The ECE Current

ELECTRICAL AND COMPUTER ENGINEERING DEPARTMENT, UC SANTA BARBARA

60 GHz MIMO Prototype Demonstrates Line of Sight Spatial Multiplexing

see page 4 for details

ECE DEPARTMENT HIGHLIGHTS:

Ranked in the top 5 ECE Departments in the nation in the latest NRC rankings

Ranked nationally in the top 3 departments in terms of research expenditures per faculty FTE, with over $21 million in new research expenditures each year

Out of 43 affiliated faculty, there are 24 (55%) IEEE Fellows and 8 (18%) members of the National Academy of Engineering

Recent faculty awards include major awards from the IEEE Photonics Society and an NIH New Innovator Award

Fall 2010 issue

News Flash

Results are in:
National Research Council ranks department in Top 5

According to the assessment released by the National Research Council (NRC) on September 28, 2010, the ECE Department ranks among the top 5 ECE departments in the nation.

The NRC collected data on 20 program characteristics and provided rankings using two different weightings of these characteristics, the R-ranking and the S-ranking. The ECE Department at UCSB is 5th according to the R-ranking and 4th under the S-ranking.

The UCSB Graduate Division's NRC Assessment of Research Doctoral Programs provides a summary that also includes all departments in the College. Also the Chronicle of Higher Education has a site which allows comparisons between programs by category.

By any ranking that weights research productivity as measured by publications per faculty, citations, and percentage of faculty with research grants, the ECE Department ranks in the top 5 or higher.

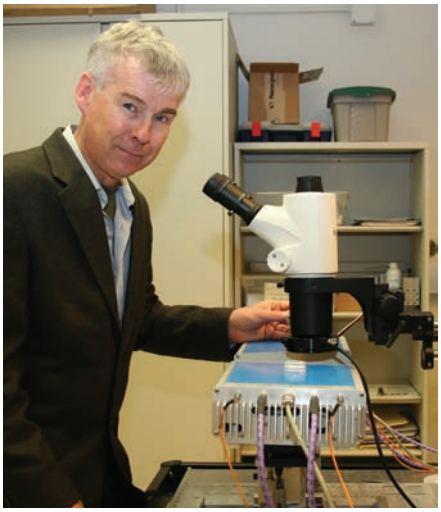
For more information about UCSB's rankings, visit www.graddiv.ucsb.edu/nrc

Professor Luke Theogarajan receives National Institutes of Health New Innovator Award

ECE Assistant Professor Luke Theogarajan received the prestigious 2010 New Innovator Award from the National Institutes of Health (NIH) for his research on optimal neural prosthetic devices to restore neural functions. He is one of only 52 such award winners out of 2,200 applicants and one of only a few engineers designated as direct recipients of the $1.5 million research award.

Theogarajan has been at UCSB for two years and came from MIT, where he received his Ph.D. While at MIT he worked on a retinal prosthesis project: an electronic implant to restore vision to the blind. He has continued and expanded that research since his arrival at UCSB, where he works in three areas: electrical engineering, microfabrication and materials, and pure chemistry.

"I like the fact that it's truly interdisciplinary here," he said. "There is no other place where I could find such openness to research."



Professor Mark Rodwell honored with Doluca Family Endowed Chair

It is with great excitement that the department announces the appointment of Dr. Mark Rodwell to the Doluca Family Endowed Chair in Electrical and Computer Engineering. The Chair was established as a legacy in honor of the Doluca family and is intended to function as part of an overarching vision of building leadership and synergy in research focused on analog/mixed-signal circuit design, and complement and leverage existing research efforts at UC Santa Barbara. It is the desire of the generous benefactors, Tunc and Lale Doluca, that the endowed chair be bestowed upon an outstanding scholar who embodies a passion and world-renowned research expertise in analog/mixed-signal circuit design.

Mark Rodwell is an ECE professor and also directs both the SRC Nonclassical CMOS research center and the UCSB Nanofabrication laboratory and its participation in the NSF National Nanofabrication Infrastructure Network (NNIN). He received his Ph.D. in Electrical Engineering from Stanford University in 1988 and worked at AT&T Bell Laboratories during 1982-1984. Professor Rodwell's research group works to extend the operation of electronics to the highest feasible frequencies. Their research thus includes semiconductor devices (diodes & transistors), semiconductor fabrication process, circuit design, interconnects, instruments, and communications systems. Particular interests include THz InP bipolar transistors, nm III-V MOSFETs for both VLSI and THz applications, and IC design above 50 GHz in both III-V and Silicon VLSI technologies.

Professor Rodwell received the 2010 IEEE Sarnoff Award and the 2009 IEEE IPRM Conference Award for the development of InP-based bipolar IC technology, at both device and circuit design level, for mm-wave and sub-mm-wave applications. His group's work on GaAs Schottky-diode ICs for subpicosecond / mm-wave instrumentation was awarded the 1997 IEEE Microwave Prize and the 1998 European Microwave Conference Microwave Prize. Professor Rodwell was elected IEEE Fellow in 2003.

