Spring 2007

Electrical & Computer ENGINEERING News

Greetings! The Department of Electrical and Computer Engineering continues to experience successes among our faculty, staff, students, and alumni. Our latest accomplishments are highlighted in this issue, with our most notable achievement front and center: The ECE faculty recently was ranked in the top 10 nationally for scholarly productivity. Needless to say, I am thrilled with this recognition, which truly speaks to the quality of the educators and researchers in our department. We will build on the momentum, as we work to expand our programs, recruit the best and brightest new students, and grow our faculty. I look forward to sharing more exciting news in the months to come.

Tony Maciejewski,
ECE Department Head

Colorado State University

Department of Electrical and Computer Engineering faculty

ECE Is in the Top Ten, Nationally

The Department of Electrical and Computer Engineering at Colorado State University recently ranked in the top 10 nationally by the Faculty Scholarly Productivity Index. These rankings, a new standard for measuring doctoral programs based on scholarly output, were produced by Academic Analytics with support from State University of New York-Stony Brook.

The new annual index, derived from 2005 data, has burst onto the scene to provide a service that administrators have long been requesting: a scientific ranking that compares peer programs according to objective measures. Unlike *U.S. News and World Report*, the index is not based on perception – it examines quantifiable data to determine its rankings, such as faculty publications (including published books, journal articles, and citations of journal articles), federal grant dollars awarded, and honors and awards. The last major study of its kind was released by The National Research Council in 1995.

"Our faculty work hard, and most importantly, they produce excellent results," said ECE Department Head Tony Maciejewski. "It is great to see a new metric that ranks departments by their scholarly output." He added, "In terms of our productivity and the quality of our work, we clearly can compete with the best universities in the nation."

The Faculty Scholarly Productivity Index ranked 7,294 programs in 104 disciplines at 354 institutions, encompassing a total of 177,816 faculty members. The ECE department ranked 10th in the nation among institutions that offer both an electrical engineering and computer engineering major; the index includes a separate ranking for departments with only an electrical engineering major.

Seven other academic departments at Colorado State University also were ranked in the top 10 in their discipline, outperforming all other Colorado universities in the index rankings. The colleges of Agricultural Sciences and Engineering had multiple departments ranked by the survey.

"While our faculty, in general, are highly productive using these standard measures, the recognition of specific Colorado State departments and programs as highly productive in comparison to their peers on a national level is very rewarding and a compliment to the hard work of the faculty in these departments," said Tom Gorell, vice provost for Faculty Affairs at Colorado State.

New Look and Feel for ECE

In the pages of this newsletter, you will notice a new look and feel for the Department of Electrical and Computer Engineering. Combining colors and fonts that align with the University brand, we think our refreshed look better represents our department's thriving academic and research environment, and we believe our new image will appeal to prospective students. The new graphics are being incorporated into all our departmental communications, including brochures and the ECE web site. Take a look at www.engr.colostate.edu/ece.

Record Turnout for Engineering Career and Internship Fair

On February 20, more than 100 companies and agencies across the United States packed the Lory Student Center for the College of Engineering Career and Internship Fair, with a number of companies pushed to a waiting list due to limited space. The annual event also drew a record student turnout, with almost 750 undergraduate and graduate students attending.

"We are extremely pleased with the success of this year's event," said John Haines, engineering career liaison. "I think the response to our fair is indicative of the current economic climate. There are a lot of companies that want to hire our engineering graduates, and I believe that trend will continue."

The fair gave students an opportunity to learn about many different companies and industries and explore various career paths. Likewise, company representatives were able to visit with potential employees and interns and schedule follow-up interviews with promising candidates.

Because of the overwhelming response to the 2007 fair, the college is considering a two-day Career and Internship Fair in 2008. Watch the College of Engineering web site for details (www.engr.colostate.edu) or contact John Haines at (970) 491-0716 or john.haines@colostate.edu.

ECE Ramps Up Recruitment

Prospective engineering students around the country currently are making their important college decisions. Through a series of targeted events, publications, personal contacts, and mentoring programs, this year the ECE department has placed a renewed emphasis on attracting talented undergraduate and graduate students to Colorado State University.

