

Spring 2006

## Design Project Could Open New Doors for ECE Alumnus

When Justin Moninger graduated from the ECE department in 2003, he had no idea he would be returning two years later as the inspiration for a senior design project that could impact his life. Last year on March 11, Moninger broke his neck in a diving accident while in Steamboat Springs, resulting in a major spinal cord injury. He is now a quadriplegic and may spend the rest of his life in a wheelchair.

Not long after news of the accident reached Colorado State, academic adviser Elisabeth Wadman and Nicole Knafelc, an ECE alumna and friend of Moninger's, began to think of ways that ECE students could help.

"Justin really stood out in our program, not only for his outstanding academic performance but also for his interpersonal and leadership skills," said Wadman. "I grew to know him quite well, and I knew our students could help improve the quality of his life."

A three-person student design group was formed to work in collaboration with Moninger and Knafelc to develop a project idea. Their mission is to create a solution that will allow individuals with disabilities to open doors without having to push wheelchair access buttons. Because quadriplegics have limited to no use of their fingers, biceps, and triceps, such a solution would literally open new doors to greater independence and mobility.

With Moninger's involvement, the team currently is designing and constructing a wheelchair sensor system that will communicate with sensors equipped on doors in a test home and workplace setting. A door sensor will respond to the approaching wheelchair, causing the door to automatically open long enough for a wheelchair user to enter the building.

"This is a very exciting project," said Moninger. "No one is ever prepared to face the daily challenges of being in a wheelchair, and I think it's great to see this senior design team applying their engineering education in a way that truly benefits society."

The project is still under way, but the team's vision is to implement their solution in more wheelchairs and doors, ultimately impacting individuals with disabilities around the country.

The design team received funding for the project from Anheuser-Busch as well as individual donors. Thanks to contributions such as these, ECE students can fully participate in innovative projects that make a difference in our world.



*Alumnus Justin Moninger (center), EE '03, is involved with a student project to develop a new wheelchair sensor system. He is featured here with senior design team member Wanning Jen, ECE academic adviser Elisabeth Wadman, and his dog, Rocky. Not pictured: senior design team members Michelle Dummer and Sam Mast.*

### View ECE Student Projects at 2006 E Days

Join the ECE department for the annual Engineering Days (E Days) celebration on Friday, April 14 in the CSU Lory Student Center. Student projects will be on display from 9 a.m. to 3 p.m. for free viewing by the public.

## Senior Design Students to Compete in Inaugural Best Paper Contest

This spring, students in ECE's senior design program will have a chance to showcase their writing skills and compete for a \$500 cash prize in the department's first-ever Best Paper Contest. Sponsored by the IEEE Denver Section and the local IEEE Solid-State Circuits Society, the idea was conceived during a meeting of the ECE Industrial Advisory Board (IAB).

"While discussing skills that employers look for in recent graduates, the IAB unanimously agreed that effective communication skills are critical," said Alvin Loke, design engineer for Avago Technologies and chair of the IEEE Solid-State Circuits Society Denver Chapter. "Of course companies are seeking engineers with solid technical backgrounds, but they also want to hire individuals who can communicate clearly and concisely." He continued, "Needless to say, the IEEE was more than willing to support an initiative that encourages students to hone their writing skills."

The students' final project reports will be reviewed and evaluated by a panel of volunteers from the IAB. Using a common rating system, the judges will grade each paper on criteria including organization, development, clarity, style, and grammar.

The winner of the contest will be announced at ECE's graduation reception on Friday, May 12.

## ECE Offers Summer Research Experience for Undergraduates

This summer, the ECE department again will serve as a host institution for two Research Experience for Undergraduates (REU) programs. Supported by the National Science Foundation (NSF), the ten-week programs provide opportunities for undergraduate students to participate in hands-on research in the department's world-class Engineering Research Centers. According to the NSF, active research experience is considered one of the most effective ways to attract and retain talented undergraduates in science and engineering.

The CSU-CHILL Radar facility and its revolutionary weather sensing technology is the focus of an REU program linked with CASA, the Center for Collaborative Adaptive Sensing of the Atmosphere, while the Extreme Ultraviolet (EUV) Science and Technology Center offers cutting-edge undergraduate research experience in lasers and optics.

