Larry Sumney, and host Eric Hodge, they discussed the current physical limits of the size and speed of today's silicone chip technology.

Both Dr. Misra and Dr. Kim are funded by the SRC's latest round of grants, totaling $11.2 million across three dozen universities. The Semiconductor Research Corp. is located in Durham, North Carolina.

Professors Win Grant to Boost Solar Cell Efficiency

Dr. Nadia El-Masry, professor of materials science and engineering, and Dr. Salah M. Bedair, professor of electrical and computer engineering, have won a $1.4 million grant to conduct research aimed at boosting the energy yield of multijunction solar cells made of gallium arsenide.

Misra

The North Carolina State University professors will collaborate on the research with Spectrolab, a subsidiary of Boeing that manufactures high-efficiency solar cells for the space program. Spectrolab scientists have developed a multijunction solar cell with an efficiency rating of 40.7 percent, according to company officials. The NC State research team aims to boost the efficiency rating of the Spectrolab cells to 45 percent.

Multi-junction gallium arsenide solar cells are far more efficient than silicon cells, which have yet to reach 20 percent efficiency. Silicon cells, however, are much cheaper to produce, and this cost differential is the main reason multijunction gallium arsenide cells are used mostly in space. El-Masry said the efficiency gains achieved through this research project are expected to lower the energy costs sufficiently to make the gallium arsenide cells more competitive for earthbound applications.

To increase the efficiency of the cells, El-Masry said, the research team will seek to develop a fourth layer for three-layer Spectrolab cells. Each layer of a multijunction cell is tuned to convert specific wavelengths of the solar spectrum into electricity. The extra layer to be developed by the team would receive the now unused 1.0-to-1.4-electrovolt portion of the spectrum.

Bedair

Most of the money for the research grant is from the U.S. Department of Energy's Solar America Initiative to improve solar cell technology. The department is funding 11 solar cell projects around the country totaling $13.7 million.

Robert Kolbas Named Interim Department Head


Kolbas

Dean Louis Martin-Vega has announced that Dr. Robert M. Kolbas accepted a one year appointment as Interim Head of the Department of Electrical and Computer Engineering effective July, 1, 2008. The intent will be to conduct a national search during 2008-09 for a permanent department head who will assume the position in fall, 2009.

Dr. Kolbas has been a member of the NC State faculty for twenty three years and was formerly Head of the ECE department from 1995-2000. After receiving his Ph.D. in Physics in 1979 from the University of Illinois, he was employed by Honeywell as a Senior Research Scientist until joining the NC State faculty in 1985. His primary research interests are in Nanoelectronics and Photonics including III-V Materials and Devices, Optical Materials and Photonic Devices. He has published more than 140 manuscripts in refereed journals and is a member of IEEE, the American Physical Society, Sigma Xi and Tau Beta Phi.

The Dean extended his appreciation to Dr. Trew for his leadership and the many positive contributions that he made to the ECE department during his tenure as department head. "In addition to the recruitment of a number of outstanding new faculty, his own research efforts and professional contributions have provided the department with significant recognition enhancing the stature of both the department and the College nationally and internationally. Bob will continue as the Alton and Mildred Lancaster Professor of Electrical and Computer Engineering and we look forward to his research and teaching contributions for many years to come."

Designers, Engineers Team up on High-Tech Art

Take 11 designers and four engineers, throw in some sensors and a whole lot of creativity, and what do you get?

Students in design and electrical and computer engineering at North Carolina State University teamed up this fall to create two interactive art installations for one of the university's newest buildings.

The first, dubbed "Mr. Sound," is an experimental theater that lets the audience play an active role. Sensors connected to floor panels and poles detect when visitors are touching them, triggering individual sound tracks created by the students. The result is a chorus of sounds that can be manipulated by the visitor.


Tuck

Scyphozoa volubilis Another piece is a series of umbrella-like fans lining a staircase. Sensors detect when visitors begin climbing the stairs, telling the fans to begin spinning as the visitors approach them. Students named it "Scyphozoa (skih-foh-ZOH-ay) volubilis."


Schurig

The second installation senses when visitors come in one part of the building, prompting wood panels on an adjacent wall to open and close depending on how many people have entered the space. The panels display a blue light. The artwork is called "Wax and Wane."

The students worked all semester on the project, weathering many late nights to finish it in time.

"In the end, they were extremely happy to be part of this unique experience," said Mehmet Ozturk, a professor of electrical and computer engineering who advised the engineering students with Alex Dean, associate professor in the same department. Dana Raymond, associate professor of art and design, advised the design students.

Mr. Sound The building that houses the artwork, Engineering Building II, opened in fall of 2005. Its 181,000 square feet of classroom, office and laboratory space represent the second phase of the plan to move the College of Engineering to Centennial Campus.

The engineering students who worked on the project are Eric Aumiller, Jason Frankie, Richard Jankovics and George Platica.

The design students are Jenna Bost, Lauren Deans, Enrique Dominguez, Julianne Gonski, Will Hagna, Dana Hartweg, Miles Holst, Maddie Langley, Lauren Pegram, Morgan Spivey and Andrea Stroud.

New Faculty join ECE

The department is pleased to announce the additions of Dr. David Schurig and Dr. James Tuck to the ECE faculty.

Dr. David Schurig, ECE Department, NC State University Dr. Schurig comes to the department from Duke University. Previous to Duke University, Dr. Schurig was with the University of California, San Diego. He has also worked at Tristan Technologies Inc. and Lawrence Berkeley Laboratory. Dr. Schurig holds a Ph. D. from the University of California, San Diego and a B.S. from the University of California, Berkeley. His research interests include transformation design method and metamaterials: tools to realize invisibility and other interesting effects.

Dr. James Tuck, ECE Department, NC State University Dr. Tuck comes to the department from the University of Illinois at Urbana-Champaign where he received a Ph. D. in Computer Science and an M.S. in Electrical and Computer Engineering. He has previously worked at and attended Vanderbilt University, where he earned a B.E. in Computer Engineering. His research interests include Computer Architecture and Systems including Compiler Code Generation / Code Optimization, Memory Systems / Memory Management, Microprocessor Architecture, and Parallel and Distributed Computer Architecture.

Nagle (center)

Masnari and Nagle Receive Holladay Medals

The North Carolina State University Board of Trustees awarded the Alexander Quarles Holladay Medal for Excellence to three faculty members in recognition of their outstanding careers at NC State. The Holladay Medal is the highest honor bestowed on a faculty member by the trustees and the university.

This year's honorees are Drs. Nino A. Masnari, Distinguished Professor of Electrical and Computer Engineering; Troy Nagle, professor of Biomedical Engineering and Electrical and Computer Engineering; and Raymond E. Fornes, professor of physics and associate dean for research in the College of Physical and Mathematical Sciences.

The Holladay Medal is named for Col. Alexander Quarles Holladay, the university's first president. It recognizes the contributions of faculty members in teaching, research and service. Winners receive a medal and a framed certificate, and their names are inscribed on a plaque in the NC State Faculty Senate chambers.

Dr. Nino A. Masnari has served NC State for more than 28 years as faculty member, department head, research center director, and dean of the College of Engineering. Highlights of Masnari's 10-year term as dean of the College of Engineering include substantial growth in undergraduate and graduate enrollments - especially enrollments of minority and female students; a fourfold increase in scholarship funding; a tripling in the number of National Science Foundation CAREER awards by engineering faculty; a tripling in college research funding; a doubling of the college's endowment; and the implementation of a plan for the transfer of the College of Engineering to the Centennial Campus.

During his term as head of the Department of Electrical and Computer Engineering, the department's undergraduate enrollment doubled and its graduate enrollment tripled. In 2007 he received the Award of Merit from the NC State Alumni Association. A fellow of the Institute of Electrical and Electronics Engineers, Masnari's research interests in semiconductor devices and circuits, electronic materials processing, fabrication technology, ion implantation, microwave solid-state devices and circuits, bipolar magnetic transistors, microwave tubes, electron beams, and plasma physics led to 47 journal articles and more than $60 million in research funding. He has supervised 14 doctoral and 28 master's degree students.

Dr. Troy Nagle has dedicated 23 years of teaching, research and service to NC State. As founding chair of the joint NC State-UNC Chapel Hill Department of Biomedical Engineering, he led the development of the first joint department in the UNC system. During his term of office, the department has achieved an accredited undergraduate biomedical engineering program at NC State and 80 graduate students at NC State and UNC-CH in the department's joint graduate program. Prior to his work with the Department of Biomedical Engineering, Nagle was an early leader in the development of the NC State computer engineering curricular program.

His research expertise in medical devices and microsensors, digital signal processing, design for testability, and digital control systems has led to more than 60 refereed journal articles, a number of co-authored books, edited volumes, and book chapters, 11 issued and pending patents, more than $4 million in research and instructional funding, and formation of two medical device start-up companies. He is a fellow of the Institute of Electrical and Electronics Engineers (IEEE), serving as president in 1994 and currently as editor-in-chief of its new IEEE Sensors Journal. He is also a fellow of the American Institute of Medical and Biological Engineering and a registered professional engineer. He has received the NASA New Technology Award and the IEEE Richard M. Emberson Award for technical contributions to the institute. He has directed eight doctoral and 23 master's degree students.

Previous ECE award winners include Dr. Michael Littlejohn in 1998 and Dr. John Hauser in 2003.

Littlejohn

Hauser

Masnari (center)

PROMOTIONS

The Department of Electrical Engineering would like to congratulate the following individuals on their promotion to Associate Professor.

Dr. Doug Barlage

Dr. Wenye Wang

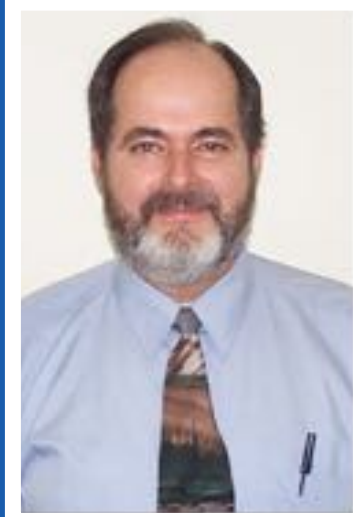
Dr. W. Rhett Davis

RETIREMENTS

The Department of Electrical Engineering would like to thank the following individuals for their many years of faithful service to the University.