Not only are we proud to tout our programs and nationally ranked faculty, we also believe there is much to promote about the industry. According to the 2007 Job Outlook Report from the National Association of Colleges and Employers, electrical engineering and computer engineering are among the top 10 majors in demand for bachelor's, master's, and doctoral degrees. The number of U.S.-based high-tech workers is higher today than it was at the peak of the Internet boom, and ECE graduates consistently earn higher starting salaries than most other disciplines.

"Unlike more familiar occupations such as a doctor or lawyer, I think many prospective students are unclear about what a career in electrical or computer engineering entails," said Tony Maciejewski, ECE department head. "In addition to marketing the strengths of our department, we're really trying to raise awareness of the many benefits of an ECE degree."

The College of Engineering also has formed undergraduate and graduate committees, with representatives from each department, dedicated to recruitment and retention. The combined effort of these teams already has resulted in a number of successful events and initiatives.

As ECE alumni and friends, we invite you to serve as our advocates and help promote the ECE department throughout the country. If you know any talented young students who excel in math and science, please encourage them to consider a degree in electrical and computer engineering. We would be pleased to provide students with additional information and help to arrange a personal campus tour. For more information, please contact Karen Ungerer, ECE recruitment coordinator, at (970) 491-0500 or kungerer@engr.colostate.edu.

ECE to Host Summer Research Programs for Undergraduates

This summer, the ECE department again will offer two 10-week Research Experience for Undergraduates (REU) Programs sponsored by the National Science Foundation. Providing an opportunity for undergraduate students to participate in cutting-edge research in the department's world-class Engineering Research Centers, the programs will be hosted by the Center for Collaborative Adaptive Sensing of the Atmosphere and the Extreme Ultraviolet Science and Technology Center.

In addition to providing valuable research experience, both programs offer writing workshops and social activities. Students are granted stipends and, in most cases, assistance with housing and travel. Visit the ECE web site (www.engr.colostate.edu/ece) for REU program details and eligibility requirements.

Student Spotlight: Electrical Engineering Is Music to Student's Ears

ECE senior Dallin Kuzmich

As a person who has been passionate about music and engineering since a young age, ECE senior Dallin Kuzmich seems to have hit the right note with his academic pursuits. Dallin is attending Colorado State University with a scholarship for violin performance, while studying to be an electrical engineer, his dream career.

Carrying a double major is a heavy load, but Dallin, who said he believes in living a balanced life, continues to excel at both. In addition to maintaining a high GPA in his electrical engineering courses, he recently served as the CSU concert master for the opera *The Marriage of Figaro,* one of Mozart's most popular works.

This semester, Dallin began work on his capstone senior design project, where his passions once again have intersected. In collaboration with two other students, who also are double majoring in engineering and music, Dallin is working to develop an electronically controlled pipe organ using mathematical equations to synthesize the sound. He said this senior design project provides an opportunity to further explore how skill and engineering can turn sound into music. "When I hear music, I think about the science behind it. I try to understand the relationship between the notes and how the tune is structured," said Dallin. He continued, "I see a lot of parallels between electrical engineering and music. While both disciplines require creativity, I think you also have to be organized and logical to be effective."

Upon graduating in 2008, Dallin's goal is to use his ECE education to pursue a leadership role in a prominent engineering company. He also hopes to play in a symphony orchestra one day.

ECE Students Cook up Support for Kautz Scholarship

A group of ECE volunteers prepare food for the Kautz Memorial Cajun Boil. The students managed all the cooking and serving at the event.

Last fall, the ECE department launched a fundraising campaign for the Chris Kautz Memorial Scholarship Fund. Shortly after the new fund was announced, a volunteer group of ECE students worked together to create a recipe for generating support: great cause, great people, and spicy boiled seafood.

In collaboration with Kautz's family and the ECE staff, the students, led by Miguel Galvez and Miguel Morales, planned and executed the first-ever Kautz Memorial Cajun Boil. The event attracted more than 60 attendees, raising $1,638 for the fund.