Alumni Spotlight

Dennis Monticelli

Dennis Monticelli received his BSEE from UCSB in 1974 and joined National Semiconductor Corp. upon graduation. For 16 years he worked on a wide variety of analog and mixed signal development projects, both as a circuit designer and as Design Manager. He was selected to lead the newly formed Power Management business unit in 1991, promoted to Vice President in 1995, and named National Fellow in 2000. He currently serves as CTO for National Semiconductor with responsibility for strategic planning of technology, collaborative research, and business development.

Q: Why did you choose UCSB over other colleges?

A: I think the primary reason was that there was a teacher at my high school that had attended UCSB in the very early years and he spoke very highly of the education I would get there. He knew the educators and knew their dedication to teaching and he said for an undergraduate education, you will get as good or better there and probably more professor attention than some of the other campuses.

Q: What was a pivotal moment or class for you at UCSB?

A: When I started taking graduate classes in my senior year, it was then that I discovered the world of integrated circuits and what was happening. Really a revolution was in progress and I wanted to be a part of that. It really dictated where I went when I entered the industry.

Q: How has the knowledge you gained in the ECE department helped you at National?

A: Well certainly the fundamental grounding you get in your undergraduate years is important. I've saved a lot of my course notes. And then there is the specialization. I specialized in semiconductor devices and circuits my final year and that became my career. So that was extremely instrumental in terms of making me attractive to companies and hit the ground running when I came here.

Q: Since you've been working at National, what has been one of your proudest moments?

A: I've been here a long time, so there is a lot of history here at National. In terms of what I'm the most proud of, on the technical side of my career, which is the longest arm in my career, probably developing the world's first high performance CMOS Operational Amplifier. That was a turning point, not only for the company but also for the industry. That was a big deal. That was back in 83. Then on the business side of my career, it's founding and growing the power management business unit. It grew into the biggest business unit in the company and today represents over half our revenue.

Q: Do you still work with the College of Engineering?

A: More recently there has been a fair amount of discussion going on about collaborations in the areas of 3-5 materials, especially gallium nitride transistors for applications in power, which is a new application for GaN as opposed to the traditional high frequency application: power amplifiers for communication. We are talking power conversion, energy efficiency.

Q: How would you say we as a department could better serve our students?

A: Internship opportunities are something I'm very positive on. I help drive that here at National Semiconductor. The more any department can do to encourage these internships the better. And they seem to be most valuable at the graduate level, both masters and PhD.

Dennis Monticelli and Roger Wood at the 2008 ECE Alumni, Parent and Family Event (San Jose Museum of Art)

Q: What advice would you give to students in the College of Engineering?

A: Make sure that engineering is something you enter in for all the right motivations. It really should be something that you derive energy from, you're passionate about, and something that you would be willing to really stick to. It has to have some intrinsic connection with you. And as for courses, when you're an undergrad, be broad, even if you have a pretty good idea of what you want to specialize in. This is your opportunity to sample a lot of things. Find your passion, stay uncommitted for a while, and then go for it. Really go for it.

Major Research Initiatives

Did you know?

The ECE Budget Office

Manages research spending activity of approximately $21.5 million per year on over 240 active extramurally-funded awards and gifts from over 100 different funding agencies.

Works with PIs on research budgets and proposal submissions resulting in an annual average of 110 research awards totaling over $24.5 million in new award funding.

Is responsible for the payroll/personnel activity for over 250 research scholars and students.

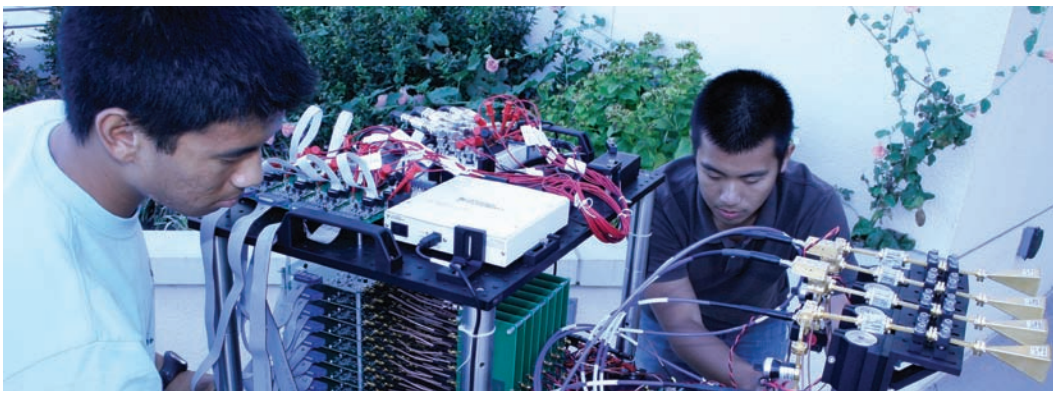
Processes approximately 1,500 purchase orders to vendors, and reviews/audits over 1,800 reimbursement payments to individuals each year.