Dr. John J. Grainger

Dr. John R. Hauser



Dr. Carlton Osburn

CORPORATE PARTNERS NEWS

Next-Generation Computing Linked to NC State Engineering Program

In the world of gaming and fast computers, integrated circuit designers create the magical chips that give game boxes the speed to produce lightning fast video stream and realistic action that challenge players. They also explore the next generation of computing, pushing to expand the capabilities of computers.


Franzon

Producing a highly qualified workforce to feed high tech industry is important to the economy of the Research Triangle area and to North Carolina. The College of Engineering at North Carolina State University has produced more than 150 graduates in its innovative chip design program. These graduates make up a specialized work force that helps attract companies like Qualcom, nVidia, Rambus, IBM, RFMD and Analog Devices that offer excellent work environments and competitive salaries.

Designing chips for high performance computing requires an expert knowledge of circuitry, a familiarity with the properties of silicon chips, a vivid imagination, a healthy dose of curiosity and professors with these same qualities. Dr. Paul Franzon, Distinguished Graduate Professor of Electrical and Computer Engineering, is just such a professor. Franzon and his colleagues in the Department of Electrical and Computer Engineering make up the core faculty of NC State's chip design program. Other core faculty include Dr. Kevin Gard, Dr. Rhett Davis, Dr. Xun Liu and Dr. Christal Gordon.

Graduates of the program, Lei Luo (PhDEE '05), Fredy Quan (MSEE '96) and John Wilson (PhDEE '03), work for Rambus, a leading technology licensing company specializing in the invention and design of high-speed chip interfaces. Rambus engineers have designed a variety of high-performance interfaces, including the interface between the main processor and various components in Sony's latest entertainment console, PLAYSTATION 3. This design allows the processors in the game box to communicate rapidly, making the gaming much more realistic.

All three graduates cite Franzon as the one who most influenced them. His website offers tips on what courses to take and why master's and Ph.D. degrees are important in the chip design world.

"I followed his advise from his website for a year before I ever met [Dr. Franzon]," said Luo. "At the end of that year, I went to him and said 'you've been advising me for a year, and I want to be in your program.' And he looked at my work and accepted me."

Franzon continues to be involved in the work of his former students, giving pres entations at most of the major chip design companies and at conferences and seminars. According to Quan, both Franzon and the graduates of the program are well-known in the industry.
"He is very influential in the chip design world," said Wilson. "That is one reason he is such a great teacher. He is as enthusiastic about chip design as his students are."
Jenny Weston

EnerNex Corporation Awarded DOE SBIR Phase II Grant

EnerNex Corporation, an electric power engineering and consulting firm specializing in the development and application of new electric power technologies, today announced it has been awarded a Small Business Innovative Research Phase II grant from the U.S. Department of Energy to develop Distribution State Estimation. This includes EnerNex partners North Carolina State University (NCSU) and OSIsoft.

EnerNex was notified of the award by the office of Senator Bob Corker (R-Tenn.), who serves on the Senate committee and subcommittees on energy and small business and entrepreneurship. EnerNex was one of two companies to receive awards in the topic area of electric transmission and distribution technologies.

The grant will continue supporting the creation of a software product that will enable load modeling and prediction tools for the improved resolution of customer loads; accurate sensitivity assessments of the impact of r conditions, new technologies, demand response programs and load curtailment practices; and advanced algorithms and decision logics for the large data set analysis. The software will maximize use of current system capacity and meet contingency planning and response requirements.


Baran

EnerNex will use the research of NCSU Professor, Mesut Baran, to produce better methods of load modeling from statistical data, with branch current state estimation and bad data identification. Using the load estimation toolbox, industry researchers can develop new modules as add-ons to the industry-leading data historian software, the OSIsoftPI System, for electric utilities.

"We are pleased to continue our work with DOE. This demonstrates further advancements in our technology and ability to develop tools that will continue to enhance the reliability and efficiency of the electric system," said Jeff Lamoree, EnerNex President and Chief Executive Officer. "As our nation continues to address concerns about the reliability of the electric power system, our de-

velopments will play an important role in the progress of flexible, customizable solutions to better understand the operation of electric power distribution systems."

The project will be led by EnerNex employee, Tom McDermott, a recognized expert in circuit simulation, distribution systems, lightning protection, power quality data analysis and the development of software tools.
EnerNex Corporation provides engineering and consulting services, along with software solutions and customization, for the electric power industry. EnerNex offers these in the areas of power system studies and analysis as well as utility communication and automation.

College of Engineering to Receive $1.25 Million Investment from Duke Energy

North Carolina State University's College of Engineering will receive a $1.25 million endowment gift from the Duke Energy Foundation to support workforce development and teaching and research related to the clean generation and delivery of energy.

The gift will create two named professorships, one each in nuclear engineering and electrical and computer engineering, and will establish an endowed K-12 educational outreach fund to promote the continued development and diversification of the future engineering workforce. These endowments will help produce highly qualified engineers familiar with the core concepts of clean energy generation.

Duke Energy officials will formally present the gift to the college later this year. The investment will be made over five years.

"At NC State, we are grateful for our partnership with Duke Energy," said Chancellor James Oblinger. "As 2008 is the Year of Energy at NC State, this gift reflects our record of activities that fuel economic development and our commitment to a universal need commanding attention - clean energy generation and sustainability. Endowed professorships enable us to increase our ability to have significant impact in this area by helping to attract and retain the top faculty and to produce cutting-edge research that yields innovative solutions."

Engineering Building II AtriumIn recognition of Duke Energy's gift and its longstanding support for the college, NC State is naming a high-profile space on the NC State campus. The west atrium in Engineering Building II, home to the Department of Electrical and Computer Engineering, will be renamed the Duke Energy Atrium. The gift also includes funds to renovate two conference rooms in the college, and those will also bear the Duke Energy name. Duke Energy, based in Charlotte, delivers energy to about 4 million customers and is one of the nation's largest electric power companies. The company has a long history of successfully recruiting NC State engineering graduates into its workforce.

"Duke Energy is proud to support North Carolina State University's College of Engineering with this gift," said Ellen Ruff, president of Duke Energy Carolinas. "We are fortunate to have a large number of engineers from NC State working throughout our company, including many in senior management positions. This gift supports both our workforce development strategy and our strong interest in supporting the development of carbon-reduced energy sources. In addition, we view the College of Engineering as an engine of economic development within our state."

"This generous gift will improve our academic stature, get more young people interested in engineering, and accelerate our energy research efforts," said Dr. Louis A. Martin-Vega, dean of the College of Engineering. "We are grateful for Duke Energy's long history of support and their continued interest in engineering education at NC State."

Duke Energy The endowed professorships - the Duke Energy Professor of Nuclear Engineering and the Duke Energy Professor of Electrical and Computer Engineering, Power Program - will help the college attract high-achieving research faculty and students in areas of interest to Duke Energy, which is working to reduce carbon emissions. The nuclear program helps develop energy technologies that produce far less carbon than fossil fuels, and the power program leads a multi-university effort to study the integration of renewable energy sources into the nation's electrical power grid. Carbon emissions have been cited as a chief contributor to global warming.

The Duke Energy Dynamic and Diverse Engineering Workforce Fund will support collaborations with Duke Energy to expand the college's efforts to improve math and science education, promote careers in energy-related engineering, and improve the diversity of the future engineering workforce.

"The College of Engineering and NC State value our longstanding relationship with Duke Energy," said Ben Hughes, executive director of the NC State Engineering Foundation Inc. "The partnership has produced a strong recruiting relationship and valued research and K-12 engineering outreach efforts."

Progress Energy Grants $223,500 to the College of Engineering at NC State

Progress Energy has awarded a grant of $223,500 to the College of Engineering, part of its $308,500 gift to academic programs at North Carolina State University. Lee Mazzocchi, vice president of distribution for Progress Energy Carolinas, presented a gift check to Dean Louis Martin-Vega on December 10 at NC State.

Progress Energy has been a long-standing supporter of NC State and the College of Engineering. This year the grant will support programs in civil engineering, computer science, electrical and computer engineering, mechanical and aerospace engineering and nuclear engineering. In addition, the grant will fund the Undergraduate Research in Energy Awards, the NC Solar Center's Hybrid

Mazzocchi and Martin-Vega

Electric Vehicle Challenge and college-wide programs such as the Engineering Workforce Initiative, which includes a new lecture series.

"We greatly appreciate Progress Energy's long and generous support of Engineering at NC State. The college has no closer corporate partner than Progress Energy," said Dean Louis Martin-Vega. "This funding provides another important investment in tomorrow's engineers."

The gift to the College of Engineering will be administered by the NC State Engineering Foundation, Inc.

Cisco Systems Equipment Donation to Support Joint ECE/CSC Lab

ECE Valued Corporate Partner, Cisco Systems, has made a significant networking and wireless equipment donation to NC State University, valued at over $540,000. The partnership will provide future generations of engineering students with hands-on learning experience with Cisco technology.


Kekas

The donation includes four racks of new equipment to be used in a joint laboratory by students in both the Computer Science and Electrical and Computer Engineering Departments. The new laboratory, which opened in January 2008, is used by students who are on the path to receiving bachelors, masters or doctorate degrees from the departments. Though students will use the laboratory primarily for networking courses, students who choose to pursue a CCNA or CCNP certification may be able to use the laboratory while registered for a relevant networking class.

Dr. Harry Perros, Alumni Distinguished Graduate Professor at NC State University, and faculty prime for the partnership says, "Much of the equipment will be housed in the new 'Don Martin Computer Science Teaching Lab' where it will primarily be used for lab exercises for ECE/CSC 576 'Connection-Oriented Networks' course."