The students not only devised the idea, they also managed all the cooking and serving at the event. "This was the first cajun boil I have ever attended," said ECE Department Head Tony Maciejewski. "The format was a lot of fun and the food was excellent." He added, "I was really impressed with our students for their initiative and teamwork. They clearly are passionate about this cause." Galvez and Morales said they plan to host another cajun boil this spring.

If you would like to make a gift to the Chris Kautz Memorial Scholarship Fund, please contact the ECE department at (970) 491-1033 or ece@engr.colostate.edu.

Bartels' Project Funded by New Bioscience Grant

Colorado State University has landed more than $440,000 for five bioscience projects from the Colorado Office of Economic Development and International Trade. The projects span a wide range of disciplines from engineering to veterinary medicine.

A portion of the grant money will be awarded to ECE Assistant Professor Randy Bartels for his project to develop novel forms of nonlinear optical microscopy that could produce images of the inside of living organisms at the molecular level. The application of such technology could lead to a greater understanding of diseases such as bovine spongiform encephalopathy or mad cow disease, chronic wasting disease in deer and elk, and scrapie in sheep.

"These funds will assist Colorado State's leading scientists to more quickly turn their scientific findings into products that could lead to new ventures and job creation," said Bill Farland, vice president for Research at CSU. "One of the University's major goals is to fully realize the potential impacts of discovery and contribute to economic prosperity."

ECE Alumnus First Licensure Student of Engineering Education Degree Program

ECE alumnus Kate McDonnell (center) assists two students with an engineering problem. Kate is the first licensure student of Colorado State's engineering education degree program.

Colorado State University's new one-of-a-kind engineering education bachelor's degree trains engineers to be junior high and high school engineering and technology teachers in an effort to improve the nation's technological literacy and its global competitiveness.

The program, which is co-sponsored by the College of Engineering and the School of Education in the College of Applied Human Sciences, requires students to earn an engineering bachelor's degree with a concentration in engineering education before they can obtain their nationally accredited technology education teaching license.

Kate McDonnell, computer engineering alumnus, is the first licensure student of the new engineering education program. She'll obtain her teaching certificate in May after spending the spring semester student teaching at Fossil Ridge High School in Fort Collins, which offers several pre-engineering courses. So far, McDonnell has been working with students to design an eight-foot catapult and an electric car.

When McDonnell graduates, she'll be head-and-shoulders above counterparts around the country who have technology education degrees that don't include strong science, mathematics, and engineering training, said Michael De Miranda, engineering education professor based in the School of Education. "Think what influence she'll have on those young girls who don't have many role models," he said. "Boys have a lot more role models in this field. We're excited about the program, that we're attracting students like Kate."

For more information about the program, go to http://www.mycahs.colostate.edu/Michael.DeMiranda/engineeringed.htm.

Menoni Named VP for IEEE-LEOS Publications

Dr. Carmen Menoni, ECE professor, recently was elected vice president of publications for the IEEE Lasers and Electro-Optics Society (IEEE LEOS). In her new role, Menoni will work with the editors-in-chief and the LEOS Editorial Office to promote LEOS publications by increasing their visibility and prestige. IEEE LEOS publishes the *IEEE Journal of Quantum Electronics, IEEE Photonics Technology Letters,* and *IEEE Journal of Selected Topics in Quantum Electronics.* In collaboration with the Optical Society of America, IEEE LEOS also produces the *Journal of Lightwave Technology* and the *Journal of Display Technology*. These journals rank among the top ten in the IEEE for highest citation index.

Can You Identify This Alumnus?

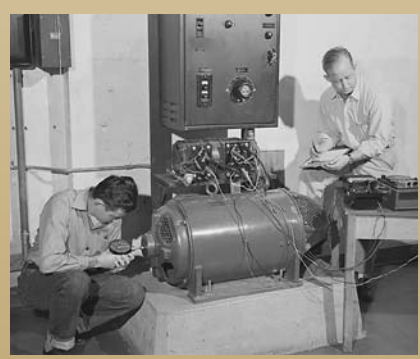
Can you name the alumnus featured here? Call (970) 491-6600 or send an e-mail to ece@engr.colostate.edu.

