



The end of 2013 marks my tenth year as department head, and I am thrilled to share our latest successes and initiatives. When I reflect on the progress of the last decade, I couldn't be happier with the current state of our department. In the face of turbulent economic times, we have grown our enrollments, hired talented new people, expanded our programs, and dramatically increased our research funding. You will see evidence throughout this publication.

I am proud of the people in our department for demonstrating excellence in all we do. We continue to provide a world-class education that generates "outsourced proof" graduates. In fact, a recent study by College Measures found that our graduates garnered the highest median first-year earnings as compared to ECE graduates from all other Colorado institutions.

Looking ahead, my personal goal is to enrich my connections with our alumni. I will reach out to you as I travel the country, and I encourage you to contact me anytime if you are ever in the area: aam@colostate.edu.

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Colorado State University
OnlinePlus 
 A division of the Office of Engagement

ECE Launches Online Master's Degree and Certificate Program

Through a partnership with Colorado State University's OnlinePlus, students virtually anywhere in the world can benefit from the ECE department's top-ranked graduate program and expert faculty. An online Master of Engineering degree in electrical and computer engineering is now available from Colorado State University.

"Whether students are looking to increase their salary, earn the opportunity to work on higher-level projects, or keep up with the pace of innovation, this degree can help them get there," said Tony Maciejewski, department head and ECE professor.

As one of the few online graduate degrees in this discipline, the program is tailored to provide flexibility for working professionals,

both in the delivery format and the course offerings. Requiring a minimum of 30 credits, the coursework-only degree equips students to make a bigger impact within their companies.

"Electrical and computer engineers are in demand across nearly every industry, allowing students to pair their passion with this advanced education," said Maciejewski. "Designed with input from industry leaders, our curriculum has been reinvented to meet modern workforce needs, and has the flexibility to evolve as job sectors continue to shift."

The department also is offering online courses and certificates for students who are not yet ready for a full degree program. Designed for individuals who want to gain depth in specific focus areas,

the certificates offer a three- or four-course series in computer engineering, embedded systems, power and energy engineering, and systems engineering. Additional certificates, such as IC design, communications and signal processing, and controls, will be rolled out next year. Certificates serve as a companion to the master's degree; credits may be applied toward the degree after formal admission to the University.

Military personnel admitted to the degree program may be eligible for a 15 percent tuition discount. In addition, the department is working to offer tuition discounts for organizations with multiple employees enrolled in ECE coursework. For more information or to register, please contact Scott Woods, program director, CSU OnlinePlus, at (970) 492-4741.

To learn more about the new online programs, visit www.online.colostate.edu/degrees/electrical-computer-engineering.

ECE Coffee Club Allows Female Students to Connect and Espresso Themselves

With the ongoing goal of recruiting and retaining women in electrical and computer engineering, the department established the ECE Ladies Coffee Club to promote a sense of community among the ECE female population.

The group was created in 2010 when a group of female students were looking for a way to connect with other women in the major. Since then, the group has been meeting informally about once a month.

“The best part about the club is that our gatherings are laid back,” said Olivera Notaros, head of senior design and a sponsor of the group. “Students just come in, relax, and talk about whatever interests them.”

Notaros, who has enjoyed watching the students bond, says they also help each other with homework and projects, and she believes it is helping retain women in the major. In addition to the camaraderie, each year the female students receive a Ladies Coffee Club mug sponsored by Intel.



From left to right: adjunct faculty Olivera Notaros; students Maram Alfaraaj and Sarah Romer; program coordinator Karen Ungerer; and student Katie Wetzel

ECE Students Shine at Premier Design Automation Conference

ECE graduate students, Yi Xiang and Pramit Rajkrishna, were named A. Richard Newton Young Student Fellows at the prestigious IEEE/ACM Design Automation Conference (DAC) in Austin, Texas. Advised by ECE Assistant Professor Sudeep Pasricha, the students received the honor for early career contributions to the field of electronic design automation and embedded systems.

In addition, Pasricha's graduate students, Shirish Bahirat and Nishit Kapadia, were selected to present their Ph.D. research at the SIGDA Ph.D. Forum at DAC. The SIGDA Ph.D. Forum is an annual competitive event that selects the most promising Ph.D. research in the field of electronic design automation and embedded systems. With an acceptance rate of around 30 percent, only the best work is featured at this premier conference.

Underwater Vehicle Project Team Wins Best Paper Contest

This year's Best Paper Contest Award was given to a team that developed N.E.M.O., an underwater remote operated vehicle that is lightweight, robust, and portable. The team consisted of ECE students Rachel Dondero, Sarah Romer, and Justin Kopacz, along with mechanical engineering students Luke Stahler and Michael Hake. The project was supervised by ECE Professor Tony Maciejewski and Hydro-Technologies President Corey Jaskolski, a National Geographic Fellow.

The team received a cash award from the IEEE High Plains Section, sponsor of the contest. A group of volunteers from the ECE Industrial Advisory Board and the IEEE selected the paper for its exceptional technical content, organization, development, clarity, style, and grammar.

The Best Paper Contest is an annual competition open to all electrical and computer engineering senior design students.