The ECE Budget Office staff are: Shannon Gann, Alex Glover, Lisa King, Robbin Mata, Megan Moore, Mike Moore, Deby Puro, and Jessica Sanchez

60 GHz wireless networking

The next order of magnitude jump in wireless communication will come from utilizing the 7 GHz of unlicensed bandwidth in the 60 GHz ("millimeter wave") band to reach multiGigabit speeds. Professor Upamanyu Madhow (wireless communications) and Professor Mark Rodwell (ultra high-speed electronics), in collaboration with Professor Elizabeth Belding (computer science) have assembled an interdisciplinary program to address the challenges in realizing this vision. The order of magnitude smaller carrier wavelength at 60 GHz (relative to WiFi and cellular) calls for fundamentally new approaches at many levels of wireless system design. Research activities include hardware validation of novel transceiver concepts, channel measurement and modeling, signal processing architectures that scale to multiGigabit speeds, and a clean slate rethinking of wireless network protocols in order to cope with the blockage and highly directional links characteristic of millimeter wave communication.

While there is significant industry interest in indoor mm wave networking for applications such as wireless HDTV, wireless USB, and wireless Gigabit Ethernet, the UCSB group is also exploring outdoor mm wave mesh networks for providing quickly deployable broadband infrastructure for applications such as backhaul for picocellular networks.



Pictured: Chris Chan and Alvin Fong (above); Eric Torkildson and Hong Zhang (cover photo). Shown is a 60 GHz MIMO prototype (built by Colin Sheldon, Munkyo Seo and Eric Torkildson) that has been used to demonstrate that spatial multiplexing (sending parallel data streams over the same band) is possible even in line of sight environments.

A multidiciplinary approach: Center for Energy Efficient Materials

A year after its launch, the Center for Energy Efficient Materials continues to expand its reach and research. This year members worked to set up research programs and develop collaborations with partners outside the university, including the National Energy Renewable Lab (NREL). "The most significant thing we have done is really to identify the key challenges we will be facing in the center, such as the importance of developing these new materials," said CEEM Executive Director Dave Auston.

The center focuses on materials that are useful in three particular areas. One is solar cells, both organic ones using plastic materials and inorganic using semiconductors. The second is in thermoelectrics - materials and devices that convert heat, especially waste heat, directly to electricity. And the third area is in sulfate lighting - new materials, especially the nitrate family of semiconductors, that are useful for making more efficient and better sulfate lighting.

According to Auston, the significance of this is two-fold. "CEEM provides terrific opportunities for faculty and students to make some real breakthroughs, as opposed to just some incremental improvements, of new materials and to understand them in ways that can lead to the more important advances. An example of this is solar cells. The use of plastic materials could lead to the production of solar cells that are much less expensive and can be made much more readily," Auston said. "It is also important in terms of its social impact. There is an enormous amount to be done, not just in terms of the science and engineering, but also in education. Anything we can do, even in a small way, in my opinion is not only helpful, but necessary and important."

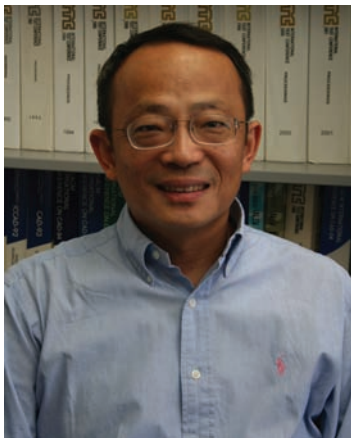
Control over communication networks

Network control systems (NCSs) appear in a broad range of engineering applications such as automobiles, aerospace systems, mobile sensor networks, remote surgery, automated highway systems, and unmanned aerial vehicles. Professors Joao Hespanha and Andrew Teel, along with their students in the Center for Control, Dynamical Systems, and Computation, are developing tools to enable the design and analysis of complex NCSs. These systems contain spatially distributed sensors, actuators, and controllers that communicate through a shared band-limited digital communication network. The use of a multi-purpose shared network to connect spatially distributed elements results in flexible architectures and generally reduces installation and maintenance costs.

The design of NCSs poses novel questions that lie at the intersection of control, communication, and signal processing. The research of Professors Hespanha and Teel is motivated by the observation that, at essentially every layer of the communication protocol stack, the protocols needed for networks of embedded systems are fundamentally different than those needed for bulk data transfer or even for other "real-time" applications such as voice-over-ip or live video streaming. Fundamental research is needed to solve multiple open problems in the area of networked embedded systems; ad hoc approaches without a strong theoretical underpinning will fail to generate the required solutions.

Robotic agents have the potential to free humans from unpleasant, dangerous, and/or repetitive tasks in which human performance would degrade over time due to fatigue. The coordination of teams of robotic agents (ground-based or aerial, as shown in the photos) is typically supported by wireless networks and requires the co-design of control algorithms and communication protocols.