"It is incredibly rewarding to work in a research environment," said Courtney Brewer, who participated in the 2004 REU program for the EUV ERC. "The feeling I get when I am able to understand a difficult problem, form new ideas, and come up with solutions is immeasurable and addicting." Brewer currently is working toward her master's degree in electrical engineering at Colorado State.

Both REU programs also offer writing workshops that teach students how to compose and prepare scientific papers, technical journal

articles, poster presentations, proposals, and comprehensive research reports. Students are granted stipends and, in most cases, assistance with housing and travel.

Visit the ECE web site ([www.engr.colostate.edu/ece](http://www.engr.colostate.edu/ece)) for more information about this summer's REU programs.

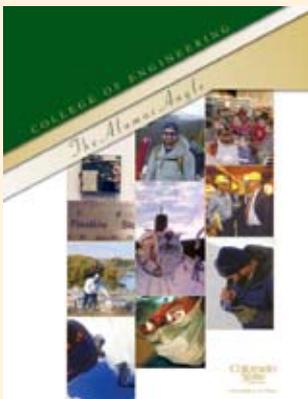
### ECE Undergraduates Win IEEE Senior Design Award

ECE seniors Abbie Tippie and Christopher Kautz recently won the IEEE P.K. Sen Senior Design Award for their project entitled, "High resolution microscope of the future: Using an ultrashort wavelength laser to image integrated circuits."

Tippie and Kautz competed with students from eight other regional universities and were judged on a project proposal presentation at a meeting of the IEEE Denver Section. The students will use the cash award to help fund expenses associated with their project.

Working under the direction of Drs. Carmen Menoni and Jorge Rocca in the Extreme Ultraviolet Science and Technology Center, Tippie and Kautz both rank among the top ten students in the ECE senior class.

## College of Engineering Spotlights Alumni Angles



The College of Engineering takes pride in its alumni, a dynamic group of individuals who have achieved countless successes, while experiencing full and adventurous lives. In February, the college launched a new annual publication, *The Alumni Angle*, to highlight amazing stories about engineering alumni – their work, their hobbies, and their passions. ECE alumnus Ron Gilbert (B.S. '78, M.S. '80) was featured in the first issue for his unique work in the field of RFID (Radio Frequency Identification).

Additionally, a supporting web page was created to serve as an online forum for alumni to share memories of their college days. Visit [www.engr.colostate.edu/memories](http://www.engr.colostate.edu/memories) to view memories about professors, projects, classes, and old friends.

We believe that the excellence of the engineering education at Colorado State is reflected in the accomplishments and varied interests of its graduates. If you have memories or stories to add, please share your alumni angle by e-mailing [ece@engr.colostate.edu](mailto:ece@engr.colostate.edu).

## ECE Faculty Named Fellows of Prestigious Societies

Drs. Jorge Rocca and V. Chandrasekar (Chandra) recently were named Fellows of prestigious engineering societies, adding to the department's growing list of faculty achievements. The percentage of Fellows in the ECE department is comparable to the top electrical and computer engineering departments in the country such as MIT, UC Berkeley, Carnegie Mellon, and the University of Illinois.

### Rocca Named Fellow of American Physical Society for Pioneering Contributions to the Development and Application of X-Ray Lasers



*Dr. Jorge Rocca and students*

ECE Professor Jorge Rocca was named a Fellow of the American Physical Society (APS), a prestigious organization created to advance and diffuse the knowledge of physics. Fellowship in the APS recognizes members who have made advances in knowledge through original research and publication or made significant and innovative contributions to the application of physics to science and technology. Each year, no more than one-half of one percent of the current membership of the organization is recognized by their peers with this honor.

Rocca is a world leader in the development of compact X-ray lasers and their applications. He serves as director of the National Science Foundation Engineering Research Center for Extreme Ultraviolet Science and Technology. New laser technologies developed through the center impact numerous applications such as the development of the next generation of integrated circuits, nanofabrication, high-resolution imaging, spectroscopy, and the diagnostics of dense plasmas. Rocca is also a Fellow of the Optical Society of America and the Institute of Electrical and Electronic Engineers.