2013-2014 ECE Scholarship Recipients

Undergraduate Scholarships

Allen Porter Mowry Memorial Scholarship

Marcus Johnson

Aram Budak ECE Fellowship

Harrison Houlton

Jordan Tunnell

Trey Kind

Jeremy Eldridge

Chris Kautz Memorial Scholarship

Oscar Martinez

Eads Family Scholarship

Justin Haze

Tinnamon Landrey

Katharine Nance

Edward B. House Scholarship

Benjamin Chrysler

Electrical and Computer Engineering Alumni Scholarship

Christian Carrico

Michael Rader

Electrical and Computer Engineering Undergraduate/Graduate Scholarship

Kyle Huggins

Fry Family Scholarship

Aaron Smull

Michael Habel

Melissa Wirtz

John and Amy Lawton Scholarship

Laura Imbler

Lee and Bette Wehrman Scholarship

Robert Kahler

Ryan Kent

Richard Krahn

Cameron Kleinkort

Joshua Cogdill

Myron Brown Ludlow Scholarship

Tyler Kidney

Thomas A. Brubaker Scholarship

Kaden Strand

Vorhees Family Scholarship

Dylan Machovec

Willis T. Johnson Memorial Scholarship

Travis Bayne

Graduate Scholarships

Perl Family Graduate Fellowship

Justin Kopacz

Keith Wernsing

Shrake Culler Graduate Scholarship

Reed Hollinger

Sjostrom Family Scholarship

Justin Kopacz

Student-Led Design Competition Fosters Ingenuity Across Disciplines

Last spring, the IEEE student organization shared their love of engineering with the Colorado State community. The student officers planned and hosted the 3rd annual Open Design Competition, allowing participants from a range of majors to let their inner-engineer shine.

The idea for the event, which continues to grow in popularity, originated in 2009. Austin Steingrube, ECE senior and former CSU IEEE president and secretary, was the leader in establishing and managing the competition. He and his fellow IEEE officers wanted to give students of all backgrounds a chance to design, plan, and build a project outside of the classroom.

“We engineers love the opportunity to get our hands dirty, blow up capacitors, and get shocked by

projects,” said Steingrube. “We wanted to create something that lets folks make projects that are unique and interesting to them and that allows people from all majors to join in.”

The Open Design Competition is specifically designed to appeal to a broad audience. Students from various backgrounds are able to create any gadget or gizmo of their interest. The IEEE student group offers weekly workshops to help contest participants learn programming, circuit design, and project development skills.

The 2013 competition attracted more than 100 students across multiple majors, including all the engineering disciplines and a few liberal arts majors. The top prize went to a team project entitled, “Arduino Palmer,”



Students share their project with a judge at the 2013 Open Design Competition.

a robotic lemonade and tea mixing system.

The CSU IEEE student branch secured sponsorships and grants from industry partners Advanced Energy, Wolf Robotics, and Mountain

States Electronics, as well as the IEEE Standards Education Committee.

For more information about the IEEE Open Design Competition, or to sponsor the workshops and event, visit <http://csuieeedesign.blogspot.com/>.

ECE Graduate Student Receives Highly Competitive NSF Fellowship

ECE graduate student Drew Schiltz was selected to receive a 2013 National Science Foundation (NSF) Graduate Research Fellowship (GRF) for his outstanding abilities and accomplishments, as well as his potential to contribute to strengthening the vitality of the U.S. science and engineering enterprise.

A highly competitive award, the GRF program recognizes and supports outstanding graduate students in NSF-supported science, technology, engineering, and mathematics disciplines who are pursuing research-based master’s and doctoral degrees at accredited United States institutions. As the oldest graduate fellowship of its kind, the GRF program has a long history of selecting recipients who achieve high levels of

success in their future academic and professional careers. Past fellowship award recipients include numerous Nobel Prize winners; U.S. Secretary of Energy, Steven Chu; Google founder, Sergey Brin; and Freakonomics co-author, Steven Levitt.

Schiltz – who is advised by Professor Carmen Menoni, a highly decorated researcher and longtime member of the ECE faculty – is pursuing his Ph.D. in electrical engineering at Colorado State University. He earned his bachelor’s degree from Winona State University in his hometown, Winona, Minn., where he studied physics and composite materials engineering. Schiltz also participated in two NSF Research Experience for Undergraduates (REUs) programs at the Georgia

Institute of Technology and the University of Colorado.

Schiltz’s research focuses on optical interference coatings, with the goal of making interference coatings that are more resistant to high-power lasers that produce short, high energy pulses. Through this work, Schiltz and his fellow researchers want to better understand laser/materials interactions and determine ways to improve performance of multilayer structures – a difficult challenge that researchers around the world are trying to overcome.

In addition to the NSF Graduate Research Fellowship, Schiltz also received a prestigious scholarship from the Directed Energy Professional Society, the premier organization for the exchange of



Drew Schiltz

information on the development and application of directed energy, which includes both high-energy lasers and high-power microwaves.

ECE Students Win Best Paper Award at International Conference

ECE Ph.D. students, Kyle Tarplee and Ryan Friese, recently received the Zdzislaw Pawlak Best Paper Award at the Federated Conference on Computer Science and Information Systems (FedCSIS) in Kraków, Poland.

Named the best submission among 60 accepted entries at the sub-conference for Advances in Artificial Intelligence Applications, the students received the award for their paper and presentation entitled, "Efficient and Scalable Computation of the Energy and Makespan Pareto Front for Heterogeneous Computing Systems."

Tarplee and Friese are co-advised by ECE Professors Tony Maciejewski and H.J. Siegel. Their work highlights a novel algorithm that allows system administrators to examine the performance level of their computing systems and analyze the associated energy costs, giving them insight into the challenge of lowering operating costs while offering state-of-the-art performance. With the rising costs and demand of electricity for high-performance computing, the new finding is especially important as it demonstrates what kind of performance to expect with a given energy budget.

FedCSIS attracted upwards of 300 participants spanning 36 countries. The annual event provides a platform for researchers, practitioners, and academia to present and discuss ideas, challenges, and potential solutions on established or emerging topics related to research and practice in computer science and information systems.

Suzanne and Walter Scott, Jr. Bioengineering Building Now Open

The Suzanne and Walter Scott, Jr. Bioengineering Building, the newest building at CSU and the second engineering building on the Fort Collins campus, celebrated its grand opening on Sept. 12.

"The Scott Bioengineering Building, with its innovative design and state-of-the-art technologies, will allow us to better educate our students and better prepare them to make an impact on our world," said President Tony Frank. "We are enormously grateful to the students and donors – particularly Walter and Suzanne Scott – who believed in this project and made it such a true success."

