VOL. 1, ISSUE 2

innovations

THE HENRY SAMUELI SCHOOL OF ENGINEERING AT THE UNIVERSITY OF CALIFORNIA, IRVINE

Engineering the Future

Dean's **Corner**

Dear Friends,

Welcome to the second edition of *Innovations* from The Henry Samueli School of Engineering at UC Irvine. I would like to take this opportunity to celebrate recent faculty and student accomplishments, and also welcome our incoming 2006-07 engineering class. This year promises many new research initiatives for students and faculty, focusing on advancements in all engineering fields through interdisciplinary collaboration and teamwork.

I am excited to announce that our School has been awarded nearly $2.9 million over five years to create a new graduate program called LifeChips, where students will combine the practices of engineering, physical sciences, biological sciences and medicine to produce small-scale technologies that benefit human health. This grant is funded by the National Science Foundation's Integrative Graduate Education and Research Traineeship program, and LifeChips will specifically focus on the study of micro and nanotechnology as it applies to life sciences. We look forward to sharing this new program's progress with you.

I would also like to introduce our 10 new Samueli School faculty members, including H. Kumar Wickramasinghe, professor of electrical engineering and computer science, and The Henry Samueli endowed chair, who is a recognized pioneer in nanotechnology and member of the National Academy of Engineering, and William Cooper, who will serve as the new director of UC Irvine's Urban Water Research Center, as well as professor of civil and environmental engineering. I am confident that our students and university community will greatly benefit from these new faculty members and all they have to offer in their different areas of expertise and research focuses.

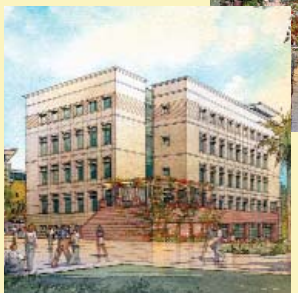
Further, I also welcome you to visit our newly renovated Samueli School website at www.eng.uci.edu. Here, you can catch-up on new leading-edge research, faculty and student projects, School activities, as well as peruse upcoming events, and even listen to our 2006 "California: Prosperity Through Technology," industry research symposium session video clips at www.eng.uci.edu/cptt.

Finally, I am pleased to announce the initial planning and construction phase of our new Engineering 3 building. Scheduled to open in 2009, this building will primarily house the Electrical Engineering and Computer Science department, as well as MEMS and photonic laboratories for the Biomedical Engineering department, offices for faculty and students, administrative offices, and a spacious 350-seat auditorium. Engineering 3 will be conveniently located in the engineering quad in close proximity to the California Institute for Telecommunications and Information Technology, the new Donald Bren School of Information and Computer Sciences, and Natural Sciences II.

I look forward to sharing the many new research developments, student and faculty achievements, alumni successes, and upcoming School events for the 2006-07 academic year, and wish you a prosperous fall.

Sincerely,

Nicolaos G. Alexopoulos



Innovations is published twice annually by the Office of Development and External Relations at The Henry Samueli School of Engineering at UC Irvine.

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SEPTEMBER

Symposium on Synthetic Biology
Presented by UC Irvine's Institute for Genomics and Bioinformatics
Sept. 15, 2006, 8:30 a.m. – 6 p.m.
Aliso Creek Inn, Laguna Beach, CA
Co-sponsored by The Henry Samueli School of Engineering
For more information and registration, visit http://www.igb.uci.edu/

California Hydrogen Business Council General Meeting
Sept. 15, 2006, 8 a.m. – 5 p.m.
Engineering Lecture Hall
For more information and registration, visit
www.californiahydrogen.org

Clean Fuels for California and the West
Sept. 19, 2006, 8 a.m. – 5 p.m.
Hyatt Newport Beach, Newport Beach, CA
For more workshop information, visit
http://www.chpcenterpr.org/cleanfuelsforcaliforniaandthewest/

OCTOBER

Tour of *Road and Track* Magazine
Engineering Alumni Advisory Council Activity
Oct. 5, 2006, 4:30 p.m.
Newport Beach, CA
For more information, contact Courtney Billing at cbilling@uci.edu

California Infrastructure – Voting It In
Civil and Environmental Engineering Affiliates Fall Quarterly Meeting
Oct. 13, 2006, 7 – 9 a.m.
UCI University Club
For more information, call (949) 824-4757

The Gordon and Betty Moore Foundation: Environment and Science
Dean's Distinguished Lecturer Series
Featuring Jim Omura, Gordon and Betty Moore Foundation
Oct. 25, 2006, 6 – 7 p.m.
McDonnell Douglas Engineering Auditorium
Reception to follow
To RSVP, email engineerRSVP@uci.edu

NOVEMBER

What are the Cellular and Molecular Role Players in Arteriolar Adaptation? In vivo and Computational Systems Approaches
Biomedical Engineering Distinguished Lecturer Series
Featuring Tomas Skalak, University of Virginia
Nov. 2, 2006, noon – 1 p.m.
McDonnell Douglas Engineering Auditorium

7th Annual Engineering Alumni Career Night
Nov. 7, 2006, 6 – 8:30 p.m.
UCI University Club
For more information, contact Courtney Billing at cbilling@uci.edu

Cells-on-Chips for Biomedical Applications
Biomedical Engineering Distinguished Lecturer Series
Featuring Mehmet Toner, Harvard Medical School, Surgery – Massachusetts General Hospital
Nov. 16, 2006, noon – 1 p.m.
McDonnell Douglas Engineering Auditorium

Bronchoconstriction in Asthma: An Integrated System Response Beyond the Summed Behavior of Individual Airways
Biomedical Engineering Distinguished Lecturer Series
Featuring Jose Gabriel Venegas, Harvard Medical School, Anaesthesia - Massachusetts General Hospital
Nov. 30, 2006, noon – 1 p.m.
McDonnell Douglas Engineering Auditorium

JANUARY

Skeletal Tissue Engineering
Biomedical Engineering Distinguished Lecturer Series
Featuring Michael T. Longaker, Stanford University
Jan. 18, 2007, noon - 1 p.m.
McDonnell Douglas Engineering Auditorium

Brain on a Chip: Engineering Form and Function in Cultured Neuronal Networks
Biomedical Engineering Distinguished Lecturer Series
Featuring Bruce Wheeler, University of Illinois, Urbana-Champaign
Jan. 25, 2007, noon - 1 p.m.
McDonnell Douglas Engineering Auditorium

FEBRUARY

Systems Approaches to Robustness Analysis of Circadian Oscillators
Biomedical Engineering Distinguished Lecturer Series
Featuring Frank Doyle, University of California, Santa Barbara
Feb. 8, 2007, noon - 1 p.m.
McDonnell Douglas Engineering Auditorium

National Engineers Week
Feb. 18 - 24, 2007
Samueli School Engineering Quad
For more information, contact Courtney Billing at cbilling@uci.edu

MAY

California: Prosperity Through Technology
2007 Industry Research Symposium
Theme: Energy and the Environment
May 15 and 16, 2007
Arnold and Mabel Beckman Center of the National Academies

International Embedded Systems Symposium
May 29 – June 1, 2007
Arnold and Mabel Beckman Center of the National Academies
For more information and registration, visit http://www.iess.org/

Save the Date:

Be Part of the 2007 EngiTECH Career Fair!

The Engineering Student Council invites your company to participate in the 2007 EngiTECH Career Fair on Feb. 21, 2007 from 9 a.m. to 3 p.m., during National Engineers Week. This fair is a prime opportunity for your company to recruit outstanding students from all engineering majors, including undergraduates, graduates, and alumni for summer internships, part-time or full-time positions.