New design technologies for flexible electronics

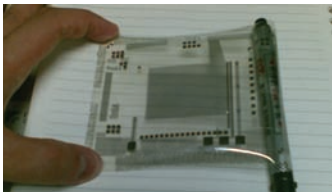


Flexible electronics can provide cost-efficient solutions to large-area applications such as rollable displays, e-paper, smart sensors, and RFIDs. The key advantages of flexible electronics are low-cost manufacturing and inexpensive flexible substrates (e.g. plastics), which make it an attractive candidate for next-generation consumer products that require lightweight, bendable, portable, and low-cost electronics.

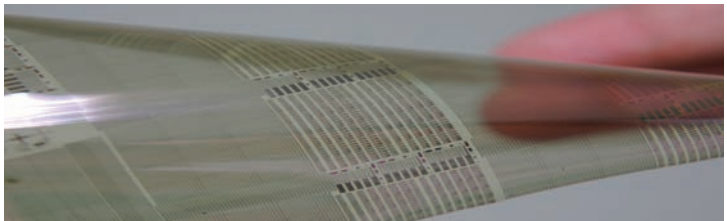
However the key elements of flexible electronics, thin-film transistors (TFTs), have much slower operating speeds and are less reliable than their Si electronics counterparts. Furthermore, TFTs are usually mono-type (either p- or n-type) devices, thus making air-stable complementary TFT circuits is challenging. Existing design technologies for Si electronics, therefore, cannot be applied to flexible electronics.

ECE Professor Tim Cheng's research group addresses the design challenges of these technologies. His group recently developed a novel design style, known as Pseudo-CMOS, for flexible electronics that uses only mono-type, single-Vt TFTs but achieves comparable performance with the complementary-type or dual-Vt designs. The manufacturing cost and complexity can therefore be significantly reduced while the circuit yield and reliability are enhanced with built-in post-fabrication tunability offered by this new design technology.

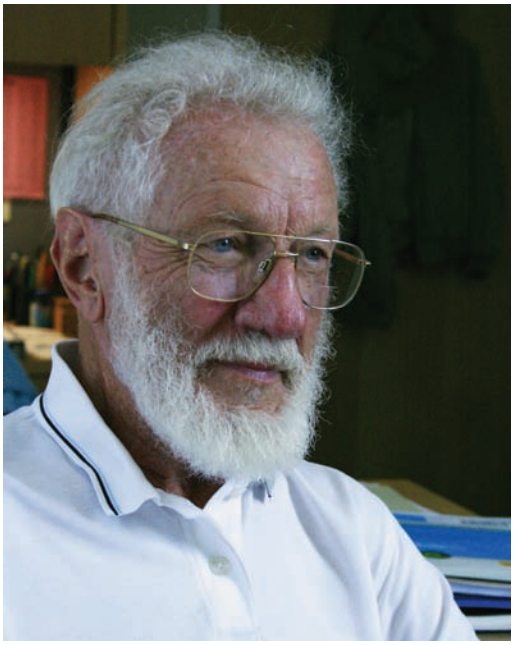
This Pseudo-CMOS design has recently been validated successfully in p-type self-assembled-monolayer (SAM)-organic TFT technology developed at University of Tokyo, as well as in n-type metal-oxide InGaZnO (IGZO) technology developed at ITRI Taiwan, with a world-record performance in power consumption and reliability. This result, first announced at the 2010 Design, Automation, and Test Conference in Europe, will soon appear in IEEE Transactions on Electron Devices.



Array of thin-film transistors and pseudo-CMOS logic printed on two different low-cost plastic substrates



Q & A with
Herb Kroemer



Professor Herbert Kroemer has been a faculty member in the ECE Department since 1976. He had persuaded the department to put its resources into the emerging compound semiconductor technology, thus founding one of the leading groups in this area. He was also an early pioneer in molecular beam epitaxy. In 2000 he received the Nobel Prize in Physics "for developing semiconductor heterostructures used in high-speed- and opto-electronics." He also received the 2002 IEEE Medal of Honor and is a member of both the National Academy of Engineering and the National Academy of Sciences.

Q: How did you become interested in the Engineering field?

A: This happened gradually. I'm basically a physicist. Back when I was a graduate student at the University of Göttingen, Germany, one of the theoretical physics professors decided that semiconductors were something that was interesting, and he wanted to learn more about them. He was running a weekly affair called the Seminar in Theoretical Physics. His idea about learning about semiconductors was to determine which were the key papers, give them to individual students who were participants in that seminar, and ask them to give detailed reports about them. So I ended up with a key paper by Bardeen and Brattain about Physical Principles involved in Transistor Action. This was a beautiful paper – it contained detailed descriptions of everything they understood and a few things that they didn't understand, and I latched on to one of the things that puzzled them. And at the end of the seminar I offered a crazy hypothesis of what the explanation might be and the professor said that would be an interesting topic for a PhD dissertation. So not only had I learned semiconductor physics in that seminar, which in 1950, that was not something that people were teaching, but I got a PhD topic.

Q: What would you say one of the biggest changes you've seen in the ECE department in the last 34 years?