*Dr. V. Chandrasekar (Chandra) and students*

### Chandra Elected Fellow of the American Meteorological Society

Dr. V. Chandrasekar (Chandra), professor of electrical and computer engineering, was elected a Fellow of the American Meteorological Society. The grade of Fellow is one of the Society's most prestigious honors bestowed upon members who have made outstanding contributions to the atmospheric or related oceanic or hydrologic sciences during a substantial period of years. Only two-tenths of one percent of the membership is approved as Fellow each year.

Chandra, who has made pioneering contributions in the area of Polarimetric Radar Observations of the Atmosphere, is a co-principal investigator of the CSU-CHILL radar facility, one of the most advanced meteorological radar systems in the world. He also serves as the deputy director of the National Science Foundation Engineering Research Center for Collaborative Adaptive Sensing of the Atmosphere, a multidisciplinary center created to revolutionize weather sensing technology and ensure earlier and more accurate forecasts of hazardous weather events. Chandra is also a Fellow of the Institute of Electrical and Electronic Engineers.

### ECE Faculty Elected to Professional Boards

Three ECE faculty members have been elected to serve on professional boards in their respective fields. Their terms began on January 1.

**Professor Edwin Chong** was elected to the Board of Governors for the IEEE Control Systems Society (CSS). Founded in 1954, IEEE CSS is a scientific, engineering, and professional organization dedicated to the advancement of the theory and practice of systems and control in engineering. Chong was named a Fellow of the IEEE in 2004.

**Professor Carmen Menoni** is one of four newly elected members to the Board of Governors for the IEEE Lasers and Electro-Optics Society (LEOS). The IEEE LEOS focuses on lasers, optical devices, optical fibers, and associated lightwave technology and their applications in systems and subsystems in which quantum electronic devices are key elements. Menoni has been actively involved with the Society since joining the ECE department in 1991.

**Associate Professor Steven Reising** has been re-elected to the Administrative Committee for the IEEE Geoscience and Remote Sensing Society (GRSS). The GRSS seeks to advance science and technology in geoscience, remote sensing, and related fields through scientific, technical, and educational activities. Reising, a senior member of the IEEE, came to Colorado State in 2004.

### Haines Joins College as Career Center Liaison

The College of Engineering recently welcomed John Haines to the new position of career center liaison. Working in partnership with the University's Career Center, Haines is responsible for establishing relationships with potential employers and students to expand internship and permanent employment opportunities.

Haines, who is passionate about working with students, provides individualized guidance on all aspects of the career planning process, including career exploration, job search strategies, interview preparation, and resume critiques. "Our engineering students are incredibly talented," Haines shared, "I take great pride in helping them find the right career path."

Prior to joining the college, Haines was an area director and university judicial officer for Residence Life, supervising numerous residence halls at Colorado State. He earned both a Bachelor of Science in electrical engineering and a Master of Education from Lehigh University.



## Industrial Advisory Board Helps Engineer the Future

When the ECE Industrial Advisory Board (IAB) reconvenes in April, they will be prepared to discuss the latest concerns, trends, needs, and challenges of the industry. Providing invaluable input that shapes the department's vision, the IAB is helping engineer the future at Colorado State.

In addition to recommending curriculum updates and revisions, the board has identified key skill sets that they believe will give graduates a competitive advantage, including creativity, teamwork, problem solving, and effective written and verbal communication skills. Their suggestions have resulted in student activities and events tailored to address these areas of importance, such as the new Best Paper Contest, which offers a \$500 cash incentive for the top senior design report (see related article on page 2).

"I think the department really understands the needs of the industry and has done a great job of implementing our ideas and recommendations," noted Tim Ash of Advanced Energy, IAB president and board member since 1998. "It is great working with the IAB and knowing that our actions directly impact students."

The board has been in place for several years, but the group has evolved. Welcoming 18 new members since 2004, the revitalized IAB is comprised of high-level, energetic, experienced, and knowledgeable engineering professionals from companies across the country.