If your company is interested in sponsoring a booth, please contact corporate@esc.eng.uci.edu or call (949) 824-2055 for more information.

California: Prosperity Through Technology Celebrates 5th Annual Symposium by Focusing on Engineering in Medicine and LifeChips

Academic experts and industry leaders gathered to highlight technological advancements and discuss emerging issues facing the state and nation's biomedical community

Photos: Professor Fan-Gang Zeng, Research Director of the Department of Otolaryngology – Head and Neck Surgery, UC Irvine (middle), Michael J. Natan, President, Oxonica, Inc. (right)

The Henry Samueli School of Engineering, in collaboration with the School of Medicine and the Integrated Nanosystems Research Facility, hosted its fifth annual "California: Prosperity Through Technology" industry research symposium May 15 - 17, 2006. More than 400 people attended this dynamic event, which was developed to create an interactive forum where academic visionaries and industry leaders addressed and discussed the convergence of engineering and medicine, focusing on emerging trends and issues facing the state and nation's biomedical community.

The three-day symposium was held at the Arnold and Mabel Beckman Center of the National Academies, in Irvine, Calif., and was supported by 19 sponsors from leading companies across the biomedical and information technology industries.

UC Irvine Chancellor, Michael V. Drake, M.D., welcomed attendees on May 15, introducing the key goals of the symposium and addressing the importance of engineering in medicine. Session Chair Bruce Tromberg, Ph.D., director of the Beckman Laser Institute and Medical Clinic, kicked off the event by initiating the morning's session topic, engineering science in ophthalmology and vision technologies, which included presentations focused on Chancellor Drake's own area of expertise – ophthalmology.

Symposium session themes also included engineering in neuroscience and rehabilitation, nano/micro technologies for cancer, bio-MEMS for medical implantable devices, and array technologies for genomic, proteomic and cellular screening/ diagnostics.

In addition to UC Irvine faculty, the symposium featured industry experts, as well as prominent scientists and researchers from around the world, who all highlighted their advancements and shared their specific technologies relating to the biomedical field.

Guest speakers included:

Paul Bach-y-Rita, Professor, University of Wisconsin-Madison

David Barker, Vice President and Chief Scientific Officer, Illumina, Inc.

Georges Belfort, Professor, Rensselaer Polytechnic Institute

Andrew Berlin, General Manager, The Fred Hutchinson Cancer Research Center, Intel

Continued

Elizabeth J. Orwin, Professor, Harvey Mudd College

Robert F. Bonner, Chief, National Institute of Child Health and Human Development

Gregory Downing, Director, National Cancer Institute, National Institutes of Health

Robert J. Greenberg, President and CEO, Second Sight Medical Products, Inc.

David Huang, Professor, University of Southern California

Makoto Ishida, Professor, Toyohashi University of Technology

Tae Kook Kim, Professor, Korea Research Institute of Bioscience and Biotechnology

E. K. Lee, Professor, Hanyang University

SangHoon Lee, Professor, Korea University

Gerald E. Loeb, Professor, University of Southern California

Anita Mahadevan-Jansen, Professor, Vanderbilt University

Michael J. Natan, President, Oxonica, Inc. (formerly Nanoplex Technologies)

Shuming Nie, Professor, Emory University and Georgia Institute of Technology

Elizabeth J. Orwin, Professor, Harvey Mudd College

James C. Osborne, Jr., Vice President, Beckman Coulter, Inc.

Niroshan Ramachandran, Research Associate, Harvard Medical School

Kazuaki Sawada, Professor, Toyohashi University of Technology

Francis "Sandy" Spelman, Professor, University of Washington

Saburo Tanaka, Professor, Toyohashi University of Technology

Mehmet Toner, Professor, Harvard Medical School

Bill Van Antwerp, Vice President and Chief Scientific Officer, Medtronic MiniMed Inc.

"It was inspiring to be in the presence of so many creative minds, and to give our attendees the opportunity to participate in discussions and collaborate with nationally and internationally respected peers and colleagues," said Nicolaos G. Alexopoulos, dean of The Henry Samueli School of Engineering.

On Tuesday and Wednesday, the INRF featured speakers who focused on the importance and advancement of LifeChips technology. These session themes were motivated by a new program at UC Irvine dedicated to promoting the union of technology arts and life sciences through research and education at the micro and nano scales.

Director of the INRF and the new LifeChips Program, Professor G.P. Li explained, "LifeChips refers to both our program at UC Irvine, as well as a type of research and teaching paradigm - one that embraces the overlap between life science and technology that naturally occurs at microscopic scales."

Attendees had the unique opportunity to hear about different interdisciplinary research projects taking place around the world, and also participate in a networking dinner, view student research poster projects, and tour the INRF, as well as the Beckman Laser Institute on campus.

Steven C. Cramer, Associate Professor, UC Irvine

"I was pleased to collaborate with the INRF and the new LifeChips Program, and create an academic and professional platform in which the invited speakers had a chance to share their knowledge and current projects taking place at their home institutions and companies, as well as have the opportunity to showcase innovative research happening here on our campus," added Alexopoulos.

Please visit the symposium website to watch these beneficial sessions at http://www.eng.uci.edu/cptt

Engineering the Future and Outstanding Alumnus of the Year Awards Presented at the Annual Samueli School Awards Banquet

Prominent biomedical community leader, Dr. William J. Link, and Professor Georges Belfort honored for exceptional contributions to academia

Chancellor Drake, Marsha Link, William Link, and Dean Alexopoulos

Chancellor Drake, Georges Belfort, and Dean Alexopoulos

The Henry Samueli School of Engineering recognized two guests of honor during the School's annual awards banquet held on Monday, May 15, 2006. **Dr. William J. Link,** a managing director of Versant Ventures, accepted the prestigious "Engineering the Future" award, and **Georges Belfort, Ph.D.**, the Russell Sage Endowed Professor of Chemical and Biological Engineering at Rensselaer Polytechnic Institute, was presented with the first "Outstanding Alumnus of the Year" award.

Nicolaos G. Alexopoulos, dean of The Henry Samueli School of Engineering said, "It was an honor for the School to recognize two exceptional engineers who are continuously contributing to the advancement of technology, and are respected leaders in their fields."

UC Irvine Chancellor, Michael V. Drake, M.D., attended the engineering banquet and presented the awards to Link and Belfort, offering his congratulations and also speaking to guests about the importance of biomedical engineering advancements and exciting research initiatives happening within the biomedical field.

Samueli School Honors Outstanding Faculty at Annual Awards Banquet

Selected engineering professors received Fariborz Maseeh best teaching and research awards

Three outstanding faculty members were also recognized for their many contributions in teaching and research at The Henry Samueli School of Engineering's annual awards banquet held on May 15 at the Engineering Plaza on campus.

Tara Hutchinson, Ph.D., assistant professor of civil and environmental engineering, received the Fariborz Maseeh Best Teaching award, and Zhongping Chen, Ph.D., professor of biomedical engineering, and Andrei Shkel, Ph.D., associate professor of mechanical and aerospace engineering and director of the UCI Micro-Systems Laboratory, were each honored with the Fariborz Maseeh Best Faculty Research award.

Professor Hutchinson - Fariborz Maseeh Best Teaching Award
Hutchinson's research includes both experimental and analytical studies primarily in earthquake engineering and emphasizing seismic performance assessment of structures, particularly with soil-structure interaction, seismic response of concrete and timber structures and response of nonstructural components.