Perros adds, "This course is taught every semester, and one of its main components is MPLS, a signaling protocol for setting up connections within the IP network. Currently, the MPLS lab exercises that the students do are based on emulated software. This donation will enable the students to carry out MPLS lab exercises from the CCNP and CCIE training manuals on real equipment. This is a major boost in the way that we teach this course."


Escuti

In addition to enjoying a strong partnership in the classroom and labs with Cisco, NC State is the #1 supplier of new grad talent nationwide to Cisco Systems.

The key enablers of this donation are Tsege Beyene and Wayne Clark from Cisco RTP, and Dr. Mihail L. Sichitiu (ECE) and Dr. Harry Perros (CSC) from NCSU.

ImagineOptix Places 4th in Rice University Business Plan Competition

ImagineOptix, a startup company located at NC State University, placed fourth overall in the Rice University Business Plan Competition, the largest intercollegiate business plan competition in the world. They received cash and prizes totaling more than $4,500.

ImagineOptix, which "is focused on developing silicon imager solutions for the emerging personal projection device market", is helmed by Dennis Kekas and Michael J. Escuti, faculty in NC State's ECE Department, as well as Jason Kekas, a doctoral student in the ECE Department.

The Rice University Business Plan Competition offers more than $345,000 in cash and prizes annually. The competition took place over the course of three days.

NC State Launches Secure Open Systems Initiative

With governments and companies all over the world installing open computer systems to exchange and process information, more data is vulnerable to outside attacks. A bold new initiative at North Carolina State University will make those systems more secure and trustworthy.

"This initiative will contribute to our national security and economic health by making vital computer systems more secure," said Dr. Louis A. Martin-Vega, dean of the College of Engineering. "We are pleased that this important work is being conducted on NC State's Centennial Campus."

The Secure Open Systems Initiative center opens during a period of increasing popularity for open computer systems, which can be modified by outside users and work in a variety of computing environments. Centennial Campus played an important role in this growth as the site of open-source giant Red Hat. More than a dozen NC State faculty members have been focusing research on software security, network security, software engineering, and new networking technologies, which are related to the SOSI initiatives.

Because open systems are accessible by the public, they can be vulnerable to hackers and malicious attacks. SOSI will help advance the trustworthiness and security of those systems, making it easier for the Department of Defense to adopt more open source software and systems into its operations. The initiative will develop a highly secure computational, networking and software test-bed "cloud" in which NC State researchers and external partners will be able to conduct experiments, verify and validate their results, and develop prototypes. The institute will be a repository for research results and testing tools, and will foster start-up technology companies during early stages of business development. Partners will include Red Hat, IBM and Cisco.

"The growth in open-source software has created a demand for cutting-edge research that makes open systems more secure," said Dennis Kekas, the executive director of the NC State Networking Technology Institute who is leading the new initiative. "This initiative will help meet that demand."

ADVISORY BOARD

With a strong emphasis placed on an interactive relationship between the ECE department and the corporate community, the advisory board plays an important role in bringing the two together. The advisory board consists of a group of prominent professionals in both technical and academic fields, with a broad range of companies represented. Meeting bi-annually on NC State's Centennial Campus, the board provides strong council for ECE and helps to keep the department aware of market trends and needs within the corporate world.

Ray L. Davis, Jr.
General Manager
Transmission Construction and Engineering, Carolinas

Dean H. Hering
Vice President
NetCentrics Corporation

Eric P. Pearson
Director, Staff Development for Engineering & Manufacturing
Northrop Grumman Electronics Systems Sector

Ed Hutton
Vice President, Engineering
Harris Stratex Networks

David Koepnick
Engineering Manager
Progress Energy

Ali S. Khayrallah
Director
Ericsson

Samir M. El-Ghazaly
Distinguished Professor and Department Head
University of Arkansas

Tony Montalvo
Analog Devices

Wes Covell
President, Defense Systems Harris,
Government Communications Systems Division

Brad Potts
Mentor Graphics

Robert Moye
Projects and Planning Supervisor
Southern Company

Andy Rindos
Head, RTP Center for Advanced Studies (CAS) & WW CAS Coord.
IBM

Dan Green
RFMD

Bryson Trumble
Maintenance and Engineering Manager
Nucor Steel

Michael Tiefenbacher
Qimonda

Ron Tessitore
Vice President of Advanced Applications Platforms
Qualcomm

http://www.ece.ncsu.edu/corporate/advisory/

Senior Design Sponsors

The department would like to take the opportunity to thank our corporate sponsors who supported this year's Senior Design project teams:

Fall 2007

A-B-Sea Research, Inc.
ABB, Inc.
Appealing Products Inc.
Cisco Systems
ECE Underwater Communications Projects
Frank Noser
IBM
NCSU - ECE Department
NCSU IEEE Student Branch
NCSU Mechanical Engineering Department
NetCentrics Corporation
Northrop Grumman
Pentair Water Pool & Spa
Renesas Technology Corporation
Robbie Troxler
SAS
Wavecom
WKNC Radio

Spring 2008

Appealing Products Inc.
Centennial Networking Lab
Frank Noser
IBM and ECE Department
Jeff Williams
MeadWestvaco
NCSU - ECE Department
NCSU - School of Design
NCSU IEEE Student Branch
NetCentrics Corporation
Nucor Steel
Seimens
Square D / Schneider Electric
Wavecom

EEP Engineering Entrepreneurs Program

Silicon Valley Trip Brings Together Entrepreneurial Alumni and Students

They are the iPod Pioneers, the Sultans of Search, the Swamis of Social Networking.

They are Silicon Valley entrepreneurs, and NC State engineering and business students spent spring break learning about what makes them tick. The students headed to California's Bay Area as part of the Engineering Entrepreneurs Program (EEP), which immerses students in a business environment where they roll out startup companies and products.

The program sends a group of students to Silicon Valley each year to chat up successful alumni and soak in the West Coast culture that has spawned some of the world's most influential companies. Visits to Apple, Google and Facebook were part of this year's itinerary.

The trip was led by Dr. Tom Miller, the EEP director who is a professor of electrical and computer engineering and vice provost for distance education and learning technology, and Dr. Stephen Walsh, a teaching associate professor of electrical and computer engineering and the program's entrepreneur-in-residence. Miller, who started the EEP program in 1993, has watched more than 450 students complete it.

The 2008 trip began with a guided tour of the Stanford University campus led by engineering alumnus Saket Vora, a master's student at Stanford. Vora, who attended last year's EEP trip, urged students to learn as much as they could about Silicon Valley's entrepreneurial, business-friendly spirit.

"They should figure out why this place is what it is," he said. "See how they think out here." Later that evening, students traveled to nearby Half Moon Bay to dine with Tony Blevins, vice president of corporate procurement for Apple. Blevins, a 1989 graduate in industrial engineering, took the students on a walk along the beach and shared his experiences at Apple over a dinner of grilled hamburgers.

More than anything else, Blevins said, his job was about managing relationships. So he was impressed that the students took time over spring break to meet people who could help their careers.

"I'm an absolutely incredible fan of this program," Blevins said later. "The quality of the students has just been so impressive, and each year it gets a little bit more impressive."

Students visited the Apple headquarters the next day, hearing from Blevins and Joe Fisher, a 2001 NC State graduate in electrical engineering who helped develop the company's iPods. The group ate lunch at Apple's giant cafeteria before heading to Rosum, which has developed a system that uses television signals for tracking people and objects. The students heard from alumnus Todd Young, a 1988 electrical engineering graduate who has worked at Palm, Ford Motor Company and Bell Laboratories. He also founded an education software-and-services company.

"Know yourself. Know what you're good at," said Young, Rosum's vice president of marketing. "If you're not talking to people. You're missing out on a lot."

Then the students visited Jaxtr, a year-old startup that links phones to the Web. That night, they talked about technology with alumni over spaghetti and meatballs at a downtown Palo Alto restaurant.

Alumnus John Steensen, a 1973 computer science graduate, was part of the group. He has held senior management positions in Oracle and Computer Associates. Now, he's the president of Spatial Dynamics Corp. said Steensen, "Figure out what your track is, go after it, and don't let anybody get in your way."

Students visited more companies over the next two days. They wandered past the pool tables and swimming pool at the sprawling "Googleplex" in Mountain View, hearing from alums who now work at what's been called the world's most innovative company. At Facebook, they watched twenty-something engineers whiz around the office on skateboards and learned about the company's blistering growth.

Later, students visited Kleiner Perkins Caufield & Byers, the legendary venture-capital firm that helped start iconic companies such as Google, Amazon and Netscape. Addressing the group was Randy Komisar, a partner in the firm who brought along one of the co-founders of CoolIris, which transforms sites like Google Images and Flickr into three-dimensional slideshows.

Students had been reading Komisar's book, The Monk and the Riddle, so they were excited to see him in person.

"There never was one mention of getting rich or going down that path," said Justin Milam, a senior in electrical and computer engineering. "It was all about what you want in life to be happy and to fulfill your own dreams."

Many former EEP students found that success. Donnie Barnes was among the first employees of Red Hat and retired from the company at age 27. Scot Wingo co-founded Stingray Software and AuctionRover.com, the latter of which sold for $166 million. He credits the entrepreneurs' program for his success.

But there have been failures, too. Many of the Silicon Valley alumni spoke about the long hours and frustrating moments that preceded their ultimate successes.

"Just being able to remember what they've struggled with and what they've gone through will help me in my future," said Jennifer Webster, a junior in electrical and computer engineering.

The trip's final day began with a visit to Applied Signal Technology, where co-founder and NC State alumnus Jim Collins explained the company's digital signal processing systems. He challenged the students to start their own companies.

"If you're young, take that chance," Collins told the group. "Do something new. Do something different."

Then the students went to Danger, Inc., which develops software of mobile devices. Like other alumni, Chief Technology Officer Joe Britt, a 1991 computer engineering graduate, took a winding road to his current job. He worked for Apple, 3DO, Catapult Entertainment and Web TV before co-founding Danger in 1999. Britt scored a big success earlier this year when Microsoft agreed to buy Danger. He's been a favorite stop for the EEP students for the past several years.