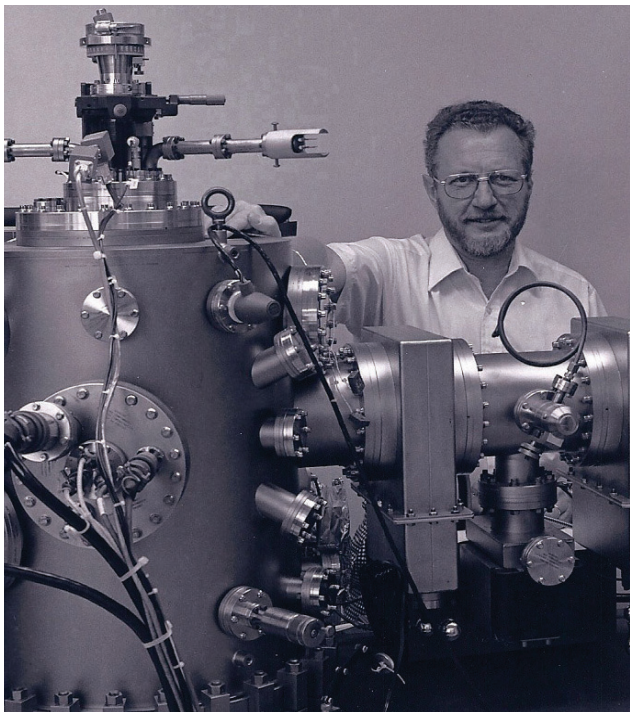
A: I was working on a book with Charles Kittel at Berkeley. Charlie is a very famous person in physics. When I told him I was leaving the University of Colorado and going to UCSB he said, "I hope you know what you're doing," because he knew a little bit about Engineering at UCSB back in 1975. And his comments were not particularly charitable. Anyway, today nobody would ask "I hope you know what you're doing." It's a startling transformation. And it's one of the most satisfying parts for me that I was part of that transformation. It's the most gratifying thing of them all.

Q: Have there ever been any classes that have been your favorite to teach or be involved in?

A: Well I've taught a lot of different things and the one that always comes as a surprise to people – the one I like most – is Statistical Thermodynamics, which was what that book with Charlie Kittel was about. That's something that I really enjoyed but also probably should admit that it ultimately really should not be part of the required curriculum for electrical engineering students. Quantum Mechanics of course has been another favorite of mine.

Q: Any fond memories of when the compound semiconductor technology group was founded? What it was like being a founder?

A: Well, we were convinced it was going to be important. We were not always right about what the important parts would be, but it has become very, very important. And it was a joy putting it together, of course we needed



Professor Kroemer with an Army-funded Molecular-Beam Epitaxy (MBE) apparatus. It was only the second MBE machine at any university.

technology. So I ended up getting a MBE system, courtesy of the Army Research Laboratory. It was wonderful fun to grow semiconductors this way.

Q: Being a Nobel Prize winner, does it change things much?

A: You get a lot of invitations where you know darn well you're being invited for decoration. Those I mostly turn down. But there is one kind of invitations where I feel I can give back to society, invitations talking to students. That's one thing. Society has been good to me and that's one way I can return that.

Q: What advice would you give to the students – ones that are here and ones that are coming?

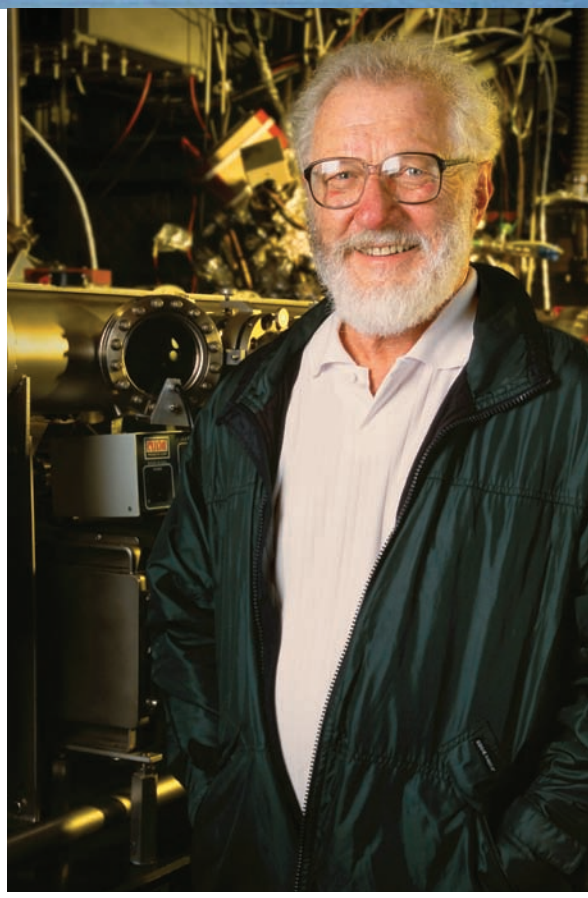
A: Pay more attention to fundamentals. You are embarking on a 40-year career. Halfway through your career almost everything in the way of practical applications you've learned will be obsolete. The fundamentals become obsolete far less rapidly and you need an obsolescence reserve. You need to be able to judge what comes; you need to be able to follow new ideas. And for that you need fundamentals.