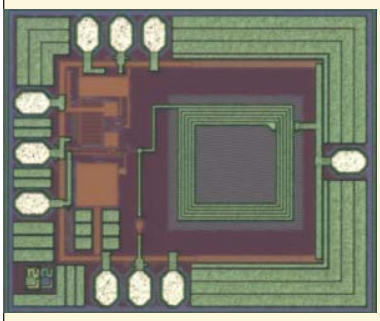
Professor Chen - Fariborz Maseeh Best Faculty Research Award
Chen, recognized for his contributions in engineering research, works in the areas of biomedical optics, photonic materials and devices, biomaterials and biosensors. His current research focuses include: investigating light/tissue interactions; developing photonic and electro-optical technology such as optical coherence tomography for medical diagnosis and therapeutics; and integrating advanced optical and microfabrication technology with biotechnology for the development of biomedical MEMS devices.

Professor Shkel - Fariborz Maseeh Best Faculty Research Award

Shkel, who has been at UC Irvine since 2000, also received the Best Faculty Research award, and concentrates on solid-state sensors and actuators, MEMS-based neuroprosthetics, sensor-based intelligence, and control theory. His current research activities include the development of MEMS-based health monitoring systems, disposable diagnostic devices, and neurological vestibular prosthetic implants.

Tackling the Challenge of Prolonging Battery Life in Cell Phones, Laptops with Advanced Radio-Frequency Technology

New prototypes reduce power consumption and extend battery life by more than eight times the current technology in popular wireless devices



Common-gate LNA fabricated in CMOS 180nm process

Imagine charging a cell phone just once a week, or a personal laptop once a month, forgoing large battery packs and cords, and always having to locate an inconvenient electrical outlet. Engineers at the Samueli School are working to make this a reality by conducting research that significantly reduces the power consumption of high performance wireless communication devices such as handsets, laptops, and cell phones, improving the total battery life by more than eight times the current radio-frequency (RF) technology.

Supported by a $200,000 grant from the Industry-University Cooperative Research Program (IUCRP), Payam Heydari, assistant professor of electrical engineering and computer science, is exploring new advanced power optimization techniques for ultra-low power (ULP) RF integrated circuit designs, developing sub-mW radios that operate at an RF frequency of 1 GHz within a wireless receiver.

Prototype 1 GHz low-noise amplifier (LNA) circuits were produced using a Complementary Metal Oxide Semiconductor (CMOS) 180 nm process, together with two additional LNA circuits, which were created and tested in the same process for comparison. These LNA circuits included a ULP common-gate LNA at 1057 µm x 865 µm, and a ULP LNA with inductive feedback at 1050 µm x 865 µm.

Measurement results displayed a power consumption of only 100 µW, functioning 10 times better than current RF technologies at 1 mW, while still maintaining their overall quality. The device is the first high-performance RF LNA circuit fabricated in CMOS to operate at this power level.

Heydari expects that these low-power RF integrated circuits (IC) will become commercially available within the next five years. His team is now working on the integration of the entire silicon-based transceiver, as well as the chip packaging design process in partnership with MOSIS, a production service company that targets ICs and related products.

Martha Mecartney Receives UC Irvine's Professor of the Year Award

Martha Mecartney, professor of chemical engineering and materials science, was honored as Professor of the Year at UC Irvine's 13th annual Celebration of Teaching event. Sponsored by the Division of Undergraduate Education and Senate Council on Student Experience, the celebration recognized individuals for excellence in undergraduate teaching.

Mecartney, who has been at UC Irvine since 1990, has also been elected chair of the Academic Senate for 2006-07. She will lead approximately 1,400 faculty members in the shared governance of the University, determining academic policy, setting conditions for admission, advising administration on budgets and voicing members' views on other issues.

Congratulations to the 2006 Samueli School Service Award Recipients

The Henry Samueli School of Engineering would like to congratulate and thank our long-term staff members for their hard work and commitment to the educational mission of both the campus and the School of Engineering.

5 Year Recipients:

Ruisheng Chang
James Collins
Joseph Harris
David Hartwig
Tao Xu

10 – 25 Year Recipients:

Hubert Hughes, 10 years
Robin Jeffers, 10 years
Christina Christensen, 15 years
Donna Hedman, 15 years
Jayne Hess, 15 years
Gale Trudeau, 15 years
Vivian Kirkpatrick-Pilger, 25 years

(Pictured from left to right): Ruisheng Chang, David Hartwig, Jayne Hess and Tao Xu

ASME Fuel Cell Conference Attracts International Audience

Toyota's Fine-N fuel cell concept vehicle

More than 200 people participated in the American Society of Mechanical Engineer's 4th International Conference on Fuel Cell Science, Engineering and Technology in Irvine this June, attracting attendees from more than 20 countries. Hosted by UC Irvine's National Fuel Cell Research Center, the conference was considered by many to be the premier technical meeting for the fuel cell community in the United States.

The three-day conference included sessions on low- and high-temperature fuel cell technologies for stationary, automotive and portable applications. General topic areas included materials science and manufacturing, thermodynamic analysis, fuel processing, controls, and transient analysis.

Subhash Singhal, director of the fuel cell program at Pacific Northwest National Laboratory; Taiyo Kawai, general manager of fuel cell system development for Toyota Motor Corporation; and Robert Sawyer, chair of the California Air Resources Board, provided keynote presentations. Chung Liu, deputy executive officer of the South Coast Air Quality Management District, the event's primary sponsor, also gave a presentation.

The conference took place at the Irvine Hyatt Regency, and participants were bused to the UC Irvine campus for an opening-night reception at the NFCRC. Guests took part in student-led tours of the center, a drive-and-ride featuring Toyota's Fuel Cell Hybrid Vehicle, and demonstrations of a Fuel Cell Powered Segway developed by the U.S. Department of Defense Fuel Cell Test and Evaluation Center. Toyota's Fine-N fuel cell concept vehicle was on display, along with a 5-kilowatt stationary fuel cell and a one-of-a-kind demonstration unit designed to show how energy efficiency is increased through the capture and re-use of heat created during the generation of electricity.

NFCRC Director Scott Samuelsen co-chaired this meeting, which will also be held June 18-20, 2007, in New York City. For more information, visit http://www.asmeconferences.org/fuel-cell07. The conference will return to Irvine in 2008.

From the World's Fair to the Orange County Fair

NFCRC fuel cell exhibit gains local popularity and exposure

Amidst carnival rides, outdoor concerts, and "best of" competitions, a fuel cell exhibit presented by the National Fuel Cell Research Center at the 2005 World's Fair, made its U.S. debut at the Orange County Fair this July in Costa Mesa, Calif. The exhibit, made possible by a gift from Toyota Motor Sales, U.S.A., Inc., was shown by invitation from the fair's board of directors and viewed by thousands of fair-goers, some of whom visited the fair expressly to learn more about this emerging energy technology.

More than two million people viewed the fuel cell exhibit at the 2005 World Exposition in Aichi, Japan, where it was one of only five exhibits highlighted in The American Journey gallery at the U.S. Pavilion.