## Jmar Licenses CSU X-Ray Laser

Laser technology developer Jmar Technologies Inc. recently finalized a licensing agreement with Colorado State University for the use of its discharge-pumped soft X-ray laser, developed at the Center for Extreme Ultraviolet Science and Technology. The laser produces high-intensity soft X-ray radiation at a wavelength shorter than any other laser on the market and complements Jmar's laser-produced plasma X-ray source that produces even shorter wavelengths.

"The CSU soft X-ray laser enhances Jmar's ability to create an entirely new class of analytical instruments and nanostructure characterization tools," said Ronald A. Walrod, Jmar CEO. "Jmar's instruments and tools using

CSU soft X-ray laser technology will enhance nanotechnology, life science, and materials research."

Applications for these Jmar products include geolocation for nuclear forensics, assessment of microbial mineralization, molecular uptake imaging for cancer therapy, cellular uptake of carcinogens, cosmochemistry analysis, and defect-analysis and repairs for the semiconductor industry.

ECE Professor Carmen Menoni, the lead principal investigator on the project, added, "This alliance presents an opportunity for us to realize an important part of the EUV ERC's mission – to collaborate with industry to commercialize center technology."

## Dr. Derek Lile Retires



Derek Lile, ECE professor and former department head, announced his retirement from Colorado State University after more than 20 years of service. Lile joins the ranks of the department's esteemed emeritus faculty.

"I want to thank Derek for his leadership and commitment to the department, the college, and the university," said Tony Maciejewski, ECE department head. "He is a highly respected educator, who really connected with the students. He will be missed."

Since joining the department in 1984, Lile's research focused on compound and alloy semiconductor electronics, optoelectronics, and surface passivation. In addition to serving as head of the ECE department from 1993-2003, he taught a number of courses, including electrical engineering fundamentals, telecommunications networks, linear systems, electromagnetic fields, semiconductor devices, and physical electronics.

Lile resides in Fort Collins with his wife, Christine.

## Industrial Advisory Board Companies

Advanced Energy Industries, Inc.  
Agilent Technologies  
Anheuser-Busch Companies  
Arrow ASIC Engineering Services  
Avaya Communications  
Aviation Technology Group, Inc.  
Baker Instrument Company  
Ball Aerospace Technologies Corporation  
Denmac Systems, LLC  
eSoft, Inc.  
Flextronics International  
Gates Corporation  
Hewlett-Packard Company  
IBM Corporation  
ITU Ventures  
LSI Logic Corporation  
Lockheed Martin Corporation  
National Semiconductor Corporation  
Northrop Grumman Corporation  
Pelco  
Plexus Technology Group  
RF Micro Devices, Inc.  
Raytheon Company  
Seagate Storage Products  
Sun Microsystems  
Synopsys, Inc.  
Vaisala Inc.  
Vitesse  
Western Area Power Administration  
Wolf Robotics  
Woodward Governor Company  
Xilinx, Inc.

## Brickner Named Engineering Director of Development

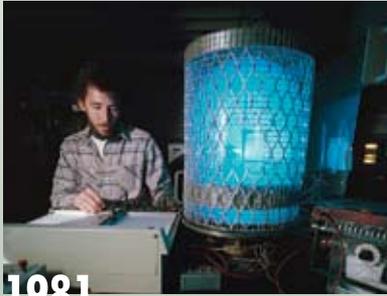
Audra Brickner has been named director of development for the College of Engineering. In her new role, Brickner will work with engineering faculty, staff, alumni, and friends to plan and execute a comprehensive program to strengthen relationships and generate additional support for the college's educational programs and initiatives.



"We are pleased to have Audra leading our development efforts," said Sandra Woods, interim dean of the College of Engineering. "She is an energetic, optimistic individual who brings a wealth of experience and knowledge to the position."

Brickner, who began her duties on February 1, came to Colorado State from Purdue University, where she served as the director of development for the School of Mechanical Engineering. She holds a Bachelor of Arts and a Master of Science from Purdue.

## Can You Identify This Alumnus?



1981

Watch for an update in the next issue of *ECE Current News*.