"I wish there had been a program like this when I was at State," he said.

ELS Offers Insights Into Success

In hopes of offering students the opportunity to build a solid foundation for the future, the NC State University Engineering Entrepreneurs Program gives engineering and non-engineering majors alike hands-on education that reaches beyond the textbook and immerses them into the real-world processes behind new product and business development.

"The Engineering Entrepreneurs Program is very good, - very exceptional," program participant and NC State graduate student Jared Everett said. "But there is still this gap that needs to be bridged between the technical understanding that you learn in the classroom and the actual, practical business and industrial knowledge. The EEP functions to give you that."

A key component of the program, the Entrepreneurs' Lecture Series gives distinguished NC State alumni and partners an opportunity to return to campus and share the secrets of their successes.

Recently, ELS organizers welcomed "serial entrepreneur" Steve Yauch ('87) to Centennial Campus to talk about making the seemingly giant leap into entrepreneurship. Yauch is the president and owner of Carolina Electronic Assemblers, an electronic contract manufacturing company he founded in 2000.

Yauch is also the founder of industrial control distribution and integration company CMC Sencon, and his most recent start-up is a 25,000 square-foot order fulfillment and service center designed to handle the logistics of a large medical device supplier. He's also involved in several Johnston County (N.C.) commercial real-estate endeavors, including the renovation of a 1900's-era, cotton-spinning mill.

"When I was at N.C. State eons ago, this program didn't exist," he said. "I think had it existed - although I don't think my path would have been different - I think my path would have been much more condensed because I would have not been as afraid as I was to go out and do the entrepreneurial thing."

Past speakers include Jim Goodnight, CEO of SAS, Neal Hunter, founder of Cree, Inc. and Barbara Mulkey, president and CEO of Mulkey Engineers & Consultants - all NC State graduates.
The Engineering Entrepreneurs Program began in 1993 to help students develop skills in management, finance, marketing, product development and entrepreneurship - all essential in forming an idea into a successful business. It's been a key to NC State's entrepreneurial success - the university has launched more than 60 companies and holds more than 500 active patents.

"I spent a lot of years staring 'over the cliff,' deciding if I wanted to jump off," Yauch said. "If I had been able to go out in the real world and see the success and understand what it took, I would have been able to make a very informed decision as to whether to do that."

Since 1993, more than 450 students have completed the EEP, turning creative concepts into marketable products. In addition to their courseloads, students participate in the Entrepreneurs' Lecture Series (ELS) as well as twice-yearly field trips to companies both locally and in Silicon Valley, CA, including Google, Apple and others to see how the knowledge they gain in the classrooms of NC State apply in the real world.

"I think what students pull from the lectures and the visits is a level of confidence once they are done with the class," said Dr. Stephen J. Walsh, the EEP's entrepreneur-in-residence and a teaching associate professor of electrical and computer engineering at NC State. "They see that you don't have to be a 4.0 person to be the next Bill Gates, and learn what it's like to really create something and get other people pumped up about what you are doing."

For more information on the Engineering Entrepreneurs Program please visit their website at http://www.engr.ncsu.edu/eep.

CISCO Support Goes to Fund ECE/ CSC Game Room and Student Organizations

Students in Electrical and Computer Engineering as well as Computer Science now have a place on Centennial Campus to socialize and have a little fun. With generous support from Cisco, a game room is up and running in Engineering Building II in a room just off of the atrium. The game room comes complete with a ping pong table, air hockey table, foosball machine, a large television with PlayStation II games as well as Guitar Hero and Dance Revolution. Student organizations will also provide board games from various cultures so that all students can enjoy this room.

In addition to the game room, Cisco has provided support to many of the student organizations within CSC and ECE. Funds were provided to the Society of Hispanic Engineers (SHPE), the Underwater Robotics Club, Eta Kappa Nu (HKN), the ECE Graduate Student Association, the student branch of the Institute of Electrical and Electronic Engineers (IEEE), the CSC Geek-A-Thon (providing refurbished computers), the Association for Computing Machinery (ACM) and Women in Computer Science (WICS).

Students rocking out to Guitar Hero 2 in the game room.

"We are so appreciative of the support Cisco provides to our programs and our students. They are a great partner to both the CSC and ECE departments and we appreciate their continued interest in our students," said Tara J. Britt, former Director of External Relations for the ECE department.

The support from Cisco makes it possible for students who are in these organizations to attend leadership conferences, establish outreach efforts in the community, compete in national competitions, and help fellow students with tutoring and other educational needs.

Dawn Johnson, University Relations Manger for Cisco, said, "Cisco has had a very long-standing partnership with NCSU, and we are very proud to have been able to contribute funding for the game room. As a corporate partner with NCSU it is imperative that we take notice of other ways that we can enhance student life. Cisco recognizes the need for both academic and social experience to foster a true higher education. With the opening of the game room we hope to promote a place for social gathering with students that normally would not have the opportunity to engage with one another. Education does not just happen in the classroom, but also when students from various background can come together and learn about each other and share their cultures, backgrounds and experiences."

Pictured in this photo from left to right: Wayne Clark from Cisco Systems; Kyle Luthy, President of GSA; Glen Garner, President of HKN; Ahmed Bakir, ECE; Mike Cho, Cisco Systems; Dawn Johnson, Cisco Systems; Tara Britt, Director of Corporate Relations, ECE; Andrew Pita, President of SHPE; Kimberly Quinn, Cisco Systems and Greg Mulholland, ECE.

Appendix

PHD DISSERTATIONS

Fall 2007

Design of Pipeline Fast Fourier Transform Processors using 3 Dimensional Integrated Circuit Technology
Ambarish Mukund Sule, PhD - Computer Engineering

Speech Recognition Co-processor
Dhruba Chandra, PhD - Computer Engineering

A Performance Analysis Framework for the Design of DSP Systems
Ramsey Salim Hourani, PhD - Electrical Engineering

Rotary Clock based High-Frequency ASIC Design Methodology
Zhengtao Yu, PhD - Electrical Engineering

Energy Optimization in Sensor Networks
Mu-Huan Chiang, PhD - Computer Engineering

Characterization of High-k gate dielectrics based on HfO2 and TiO2 for CMOS Application
Sanghyun Lee, PhD - Electrical Engineering

3D Integral Invariant Signatures And Their Application on Face Recognition
Shuo Feng, PhD - Electrical Engineering

Mobile Movement Patterns and Applications in Wireless Networks
Fang Feng, PhD - Computer Engineering

Distributed and Collaborative Processing in Wireless Sensor Networks
Wenjun Li, PhD - Electrical Engineering

Spring 2008

Analyzing and Managing Shared Cache in Chip Multi-Processors
Fei Guo, PhD - Computer Engineering

Nonvolatile Spin Memory based on Diluted Magnetic Semiconductor and Hybrid Semiconductor Ferromagnetic Nanostructures
Hani Enaya, PhD - Electrical Engineering

Engineering Methodologies and Design Concepts for Systems Biology
Cranos Monroe Williams, PhD - Electrical Engineering

Development and Application of the Light Triggered Emitter Turn-Off (LT-ETO) Thyristor
Bin Chen, PhD - Electrical Engineering

On Network-based control and sensitivity characterization of mobile robot in Intelligent Space
Rangsarit Vanijjirattikhan, PhD - Electrical Engineering

An Autonomic Service Delivery Platform for Service-Oriented Network Environments
Robert David Callaway, PhD - Computer Engineering

Electronic Textile-Based Sensors and Systems for Long-Term Health Monitoring
Carey Reid Merritt, PhD - Electrical Engineering

Modeling and Measurement of the Differential Resistance and Ideality Factors in Heterostructure Light Emitting Diodes and Laser Diodes
Xiangming Li, PhD - Electrical Engineering

Secure Localization and Tracking in Sensor Networks
Chih-Chieh Geoff Chang, PhD - Electrical Engineering

MASTER'S THESES

Fall 2007

A MIMO Receiver SOC for CDMA Applications
Tongtong Chen, MS - Electrical Engineering

Analytic Model For Acoustic Wave Propagation in Air
JoAnna Ruth Vetreno, MS - Electrical Engineering

Implementing a Metasearch Framework with Content-directed Result Merging
Santthosh Babu Selvadurai, MS - Computer Engineering

Using Software Thread Integration with TinyOS
Zane Dustin Purvis, MS - Computer Engineering

Experimental Sensitivity Analysis of a Network Controlled Unmanned Ground Vehicle in iSpace
Ioannis Pelentrides, MS - Electrical Engineering

Development of a Block Floating Point Interval ALU for DSP and Control Applications
Sandeep Krishnanand Hattangady, MS - Computer Engineering

Cache Line Boundary Allocation for Garbage Collected Systems
Prasad Ajit Wagle, MS - Computer Engineering

Intracellular recording with low-power low-noise CMOS voltage and current clamp circuits
Pradeep Charles Silva, MS - Electrical Engineering

Power Adaptive, Spatial Distributed MAC (PowSD-MAC):A Long Distance Media Access Protocol for Air-to-Air (A2A) Communication
Manjunath Madhava Prabhu, MS - Computer Networking

Identity-Based Cryptography: feasibility & applications in next generation sensor networks
Panagiotis T Mr Kampanakis, MS - Computer Engineering

Methodology for Analyzing Complex Algorithms for Small Satellites
Maitrik Yogesh Diwan, MS - Computer Engineering

Spring 2008

An Investigation and Expansion of Musculoskeletal Modeling and Analysis Techniques
John Wade Kelly, MS - Electrical Engineering

Theoretical Analysis and Design Methodologies for Low Noise Amplifiers based on Tunable Matching Networks
Mustafa Berke Yelten, MS - Electrical Engineering

Stack Space Analysis for ARM Executables
Shankar Ramachandran, MS - Computer Engineering