Q: Are you still doing research with current faculty?

A: Yes, it's sort of on a program-to-program basis. For example right now, I've started working on a project with Art Gossard on a problem involving interfaces between nitrides and other materials.

Q: How can alumni and faculty give back to UCSB?

A: Make UCSB, particularly Engineering, better known. Spread the word! Wherever they can, spread the good word. And, of course, if they are willing to give money, the more, the better.



Remembering Frank Ordung, ECE's first chair

In March this year Frank Ordung, the department's first chair, passed away.

Frank was born and raised on a farm in Luverne, Minnesota where he attended a one-room school house. He later obtained a B.S. from South Dakota State University in1940, and a Master of Engineering degree from Yale in 1942. He joined the Navy during WWII and served as a Research Engineer in the Naval Research Lab in Washington, DC. In 1945 he returned to Yale as an Instructor to teach and work on a Dr. of Engineering Degree, which he obtained in 1949. He later became a Full Professor at Yale.

In 1945 Frank married Betty Jane Soergel, and they had two daughters Christine and Katherine. Frank and Betty's home was always a welcoming place to students and faculty colleagues. In particular, two foreign students that they had hosted became, effectively, adopted daughters.

In 1962 Frank and Betty moved to Santa Barbara to start an Electrical Engineering Deptartment (later Electrical and Computer Engineering) at UCSB. He recruited a faculty, organized a curriculum and laboratories, and became the department's first Chairman. He served as an ECE faculty member until his retirement in 1990.

During all of Frank's adult life he was strongly committed to the cause of education. While teaching at Yale he became Chairman of the Board of Education at Bradford, CT (1955-1961). Besides his major contributions to ECE at UCSB, he served on the California Lutheran University Board of Regents (1977-1990), and the UC Board of Patents (1977-1983). During sabbatical leaves he taught at the Technical University of Norway in Trondheim (1969, 1970), and at Rand-Afrikaans University in Johannesburg, South Africa (1976). After his retirement in 1990 Frank was appointed to two terms at UC Riverside to help establish a new engineering program there.

Frank was well regarded in the engineering community. He was a Fellow of the IEEE (1963), received an IEEE Centennial Medal (1964), was elected to the New York Academy of Science (1975), and served on the Santa Barbara Science and Engineering Council Board of Directors (1970-1972). He will be greatly missed by his many faculty, former student, and community friends.

New Faculty

Assistant Professor Katie Byl

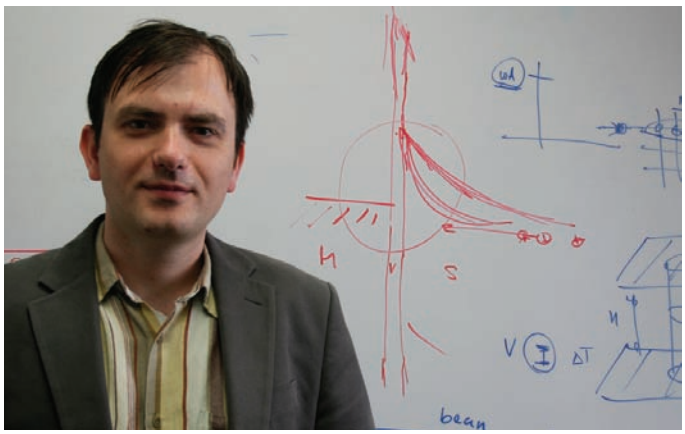
Byl is holding a toy ornithopter she and her students are studying to inspire better methods of control

Assistant Professor Katie Byl joined the ECE department in January 2010 with SB, SM and PhD degrees from MIT, all in mechanical engineering. Her doctoral work focused on control of legged robots on rough terrain and was completed at MIT's Computer Science and Artificial Intelligence Laboratory (CSAIL). As a postdoctoral fellow at the Harvard Microrobotics Laboratory, she continued her work in bio-inspired robotics, working with Professor Robert Wood on control methods for a fly-sized flapping-wing micro-aerial vehicle.

Professor Byl's research focuses on the dynamics and control of robot locomotion and manipulation in real-world environments. Her approach uses stochastic modeling, with the goal of designing systems that maximize the probability of completing a given start-to-end motion task: for example, a robot moving itself or another object from point A to point B successfully. Important challenges in this research include modeling and optimizing the interplay between passive mechanical dynamics and active control. Professor Byl's current research focuses on several inherently underactuated control problems, including compliant manipulation, rough terrain legged locomotion, and agile flapping-wing flight.