Contact the ECE department if you can identify the alumnus featured in the photo at left. Call (970) 491-6600 or send an e-mail to [ece@engr.colostate.edu](mailto:ece@engr.colostate.edu) with the person's name.

**Hint:** The photo was taken in 1981, the same year that Sandra Day O'Connor became the first female Supreme Court Justice. Pac-Man was introduced that year, sparking a huge craze across the nation, and American pop culture changed forever with the launch of MTV, the first 24 hour-a-day TV station dedicated to music.

## Update:

The students in the photograph below, taken in 1962, have not yet been identified. Contact the ECE department if you can name either alumnus.

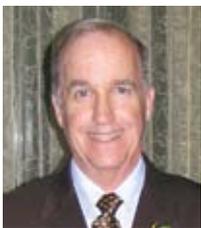


1962

## Five Alumni Receive Distinguished Awards

Already this year, five ECE alumni have been selected for prestigious awards from Colorado State University. The recipients were chosen because their distinguished career and service to the college, university, state, nation, or world, have brought honor to the College of Engineering, Colorado State University, and themselves.

Following are the alumni award winners being honored:



**Robert Johnson**, a former Air Force satellite operator, received the CSU Alumni Association's Honor Alumnus Award for the College of Engineering. Johnson graduated from Colorado State in 1969 with a bachelor's degree in electrical engineering and currently resides in El Camino, California. His career included serving as mission director at the Air Force Satellite Control Facility at Onizuka Air Force Base in California, where his team was responsible for controlling orbit constellations for two satellite programs of high national priority. Johnson has organized several events for Colorado State alumni in the Los Angeles area and has served as an alumni ambassador and coordinator for local high schools.



**Dennis and Mary Peery** of Loveland, Colorado, share the honor of the Provost Alumni Award. They both earned a bachelor's degree in electrical engineering from Colorado State University, Dennis in 1971 and Mary in 1984. After graduation, Dennis worked for Hewlett-Packard in positions ranging from R&D engineer to project manufacturing engineering, quality, consumer satisfaction, and regional facilities management. He retired in 2000 after 35 years of service. Mary also worked at Hewlett-Packard, holding senior-level positions focused on mass storage, digital imaging, and other leading-edge technologies. She currently serves as the senior vice president of Strategic Change Management for HP's Imaging and Printing Group.



**Rocky Scott** has been selected to receive the 2006 Distinguished Alumni Award for the College of Engineering. Scott, a Fort Collins resident, will be honored at the college's Alumni and Friends Awards Dinner on April 22. Scott earned his bachelor's degree in electrical engineering from CSU in 1969. He currently serves as the principal and senior vice president of

McWhinney Enterprises, the leading community and real estate development firm in Northern Colorado. Previously, Scott served for 16 years as president and CEO of The Greater Colorado Springs Economic Development Council (EDC). Under his leadership, the EDC was twice named one of the top 10 economic development organizations in the country. Scott also served as an officer in the U.S. Army and worked as a civilian engineering project manager for the Department of Defense, where he earned the Joint Services Commendation Medal for his work on data collection and processing systems around the globe.

**Gilbert Reeser** of Pleasanton, California, also will be recognized at the Alumni and Friends Awards Dinner on April 22 as the recipient of the 2006 Distinguished Alumni Award for the Department of Electrical and Computer Engineering. Reeser earned his bachelor's degree in electrical engineering from Colorado State in 1959 and a master's in electrical engineering from Stanford in 1965. Throughout his 33-year career with Hewlett-Packard, Reeser served in leadership positions including worldwide marketing manager and general manager of a division in Scotland. His career highlights include designing the world's first electronic counter using I.C.'s and meeting the Queen at Buckingham Palace, where he accepted the Queen's Award for Export and Technology Achievement. Reeser retired from HP in 1997.

## Research Spotlight: U.S. Army Utilizes Innovative Technology to Sense Danger

A new technological advancement developed by ECE Professor Mahmood Azimi and his research team at Colorado State University will improve the United States Army's ability to detect and understand enemy activities. EAR-TAP, the Environmentally Adaptive Real-Time Acoustic Predictor, is a cost-effective system that is being incorporated into the Army Acoustic Battlefield Aid (ABFA), a state-of-the-art surveillance tool for acoustic sensing in the battlefield.