Insider Threat: User Identification Via Process Profiling
Steven McKinney, MS - Computer Networking

Hardware Implementation of an XML Parser
Remya krishnamoorthy, MS - Computer Engineering

Providing Static Timing Anlaysis Support for an ARM7 Processor Platform
Sang Yeol Kang, MS - Computer Engineering

Nonlinear Acoustic Characterization of Targets
Glenwood III Garner, MS - Electrical Engineering

Design of a Flexible DSP Based Controller Hardware System for Power Electronics Applications
Rahul Pushpak Godbole, MS - Electrical Engineering

A Low Noise, High Efficiency Envelope Modulator Structure for EDGE Polar Modulation
Jifeng Qin, MS - Electrical Engineering

End-to-end Behavior of Delay Tolerant Networks with Message Ferries
Dheeraj Kandula, MS - Computer Networking

RESEARCH GRANTS

Title	Principle Investigators	Dates	Sponsor
ITWF: Collaboration Through Agile Software Development Practices: A Means for Improvement in Quality & Retention of IT Worker	Laurie A. Williams, Mladen A. Vouk, Jason A. Osborne, Winser E. Alexander, Sarah B. Berenson	07/15/03 - 06/30/08	National Science Foundation
Load Modeling and State Estimation Methods for Power Distribution Systems	Mesut E. Baran	08/08/07 - 08/07/09	EnerNex Corporation
CAREER: Low Dimension Column III-Nitride (III-N) Metal Oxide Semiconductor (MOS) Structures for Terahertz and Gigascale Electronics	Douglas W. Barlage	04/01/06 - 03/31/11	National Science Foundation
Dilute Magnetic Semiconductor Devices Based on Fermi Level Engineering	Nadia A. El-Masry, Salah M. Bedair	10/01/07 - 02/28/10	Army Research Office
Strain and Quantum Dots Manipulation in Nitride Compounds for Opto-Electronic Devices	Salah M. Bedair, Nadia A. El-Masry	10/01/04 - 09/30/07	US Army
Carbon Nanostructures and Wide Bandgap Semiconductors for Vacuum Thermionic Energy Conversion	Robert J. Nemanich, Griff L. Bilbro, Robert F. Davis, Zlatko Sitar	05/21/03 - 06/30/08	University of California - San Cruz
Architectures and Applications for Three-Dimensional Chip Multiprocessors	Gregory T. Byrd, William R. Davis	05/15/07 - 04/30/10	National Science Foundation
IPA Agreement with Asian Office of Aerospace Research & Development	Jim C Chang	01/31/06 - 01/30/10	US Air Force
A Joint Exploratory Study on the Applicability of Networked Control Systems For Critical Multi-variable Systems	Mo-Yuen Chow	08/15/06 - 07/31/08	National Science Foundation
Biologically Inspired Intelligent Fault Diagnosis for Power Distribution Systems	Mo-Yuen Chow	05/15/03 - 12/31/07	National Science Foundation
Center of Excellence in the Area of Human and Robotic Structures Technologies for Lunar and Planetary Exploration	Fred R. DeJarnette, Robert T. Nagel, Harvey T. Banks, Ashok Gopalarathnam, Vinod K. Saxena, Gregory D. Buckner, Mohammad Noori, Fuh G. Yuan, Jack R. Edwards, Mo-Yuen Chow	10/01/02 - 09/25/12	National Institute of Aerospace
Intelligent Human-Machine Interface & Control for Highly Automated Chemical Screening Processes	David B. Kaber, Robert A. St. Amant, Mo-Yuen Chow	10/01/04 - 09/30/08	National Science Foundation
Small World Stratification For Power System Fault Diagnosis With Causality	Mo-Yuen Chow, Simon M. Hsiang	09/01/07 - 08/31/10	National Science Foundation
Time and Data Sensitive Wireless Networked Control Systems	Wenye Wang, Mo-Yuen Chow	09/01/05 - 08/31/08	National Science Foundation
Advanced Memory Performance Inferencing Technologies	Thomas M. Conte	07/01/05 - 12/31/07	Red Hat, Inc.
CESR Membership Agreement	Thomas M. Conte	01/01/08 - 12/31/10	Cisco Systems, Inc.
Confidence in Computer Architecture Modeling and Simulation	Thomas M. Conte	09/15/05 - 08/31/08	National Science Foundation
Membership Agreement for the North Carolina State University Center for Efficient, Scalable and Reliable Computing	Thomas M. Conte	01/01/08 - 12/31/08	Qualcomm
Membership in the Center for Efficient, Secure, and Reliable Computing (CESR), Affiliate Member	Thomas M. Conte	09/01/04 - 08/31/08	Red Hat, Inc.
Techniques for Benchmark Characterization of the EEMBC Benchmark Set	Thomas M. Conte	05/01/06 - 04/30/08	EEMBC
Techniques for Improving Compiled Code for Embedded Superscalar Processor Pipelines	Thomas M. Conte	02/01/06 - 08/31/07	Qualcomm
Workload Characterization of Multithreaded, Multiprocessor and Clustered Applications	Thomas M. Conte	08/01/07 - 07/31/08	Hewlett-Packard Co.
Exploiting Multiple Antennas in Multiuser Wireless Networks	Huaiyu Dai, Brian L. Hughes	07/01/05 - 06/30/08	National Science Foundation
WN:Collaboration of Networked Nodes through Belief Propagation: Where Computing Meets Communications	Huaiyu Dai	09/01/07 - 08/31/10	National Science Foundation

Title	Principle Investigators	Dates	Sponsor
CAREER: Design Methodologies for Three-Dimensional Integrated Circuits	William R. Davis	04/15/07 - 03/31/11	National Science Foundation
FreePDK: An Open-Source, Variation-Aware Design Kit	William R. Davis, Paul D. Franzon	09/01/07 - 08/31/08	Carnegie Mellon University
CAREER: Software Thead Integration for Low-Through High-End Embedded Systems	Alexander G. Dean	02/01/02 - 01/31/09	National Science Foundation
CSR--EHS Rapid Efficient Implementation of Communication Protocols for Embedded Systems	Alexander G. Dean, Mihail L. Sichitiu, Thomas G. Wolcott	08/15/05 - 07/31/09	National Science Foundation
CSR-EHS: Integrated Memory Allocation and Scheduling for Real-Time Embedded Systems	Alexander G. Dean, Eric Rotenberg	08/01/07 - 07/31/09	National Science Foundation
On Demand Testbed: Monitoring For Capacity Planning and Performance Optimization	Mihail Devetsikiotis, Ioannis Viniotis	07/01/06 - 06/30/08	NCSU Center for Advanced Computing & Communication
Performance and Testing of SIP Over Wireless Mesh Networks	Mihail Devetsikiotis, Mihail L. Sichitiu	01/01/07 - 06/30/08	Nortel Networks
Adaptive Transmission and Channel Modeling for Frequency Hopping Communications	Alexandra Duel-Hallen, Hans D. Hallen	06/20/05 - 06/19/08	US Army
Channel Modeling and Adaptive Transmitter/Receiver Design for Outdoor Ultrawideband Communication Systems	Alexandra Duel-Hallen, Hans D. Hallen	03/15/08 - 02/28/09	National Science Foundation
ITR: Adaptive Signaling and MIMO Precoding for Rapidly Time Varying Fading Channels	Alexandra Duel-Hallen	07/15/03 - 12/31/07	National Science Foundation
Collaborative Research: Advanced Small Satellite Technologies Research and Education Center (AS2TREC)	William W. Edmonson	08/01/07 - 07/31/08	National Science Foundation
Flexible Hardware Design Methodology	William W. Edmonson	07/01/07 - 06/30/08	NCSU Faculty Research & Professional Development Fund
Liquid Crystal Polarization Gratings for Photonics Applications	Michael James Escuti	09/01/06 - 08/31/08	National Science Foundation
Modular Laboratory Experiments on Organic Electronics and Liquid Crystal Displays for Undergraduates	Michael James Escuti	01/01/07 - 01/31/09	National Science Foundation
Polymer Polarization Gratings For Liquid Crystal Microdisplays	Michael James Escuti	05/01/08 - 04/30/09	ImagineOptix Corp
SBIR Phase II Wide-Angle Nonmechanical Steering Development	Michael James Escuti	10/16/07 - 10/15/09	Boulder Nonlinear Systems
Career: A Stochastic Approach to the Design of Communication Networks: An Alternative to Fluid Modeling	Do Young Eun	03/01/06 - 02/28/09	National Science Foundation
CAD Support For the Third MIT-LL 3D-Integrated Circuit Run	Paul D. Franzon, William R. Davis	04/01/08 - 12/30/08	Massachusetts Institute of Technology
Computer Aided Design For Digital Trust	Paul D. Franzon	02/01/07 - 12/31/08	Irvine Sensors Corporation
Development and Use of Sensors in Validating Aseptic Processing of Multiphase Foods	K. P. Sandeep, Paul D. Franzon, Josip Simunovic	09/01/06 - 08/31/09	US Dept. of Agriculture
Development of a Micro-Electro-Mechanical-System-Based (MEMS) Temperature Sensor to Determine Internal Temperatures Within Multiphase Food Products	K. P. Sandeep, Paul D. Franzon, Josip Simunovic	05/01/06 - 12/31/07	Ohio State University Research Foundation
DNA-Nanotube Assemblies for Molecular Electronics: DNA Directed Circuit Assembly	Paul D. Franzon	09/15/03 - 08/31/07	Duke University
Micromachined Braille Reader	Paul D. Franzon	10/01/07 - 09/30/10	US Dept. of Education
Multimode Interconnect	Paul D. Franzon	11/01/06 - 10/31/09	Semiconductor Research Corp.
System Packaging With AC Coupled Interconnect	Paul D. Franzon	11/01/06 - 04/30/09	Irvine Sensors Corporation