The \$75 million, 122,000-square-foot building occupies the southeast corner of Laurel Street and Meridian Avenue. The Scott Bioengineering Building contains classroom and high-tech research space for about 40 faculty members in the disciplines of biomedical engineering, including ECE faculty members Randy Bartels, Tom Chen, Diego Krapf, and Kevin Lear. These cross-disciplinary professors serve as core faculty for the School of Biomedical Engineering and conduct research primarily in the areas of imaging and diagnostics.

The building, which has been built to LEED Gold standards, also includes teaching labs, design studios, and a 24-hour study space. Students played a major role in creating the new engineering building. In 2010, the CSU student body voted to impose a new student facility fee that provided \$30 million in funding for the project. Engineering students were also deeply involved in planning and designing the building.



ECE Alumni Establish Biomedical Engineering Teaching Laboratory

In the spirit of making an impact on the world, ECE engineering alumni Lisa (B.S. '84) and Desi (B.S. '83, M.S. '84) Rhoden provided funding to establish the Biomedical Engineering Teaching Laboratory in the new building. The leading-edge lab will provide a unique learning environment for students to investigate, explore, create, and solve problems. The Rhodens take great pride in their engineering education from Colorado State and hope the lab will make a difference in the lives of students for years to come.

"CSU engineering gave us the knowledge to excel and we are delighted to assist future alumni in their quest for knowledge on the cutting-edge of engineering," said Desi and Lisa Rhoden. "The natural partnership with ECE enables biomedical engineering to cut across disciplines and build the technology necessary to create a better future."



ECE Alumnus Honored by CSU

ECE alumnus Paul Spencer (B.S. '94) recently received the Colorado State University alumni award for the College of Engineering, along with his business partner and lifelong friend, Mark Boyer, a civil engineering alumnus (B.S. '96). Spencer and Boyer were honored in October at a ceremony in Fort Collins.

Mr. Spencer is an entrepreneur with 23 years of experience in building progressive businesses from the ground up through self-funding, private equity, and venture capital organizations. He started his first company, a systems engineering business, while a freshman at CSU. Mr. Spencer spent the next decade of his career building emerging technology and software companies within systems engineering, followed by a successful role in Qwest Communication's e-business division. Starting in 2007, as the president and co-founder of Bonsai Communities, Mr. Spencer led the charge in making sustainable neighborhoods a reality with a holistic approach in conservation and resource use, creating healthy living

environments. This concept paved the road to what would become Clean Energy Collective (CEC).

The CEC develops affordable, community-owned renewable energy projects in full partnership with local utilities. In collaboration with Holy Cross Energy, they offer the nation's first customer-owned community solar program. Mr. Spencer and Mr. Boyer have been instrumental in pushing state and federal legislation to support their evolution of community-based



Paul Spencer

clean energy ownership under a directive of mutual benefit and fairness to both utilities and their ratepayers. Their efforts have resulted in Clean Energy Collective having implemented more community solar projects than all of the U.S. community solar market combined.

The two have partnered with local businesses to reach out to local nonprofits in their community like the Aspen Homeless Shelter and LIFT-UP in Garfield County. Some of their awards include: the Colorado Sunny Award, the National Innovate Green Power Program of the Year from the Department of Energy, PV America's 2012 National PV Project of Distinction, Climate Change Business Journal's 2012 Project Merit Award, and the Rocky Mountain Land Use Institute's 2011 Land Use Entrepreneurs Award.

Mr. Spencer is a past member of the board of directors of the Mountain 2 Mesa Home Builders Association and serves as president of the board of Tom's Door, a local nonprofit serving individuals in financial need.

Chris Kautz Memorial Scholarship Endowed

The ECE department is proud to announce that the Chris Kautz Memorial Scholarship has reached the endowment level of \$25,000, ensuring that the fund will be awarded each year in perpetuity.

The fund was established to honor and celebrate the life of Chris Kautz, a former ECE student who passed away in 2006. Graduating at the top of his spring 2006 class, Chris touched the lives of many people at Colorado State through his leadership and service work. Thanks to the support of ECE alumni and friends, the Chris Kautz Memorial Scholarship will help fund the education of ECE students for years to come.

Can You Identify These Alumni?

Can you identify the alumni in this photo (or do you recognize yourself?) taken at a retreat at Pingree Park – Colorado State's mountain campus? If so, do you remember what year it was taken? Contact the ECE department at (970) 491-6600 or ece@engr.colostate.edu, and we will run an update in the next issue.



UPDATE:

When ECE alumnus Joel Edwards spotted himself seated at the computer to the immediate right of ECE Professor Anura Jayasumana, he said it brought back fond memories. Since graduating from the ECE department in 1991, Edwards has been working at Gates Corporation in Denver, where he holds the position of vice president of construction, agriculture, and resources business development for a global division of Gates. "CSU definitely provided me a solid foundation upon which my career has steadily grown," said Edwards. He added, "Thanks, CSU!"



Class Notes

ECE alumni recently received an e-mail asking them to share their latest professional and family updates. If you did not receive the e-mail, or if you would like to share your news, please contact the ECE department at ece@engr.colostate.edu. Your updates will be published in the next ECE newsletter.

Ralph Green (B.S. EE '44) has enjoyed observing the extensive changes in the field of electrical and computer engineering and wonders what the next two generations of engineers will discover. After graduating from Colorado State in 1944, he spent two years teaching veterans returning from World War II. He later joined a venture with his father offering two-way radio sales and service throughout Northern Colorado. They sold that business – a forerunner to today's cell phone services – and began operating Radio Station KFKA in Greeley. Before retiring, Green also served as a faculty member for the electronics department at Aims Community College.

Lloyd Affleck (B.S. EE '49) has been living in Australia for 52 years. His wife since 1947 passed away of ALS in 2001. Their five sons, all born in the United States, still enjoy the milder weather in New South Wales.

Jim Wheatley (B.S. EE '63) is now retired and living in Rockwall, Texas, with his wife of 43 years. He has a son, daughter, and two grandsons. Throughout his career, Wheatley served in the U.S. Air Force and worked for Avco, Xerox, General Dynamics, and E-Systems. He most recently served 23 years with Raytheon Intelligence and Information Systems.