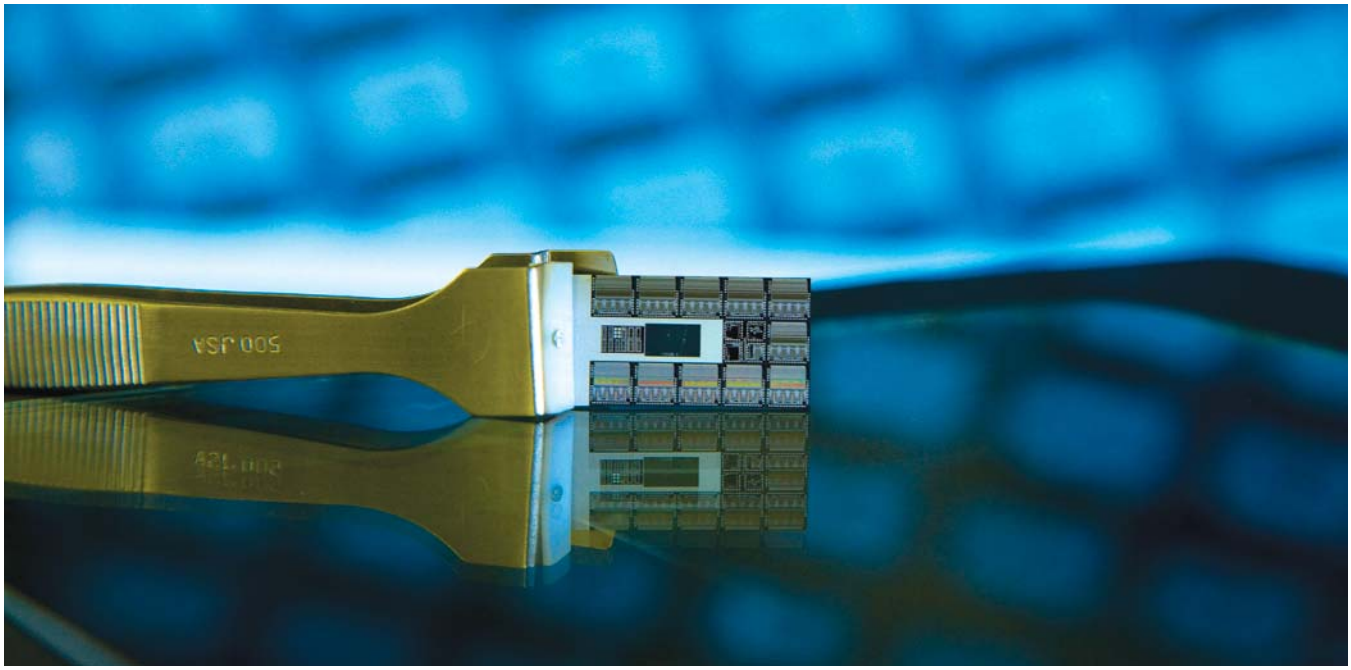
The local fuel cell exhibit was modified slightly, but utilized the original signage, which featured English and Japanese text in respect of the Expo's host country. The display included a brief animated video, a stationary fuel cell, a one-of-a-kind unit showing how the heat created by the fuel cell in the production of electricity can be captured and used, as well as images of current and future fuel cell technologies. Conceptual panels depicting the three main elements of a fuel cell, and an architectural model showing how fuel cells and photovoltaic technology could be combined in the future to provide all of the power needed in a residential setting, were also shown.

Fuel cell exhibit at the Orange County Fair, presented by UC Irvine's National Fuel Cell Research Center

New LifeChips Program Launches, Attracting Interdisciplinary Graduate Students to Study and Advance Small-Scale Technology

Program will blend engineering, physical sciences, biological sciences and medicine to benefit life science research and human health

BY JENNIFER FITZENBERGER, UNIVERSITY COMMUNICATIONS



UC Irvine has been awarded nearly $2.9 million over five years to create a new graduate program in which students will combine the practices of engineering, physical sciences, biological sciences and medicine to produce small-scale technologies that benefit human health. Graduates of the LifeChips program will have the skills necessary to develop technology used to identify new drugs, facilitate stem cell research and improve scientists' understanding of tissue, organs, genes, proteins, cells, DNA and other basic components of life.

Funded by the National Science Foundation's Integrative Graduate Education and Research Traineeship program, LifeChips will focus on the study of micro and nanotechnology as it applies to life sciences. The program takes its name from a new term scientists use to describe research on the overlap between life sciences and technology that naturally occurs at microscopic scales.

Microtechnology refers to devices measured in micrometers – one micrometer is one millionth of a meter – which are widely used in electrical and mechanical equipment such as blood-pressure monitors and automobile airbags. A human hair is about 50 micrometers wide. Nanotechnology is based on work done at an even smaller level, the nanometer, or one billionth of a meter. A red blood cell is about 10,000 nanometers wide.

The LifeChips program is innovative because students will study miniaturized technology as it applies to several scientific areas, allowing them to develop a broad base of skills. Biology students will learn engineering principles of design and manufacturing, enabling them to create useful and powerful tools for laboratory research, while engineering students will study life's remarkable technology that has evolved over three billion years. Traditionally, students specialize in one area and occasionally collaborate with other disciplines.

LifeChips officially began July 15 and is in the process of recruiting students.

"Today's engineers rarely apply biological processes and insights to nanotechnology, and nanotechnology has yet to be fully utilized to study biology," said G.P. Li, head of the LifeChips program, director of the Integrated Nanosystems Research Facility, and professor of electrical engineering and computer science at UCI. "By focusing on training a new group of cross-disciplinary students, our program will encourage development in this under-explored scientific and engineering frontier."

This is the first time UCI has received a highly competitive IGERT grant, designed to support well-focused multidisciplinary graduate programs. The grant and subsequent UCI funding will support six new students each year, for a total of 30 students over five years. Each student will receive a $30,000-per-year stipend, with tuition and fees waived each year for two years.

Students will be required to take classes in multiple disciplines, and they will have two advisors from different campus units to encourage interdisciplinary learning. More than 20 faculty members in areas such as physiology, microbiology, chemistry, physics, and biomedical and electrical engineering will teach classes, supervise research and serve as advisors.

"The LifeChips program will benefit from the momentum and excitement already generated by our talented faculty who understand the importance of collaboration," said Bill Parker, vice chancellor for research and dean of graduate studies at UCI. "We have outstanding professors with expertise in micro and nanotechnology, biochip fabrication, biology and medicine. LifeChips will bolster our already strong interdisciplinary culture."

"Students who graduate from this program will be prepared to lead the next generation of LifeChips research," said Nicolaos G. Alexopoulos, dean of The Henry Samueli School of Engineering. "They will be poised to make scientific discoveries, transform these discoveries into broadly available technologies and apply these technologies to problems in the fields of engineering, medicine and life sciences."

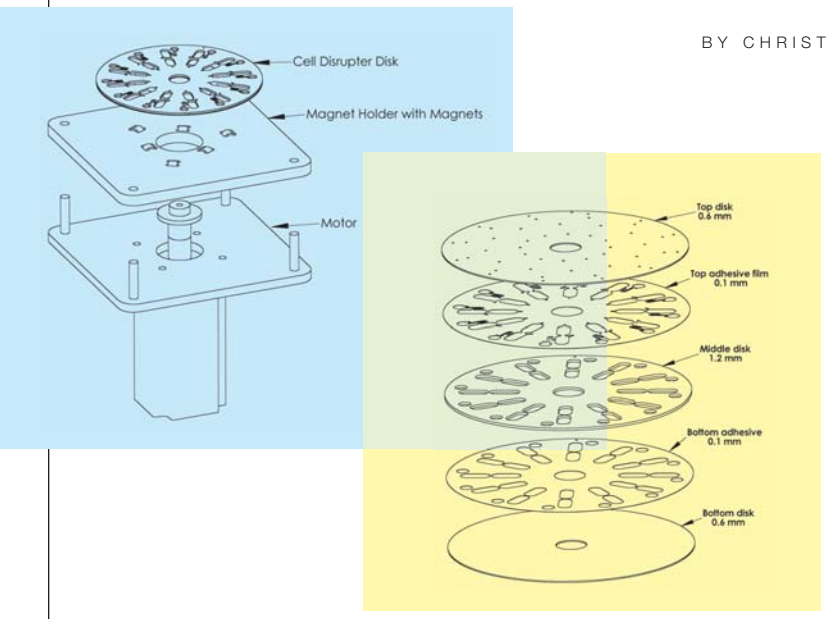
The LifeChips program is organized and supported by the Integrated Nanosystems Research Facility, an interdisciplinary research laboratory in The Henry Samueli School of Engineering that serves the UCI campus and industry. LifeChips also is affiliated with UCI's Stem Cell Core Facility and the Chao Family Comprehensive Cancer Center.