Title	Principle Investigators	Dates	Sponsor
System Technologies for AC Coupled Interconnect for Low Power SpaceBorne Electronics	Paul D. Franzon, Angus I. Kingon, John Michael Wilson	09/25/06 - 09/30/08	US Air Force Research Laboratory (AFRL)
Test Devices for Molecular Electronics Applications	Paul D. Franzon	05/11/06 - 11/10/08	University of Virginia
Ultra High Density Computer Interconnect	Paul D. Franzon	09/01/02 - 08/31/08	National Science Foundation
Use of RFID Tags in Determining the Time-Temperature History Within a Product During Processing, Transportation, and Storage	K. P. Sandeep, Paul D. Franzon, Josip Simunovic	11/01/06 - 12/31/07	Ohio State University Research Foundation
Advanced RF Transmitter Design for Deep Submicron CMOS	Kevin Gard	06/01/04 - 11/30/07	Semiconductor Research Corp.
Expertiza: Reusable Learning Objects Through Active/Collaborative Learning and Peer Review	Edward F. Gehringer	01/01/06 - 09/30/08	National Science Foundation
Analytical Monitoring of Pharmaceutical Compliance	Maysam Ghovanloo	01/01/06 - 12/31/07	Dow Chemical Co.
Tongue Drive: A Tongue Operated Magnetic Sensor Based Assistive Technology for People with Severe Disabilities	Maysam Ghovanloo	08/01/07 - 12/31/08	National Science Foundation
Electrical Inert Crack Monitoring Gauge	Jerome J. Cuomo, Roger C. Sanwald, Edward Grant	06/01/07 - 03/31/09	DRS Technical Services, Inc.
Innovative Tools and Techniques for Robotic Heart Surgery	Gregory D. Buckner, Denis R. Cormier, Edward Grant, Bryan W. Laffitte	08/16/04 - 07/31/08	National Institutes of Health
Nonwoven Based eTextiles and Disposable Sensors	Behnam Pourdeyhimi, Edward Grant, H. T. Nagle	01/02/08 - 12/31/08	Kimberly Clark Corporation
MRI: Development of a Quantum Engineering Laboratory	Alexej I. Smirnov, William C. Holton, Ki Wook Kim, Veena Misra	09/01/04 - 08/31/08	National Science Foundation
Silicon Based Nanoscale Quantum Devices	William C. Holton, Veena Misra, Alexej I. Smirnov	08/01/03 - 07/31/07	National Science Foundation
10 MVA ETO-based STATCOM	Alex Q. Huang	09/15/06 - 12/31/07	Electric Power Research Institute
10 MVA ETO-based STATCOM: Digital Controller Hardware In the Loop (CHIL) Test with the real Time Digital Simulator (RTDS) at Florida State University (FSU)	Alex Q. Huang, Subhashish Bhattacharya	03/31/08 - 12/31/08	Florida State University
Advanced Power Devices and Converters	Alex Q. Huang	11/15/07 - 09/30/08	Sandia National Laboratories
Buck Boost Switching Converter for Dynamic Power Supply of a Radio Frequency Power Amplifier	Alex Q. Huang	11/15/05 - 03/31/08	RF Micro Devices
Consortium of Advanced Power Electronics and Energy Storage-CAPES (within SPEC) Pool Agreement	Alex Q. Huang	07/01/06 - 12/31/10	NCSU Semiconductor Power Electronics Center (SPEC)
Design Optimization of Silicon Carbide Bipolar Junction Transistor	Alex Q. Huang	06/02/05 - 03/29/08	CREE Research, Inc.
Development of a 69 kV Class Solid State Current Limiter (SSCL)	Alex Q. Huang	12/01/06 - 11/30/08	Silicon Power Corporation
Development of a Scalable, Transportable Energy Storage System for Effective Integration of Renewable Energy Sources	Alex Q. Huang, Mesut E. Baran, Subhashish Bhattacharya	04/17/07 - 08/01/08	Bonneville Power Administration
High Voltage SiC MOSFET/IGBT Development and Their Applications	Alex Q. Huang	11/21/05 - 11/30/07	CREE Research, Inc.
High Voltage Silicon Carbide Emitter Turn-off Thyristor	Alex Q. Huang	07/01/07 - 03/19/08	Solitronics, LLC

Title	Principle Investigators	Dates	Sponsor
Communications Theory Perspectives on the Design of Compact Multi-Antenna Wireless Transceivers	Brian L. Hughes, Gianluca Lazzi	09/15/07 - 08/31/10	National Science Foundation
NIRT: Reduced Degree of Freedom Predictive Methods for Control and Design of Interfaces in Nanofeatured Systems	Donald W. Brenner, Marco Buongiorno-Nard, Ron O. Scattergood, Mohammed A. Zikry, Gerald Iafrate	07/01/03 - 06/30/09	National Science Foundation
Non-Equilibrium Phonon Processes and Degradation in Gigahertz Nanoscale Mechanical Resonators	Gerald Iafrate, Valeriy Sokolov, Andrey A Kiselev	10/01/07 - 06/30/08	Army Research Office
Request for Support for the International Conference on Information and Communications Security (ICICS 2006)	Dennis H. Kekas	09/15/06 - 08/31/07	National Science Foundation
Secure Open Systems Institute	Dennis H. Kekas, Peng Ning, Mladen A. Vouk, Rudra Dutta, John C. Bass	04/03/08 - 11/30/12	Army Research Office
Workshop on STEM Education K-12	Dennis H. Kekas	07/15/07 - 06/30/08	National Science Foundation
Carrier Spin Dynamics and Device Applications in Carbon Nanotube	Ki Wook Kim, Marco Buongiorno-Nard	09/01/06 - 08/31/09	National Science Foundation
MARCO Center on Functinal Engineered Nano Architectonics (FENA)	Ki Wook Kim	09/01/03 - 08/31/08	University of California
Novel Non-Volatile Memory Devices Based on Magnetic Semiconductor Nanostructures for Terabit Integration	Ki Wook Kim	07/01/06 - 06/30/09	Army Research Office
Materials for Terahertz Generation	Robert M. Kolbas, John F. Muth	01/18/08 - 10/18/08	Digital Fusion Inc.
Rare Earth Materials	Robert M. Kolbas, John F. Muth	02/20/08 - 09/27/08	CAS, Inc.
A Test Bed for Range Imaging and 3D Object Measurement and Exploitation	Hamid Krim	06/01/06 - 08/31/07	US Air Force-Office of Scientific Research (AFOSR)
Bio-inspired Invariants: Target Representation and Classification towards Scene Understanding	Hamid Krim	05/15/06 - 09/30/09	US Navy-Office Of Naval Research
Graphs and Homology in 3D Object Classification	Hamid Krim	01/15/07 - 11/30/09	US Air Force-Office of Scientific Research (AFOSR)
Information Systems and Interdisciplinary Research Seminar Series	Hamid Krim	01/01/06 - 12/31/08	Army Research Office
Proposal in Support of the 14th Workshop on Statistical Signal Processing (SSP'07)	Hamid Krim	08/01/07 - 07/31/08	Army Research Office
Workshop Proposal: New Directions in Complex Data Analysis for Emerging Applications	Hamid Krim	05/15/07 - 12/14/07	US Air Force-Office of Scientific Research (AFOSR)
A High-Density Microelectronic Tissue for Imaging: Electromagnetic and Thermal Effects	Gianluca Lazzi	12/15/03 - 12/14/10	US Dept. of Energy
Biomimetic Electronic Systems (BIMS): Electrical and Electromagnetic Interactions	Gianluca Lazzi	09/01/04 - 08/31/08	University of Southern California
Multi-Functional Engineered Fabrics for Tarps	Behnam Pourdeyhimi, Gianluca Lazzi	09/25/06 - 09/30/07	US Army
Protocol Driven Studies to Measure Absorbed Radiofrequency, Microwave and Millimeter Wave Energy: Computational Electromagnetic	Gianluca Lazzi	01/01/07 - 03/31/08	Henry M. Jackson Foundation
IPA Agreement with NSF	Leda Lunardi	06/06/05 - 07/31/07	National Science Foundation
North Carolina Photonics Initiative Phase II	Leda Lunardi	04/21/04 - 06/30/08	UNC - General Administration
Collaborative Research: High Density Metal and Semiconductor Nanoparticles for Memory and Photonic Applications	Veena Misra, John F. Muth	06/01/08 - 05/31/11	National Science Foundation