Terry Boucher (B.S. EE '73) retired from Gambro BCT in May 2004. His wife, Pat, passed away in 2010. In March, Boucher married Debbie Mueller and the couple currently resides in Highlands Ranch, Colo.

Larry Ellis (B.S. EE '81) has been employed by Lockheed Martin in Littleton, Colo., for 28 years. He's currently working on another Mars mission, InSight, a Mars Lander much like Phoenix. Both of his daughters graduated from CSU, along with several other family members. Ellis

recently welcomed his first grandson, Jackson, to the family. His wife, Debbie, has been a nurse in the Cherry Creek School District for 23 years.

Dennis Schlaht (B.S. EE '83) is the vice president of product development, quality, and marketing for ImpediMed, a medical device manufacturer based in Brisbane, Australia. He has been married to Christine Schlaht, a professional tutor, for 25 years. They have three children: one in high school and two in college. Schlaht is a member of the CSU School of Biomedical Engineering Advisory Board.

K. Paul Cook (B.S. EE '88) is a software engineering manager at Boeing, where he has served for 23 years. He leads a group of 40 software engineers in building software for Boeing flight test and the testing laboratories. Cook is married with two daughters.

John Brach (B.S. EE '02) attended medical school at the University of Texas Medical Branch in Galveston, Texas, after graduating from CSU. While there, he was inducted into the Alpha Omega Alpha Medical Honor Society and graduated with high honors in 2009. After finishing an internship at the Methodist Hospital in Houston, he completed his residency in Ophthalmology at the Mayo Clinic in Rochester, Minnesota. In 2013, Brach joined a group ophthalmology practice in Durango, Colo.

Dr. Bala Natarajan (Ph.D. EE '02) was recently promoted to full professor with an endowed position in the Department of Electrical and Computer Engineering at Kansas State University. His wife completed her Ph.D. in math in 2012 and also teaches at Kansas State University. They have two boys, Advith (six) and Ayavanth (two).



Dr. Bala Natarajan (Ph.D. EE '02) and his family.

Josh Walker (B.S. EE '03) lives in Colorado and works as a C++ software developer at MEPCAD, a company that designs computer aided

drafting products. Prior to that, Walker, his wife, and five year-old son lived in Destin, Fla., where he ran a small non-technical company.

Jesse Wilson (B.S. EE '04, M.S. EE '07) is conducting research at Duke and recently received an NRSA Postdoctoral Fellowship Award from the National Institutes of Health. He and his wife just celebrated their five-year anniversary.

Nick Roseveare (B.S. EE '05, M.S. EE '07) completed his Ph.D. in electrical engineering at Kansas State University in 2013. Prior to that, he worked for Numerica Corp. in Loveland, Colo. In May 2013, he married Teresa Brons, and in August the couple moved to Paderborn, Germany, where Roseveare is a research associate working on high-dimensional low

sample support statistical signal processing techniques.

Miguel Salas (M.S. EE '12) currently is employed at Intel in Fort Collins. He recently was promoted to SoC methodology lead for automatic place and route tools.

Frank Turner (B.S. EE '12) joined Agilent Technologies in Englewood, Colorado, when he graduated from CSU. After serving six months as an inside applications engineer, he transitioned into an inside sales engineer, assisting customers and account managers throughout the Agilent sales process. In August, Turner earned another promotion that required a move to Dallas, Texas. He is now an account manager in the Dallas area, calling on accounts like Lockheed Martin, Blackberry, and Triquent.

New Fellow Awards for ECE

Two more ECE faculty members garnered Fellow awards in their respective areas. Being named a Fellow is an important metric for assessing academic quality and productivity because only the most accomplished scientists and researchers are elevated to this distinguished level.

Biedron Elected Fellow of SPIE and APS

Associate Professor Sandra Biedron was named a Fellow of SPIE – the international society for optics and photonics. Biedron, who joined the ECE department in 2011, was honored for her achievements in detection systems and sensors, and nonlinear harmonic emission in high-gain harmonic generation free-electron lasers. In December, Biedron received another Fellow award from the American Physical Society (APS), an honor achieved by less than one percent of the organization's 50,000-plus members.



Sandra Biedron

Bartels Elevated to Fellow of APS

ECE Professor Randy Bartels also was recognized in December as a Fellow of the APS. Bartels joined the department in 2003, where he runs the laboratory for ultrafast nonlinear optics. During his career, Bartels has gained wide recognition as a leader in the field. Among his many accomplishments, he received the 2006 Presidential Early Career Award, the U.S. government's highest honor for outstanding up-and-coming scientists and engineers. Bartels also is a Fellow of the Optical Society of America (OSA).



Randy Bartels

In addition to SPIE, APS, and OSA, ECE faculty Fellow awards span a broad range of professional societies, including the Association for Computing Machinery, the American Meteorology Society, and IEEE.

College News

Introducing the New Dean of the College of Engineering

Colorado State University has chosen Dr. David McLean, former director of the Transportation Research Center at Washington State University, as its new College of Engineering Dean. McLean joined the College on July 1.



David McLean

A faculty member at WSU for 26 years, McLean held a number of administrative appointments at the university, including chair of the Department of Civil Engineering and associate dean for the College of Engineering. He has received numerous regional, national, and international awards for his research, teaching, advising, and consulting activities.

Under McLean's leadership at WSU, dual-degree graduate programs with universities in France and China were developed, providing global experiences for the participating students and faculty. During his tenure as chair at WSU, the civil engineering department achieved significant progress on every strategic metric, despite significant reductions in state funding. Undergraduate and graduate enrollments more than doubled, including significant increases in the number of underrepresented minority and female students, and external grant funding in the department grew from \$3 million to \$7.5 million per year.

McLean is a graduate of Colorado State University, earning his master's degree in civil engineering in 1982. "Colorado State University provided me an educational and experiential foundation that has guided me throughout my career. I am excited to be back at CSU and have the opportunity to serve and give back to the institution," McLean said.