The photo was taken in September 1967, just weeks before Thurgood Marshall was sworn in as the first black U.S. Supreme Court justice. At that time, the unemployment rate was 3.8 percent, and the average cost of a new home was $24,600. *Rolling Stone* and *New York Magazine* debuted in 1967, spawning the popularity of special interest and regional magazines. In music, Sinatra serenaded the country with his Grammy-winning record, *Strangers in the Night.*

Watch for an update in the next ECE newsletter.

Update:

Two alumni from the Class of 1953, Bill Evans and Raul Pettai, contacted the ECE department to identify the gentlemen in the photo below. Sadly, Lewis Martin (left) and Otis Johnson (right) are deceased. According to Pettai, there were nine students in their class, four of whom are living: Clifford Allen, Bill Evans, Homer Mayberry, and Raul Pettai.



Richard Farmer was selected to receive the Distinguished Alumni Award from the Department of Electrical and Computer Engineering.

Richard Farmer Named 2007 ECE Distinguished Alumnus

In recognition of his outstanding career achievements, ECE alumnus Richard Farmer was selected to receive the Distinguished Alumni Award from the Department of Electrical and Computer Engineering. He was honored at the college's annual Alumni and Friends Awards Dinner on March 31.

Farmer, who originally is from Eaton, Colorado, earned his bachelor's degree in electrical engineering from Colorado State in 1952 and a master's in electrical engineering from Arizona State University in 1964. He has more than 50 years of industry experience in electric power, having held engineering positions with MIT Digital Computer Laboratory, Miner & Miner Consulting Engineers, and Arizona Public Service, where he retired in 1994 as a principal engineer.

Farmer also taught evening courses as an adjunct faculty member at Arizona State University from 1966 to 1994. Upon retirement, he accepted a faculty research associate position with ASU, teaching electric power classes and assisting graduate students with research. In 2006, Farmer was promoted to research professor. He co-authored a book on the application of series capacitors in power systems and has written more than 35 papers.

Last year, Farmer was elected to the National Academy of Engineers, one of the highest professional distinctions in the field. He is a Fellow of the Institute of Electrical and Electronics Engineers (IEEE) and previously has been honored by the IEEE with the Power System Engineering Distinguished Service Award, the Third Millennium Medal, the Power System Dynamic Performance Committee Distinguished Service Award, and the Phoenix Section Senior Engineer of the Year Award. He also was named Arizona Engineer of the Year by the National Society of Professional Engineers.

Class Notes

Please send your professional and family updates to ece@engr.colostate.edu. Your news will be published in the next ECE newsletter.

Michelle (EE '99) and Jason (EE '00) Gentry welcomed their first child, Graden Michael, on January 16, 2007. Jason said both mom and baby are doing well.

Laser Research Benefits State

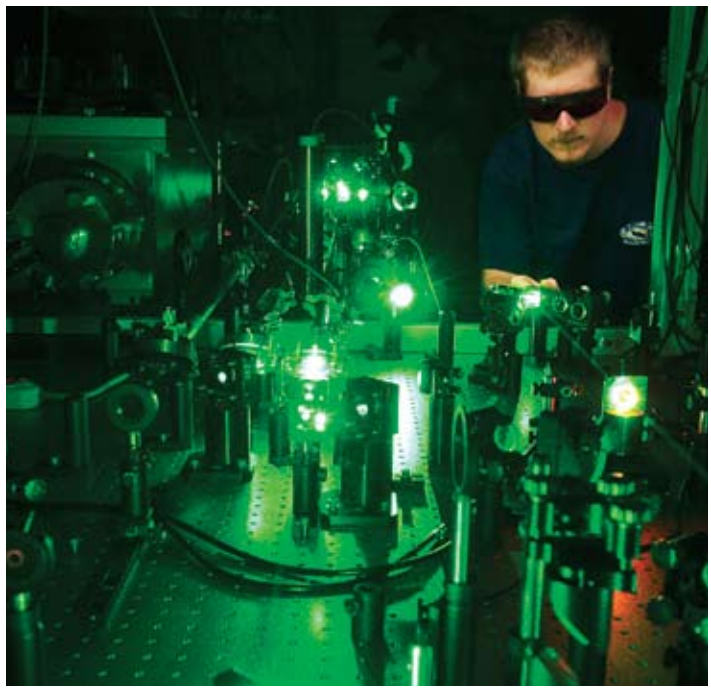
Presidents of Colorado's major research universities are working collaboratively in ways that benefit Colorado. That cooperation also extends to scientific discovery.