Title	Principle Investigators	Dates	Sponsor
Molecular Information Storage	Jonathan S. Lindsey, Raymond E. Fornes, Veena Misra, John S. Strenkowski	01/01/02 - 12/31/07	Zettacore, Inc
Novel Approaches for Integration of Vertical Silicon Nano-electronics	Veena Misra	02/01/01 - 01/31/08	National Science Foundation
Porphyrin-Based Molecular Memories	Jonathan S. Lindsey, Veena Misra	09/19/06 - 09/30/07	University of California - Riverside
SGER: Novel Ultra Fast Heating Platform for In-Situ Study of Nanoparticle Based Devices	Veena Misra	03/01/08 - 02/28/09	National Science Foundation
Solid-State Hybrid Molecular Memory Devices	Jonathan S. Lindsey, Veena Misra	09/14/07 - 09/30/08	University of California - Riverside
Carolina Center of Cancer Nanotechnogy Excellence	John F. Muth	09/01/07 - 08/31/08	UNC - UNC Chapel Hill
Carolina Center of Cancer Nanotechnology Excellence	John F. Muth	09/30/06 - 08/31/07	UNC - UNC Chapel Hill
Defining the Boundaries of Free Space Underwater Communications	John F. Muth	01/01/07 - 12/31/09	National Science Foundation
Micromachined Chemical Sensor	John F. Muth	08/15/05 - 08/15/08	Naval Research Laboratory
Novel Coding Methods and Receiver Designs For Underwater Optical Communications	John F. Muth, Brian L. Hughes	05/23/07 - 03/22/08	Ambalux Corporation
Photocatalytic Sensors for VOC Sensing	John F. Muth	09/30/07 - 08/31/08	Valencell Inc.
Underwater Optical System	John F. Muth	09/12/07 - 09/01/10	Naval Research Laboratory
Valencell: Pulse Oximetry	John F. Muth	05/01/07 - 06/30/08	Valencell Inc.
National Nanotechnology Infrastructure Network - Triangle National Lithography Center	Carlton M. Osburn	03/01/04 - 02/28/09	Cornell University
Recessed SiGe and SiC Source/Drain Engineering For Future CMOS Technologies Employing Uniaxial Channel Stress For Channel Mobility Enhancement	Mehmet C. Ozturk, Veena Misra	07/01/06 - 06/30/08	Semiconductor Research Corp.
REU Site: Research Experiences For Undergraduates in the Department of Electrical and Computer Engineering at North Carolina State University	Mehmet C. Ozturk, Mihail Devetsikiotis	03/01/07 - 02/28/09	National Science Foundation
Control-Flow Processors	Eric Rotenberg	09/01/04 - 08/31/08	National Science Foundation
Retention-Aware Placement in DRAM (RAPID): Software Methods for Quasi-Non-Volatile DRAM	Eric Rotenberg	07/01/07 - 06/30/09	NCSU Center for Advanced Computing & Communication
Static-Power-Efficient Caches	Eric Rotenberg	05/16/06 - 08/15/08	Texas Instruments
The Phase Based Behavior of Objects	Eric Rotenberg	07/01/07 - 06/30/10	National Science Foundation
The Phase Based Behavior of Objects: Enabling a New Generation of Microarchitecture	Eric Rotenberg	04/01/07 - 03/31/10	Semiconductor Research Corp.
Virtual Simple Architecture (VISA): Exceeding the Complexity Limit in Safe Real-Time Systems	Eric Rotenberg, Frank Mueller	08/15/03 - 07/31/07	National Science Foundation
Development of Highly-Sensitive HgCdTe Detectors and Large-Format Focal Plane Arrays for Space-Based Imaging Applications in the 2-14 um Infrared Region and Beyond	Jan F. Schetzina, Mark A. Johnson	09/30/05 - 09/29/08	US Missile Defense Agency
NeTS-NBD: Measurement-Based Mobility Modeling for MANETs	Mihail L. Sichitiu, Injong Rhee	08/15/06 - 07/31/08	National Science Foundation

Title	Principle Investigators	Dates	Sponsor
On-the-fly Scene-dependent ATR	Wesley E. Snyder, Siamak Khorram	02/15/07 - 11/30/09	US Air Force-Office of Scientific Research (AFOSR)
CAREER: Intelligently Managing the Memory Hierarchy of Future High Performance Servers	Yan Solihin	03/01/04 - 02/28/09	National Science Foundation
Collaborative Research: Software and Hardware Support for Efficient Monitoring of Program Behavior	Yan Solihin	09/01/06 - 08/31/09	National Science Foundation
Providing and Maximizing Quality of Service in Utility Computing Servers	Yan Solihin	09/01/04 - 08/31/07	National Science Foundation
Electrical Network Design and Characterization For Three Dimensional Integrated Circuits	Michael B. Steer, Kevin Gard	10/01/07 - 12/31/08	Boise State University
Electromagnetic Modeling Tools for Three Dimensional Integrated Circuits	Michael B. Steer, William R. Davis, Paul D. Franzon	07/05/04 - 07/12/08	Parametric Technology Corporation (PTC)
Optimum Waveform Design for Electromagnetic Disruption and Probing of Remote Devices	Michael B. Steer	11/01/06 - 10/31/08	Army Research Office
Standoff Inverse Analysis and Manipulation of Electronic System	Michael B. Steer, Kevin Gard	07/01/05 - 04/30/10	Army Research Office
Ultra-Wideband Impulse Radio for Ad-Hoc Tactical Military Communications	J. K. Townsend	05/15/07 - 01/14/09	Army Research Office
Ultra-Wideband Impulse Radio for Tactical Military Communications	J. K. Townsend	08/20/03 - 08/19/07	US Army
IMPATT-mode AlGaN/GaN mm-Wave HFETs	Robert J. Trew	10/03/06 - 10/03/08	SVT Associates
Label-Free THz-Optoelectronic Sensing of Ultra-Low Concentration of Genetic Sequences: Theoretical Treatment	Robert J. Trew, Carl T. Kelley, Peiji Zhao	08/01/04 - 01/31/09	US Army
mm-Wave AlGaN/GaN HFET's	Robert J. Trew	06/09/03 - 06/08/08	US Army
Modeling Support For Investigation of AlGaN/GaN-Based Transistors on Nonpolar AlN Substrates	Robert J. Trew	03/01/07 - 01/31/08	Crystal IS, Inc.
Physics-Based Device Modeling	Robert J. Trew	05/20/05 - 02/01/08	Northrop Grumman
Proposal for Defense University Research Instrumentation Program	Carl T. Kelley, Robert J. Trew	05/01/06 - 10/31/07	Army Research Office
QMHP: Exploring the Limits of Energy Scavenging - From Microwave to Nanoscale	Robert J. Trew, Ki Wook Kim, David Schurig	04/01/08 - 03/31/11	National Science Foundation
The Millimeter-Wave Initiative for Nitide Electronics	Robert J. Trew	04/01/05 - 03/31/11	University of California - Santa Barbara
IP Triple and Quadruple Play Services: Modeling and Design	Harry G. Perros, Ioannis Viniotis	07/01/06 - 06/30/08	NCSU Center for Advanced Computing & Communication
Reliable Medium Access in Wireless Networks: Vulnerabilities, Protection, and Recovery	Wenye Wang, Peng Ning	03/01/05 - 02/28/08	Army Research Office
Robust Network Architecture Against Random Threats in WMD Environments: Theoretical Limits and Recovery Strategies	Wenye Wang, Hamid Krim	04/01/08 - 03/31/11	Defense Threat Reduction Agency
Magneto-Transports in Interband Resonant Tunneling Diodes (I-RTDs) and Dilute Magnetic Semiconductor (DMS) 1-RTDs	Peiji Zhao	05/01/07 - 04/30/10	Army Research Office
Nanoscale Imaging Technology for THz-Frequency Transmission Microscopy I.F.1.h (CBT)	Peiji Zhao, Robert J. Trew	06/01/07 - 05/31/08	Army Research Office

SEMINARS

Title	Speaker	Institution	Date
Innovation to Commercialization, Using Government Funding to Kick Start Your Start-Up	Thomas Allnut, Program Director; Milton Chen, CEO; Bruce Gellerman, Moderator; Christopher Loose, Founder; Bill Townsend, Founder	NSF; Vsee; Public Radio International; SteriCoat; Barrett Technology	June 04, 2008
Spectral Graph Matching	Dr. Yosi Keller	School of Engineering, Bar Ilan University	May 16, 2008
Engineering Methodologies and Design Concepts for Systems Biology	Cranos Williams	Systems Biology, NC State	May 15, 2008
Capabilities of the Nano eNabler System	James Adams	BioForce Nanosciences, Inc.	May 13, 2008
On Optimal Hand Gestures Design	Juan Wachs	NRC Research Associateship Program	May 06, 2008
Nanofabrication for Nanoscience	Dr. Deirdre L. Olynick	The Molecular Foundry at Lawrence Berkeley National Laboratory	May 05, 2008
Length-Adaptive Processors: The Solution for Power-Performance Dilemma	Balaji Iyer	North Carolina State University	April 25, 2008
Imaging Experience -Dependent Emergence of Functional Circuits in the Visual Cortex	Dr. David Fitzpatrick	Department of Neurobiology, Duke University Medical Center	April 25, 2008
Global Warming: Some Science and Solutions	Dr. Robert Jackson, Nicholas Professor of Global Environmental Change and Professor of Biology	Duke University	April 23, 2008
The Exploration of Hardware Simulation using CUDA	Paul Bryan	North Carolina State University	April 18, 2008
Nanosensors and Nanoprobes: A New Generation of Tool Set for Environmental and Biomedical Applications	Dr. Tuan Vo-Dinh	Fitzpatrick Institute for Photonics, Departments of Biomedical Engineering and Chemistry, Duke University	April 17, 2008
IEEE Technical Presentation	Lance Tucker & Nigel Keane	NAVAIR	April 16, 2008
Global Warming and the Neglected Majority	Dr. Rob Dunn, Professor of Zoology	North Carolina State University	April 16, 2008
Energy Leader Norris to Present Entrepreneurial Lecture	John F. Norris Jr.	Fuel Tech Inc.	April 14, 2008
Configurational Workload Characterization	Hashem Hashemi	North Carolina State University	April 11, 2008
The Power of Corporate Culture	Tom Mendoza	President of NetApp	April 10, 2008
Oil and Transportation-What's Coming?	Dr. John Blackburn, Professor Emeritus	Duke University	April 09, 2008
Computer Design in the Nanometer Scale Era: Challenges and Solutions	Prof. David Brooks	Harvard University	April 04, 2008
Protection Relay Testing	Ed Khan	Doble Engineering, Raleigh NC	April 04, 2008
Biofuels Today	Dr. Lyle Estill, Founder and CEO of Piedmont Biofuels	Piedmont Biofuels	April 02, 2008
Argus: Low-Cost, Comprehensive Error Detection in Simple Cores	Albert Meixner	Duke University	March 28, 2008
Looking For Patterns In Video	Dr. Rama Chellappa	University of Maryland, Electrical and Computer Engineering and UMIACS	March 28, 2008
Recent Advances in Modern Electric Machines and Power Electronics Converters	Prof. Hamid A. Toliyat	Advanced Electric Machines & Power Electronics (EMPE) Lab, Texas A&M University	March 27, 2008
GE - Global Research Projects and Technology in Electronic and Energy Conversion	Dr. Rajendra Naik	GE - Global Research in Bangalore, India	March 24, 2008
Distributed Flow Detection via Timing Analysis	Dr. Lang Tong	Electrical and Computer Engineering, Cornell University, Ithaca, New York	March 14, 2008