Carlyon Named Engineering Director of Development

Matt Carlyon has been named director of development for the College of Engineering. In his new role, Carlyon will lead alumni engagement and development efforts for the College, working in close collaboration with the dean and department heads. He is responsible for strengthening relationships with engineering alumni and friends and generating additional support for the College's educational initiatives.

Carlyon, who began his duties in August, came to Colorado State from the University of New Hampshire, where he served as director of development for the College of Engineering and Physical Sciences.

"I am absolutely thrilled to be at CSU," said Carlyon. "I look forward to meeting our alumni and friends and working with them to match their interests with College priorities."



Matt Carlyon

ECE Staff News

ECE Welcomes New Academic Advisor



Kate Sherrill

This summer, the ECE department welcomed Kate Sherrill as its new academic advisor. In the short time she has been with CSU, Sherrill has made a positive impact on the department.

"Kate has been a great addition to our staff," said Tony Maciejewski, ECE department head. "She takes her work seriously and has been quick to learn our curriculum and academic requirements." He added, "She is friendly and funny, and she truly knows how to connect with our students."

Sherrill brings to the position an extensive background in academic advising and program management with a proven history of leadership on a college campus. Her dedication to creating an inclusive, welcoming environment for all student populations is evidenced by the many positive relationships she is forming with undergraduate and graduate students of diverse backgrounds.

Prior to joining Colorado State, Sherrill most recently served as the assistant director and retention advisor for the Career and Counseling Center at Front Range Community College. She earned her Master of Education in counseling and career development from Colorado State University in 2010.

In her free time, Sherrill enjoys yoga, cooking, and spending time outdoors with her new husband, Kirk, and their two dogs.

Seim Joins Department as Laboratory Manager

John Seim has joined the department as the new laboratory manager. He assumes the position previously held by Tom Aurand, who retired in September 2012 after 34 years of service.

Seim oversees the department's teaching laboratories and is responsible for maintaining current equipment and implementing new technologies. He also manages the ECE web site



John Seim

and online databases. Seim's experience and educational background are uniquely suited for this role. He comes to CSU from the University of Illinois at Chicago, where he served as the supervisor of instructional laboratories in the Department of Mechanical and Industrial Engineering. Seim holds a bachelor's in electrical engineering and a master's in computer science, as well as a Master of Education in mathematics and physics. He previously worked as a digital designer for Texas Instruments and a high school physics teacher.

Ungerer Wins College Staff Award

Karen Ungerer, ECE academic advisor and program coordinator, was the recipient of the 2013 Outstanding Administrative Professional Staff Award for the College of Engineering.

Ungerer, who joined the department in 1998, was recognized for her strong commitment and contributions to the department. From project management to advising students, Ungerer has been an invaluable resource to the University. She is conscientious and thorough in every task she undertakes and has a unique ability to relate with students and colleagues.

"I met Karen my second year at CSU after transferring into the ECE department," said Torie Hadel, ECE graduate student. "It was a difficult transition for me, but she really helped me excel in a new environment." She added, "Every time we worked together it amazed me how she approached each project with such enthusiasm and passion. I feel very fortunate to have had Karen as a mentor, role model, and friend during my undergraduate and graduate studies."

Throughout her career, Ungerer has played a pivotal role in countless projects for the department. She has supported the National Science Foundation Research Experience for Undergraduates summer program, the ECE scholarship awards process, recruitment, advising, and many other projects designed to recruit and retain students. Regardless of the task, Ungerer shines when she is working one-on-one with students, and this is the reason many of them stay in contact with her long after graduation.



Karen Ungerer

Research Spotlight: ECE Professors to Design Green Supercomputers

ECE Professors Sudeep Pasricha, H. J. Siegel, and Tony Maciejewski, along with Mechanical Engineering Professor Pat Burns, are working with a team of graduate and undergraduate students to enable the next generation of green

supercomputers. The team recently received a grant for \$850,000 from the National Science Foundation to conduct the research.

The grant was awarded for their proposal, "Energy Efficient and

Stochastically Robust Resource Allocation for Heterogeneous Computing." Pasricha, ECE assistant professor, is the principal investigator, with Siegel, Maciejewski, and Burns serving as co-PIs.

"High energy consumption in supercomputing is inevitable given the rising complexity of these systems in an attempt to solve some of the most challenging problems in science," said Pasricha. "The goal is to bring together researchers and practitioners to collectively investigate the problem of energy-efficient computing for massively parallel supercomputers of the future."

The research team will design novel theoretical foundations, metrics, and mathematical optimization techniques for robust, energy-efficient, and power-constrained

resource management in heterogeneous large-scale parallel computing systems. In doing so, the research will attack rising energy consumption, which is one of the biggest challenges facing high-performance computing (HPC) systems today.

"HPC systems are the backbone of the worldwide Internet and cloud computing revolution," said Tony Maciejewski, ECE department head. "As these systems become even more integrated with everyday life, it's very important that we focus on limiting their carbon footprint and reducing their energy costs, which can run into several millions of dollars every year for many HPC systems."

The three-year research project led by CSU also involves collaboration with researchers and state-of-the-art HPC systems at Oak Ridge National Laboratory, the National Center for Atmospheric Research, and Lagrange Systems.



ECE Professors H.J. Siegel, Sudeep Pasricha, and Tony Maciejewski

Pasricha Wins Air Force Young Investigator Award



Sudeep Pasricha

Dr. Sudeep Pasricha, ECE assistant professor with a courtesy joint appointment in the Department of Computer Science, is one of 40 scientists and engineers to receive approximately \$15 million in grants from the Air Force Office of Scientific Research through its Young Investigator Research Program (AFOSR-YIP).