"By focusing on training a new group of cross-disciplinary students, our program will encourage development in this under-explored scientific and engineering frontier."

UC Irvine Receives $1.5 Million to Develop Handheld Device That Can Identify Microbe-Causing Infections in Patients

Scientists and researchers take part in international research project to advance molecular theranostic technologies

BY CHRISTY BOYER



UC Irvine's Biomedical Engineering department has received a $1.5 million grant as part of a three-year, $12.6 million international research initiative to develop a new device that will allow the rapid and simple detection of nucleic acids in order to identify infectious microbes in patients. Scientists and researchers will work with advanced molecular theranostic technologies, or more comprehensive diagnostic testing methods that combine both diagnosing the patient's disease as well as choosing the appropriate therapy.

By detecting nucleic acids, or protein building blocks that act on a cell's nucleus, doctors will be able to quickly test and discover certain infections in their patients, as well as explore new advancements in personalized medication and treatment therapies.

UC Irvine's research team, headed by Marc Madou, chancellor's professor of mechanical and aerospace engineering and biomedical engineering, will collaborate with three research institutions from the National Research Council of Canada. The teams, comprised of experts ranging from a variety of technological fields including engineers, physicists, chemists, molecular biologists, and infectious disease specialists, will work together on the following modular platforms - microarray platforms for multi-parametric detection, new fluorescent polymeric biosensor platforms, and microfluidic platforms on compact discs (CDs).

The research groups will merge these technologies to produce nucleic acid detection platforms and create an efficient handheld detector.

"UC Irvine is part of a multidisciplinary research effort to create and develop a disposable, handheld instrument that will integrate three modular platforms into one complete micro total analysis (uTAS) system," Madou said. "Our ultimate goal is to provide doctors with a new tool that will help them identify and administer quicker diagnoses, potentially speeding-up the recovery process for their patients."

Constructed from standard CD plastic injection molding and simple surface treatments, the device will be easily manufactured in bulk, and will use automated technology rather than current labor intensive techniques needed for fast DNA analysis. Further, the device will be more affordable due to the use of economical, disposable materials.

"In order to effectively help patients identify infectious diseases and treat them with the correct medicine, physicians need test results within a one-hour period. The current technology is expensive and slow, requiring highly skilled personnel to administer. It makes it more difficult for doctors to utilize on a consistent basis," Madou added.

Two pre-clinical trials are scheduled; one will test for the detection of respiratory viruses, and the other for the detection of microbes responsible for certain bloodstream infections.

The project, led by Dr. Michel G. Bergeron, director of the Infectious Diseases Research Centre at L'Université Laval in Québec, is primarily sponsored by Genome Canada/Genome Québec, which provides funds and resources for the exploration and advancement of genomics and proteomics, or the study of genes and proteins.

Protecting Newport Bay Top Priority for UC Irvine Researchers

Team of engineers and scientists receive funding from Orange County and the Santa Ana Regional Water Quality Control Board to study and analyze the water quality and ecology of fecal bacteria in Newport Bay

BY CHRISTY BOYER

The County of Orange and the Santa Ana Regional Water Quality Control Board have granted $800,000 to researchers at the University of California, Irvine to study the relative influence of anthropogenic and natural processes on fecal pollution in Newport Bay. The second largest embayment in Southern California, Newport Bay is a popular epicenter for recreational sports and beach activities in Orange County, while also housing a state ecological reserve, which provides refuge and breeding grounds for a number of threatened and endangered species. The study will enable coastal zone managers to reduce the frequency of beach and shellfish harvesting closures in the area.

The project, which began in January 2006 and will continue over the next 12 months, reflects the priorities of the Proposition 13 Coastal Nonpoint Source Pollution Control Program, and provides the County of Orange comprehensive resources for monitoring, collecting and analyzing ambient water quality in Newport Bay.

Stanley B. Grant, professor and chair of the Chemical Engineering and Materials Science department, together with Sunny C. Jiang and Brett F. Sanders, associate professors of civil and environmental engineering, are working to quantify urban and natural sources which contribute to the fecal indicator bacterial (FIB) impairment in Newport Bay, while developing a source management plan that specifically targets the reduction of fecal bacteria entering from priority sources, such as urban run-off and treated wastewater.

The Environmental Protection Agency and the Santa Ana Regional Water Quality Control Board have adopted bay Total Maximum Daily Loads (TMDLs) to monitor and remediate impairments for fecal coliform, nutrients, sediment, and toxic pollutants in the water.

Potential fecal bacteria sources in Newport Bay include urban run-off and sewage, as well as bird feces and sediment re-growth, which can lead to an increased public health risk in the water, causing symptoms such as abdominal discomfort and bowel problems, as well as skin irritations.

"Water quality in the Bay is threatened by numerous pollutant sources that impact the Bay directly, or through the tributaries of its watershed," Grant said. "Our source management plan will provide a framework in which the local community can progressively achieve compliance with bacterial water quality, while also addressing the beneficial use objectives within the timelines outlined in the Bay's TMDL."

Recognizing the complexity of creating an efficient and accurate management system, Grant's research team has developed an approach that involves intense data collection and analyses to quantify the impacts of specific sources of fecal coliform in Newport Bay. Karen McLaughlin, a postdoctoral researcher, manages the project's field studies, and closely monitors the FIB concentrations and physical characteristics of the Bay, along with a number of UC Irvine graduate and undergraduate researchers.

"Our students have the excellent opportunity to participate in this field study by contributing to the collection and analysis of water and sediment samples on a weekly basis," McLaughlin said. "We combine data from traditional point measurements of FIB and nutrients, physical measurements of tidal flow and stratification in the Bay, and advanced molecular approaches for fingerprinting the fecal bacteria to identify the sources and life cycles of bacteria in the Bay."

Ultimately, the plan will recommend corrective measures for Newport Bay, provide cost considerations for action measures, and develop a phased implementation plan for best management practices and control efforts. All recommendations will directly relate to the goals and timeframes designated by the fecal coliform TMDL, and will facilitate TMDL compliance.

"Our main project goals are to advance the overall awareness of Newport Bay's water quality, as well as provide county and state officials with the primary data needed to make informed decisions about how to best manage this important and beautiful resource," Grant said.

Samueli School Welcomes New Faculty

BIOMEDICAL ENGINEERING

Enrico Gratton, Professor
Gratton is the co-founder and principal investigator of the Laboratory for Fluorescence Dynamics, the first national facility dedicated to fluorescence spectroscopy which recently relocated to UC Irvine. His research interests include the design of new fluorescence instruments, protein dynamics, hydration of proteins, and I.R. spectroscopy of biological substances. He received his Ph.D. in physics from the University of Rome in 1969.

CHEMICAL ENGINEERING AND MATERIALS SCIENCE

Ali Mohraz, Assistant Professor
Mohraz's research concentrates on soft polymeric and colloidal matter, as well as advanced materials assembly. While at the University of Michigan, Ann Arbor pursuing his doctorate degree, he was part of a research team that was the first to quantify experimentally how the structural and rheological properties of amorphous colloidal materials are affected by the geometry of the primary particles. They also developed first time methods direct quantification of colloidal rod assemblies by confocal microscopy.