For example, laser research at Colorado State University, the University of Colorado, and the Colorado School of Mines generates tens of millions of dollars in annual research expenditures for the state. Those dollars have resulted in the creation of new technology, numerous research and educational opportunities for students and young scientists, spin-off companies, and jobs.

A particularly successful example of collaboration among industry and Colorado's research universities is the National Science Foundation's Engineering Research Center for Extreme Ultraviolet Science and Technology. The center, a partnership between Colorado State University, CU-Boulder, and the University of California-Berkeley, is affiliated with numerous research and educational institutions nationwide. The National Science Foundation has committed $20 million to fund the center for the next five years.

The group is among the world's leaders in developing compact extreme ultraviolet coherent light sources, optics, and optical systems that can accommodate ever-shrinking electronic circuits and nanotechnologies. Industry partners are anxious to jump on such technology. By 2009, six major technology companies, including Intel and AMD, plan to produce computer technologies using EUV light, which will allow them to fabricate chips with speeds exceeding 20 GHz – about 10 times faster than existing technologies.

"A goal of the center is to have a broad impact on science and technology from fundamental research to the development of tools that can assist large-scale manufacturing. Another is to train a new generation of engineers and scientists," said Dr. Jorge Rocca, ECE professor and director of the Extreme Ultraviolet Science and Technology Engineering Research Center. "EUV light opens numerous new opportunities in areas such as nanotechnology, surface science, photochemistry, atomic and molecular science, plasma physics, and other fields."



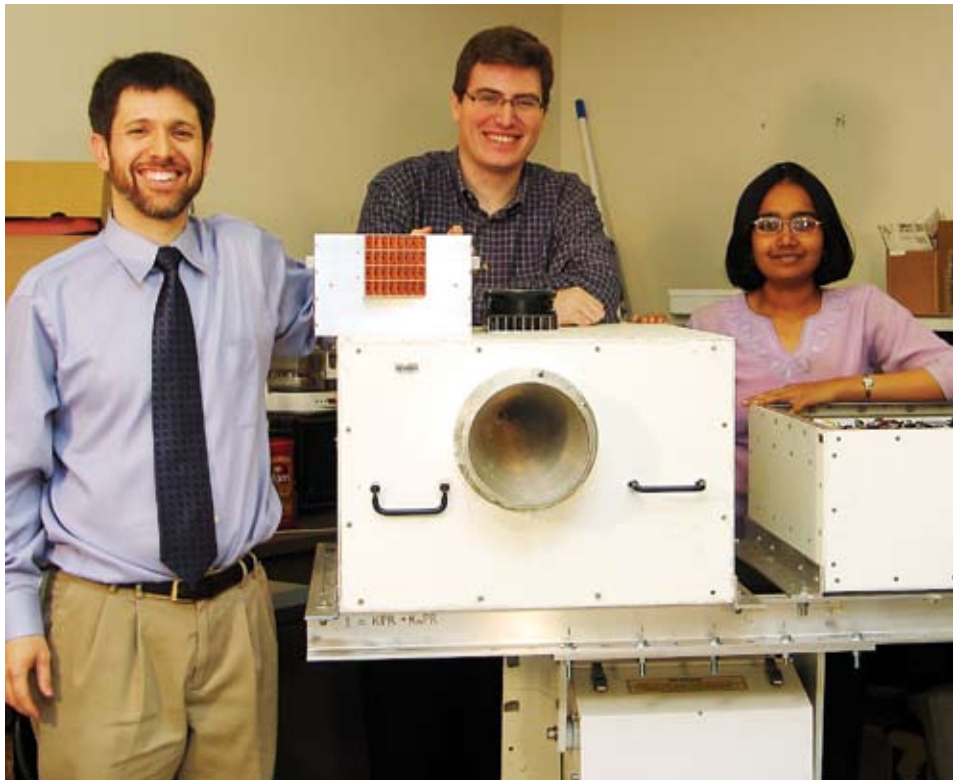
Research Spotlight: ECE Partners with Ball Aerospace to Improve Space-Based Monitoring of Severe Weather