"Segway style"controller, to balance, move and steer: designed and built by Byl's graduate students: Giulia Piovan (ME) and Pat Terry (ECE)

Assistant Professor Dmitri Strukov



In winter of this year, Strukov taught a new graduate course on reconfigurable computing

In fall 2008, after working as a postdoctoral associate at Stony Brook University and Hewlett Packard labs, Dmitri Strukov joined the ECE department at UCSB. At HP he researched various aspects of reconfigurable nanoelectronic systems, including resistive switching ("memristive") device modeling, circuit architectures, and design automation tools, for applications in digital memories, programmable logic, and in neuromorphic networks. Before that he received a MS in applied physics and mathematics from the Moscow Institute of Physics and Technology in 1999 and a PhD in electrical engineering from Stony Brook University in 2006.

Dr. Strukov's research interests are broadly in physical implementation of computation, including device physics, circuit design, and high-level architecture, with emphasis on emerging device technologies. In particular, the main focus in his group now is on hybrid CMOS/nanoelectronic circuits and their applications. The basic idea of such circuits is to combine the advantages of the CMOS technology including its flexibility and high fabrication yield with those of ultra dense stackable crosspoint devices, e.g. those based on resistive switching phenomena. If successful, such drastically new technology not only can provide orders of magnitude improvements in density of digital memories and reconfigurable logic circuits over conventional counterparts, but also for the first time enable implementation of large scale artificial neural networks for advanced information processing.

ECE Faculty Recruitment

The Department in currently seeking applications for a tenure-track, assistant professor position with a start date of fall quarter 2011. Research areas of interest include integrated electronics and photonics. Exceptional candidates in all areas of Electrical Engineering will be given serious consideration. For more details please visit http://www.ece.ucsb.edu.

Student Spotlight

Capstone course gives students real-world experience

ECE188A/B, the department's year-long Capstone course in which EE seniors design and engineer projects in small teams, is expanding in subject matter and popularity. Instructor Ilan Ben-Yaacov said the course is designed to serve as a launching point for all students in the department to enter industry or to prepare them for graduate school.

"Students not only learn to plan and execute design projects, but also have substantial collaboration with research and industry partners. This gives them additional experience and insight into what it is like working at a company or in a research group and possibly provides a stepping-stone to an interesting job upon graduation," Ben-Yaacov said.

As the course expands, he plans to offer projects from 3 categories: research group-sponsored projects, industry-sponsored projects, and student-proposed projects. He would also like to build a larger focus on interdisciplinary projects, like the electrochemical sensor project from this past year.

"While the group was tasked with building a purely electronic component, they also had to learn a bit about electrochemistry as related to electrochemical sensors. The students needed to do a lot of background research to determine exactly what their electronic component was supposed to be doing," Ben-Yaacov said. In that sense, the project was much more representative of the types of challenges that would be faced in industry than other projects which are more well-defined at the onset."

He hopes to facilitate more interdisciplinary projects by offering joint projects with ME, CE, and/or CS Capstone courses. In the future the department will make the course a required one for all seniors.

According to Ben-Yaacov, in order to accommodate a larger number of students, additional resources will need to be allocated. These include Teaching Assistant support and dedicated lab space (including a communal lab area), preferably where students will have 24-hour access. For the upcoming year he is working on establishing more projects with industry and research partners and obtaining funding from these partners.

Instructor Ilan Ben-Yaacov with the FTEGS group project members at the 2010 Capstone Event

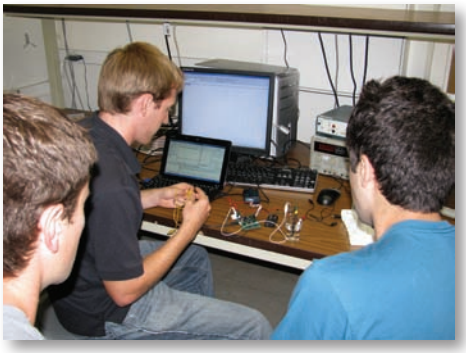
Capstone Senior Design Projects

Bio-Sensor - wireless glucose monitoring System

Danielle Morton, Niloufar Pourian

Mentor: Professor Luke Theogarajan
Other Acknowledgements: Luis Chen, Saeed Mirzaeian, Krisna Bhargava

Funding: Center for Energy Efficient Materials



ElectrodeSense - hand held potentiostat for electrochemical sensors

Michael Zimmer, Ramsin Yadgar, Anthony Hobza

Mentors: Aaron Rowe, Dr. Ryan White, and Jim Honea

Funding: Professor Kevin Plaxco's research group

Fresnel Thermoelectric Generator System (FTEGS) - self contained, automated solar tracking box

Matthew Honea, Daniel DiCarlo, Alexander Marsh

Mentors: Richard Schapker and John Bowers

Funding: Professor John Bower's research group

Congratulations to our award winning faculty!

Kaustav Banerjee

Received the Electrostatic Discharge Association of Germany (ESD Forum E.V.) Research Award. This award recognizes his work investigating the effects of strain engineering on the ESD performance of emerging Silicon nano devices.

Jerry Gibson

Received the IEEE Technical Committee on Wireless Communications Recognition Award for 2009 for his "outstanding achievements and contributions in the area of wireless communications systems and networks."