EAR-TAP technology enhances the ABFA tool, which is used to detect, track, and localize sound sources. This technology reduces computation times for sound transmission loss prediction in various atmospheric and environmental conditions from hours or minutes to a fraction of a second. The EAR-TAP capability provides real-time awareness to soldiers, allowing them to respond to threats with substantially greater speed and improved accuracy. This is particularly important in the complex environment of an urban setting, where enemy snipers and rocket-propelled grenades are often difficult to pinpoint.

"It's really rewarding to know that our research is being used by the U.S. Army," said Gordon Wichern, ECE graduate student. "I feel fortunate to be involved with a fascinating project that potentially can protect and save lives."

Additional information about the EAR-TAP project and Dr. Azimi's research can be found on the ECE web site at [www.engr.colostate.edu/ece](http://www.engr.colostate.edu/ece).

## Upcoming Events:

### Alumni and Friends Awards Dinner: Saturday, April 22

Join us for the College of Engineering Annual Alumni and Friends Awards Dinner on Saturday, April 22 at the Fort Collins Hilton. ECE alumnus Rocky Scott, '69, will be honored as the 2006 Distinguished Alumni Award winner, and Gilbert Reeser, '59, will receive the Distinguished Alumni Award for the Department of Electrical and Computer Engineering. For questions and to RSVP, contact the College of Engineering at (970) 491-7028 or [supportengineering@colostate.edu](mailto:supportengineering@colostate.edu).

### Engineering Spring Commencement: Friday, May 12

The College of Engineering spring commencement will take place at 11:30 a.m. on Friday, May 12 at Moby Arena. The ECE department will host a reception for all graduating seniors and their families before the ceremony.



### Share Your Ideas for a Fall Event

The ECE department is looking forward to hosting an event again this fall for alumni and friends. Since the gathering is in your honor and for your enjoyment, we would like to hear your event ideas. Please let us know the kinds of activities that would be of interest to you by e-mailing your suggestions to [ece@engr.colostate.edu](mailto:ece@engr.colostate.edu) or by calling Andrea Leland, ECE alumni relations coordinator, (970) 491-1033.

Watch for more details this summer!

## ECE Alumni Share Student Design Experiences

We recently asked you to tell us about your student design projects – the challenges, the rewards, the lessons learned. Featured below are two responses from the class of 1981. If you have memories you would like to share, please send your submission to [ece@engr.colostate.edu](mailto:ece@engr.colostate.edu).

### Paul Worley

Your request for senior project memories prompted me to open the reports I wrote for EE 496 and EE 497 in the fall of 1980 and spring of 1981. Surprisingly, I still have these reports on my bookshelf – I've always saved them as a reminder of CSU and my experiences in the Department of Electrical Engineering. Today, my project, titled *Color Graphics Display of Interactive Fourier Transform*, would seem to be a five-minute homework assignment using MATLAB on a personal computer; however, in 1980 the only available color display was attached to the computers used to study atmospheric research data at the National Oceanic and Atmospheric Administration.

In order to document the project, I spent one late night in the computer lab with a camera and slide film, capturing images of the displays for my final presentation. In a world of MATLAB and personal computers, the program and subroutines I wrote for this project seem simple today. However, the insight I received from this project served me well in a career performing acoustic signal processing and analysis for the U.S. Navy.

### Larry Ellis

During my senior year in 1981 as an EE student, I had a design project to implement a Kalman Filter on an 8086 processor. It was very rewarding, and I still remember with fondness not the actual project but the relationship I had with my sponsoring professor, Dr. Dan Muldavan. I worked hard and spent many hours in the lab with a clunky development system, and progress was slow. When I got stuck, though, Dr. Muldavan came into the lab and we worked side by side. On one particular Saturday, we came in early and left late, and I remember leaving that night with a different view of my professor. He had treated me as a peer, and it left me wondering if I would experience the same thing in my professional career.

I am now in the position of a mentor with the experience and confidence, and I still remember to this day how much it meant to be treated not as a student but as a colleague collaborating on a problem.