The grant was awarded for Professor Pasricha's research proposal, "Integrated Optoelectronic Networks for Application-Driven Multicore Computing." The research aims to determine the best modalities for integrating emerging photonics

technology into multicore electronic chips that drive all major modern inventions, including vehicles and airplanes, computers and phones, scientific and industrial infrastructure, and military systems. Pasricha's research will lay the groundwork for realizing electronic systems that perform at much greater levels of efficiency, reliability, and cost-effectiveness than the electronic systems of today.

Pasricha joined the department after receiving his Ph.D. in 2008 from the University of California, Irvine. In his short time at CSU, Pasricha has received Best Paper Awards at the ACS/IEEE International Conference on Computer Systems and Applications and the IEEE International Symposium on Quality Electronic Design, as well as the 2012 ACM Special Interest Group on Design Automation Technical Leadership Award, to name a few. His current research is sponsored by grants from the National Science Foundation, Semiconductor Research Corporation, Air Force Office of Scientific Research, and Oak Ridge National Lab.

New Faculty Member for ECE

Dr. Sourajeet Roy is a new assistant professor in the Department of Electrical and Computer Engineering. His research and teaching interests focus on the computer-aided design of high-speed circuits. Specifically, he designs numerical algorithms for the accurate and efficient simulation and modeling of high speed electronic circuits, microwave and RF circuits, and MEMS devices.



Sourajeet Roy

Already in his young career, Roy – who earned his Ph.D. in electrical engineering from Western University in July – has been well accepted in the academic community. His research contributions include a strong publication record in top tier IEEE transaction journals and multiple papers at IEEE international conferences. He has served as a reviewer for the *IEEE Transactions on Microwave Theory and Techniques* and the *Microelectronics Journal* published by Elsevier.

For his achievements as an undergraduate student, Roy received the Vice-Chancellors Gold Medal and the Award for Academic Excellence from the Sikkim Manipal Institute of Technology, a revered school in India. He was recognized by Western University for his contributions in graduate school, including the Queen Elizabeth II Graduate Scholarship in Science and Technology, the Ontario Graduate Scholarship, and the Graduate Thesis Research Award.

Roy also holds a master's in engineering science from Western University and a bachelor's of technology in electrical engineering from Sikkim Manipal Institute of Technology.

Rocca Gains Recognition for Pioneering Laser Research Contributions



Jorge Rocca

University Distinguished Professor Jorge Rocca has been honored with the Willis E. Lamb Award for Laser Science and Quantum Optics sponsored by the Physics of Quantum Electronics Conference. He received the prestigious award for seminal contributions and investigations in the field of tabletop X-ray laser physics. The Willis E. Lamb Award for Laser Science and Quantum Optics is named after Willis E. Lamb, Jr., a 1955 winner of the Nobel Prize in physics who is known for laser theory and quantum optics.

In addition, Rocca – one of only 16 Colorado State University Distinguished Professors – was awarded the 2011 Arthur L. Schawlow Prize in Laser Science from the American Physical Society, the highest prize for physicists working on laser science.

Most recently, Rocca and his collaborators were featured in the October issue of *Nature Photonics*, an influential publication that is the highest ranked journal in optics, for their work on ultra-high energy density plasmas and bright x-ray generation.

Rocca is an international leader in the development of compact X-ray lasers. He and his team have found ways to dramatically improve the quality of ultra-short wavelength light produced by small-sized lasers - a groundbreaking discovery particularly valuable for nanoscience and nanotechnology. Rocca is a Fellow of the American Physical Society, the Optical Society of America, and the Institute of Electrical and Electronics Engineers.

ECE Opens Advanced Beam Lab at Foothills Campus

The ECE department recently unveiled the Advanced Beam Laboratory (ABL), expanding its footprint at the foothills campus. A one-of-a-kind facility, the ABL combines the expertise and

accelerator systems and accelerator-based light sources that are powerful, compact, efficient, and low-cost. Under the leadership of Professors Jorge Rocca, Carmen Menoni, and Mario Marconi, the

pervasive in today's society, and yet there are few places in the world where these different, but complimentary, capabilities are in close proximity."

There is strong synergy between the research teams because their goals are well-aligned. The possible impact of their combined work is vast, with potential applications in industry, the medical field, defense and security, power and energy, discovery science, and education.

The ABL houses lasers from the NSF-sponsored Extreme Ultraviolet Engineering Research Center, including the world's highest average power soft x-ray laser, enabled by leading technology developed at CSU, and two unique ultra-high peak power laser systems used in plasma studies and ultra-short wavelength radiation generation. The facility also features a short-pulse, high-peak power laser system donated by Boeing Directed Energy Systems and a linear accelerator donated by the University of Twente in the Netherlands.

cutting-edge equipment of two important ECE research groups in accelerator science and technology and advanced lasers in extreme ultraviolet and x-ray generation.

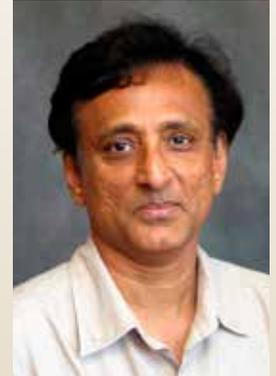
The accelerator science and technology team, led by Professors Sandra Biedron and Stephen Milton, is concerned with generating

advanced lasers group is focused on the generation of extreme ultraviolet and x-ray compact light sources and their applications in different areas that include nanoscience and nanotechnology.

"Having these two groups under one roof sets us apart as a department," said Tony Maciejewski, ECE department head. "Lasers are

Professor Bringi Retires

ECE professor V.N. Bringi has retired from Colorado State University after more than 30 years of service. Bringi joins the ranks of the department's esteemed emeritus faculty.



V.N. Bringi

"Dr. Bringi is a well-respected educator and researcher, and I want to thank him for his hard work and commitment through the years," said Tony Maciejewski, ECE department head. "We are proud of his many contributions to the university and the field. He is a pioneer of polarimetric weather radar."