Mohraz received his B.S. in chemical engineering and food science from Azad University, Tehran, Iran in 1996, his M.E. in chemical engineering from the City University of New York in 1999, and his Ph.D. in chemical engineering from the University of Michigan, Ann Arbor in 2004.

CIVIL AND ENVIRONMENTAL ENGINEERING

William Cooper, Professor
Cooper, the newly appointed director of UC Irvine's Urban Water Research Center, focuses on analytical chemistry of chlorine residuals, disinfection by-products and trace organics analysis, as well as carbon cycling in coastal oceans and the application of free radical chemistry in advanced oxidation processes. He joins UC Irvine from the Center for Marine Science at the University of North Carolina, Wilmington. He also directed the Drinking Water Research Center at Florida International University.

He received his B.S. in chemistry from Allegheny College in 1969, his M.S. in fuel science and organic geochemistry from Pennsylvania State University in 1971, and his Ph.D. in marine and atmospheric chemistry from the University of Miami in 1987.

Chenyang Sunny Jiang, Associate Professor
Jiang's research is focused on aquatic microbiology and ecology. More specifically, her research group investigates the interaction, fate and transport of microbial pathogens and bacterial indicators in the coastal environment. Prior to joining the Civil and Environmental Engineering department, Jiang was associate professor in the Department of Environmental Health, Science, and Policy at UC Irvine. She holds joint appointments with the Department of Ecology and Evolutionary Biology, and the Department of Toxicology and Community Medicine at UC Irvine.

She received her B.S. in biochemistry from Nankai University in China in 1989, and both her M.S. and Ph.D. in marine science from the University of South Florida in 1993 and 1996, respectively.

Betty Olson, Professor
Olson's research expertise is in molecular techniques, as well as the microbiology of drinking and waste waters. Her interests cover the use of molecular biological techniques to optimize wastewater treatment, the study of microorganisms of public health importance in environmental waters, and how microorganisms influence water quality. Prior to joining the Civil and Environmental Engineering department, Olson was a professor in the Department of Environmental Health, Science, and Policy and Environmental and Community Medicine at UC Irvine. She received her B.S. in biological sciences from UC Irvine, and her M.S. and Ph.D. in environmental and biomedical sciences from UC Berkeley.

Jean-Daniel Saphores, Assistant Professor
Saphores' research interests include infrastructure economics and management; urban and transportation economics, planning, and policy; water resources; waste management; environmental and natural resource economics and policy; and applied econometrics. He joins the Samueli School from the Planning, Policy, and Design department.

Saphores holds a Ph.D. in agricultural economics, with a specialization in natural resources and environmental economics; an M.S. in environmental systems (civil and environmental engineering); and an M.A. in economics, from Cornell University. He also has a civil engineering background with a degree from the Ecole Nationale des Ponts et Chaussees (Paris, France), and an M.S. in geotechnical engineering from the University of Colorado at Boulder.

Farzin Zareian, Assistant Professor
Zareian's research emphasis is in analytical and experimental studies in structural and earthquake engineering with emphasis on performance-based earthquake engineering. Additional research interests include collapse analysis of structural systems, structural reliability, and structural control. Prior to UC Irvine, Zareian was a graduate research assistant in the Structural Engineering and Geomechanics Division at Stanford University.

Zareian received his B.S. in civil engineering in 1995 and his M.S. in earthquake engineering in 1997 from the Sharif University of Technology, and his Ph.D. in structural engineering from Stanford University in 2006.

ELECTRICAL ENGINEERING AND COMPUTER SCIENCE

H. Kumar Wickramasinghe, Professor and The Henry Samueli Endowed Chair
Wickramasinghe, a member of the National Academy of Engineering, is a recognized pioneer in nanotechnology, with special focus in the development of microscopes. Prior to UC Irvine, Wickramasinghe managed nanoscience and technology research at IBM's Almaden Research Center in San Jose, Calif. Some of his most significant inventions and contributions include the development of the vibrating mode atomic force microscope into fully hardened instruments, the magnetic force microscope, the electrostatic force microscope, the Kelvin probe force microscope, the scanning thermal microscope, and the apertureless near-field optical microscope.

Wickramasinghe received his B.Sc. in 1970 and his Ph.D. in 1974 in electrical engineering from the University of London.

MECHANICAL AND AEROSPACE ENGINEERING

Benjamin Villac, Assistant Professor
Villac's research focuses on spaceflight mechanics and the study of nonlinear dynamical systems with an emphasis on stability analysis, chaotic transport across phase space and their relation to global optimization and control. Prior to UC Irvine, he worked as a postdoctoral scholar at the California Institute of Technology in the computer science department, and then joined the Outer Planets Mission Analysis Group at the Jet Propulsion Laboratory in 2004.

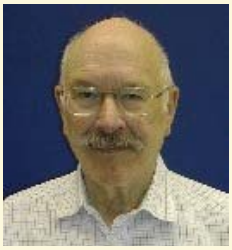
Villac received his M.S.E. in aerospace engineering in 2000, his M.S. in mathematics in 2002, and his Ph.D. in aerospace engineering in 2003, from the University of Michigan.

Yun Wang, Assistant Professor
Wang's research interests include multi-scale modeling, heat and mass transfer, micro-flow, two-phase flow, flows in porous media, electrochemistry, parallel computation, experimental design and diagnostics, fuel cells, and turbulent combustion. Prior to UC Irvine, Wang conducted research at the Electrochemical Engine Center at Pennsylvania State University, and at the State Key Laboratory for Turbulence Research in China.

He received his B.S. and M.S. in mechanical and engineering science from Peking University in 1998 and 2001, respectively, and his Ph.D. in mechanical engineering from Pennsylvania State University in 2006.

IN MEMORIUM

Remembering Frank Haight



Frank Haight, professor emeritus of the Institute of Transportation Studies and founder of three transportation journals, has died. Haight was a pioneer in transportation research, and his formal education culminated in the field of probability theory and stochastic processes.

Faculty Briefly

Nicolaos G. Alexopoulos, dean of The Henry Samueli School of Engineering, and professor of electrical engineering and computer science, received an honorary doctorate from the National Technical University of Athens, Greece (NTUA), the first distinction of its kind given by NTUA in nearly 20 years.

Satya Atluri, The Henry Samueli "von Karman" Endowed Chair in aerospace engineering and professor of mechanical and aerospace engineering, was recently honored by the Slovak Academy of Sciences, Bratislava, The Republic of Slovakia, with an honorary "Doctor of Science, Honoris Causa," and a Distinguished Alumnus award from the Indian Institute of Science.

Mark Bachman, **G.P. Li**, and **Fan-Gang Zeng**, a team of biomedical engineering professors, as well as **Keyue M. Smedley**, professor of electrical engineering and computer science, were honored at the UC Irvine Innovations ceremony held by the Office of Technology Alliances and the 40th Anniversary Committee, in recognition of their significant contributions to the University as inventors and creators.

Harut Barsamian, adjunct professor of the electrical engineering and computer science department, was recently selected to be part of the 2006-07 edition of the Marquis "Who's Who in Science and Engineering" publication for his research accomplishments, outstanding achievement in his field, and his significant contributions to society.

Michael W. Berns, the Arnold and Mabel Beckman professor of biomedical engineering, developmental and cell biology, and surgery, and co-founder of the Beckman Laser Institute at UC Irvine, was awarded the 2006 Biomedical Optics Lifetime Achievement award at SPIE's International Symposium on Biomedical Optics.