Title	Speaker	Institution	Date
Solving. Evolving. Engineering: The Progress Energy Distinguished Speakers Series	Steven Berlin Johnson	College of Engineering	March 11, 2008
Arrays And Cooperative Transceivers For Wireless Localization And Communication	Mostafa Kaveh	University of Minnesota (ECE)	February 29, 2008
SoftSig: Software-Exposed Hardware Signatures for Code Analysis and Optimization	Dr. James Tuck	North Carolina State University	February 22, 2008
Targeted Prefetching of Context Switch Related Cache Misses	Hanyu Cui	North Carolina State University	February 15, 2008
Challenges in Designing Next Generation Mobile Computing and Communication Products	Tom Collopy	Qualcomm	February 08, 2008
Single-Level Integrity and Confidentiality Protection for Distributed Shared Memory Multiprocessors	Brian Rogers	North Carolina State University	February 01, 2008
Object Categorization and the Need for Many-To-Many Matching	Dr. Sven Dickinson	Department of Computer Science, University of Toronto	January 25, 2008
ESP: Efficient Spectral Prefetching	Jesse Beu	NC State University	January 18, 2008
Complex Modulation and Acoustic Scene Analysis	Dr. Les Atlas	Department of Electrical Engineering, University of Washington	January 11, 2008
TeraGrid-Enabled Distributed Discrete Event Agent-based Epidemiological Simulations	Dr. Diglio Simoni	RTI International	November 30, 2007
Talk on Digital Convergence Demands on Design Verification	Harry Foster	Mentor Graphics	November 20, 2007
A Framework for Providing Quality of Service in Chip Multi-Processors	Fei Guo, PhD Candidate	NC State University	November 16, 2007
Is multiuser Detection Dead? Intercarrier Interference Suppression in OFDM Systems	Husheng Li	University of Tennessee	November 16, 2007
On the Design of Efficient Resource Allocation Mechanisms for Grid-like Environments	Claris Castillo, PhD Candidate	North Carolina State University	November 09, 2007
The Iterative Solution of General Finite Linear Systems VIA Flexible New Dual Variational Principles	Dr. Elmor L. Peterson	Army Research Office and Systems Science Consulting, Research Triangle, North Carolina	November 09, 2007
The Benefits of Implementing Interconnection Networks on 3DICs	Chris Mineo	North Carolina State University	October 26, 2007
Persistence and Layered Sensing Concepts	D. Gregory Arnold and Olga Mendoza	Wright-Patterson Air Force Base and Air Force Research Laboratory	October 26, 2007
A Technical Introduction to Cell/B.E Processor Architecture, Tools and Workload Scenarios	Srinivas Cheemalapati	IBM	October 19, 2007
Numerical Algebraic Geometry	Dr. Andrew Sommese	University of Notre Dame Dulac, Department of Mathematics	October 19, 2007
Combining Cluster Sampling with Single Pass Methods for Efficient Sampling Regimen Design	Paul Bryan	NC State University	October 05, 2007
Object and Scene Recognition with Bags of Features and Spatial Pyramids	Dr. Svetlana Lazebnik	University of North Carolina at Chapel Hill, Department of Computer Science	October 05, 2007
3D Integration: The Next (R)evolution in the Design of Microprocessors	Dr. Gabriel H. Loh	Georgia Institute of Technology	September 28, 2007
Integration technology application in electric vehicle drive system	Dr. Wen Xuhui	Inst. of Electrical Engineering (IEE), Chinese Academy of Sciences (CAS)	September 28, 2007
Novel Geometric Measures of Placentas and Their Branching Structure	Dr. Carolyn M. Salafia	New York University School of Medicine	September 28, 2007
CAP: Criticality Analysis For Power-Efficient Speculative Multithreading	Dr. James Tuck	North Carolina State University	September 21, 2007

Title	Speaker	Institution	Date
Content Based Visual Information Management	Dr. Djemel Ziou	Department of Computer Science, Universite De Sherbrooke, QC, Canada	September 21, 2007
Update Your Resume, Seminar Series part 1 of 3	Leslie Rand-Pickett	University Career Center	September 18, 2007
IEEE Fall 2007 Speaker Series	Bryson Trumble	Nucor Steel Hertford County	September 17, 2007
Using Address Independent Seed Encryption and Bonsai Merkle Trees to Make Secure Processors OS- and Performance-Friendly	Brian Rogers	North Carolina State University	September 14, 2007
Multiphysics Modeling Using Compact Models	Dr. Michael Steer	NC State University/ECE	September 14, 2007
Embedded Processors: Sharing our Wish-Lists	Dr. Paul Dent	Ericsson	September 07, 2007
Metamorphoses For Pattern Matching	Dr. Elie L. Younes	John Hopkins University	September 07, 2007
Neighborhood-Aware Density Control for Balanced Energy Usage in Wireless Sensor Networks	Mu-Huan Chiang	North Carolina State University	August 31, 2007
A Low-Complexity Universal Scheme for Rate-Constrained Nonparametric Regression Using A Wireless Sensor Network	Dr. Maxim Raginsky	Northwestern University	August 31, 2007
SPEC Power Electronics Seminar	Prof. Dan Chen	National Taiwan University	August 30, 2007
Exploiting Microarchitecture Insights for Efficient Fault Tolerance	Vimal K Reddy, Ph.D. Candidate	North Carolina State University	July 13, 2007
Denoising Natural Color Images	Dr. Yang Wang	National Science Foundation	May 04, 2007
VISSTA Seminar	Dr. Sheila Hemani	ECE Dept., Cornell University	April 27, 2007
Flexibly Managing Distributed L2 Caches in Many-Core Processors	Dr. Sangyeun Cho	University of Pittsburgh	April 20, 2007
IEEE Spring 2007 Seminar Series	Brad Potts, Mac Moore	Mentor Graphics	April 19, 2007
The Complex Genetics of Myopia	Dr. Terri Young, Professor of Ophthalmology and Pediatrics	Duke University Center for Human Genetics	April 18, 2007
Connecting the Dots in a Flat World	Dr. Juan E. Vargas	Microsoft and University of South Carolina	April 13, 2007
Overview of Power System Substation Projects at Black & Veatch	Jeffrey L. McElray, Sr.	Black & Veatch, Raleigh	April 13, 2007
Content based Visual Information Management	Dr. Djemel Ziou	Department of Computer Sciences, University of Sherbrook, Canada	April 13, 2007
Discreet Signaling: From the Chinese Emperors to the Internet	Dr. Pierre Moulin	ECE, UIUC	March 30, 2007
IEEE Spring 2007 Speaker Series	Eric Hullemeyer	Norfolk Southern	March 29, 2007
Advanced Image Processing for NASA Applications	Dr. Jacqueline Lemoigne	Advanced Architectures and Automation Branch, NASA Goddard Space Flight Center	March 23, 2007
Moving from Player to Creator: Opportunities in the Videogame Industry	Colleen McReary and Ryan Stradling	Electronic Arts	March 21, 2007
Reviews and Inspections of Embedded Systems In Emerson	Bill Trosky	Emerson Software Center of Excellence	March 16, 2007
Geometric aspects of learning from labeled and unlabeled data	Dr. Misha Beylkin	Computer Science Dept., Ohio State University	March 16, 2007
VLSI Design of High-Speed and Low Energy Adders	Dr. James E. Stine	Oklahoma State University	March 02, 2007

Title	Speaker	Institution	Date
Wide BandGap Power Device Development in Japan	Dr. Ohashi and Dr. Mochizuki	AIST, Japan	March 02, 2007
Topology Optimization in Sensor Networks	Dr. Jose Moura	ECE Dept, Carnegie Mellon University	March 02, 2007
Hardware/Software Codesign of a Real-Time Operating System with an Emphasis on Real-Time Deadlock Detection and Avoidance	Vincent Mooney	Georgia Institute of Technology	February 23, 2007
Fractional Calculus and Fractal Dynamics (with some applications)	Dr. Bruce West	Army Research Labs/Army Research Office	February 23, 2007
Engineering Disasters - How and Why Projects Fail	Lowry DuRant Lewis	Atmel Corp.	February 16, 2007
Statistical Analysis of Shapes of Curves and Surfaces	Dr. Anuj Srivastava	Statistics Dept., Florida State University	February 16, 2007
Network Processor Features and Design Challenges for the Network Edge	Kip Potter	Cisco Systems	February 09, 2007
Time-frequency Propagation Structure for Active Sonar Tracking	Dr. Lisa Zurk	EECS, Portland State University	February 09, 2007
IEEE Spring 2007 Seminar Series	Laura Ramseur	Hughes Network Systems, LLC	February 08, 2007
The Information Age: The Next 10 Years, Unleash the Power of Java!, and Connect Everything: Employment Opportunities at Sun and More	Sun Microsystems	Sun Microsystems	February 07, 2007
The Evolution of Useful Things	Henry Petroski	NCSU Human Factors and Ergonomics Society	February 05, 2007
Strategizing with IP: Universities and Industry Crossing Death Valley Together	Professor Mariann Jelinek, College of William & Mary	ECE	February 05, 2007
Indium Gallium Zinc Oxide and other Transparent Conducting Oxides For Transparent and Flexible Electronics	Dr. John Muth	ECE Dept. NCSU	February 02, 2007
Multiscale analysis of diffusion processes on graphs and analysis of high-dimensional data	Prof. Mauro Maggioni	Dept. of Mathematics, Duke University	January 26, 2007
Fellowship Advising Seminar	Jennie Lamonte	Eta Kappa Nu	January 25, 2007
Uncertainties-driven Registration and Statistical Modeling of Shapes with Variable Metric Kernels	Prof. Nikos Paragios	Ecole Centrale de Paris	January 25, 2007
Comsol (Femlab) Workshop	Jean-Francois Hiller	COMSOL, Inc.	January 19, 2007
Cooperative Systems: The Mathematics of Collaboration among Humans, Computers, and Bots	Chris Arney	Cooperative Systems and Mathematical Sciences Army Research Office	January 19, 2007

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