Bringi, who joined the department in 1981, was the co-principal investigator for the CSU-CHILL National Radar Facility, one of the most advanced meteorological radar systems in the world. He is a Fellow of the American Meteorological Society (AMS) and co-author of the book, *Polarimetric Doppler Weather Radar*. In 2012, Bringi received the AMS Remote Sensing Prize for his outstanding contributions to the advancement of polarimetric Doppler weather radar.

This fall, the AMS honored Bringi at a special tribute ceremony at their Annual Conference on Radar Meteorology. One of Bringi's closest collaborators, Professor Chandra, served as the emcee of the event.

Professor Bringi will continue in a part-time capacity as a senior research scientist.

ECE Women Rock

The ECE department is proud to shine the spotlight on its female faculty as it works to attract more women to a male-dominated field. Since 2010, half of the new faculty hires have been women, and the department has hired another female professor to start in 2014.

MENONI: A Laser Rock Star

ECE Professor Carmen Menoni has been an inspiration to women in engineering since the early '90s, when she joined Colorado State. In the 103-year history of the department, she is the first woman to achieve the rank of tenured full professor.



Carmen Menoni

An international leader in optics, Menoni's work encompasses two different yet complimentary areas: amorphous thin films for high power laser coatings and nanoscale imaging using novel table-top soft x-ray sources that emit bright pulsed beams of wavelength 10 to 50 times shorter than blue light. Among her many accomplishments, she was honored in 2012 by Colorado State with the Scholarship Impact Award, which recognizes outstanding faculty whose scholarship has had a major impact nationally and/or internationally. Later that year, Menoni and her team

received the Best Oral Presentation Award at the SPIE Laser Damage Conference, an important forum where the latest advances in optical materials for high-power lasers are presented. In 2008 and 2009, Menoni was selected by the International Society of Optics and Photonics, or SPIE, as an "influential scientist in optics." In 2010, on the 50th anniversary of the invention of the laser, she was selected by the American Physical Society (APS) as an influential scientist in lasers and optics. Menoni is a Fellow of the Institute of Electrical and Electronics Engineers, the American Physical Society, and the Optical Society of America. She also is the founding and present editor-in-chief of *IEEE Photonics Journal*.

BIEDRON: "A Force of Nature"

When ECE Associate Professor Sandra Biedron joined the department in 2011, she hit the ground running. She has been working tirelessly to build partnerships, secure funding, create new programs, develop courses, and mentor students – and her hard work is paying off. In October, Biedron received the 2013 George T. Abell Outstanding Mid-Career Faculty Award for the College of Engineering. She also was elected a Fellow of SPIE and the American Physical Society (page 6).

Prior to joining CSU, Biedron served as the Department of Defense project office director and a tenured physicist



Sandra Biedron

at Argonne National Laboratory, where she was known by her former supervisor and colleagues as "a force of nature." Biedron brought her strong work ethic to CSU. She has been instrumental in securing new funding and equipment grants to support her research in beam and laser source development and use at the Advanced Beam Laboratory (page 9). Biedron is inspiring the next generation of scientists and engineers through her internship program for high school and undergraduate students.

YANG: Revered in Communications and Signal Processing

In a short time period, ECE Associate Professor Liuqing Yang has garnered an international reputation for research



Liuqing Yang

excellence. The recipient of numerous awards already in her young career, Yang's honors include the prestigious National Science Foundation Early Career Development Award and the Office of Naval Research Young Investigator Program Award. She also was the 2012 recipient of the George T. Abell Outstanding Mid-Career Faculty Award for the College of Engineering.

Professor Yang, who is considered a prolific and talented scholar in her field, has been publishing in many prestigious journals and her papers have been cited more than 3,500 times. In addition to her scholarly and research accomplishments, Yang is an excellent teacher and role model for women in engineering. Three of her former Ph.D. students are now university professors. She is committed to education and has been very active in developing three new signal processing and communications courses for power engineering applications.

NOTAROS: Ignites Students' Passion for Engineering

Since joining the department in 2006, Adjunct Faculty Member Olivera Notaros has immersed herself in the undergraduate learning experience. She is a highly respected



Olivera Notaros

educator who gets to know her students and understands what stirs their passion for engineering. Such personal connections have allowed Notaros to develop coursework that is not only challenging but inspiring. She is responsible for incorporating multi-disciplinary, hands-on projects into the sophomore-level Circuit Theory Applications course, which helps students understand the practical applications of engineering early in their academic career. In addition, Notaros has made important improvements to the senior design program that broadens industry involvement in projects, educational workshops, and fundraising. A key player in recruitment, retention, and outreach, Notaros also helped establish the Ladies Coffee Club (page 2).

Menoni Delivers Webinar for IEEE Women in Engineering

Professor Carmen Menoni recently was invited to deliver a webinar for IEEE Women in Engineering. Sponsored by the IEEE Photonics Society, the live chat was broadcasted worldwide and is available for viewing at <https://www.youtube.com/watch?v=LezFAUIHyo5>. Menoni shared her background and spoke about her role as a woman in engineering, particularly her position as editor-in-chief of the *IEEE Photonics Journal*.

ECE Faculty Honored for Excellence in Teaching

The ECE department added more honors to its growing list of faculty teaching awards. The most recent examples are Professors Tom Chen and Branislav Notaros.

Chen Recognized by College of Engineering



Tom Chen

Professor Tom Chen received the 2013 College of Engineering's George T. Abell Outstanding Teaching and Service Faculty Award. Chen was chosen for his deep commitment to inquiry-based learning while teaching engineering design and

validation. His approach has been extremely effective in terms of how students learn complex design concepts and apply them in design exercises. Since joining CSU, Chen has developed five new courses and taught four additional ones, all critical to the curriculum. Most of these courses are related to the design of electronic circuits, which are traditionally difficult to teach. Chen also is well known in the community for his extensive work with industry and innovative K-12 outreach programs. He is the principal investigator for the National Science Foundation-sponsored GK-12 Program, an inventive research and outreach initiative designed to develop state-of-the-art biosensors and train a new generation of scientists in biomedical science and engineering.