Ahmed M. Eltawil, assistant professor and Henry Samueli Faculty Fellow of electrical engineering and computer science, **Fadi Kurdahi**, professor of electrical engineering and computer science, and **Young Hwan Park**, an electrical engineering and computer science student, are the recipients of a 2006 Best Paper award from the International Society for Quality Electronic Design in honor of their paper titled "System-level SRAM Yield Enhancement."

Daniel D. Gajski, The Henry Samueli "Turing" Endowed Chair in Computer Systems Design and director of the Center for Embedded Computer Systems, has been presented with an honorary doctorate from the University of Oldenburg, Germany in recognition of his contributions to the areas of embedded systems and design science.

Medhat Haroun, professor emeritus of civil and environmental engineering, was awarded the prestigious 2006 Charles Martin Duke Lifeline Earthquake Engineering Award by the American Society of Civil Engineers.

Payam Heydari, assistant professor of electrical engineering and computer science, is the principle investigator of a $600,000 grant from the National Science Foundation given to establish an infrastructure for research on broadband wireless/wireline communication circuit design. **Michael Green**, associate professor of electrical engineering and computer science and **Ahmed Eltawil**, assistant professor and Henry Samueli Faculty Fellow of electrical engineering and computer science, are co-principle investigators for this project.

Heydari also won the 2005 Darlington Best Paper Award from the IEEE Circuits and Systems Society for his journal paper entitled "Analysis of the PLL Jitter Due to Power/Ground and Substrate Noise."

Syed Jafar, assistant professor of electrical engineering and computer science, was recently awarded a CAREER grant from the National Science Foundation for his research in wireless networks, titled "Capacity of Wireless Networks with Side Information – Theory and Applications."

Hamid Jafarkhani, professor of electrical engineering and computer science and deputy director of the Center for Pervasive Communications and Computing, together with his student, Yun Zhu, received the 2006 IEEE Guglielmo Marconi Best Paper Award in wireless communications, given in honor of their paper, "Differential Modulation Based on Quasi-Orthogonal Codes." Jafarkhani was also presented with a UC Irvine Academic Senate Distinguished Mid-Career Faculty Award for Research.

Abraham Lee and **William Tang**, professors of biomedical engineering, in addition to **Bruce Tromberg**, director of the Beckman Laser Institute and Medical Clinic, and professor of biomedical engineering, were all inducted as Fellows of the American Institute for Medical and Biological Engineering.

Lee was also published in several prominent peer journals and magazines, including the *Journal of the American Chemical Society*, *Analytical Chemistry*, *Lab on a Chip*, and *Chemical Science*, for his research and advancements in the general area of microfluidic devices.

Martha Mecartney, professor of chemical engineering and materials science, was recently awarded a National Science Foundation, Division of Materials Research grant of $400,000 for her research on "The Role of Crystallographic Defects in Ceramic Superplasticity." She also received a U.S. Department of Education Graduate Assistance in Areas of National Need award.

Amelia C. Regan, associate professor of civil and environmental engineering and computer science, received a 2005-06 UC Irvine Academic Senate Distinguished Mid-Career Faculty Award for Service.

Stephen Ritchie, professor of civil and environmental engineering, is the new director for UC Irvine's Institute of Transportation Studies, and will serve a five-year term effective September 4, 2006. The ITS specializes in developing state-of-the-art solutions to contemporary transportation problems.

Scott Samuelsen, professor and founder of UC Irvine's Mechanical and Aerospace Engineering department, and director of the National Fuel Cell Research Center, was recently named an American Society of Mechanical Engineers Fellow, a prestigious distinction honoring his many career contributions to the mechanical engineering field. He was also recognized as one of the "10 to Watch," by the *Orange County Register*, which identified 10 individuals predicted to help shape Orange County's next 100 years.

Brett Sanders, associate professor of civil and environmental engineering, released a computer simulation of the dam-break flood that occurred March 14, 2006 on the Hawaiian island of Kauai following the failure of an earthen dam supporting Ka Loko Reservoir. The simulation showed the path and timing of flood waters that moved across Kuhio Highway and into Kilauea Bay.

Masanobu Shinozuka, distinguished professor and chair of the Civil and Environmental Engineering department, was presented with the American Society of Civil Engineers Robert H. Scanlan Medal in honor of his many accomplishments and contributions to the area of engineering mechanics. This marks the seventh distinguished award Shinozuka has received from the ASCE since the beginning of his honorary membership in 1993. He was also elected an honorary member of the Japan Association of Earthquake Engineering.

Andrei Shkel, associate professor of biomedical engineering and director of UC Irvine's MicroSystems Laboratory, received a $1,250,000 DARPA sub-award for development of the world's first micromachined gyroscope based on spin-polarized nuclei precession. This DARPA program, called Navigation Grade Integrated Micro Gyroscopes, supports the development of novel micro- or nano-engineered devices capable of sensing rotation rate with navigation-grade performance.

William Sirignano, The Henry Samueli Endowed Chair in engineering and professor of mechanical and aerospace engineering, received an American Institute of Aeronautics and Astronautics Sustained Service Award for his "outstanding sustained contributions to the Institute, student education and community service over the past decades."

Soroosh Sorooshian, distinguished professor of civil and environmental engineering, has been invited to join the U.S. National Committee for the International Hydrological Programme, which is recognized by the U.S. National Commission for the United Nations' Educational, Scientific and Cultural Organization, as the civil and environmental engineering department's committee representative. He was also recently appointed as vice chairman of a new federal advisory committee that is being established by the Department of Energy to oversee, review, and approve two scientific synthesis and assessment reports addressing climate change science issues.

Enthusiastic Students Revive the Biomedical Engineering Society at UC Irvine

A group of enthusiastic undergraduate students have recently revived the student chapter of the Biomedical Engineering Society at UC Irvine. Led by current chapter president, Karen Liu, a BME undergraduate student, the group has been holding monthly dinner events in the BME department's new conference room in Natural Sciences II. These events feature speakers from industry and academia, and are designed to expose students interested in biomedical engineering to the exciting and diverse career opportunities available. Many students have been attending the lectures enjoying food, conversation, networking, and exploring possible career paths.

Events for 2006-07 are being planned, and the group welcomes your support and input. Please contact the chapter officers directly at bmes.ucirvine@gmail.com, or faculty advisor, Professor Andrew Putnam at aputnam@uci.edu, if you would like to get involved, offer to speak, or wish to support the group's activities.

Undergraduate Biomedical Engineering Student, Ryan Langan, Inspires the Advanced Prosthetic Hands Project

Ryan Langan, an undergraduate biomedical engineering student, is responsible for motivating the "Advanced Prosthetic Hands Project," which started with a small grant from the Undergraduate Research Opportunities Program (UROP). Prior to enrolling at UC Irvine, Langan had the chance to meet a triple amputee Iraq war veteran, and learned about the many difficulties amputees encounter with their hand and arm prostheses, realizing the crucial need for improved upper-limb prosthetics.

Langan took advantage of UROP, and submitted a grant proposal based on the concept of developing a better hand prosthetic for amputee soldiers. His undergraduate advisor, Professor William Tang, assembled a team to begin developing the project.

Consequently, the Defense Advanced Research Projects Agency (DARPA) called for proposals to revolutionize prosthetics for the military's amputee veterans from the war on terrorism. Tang, along with his team: Professors Abraham Lee and Zoran Nenadic in the Biomedical Engineering department, Professors James Fallon and William Bunney in the Department of Anatomy and Neurobiology, and Professor Payam Heydari in the Electrical Engineering and Computer Science department, responded to DARPA's call and submitted a proposal as a subcontract to the Johns Hopkins University Applied Physics Laboratory, which has been funded for four years.