Joao Hespanha

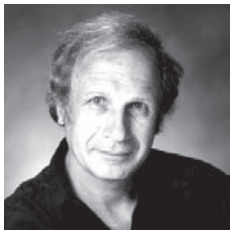
Received the 2009 Ruberti Young Researcher Prize "for fundamental contributions to adaptive control and to the theory of switched and hybrid systems." This award recognizes contributions by a researcher under the age of 41 in the broad field of systems and control.

National Academy of Engineering Members

John Bowers (2005)
Larry Coldren (2004)
Arthur Gossard (1987)
Petar Kokotovic (1996)
Herbert Kroemer (1997)
Umesh Mishra (2009)
Sanjit Mitra (2003)
Lawrence Rabiner (1983)

Behrooz Parhami

Received the 2009 Institution of Engineering and Technology (IET) Premium Achievement Award. This award is given annually to the best paper published in IET journals.



Pierre Petroff

Elected a fellow of the American Association for the Advancement of Science (AAAS) in the physics section "for his pioneering work on the growth and spectroscopy of semiconductor self assembling quantum wires, quantum dots and nanostructure quantum devices."

Andy Teel

Invited to give the 2009 Zaborszky Distinguished Lecture at Washington University, St. Louis in September 2009. This annual event was created to honor the founder and first chairman of the Department of Systems Science and Mathematics at Washington University Professor John Zaborszky.

Teaching Awards

Steve Butner

Luke Theogarajan

Professors Steve Butner and Luke Theogarajan were selected as the outstanding Faculty Members in Computer Engineering and Electrical Engineering, respectively, for 2009-10. The graduating seniors in the program made this selection based on teaching excellence.

Thank you to our 2009-2010 Donors!

July 1, 2009- August 31, 2010

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As we look to the future, we would be pleased to have your support in updating undergraduate teaching labs, endowing faculty chairs or a lecture series, or contributing to the Roger Wood endowment which support teaching activities in ECE. Details of these and other giving opportunities are provided below.

Our alumni and friends provide essential support for ECE's teaching programs and research enterprise and we invite you to be a part of the Department's success in educating the next generation of leaders. For information on how you can support the Department, please contact Melinda Glasgow Douglas at 805-893-2580 or melinda.glasgow@ia.ucsb.edu.

Endowed Chairs

Endowed Chairs honor, encourage, and support the professors whose accomplishments and commitment to education and research are the cornerstone of the University's mission. A gift of $500,000+ will establish a new endowed chair, which supports the teaching and research of the scholar, and will provide a legacy for the donor on the UCSB campus.

Current Endowed Chair Holders are:

John Bowers, Fred Kavli Chair in Nanotechnology

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Herbert Kroemer, Donald W. Whittier Chair in Electrical Engineering

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The ECE Department Naming Opportunity

The Department of ECE can be named in honor of the benefactor whose generosity establishes a significant endowment which has impact in perpetuity on the quality and opportunity of the Department. The endowment would provide a lasting source of flexible income that can be used for supporting the brightest students and most accomplished faculty. In addition, funds from the endowment could be used to stimulate new programs or innovations or for the enhancement of existing programs. For more information on how you can make a transformative gift to the Department of Electrical and Computer Engineering please contact Melinda Glasgow Douglas at 805-893-2580.

Unrestricted Support

Unrestricted gifts are allocated to the highest priority needs and allow the Department to seize new opportunities that emerge as well as support the existing outstanding students, faculty, programs, teaching laboratories, and research.

Lecture Series

Lecture series are made possible by the generosity of our donors and provide the Department with the opportunity to bring internationally recognized scholars to UCSB. The visiting scholars are invited to participate with faculty and students within the Department through a formal lecture presented to the campus and local community, presentations in undergraduate and graduate level classes, and informal, small group discussions.

Named Endowed Lecture Series are established with a gift of $50,000+ and provide a permanent named lecture that can occur annually.

Named Lectures are established with a gift of $2,500 and provide support for a single lecture.

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Teaching facilities and research labs foster interactions among students and faculty, contain areas for study and leisure, and inspire excellent work. The quality of these spaces is essential to maintaining the competiveness of the Department. There are many undergraduate laboratories available for naming gifts, including the Digital Lab, Controls Lab, Computer Engineering Lab, High Speed Communications Labs, Microwave Lab, Digital Signal Processing Lab, and the Instructional Clean Room.

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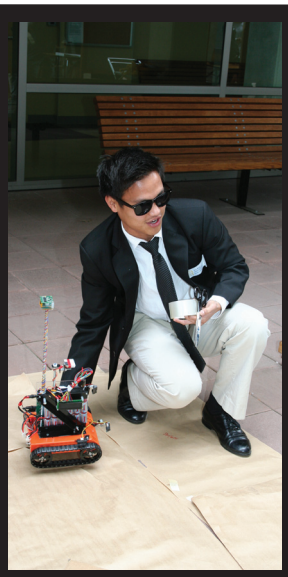

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