Notaros Received Teaching Awards from IEEE and CSU

Dr. Branislav Notaros, ECE professor, was awarded the 2013 IEEE Region 5 Outstanding Engineering Educator Award for his outstanding contributions to engineering education. Among his many accomplishments as an educator, Notaros has developed pioneering textbooks and educational tools to continuously enrich the learning environment for students. Earlier this year, he published a new textbook, *MATLAB-Based Electromagnetics*.



Branislav Notaros

In 2012, Notaros received the Board of Governors Excellence in Undergraduate Teaching Award from CSU for his innovative and unique approach to teaching. Although electromagnetics, his primary subject matter, is arguably the most difficult ECE course, Notaros is revered by

his students as an inspiring teacher. He infuses humor into his lectures and offers tangible examples that allow students to grasp challenging concepts. Notaros also received the ECE Excellence in Teaching Awards for the 2009, 2010, and 2011 school years as a result of nominations and votes from ECE students.

ECE Research at All-Time High

For the 2013 fiscal year, ECE research expenditures exceeded \$12 million – an all-time high for the department and the tenth consecutive year of growth.

According to the latest data from the National Science Foundation, ECE faculty rank 28th out of 370 programs for federally-funded research expenditures per faculty member, outpacing top-ranked universities like Purdue, Princeton, and the University of California-Davis. ECE faculty also outperformed CU-Boulder.

To complement the surge in research funding, the department has established an impressive collection of research accomplishments in the last decade. A few of the latest success stories are highlighted in this newsletter.

"With only 25 full-time faculty members, we are relatively small in terms of faculty size," said Tony Maciejewski, ECE department head. "Yet we are among the best when it comes to the quality and productivity of our faculty."

Patents on the Rise

The Department of Electrical & Computer Engineering disclosed more than 70 new technologies to CSU Ventures, which handles technology transfer for Colorado

State, between 2010 and 2013. One of the top patent-producing departments at CSU, the increase is nearly double the number of new technologies disclosed by ECE faculty between 2006 and 2009.

Chandra Recognized by CSU Ventures for Excellence in Innovation

CSU Ventures honored ECE Professor V. "Chandra" Chandrasekar for his work to create a series of small radars that could revolutionize the way meteorologists detect storms.

Much of Chandra's innovation has come from his work as a key player in the National Science Foundation Engineering Research Center for Collaborative Adaptive Sensing of the Atmosphere, or CASA, where researchers are developing a network of radar systems for deployment across the country. He is the leader of the sensing thrust of the project and also the deputy director for CASA. He is the co-principal investigator for the CSU-CHILL National Radar facility, as well as a member of the remote sensing research team at NASA.

Chandra is a Finland Distinguished Professor – a high distinction that comes with an award of one million Euros – and a Fellow of IEEE and the American Meteorological Society.



Northrop Grumman, CSU, and Cherry Creek Schools Host First STEM/Cyber Summer Camp

Northrop Grumman Corporation, the College of Engineering, and Cherry Creek School District teamed up this summer to get high school students excited about careers in science, technology, engineering, mathematics (STEM), and cybersecurity during the first annual STEM/Cyber Summer Camp.

The camp held at Grandview High School in Aurora offered students an opportunity to learn about and apply the technology that's fueling tomorrow's workforce. A total of 45 students from the Denver metro area in grades 9-12 participated in this two-track camp, where students learned from experts about clean energy technologies and cybersecurity. ECE student Daniel

Daneshka taught the clean energy track during the camp.

"Daniel was a real star," said Michael de Miranda, professor of engineering education and electrical and computer engineering at CSU.

"Our nation is facing a critical shortage of students interested in the STEM disciplines, and we need people like Daniel to cultivate the next generation of engineers and generate excitement about these important career fields."

The camp focused on clean energy systems, the causes and effects



ECE student Daniel Daneshka teaches the clean energy track during the STEM/Cyber camp.

of climate change, relationships between electricity and magnetic fields, wind power, solar power,

hydrogen fuel cells, and energy conservation.

NSF EUV ERC Team Shares Science with Girl Scouts

For the past year, the NSF-funded Extreme Ultraviolet (EUV) Engineering Research Center (ERC) at Colorado State University has been hosting workshops on light and optics for the Girl Scouts of Colorado as part of a partnership with the Optical Society of America.

Through fun, hands-on activities, such as making their own

telescopes, girls learn about the exciting world of optics, light, and color and its importance in everyday life. The workshops also highlight career profiles, showcasing some of the many job opportunities in the field.

Kaarin Goncz, the education director of the EUV ERC, has been leading the program with assistance from graduate students associated with the EUV ERC and undergraduate students from the CSU chapter of the Society for Women Engineers. These students provide valuable role models for the girls and reinforce that science can be fun and a great career.

"Providing an opportunity for these girls to explore ideas and careers in science, technology, engineering, and math (STEM) is fantastic! The Girl Scouts certainly helped me when I was younger, and have always been a great support system for girls of all ages to explore many different career paths," said Goncz.



Colorado Girl Scouts participate in EUV ERC workshop on light and optics.

EUV ERC Named Research Experience for Teachers Site

The Engineering Research Center for Extreme Ultraviolet Science and Technology, directed by ECE Professor Jorge Rocca, recently received another award from the National Science Foundation to serve as a Research Experience for Teachers (RET) site. The grant is a joint collaboration between Colorado State, CU-Boulder, and UC-Berkeley.

Building on the successes of the previous RET grant, EUV Center Education Director Kaarin Goncz and faculty from the Center will work in concert with Dr. Michael de Miranda, professor of engineering education and electrical and computer engineering, to reach out to high school teachers in the STEM (science, technology, engineering, and math) disciplines. The team will focus primarily on teachers in districts that support underrepresented minority groups.

The main goal of the site is to provide workshops in lasers and optics, internships, and other professional development opportunities for teachers that allow them to modify and build new classroom curriculum. Few places in the world offer this unique research focus area in the EUV sciences, and the grant represents a big step forward in efforts to train the next generation of STEM teachers.

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