Severe weather events can have devastating effects on society. A striking example is Hurricane Katrina, the costliest natural disaster in U.S. history, with more than 1,800 deaths and $80 billion in damage. Electrical and computer engineers at Colorado State University have established and maintained long-standing collaborations with atmospheric scientists to develop innovative instrumentation providing weather data for advance warning and prediction of severe weather. A recent example is a new collaborative partnership between the research team of Dr. Steven Reising, ECE associate professor at Colorado State University, and Ball Aerospace & Technologies Corp. This partnership is developing new instruments for future satellites to provide new and more complete measurements of the atmosphere. In the long term, it is anticipated that this information will be used to improve advance prediction and warning of severe storms.

Reising and Ball Aerospace are working together to build a demonstration prototype microwave radiometer for sensing the atmosphere from satellites. This innovative instrument is designed to provide information on the three-dimensional distribution of humidity in the Earth's atmosphere, with the long-term potential for improving weather forecasting. The new radiometer design is more power-efficient and cost-effective than conventional instruments. The prototype will be designed to meet NASA's requirements for small, low-power, and low-mass radiometer technology, requiring fewer resources to launch and operate in space.

Reising and his team of graduate students, who have been doing extensive research in miniaturizing passive microwave instruments for ground-based use, will adapt what they already have learned – and proved – to a space-based environment. Working with Ball Aerospace, the team will test the prototype in a simulated space-borne environment, exposing it to pressures, temperatures, and shock/vibration similar to those during launch and in orbit.

This newsletter is produced twice yearly by the Department of Electrical and Computer Engineering. Please send story ideas and comments to:
Andrea Leland, Lead Writer and Editor
1373 Campus Delivery, Fort Collins, Colorado 80523-1373
E-mail: lelandam@engr.colostate.edu; phone: (970) 491-1033



Dr. Steven Reising, left, and his graduate students have been performing extensive research in miniaturizing passive microwave instruments for ground-based use. The instrument (pictured on top) was built with significantly reduced mass, volume, and power consumption relative to conventional radiometers (bottom instrument). The team is working with Ball Aerospace & Technologies Corp. to adapt what they already have learned to a space-based environment.

Colorado State University is the only academic institution that Ball is funding in the area of microwave remote sensing. "Ball's commitment to this initiative demonstrates their knowledge of the high-quality research being conducted in the ECE department," said Reising. "I believe we have a viable solution that can increase the available information for weather forecasting and climate monitoring."

Upcoming Events

Engineering Days: Friday, April 13

Plan to join the ECE department for the 2007 Engineering Days celebration on Friday, April 13, in the CSU Lory Student Center. Projects will be on display and students will be on hand to discuss their projects from 9 a.m. to 3 p.m.

ECE Industrial Advisory Board Meeting: Friday, April 20

The bi-annual ECE Industrial Advisory Board (IAB) meeting is scheduled for Friday, April 20, in the Lory Student Center's Grey Rock Room. For membership information as well as past meeting notes and presentations, visit the ECE web site: www.engr.colostate.edu/ece/ind_relations/IAB.shtml.

Engineering Spring Undergraduate Commencement: Friday, May 11

The College of Engineering spring commencement will take place at 11:30 a.m. on Friday, May 11 at Moby Arena. The ECE department will host a reception for all graduating seniors and their families before the ceremony. The winner of the second Annual Best Paper Contest will be announced at the reception.