Langan continues to pursue this research in Tang's Microbiomechanics Laboratory.

A 'Rockets 'N Rollin' Summer for Future Engineers

High school students given the opportunity to explore math, science, and engineering projects through university-wide COSMOS program

Beginning this July, selected high school students across California had the unique opportunity to participate in a four-week program called California State and Summer School for Mathematics and Science (COSMOS) at UC Irvine. After completing a competitive admissions process, students began intensive summer school class "clusters," focusing on various areas of math, science, and engineering, while experiencing residence life on campus.

Twenty-two students participated in the cluster titled, "Rockets 'N Rollin' Engineering," taught by Derek Dunn-Rankin, Faryar Jabbari and Ken Mease, professors of mechanical and aerospace engineering. Through lecture material and hands-on class projects, students were able to explore different topics relating to aerospace and mechanical engineering, ranging from flight mechanics and control, aerodynamics, and jet and rocket propulsion, to basic mechanical engineering designs for creating engine power in automobiles, and the analysis and exploration of electric vehicles, hybrid-electrics, and fuel cell cars.

Student Poster Winners Announced at Samueli School's Annual Awards Banquet

Five engineering students recognized for outstanding research project posters

On May 15, 2006, the Samueli School recognized five student recipients of the 2006 Fariborz Maseeh Best Student Poster contest. The awards were presented to an undergraduate biomedical engineering team, David Truong, Garrett Thompson and Craig Griffith; mechanical and aerospace engineering graduate student, Laura Marchal, and biomedical engineering graduate student, Jian Wu.

Winners were chosen from among 55 entries as part of the engineering student poster session held during the School's "California: Prosperity Through Technology" annual symposium, providing both undergraduates and graduates an opportunity to prominently display their research.

Symposium guests and UC Irvine faculty were invited to view the posters, highlighting projects from all five academic departments, and speak with the participants regarding their research. Following the poster session, the student winners were invited to attend the School's dinner and awards banquet with their advisors, which featured Chancellor Michael V. Drake, M.D. as the evening's keynote speaker.

Fariborz Maseeh Best Student Poster Awards

Undergraduate Poster Winners:
David Truong, Garrett Thompson, and Craig Griffith
Poster Title: "Epithelial Injury Influences Angiogenesis Through a TG F–Beta-2-dependent Mechanism in Vitro"
Faculty Advisor: Steve George

Graduate Poster Winners:
Laura Marchal
Poster Title: "A Robotic Strategy for Training Children to Drive a Powered Wheelchair"
Faculty Advisor: David Reinkensmeyer

Jian Wu
Poster Title: "A Microsystem with Varying-Length Electrode Arrays for Auditory Nerve Prostheses"
Faculty Advisor: William Tang

Engineering Students Take Flight

Students place 7th in annual radio-controlled aircraft Design/Build/Fly competition

A team of 20 Samueli School engineering students placed seventh in the 10th annual Cessna/ONR Student Design/Build/Fly competition sponsored by the American Institute for Aeronautics and Astronautics (AIAA). The international event, held in Wichita, Kan., attracted students from multiple universities and engineering fields to compete for the best and most efficient design, fabrication, and demonstration of flight capabilities of an electric-powered, radio-controlled aircraft.

The UC Irvine team competed against 49 other schools and received 601.6 total points, placing above universities such as MIT, Purdue, and Embry-Riddle Aeronautical University.

The teams flew three different loads: 48 tennis balls, two 2-liter bottles of water, and a 4"x4"x24" wooden block. Scores for this mission were based on cargo loading and unloading time, giving the students a practical demonstration of the importance of cargo loading time for commercial aircrafts.

Students were also judged on their plane's ability to handle a minimum Rated Average Cost (RAC) mission of 96 tennis balls, as well as an incremental payload mission, tallied based on the highest weight carried.

UC Irvine competition advisors included Robert H. Liebeck, adjunct professor of mechanical and aerospace engineering, and senior fellow at The Boeing Company, Ben Tigner, Ph.D., from Frontier Systems, and James Bach from Swift Engineering. The students also worked with Associate Dean John LaRue to perform tests within UC Irvine's Wind Tunnel Lab.

Student Briefly

Manish Chauhan and Indranil Roy, materials science and engineering program graduate students, were each awarded $300 for their outstanding presentations on nanostructured materials at the annual Minerals, Metals & Materials Society meeting in March. Both Chauhan and Roy each presented a paper on the characterization and mechanical behavior of nanostructured materials, and received two out of the five awards. Their work was completed under the direction of their faculty advisor, Farghalli Mohamed, Ph.D., professor of chemical engineering and materials science.

Cindy Chou, a graduate who earned her bachelor's degree in mechanical engineering in June, received the 2006 Rumbaugh Outstanding Student Leader award from the Society of Automotive Engineers in recognition of her exceptional student leadership and accomplishments. Chou will receive a lifetime SAE adult membership, including invitations to future SAE functions, a complimentary trip to the SAE 2007 World Congress meeting, and a monetary stipend. She plans to attend the awards ceremony next April in Detroit, Mich. to accept this prestigious award.

Tiffany Chua, Koel Das, Gregory Elliott, Yu Hsiang Hsu, Shan Jiang, Serdar Soyoz, Albert Tsung-Hsi Hsieh and Yue Zhang, Samueli School graduate students, were named 2006-07 California Institute for Telecommunications and Information Technology Emulex Fellows this June. They are among 16 UC Irvine graduate recipients from various schools and fields, who will use the fellowships to continue their work on Calit2-related dissertations or theses. The awards were funded by a gift from the Calit2 corporate partner Emulex Corp., a Costa Mesa, Calif.-based manufacturer of storage networking devices.

John R. Clanton, an undergraduate mechanical and aerospace engineering student, was selected as a 2006-07 Tau Beta Pi Scholar, and received a senior-level scholarship of $2,000. Tau Beta Pi, the engineering honor society, awarded 123 students nationwide who demonstrated high scholarship, campus leadership and service, and a promise of future contributions to the engineering profession.

James E. Grant Jr., a mechanical engineering student, was named "Student of the Year" at the Martin Luther King Jr. Scholarship Gospel Concert in January. He was awarded $5,000 for his essay entitled, "A Seat on the Bus: Rosa Parks to Hurricane Katrina."

Amy Hellman, a biomedical engineering graduate student, received a $100,000, two-year Graduate Research and Education in Adaptive Biotechnology training grant from the UC systemwide Biotechnology Research and Education Program. These grants are among the highest individual awards given for graduate education and training in the nation.

Hellman is researching the development of a laser microbeam/microscope platform for rapid single cell bioanalytics under the direction of Vasan Venugopalan, associate professor of chemical engineering and materials science, and biomedical engineering, together with Nancy Allbritton, professor of physiology and biophysics.

Sara Suzanna Huber, who graduated cum laude with a bachelor's degree in civil engineering, was named the 2006 commencement speaker for The Henry Samueli School of Engineering. Huber is a member of Phi Beta Kappa honors society, the outgoing co-president of Chi Epsilon Civil Engineering Honors Society, and the 2006 UC Irvine "Civil Engineer of the Year." She plans to pursue a master's degree in water law and policy in Scotland at the University of Dundee's Centre for Energy, Petroleum, Mineral Law and Policy.

Brandon J. Masuda, who graduated with a bachelor's degree in mechanical engineering in June, received the Harold C. Simmons Best Student Paper Presentation award, consisting of a plaque and a $1,000 cash prize. He was recognized for his research paper, "Some Observations of Liquid Jets in Crossflow," which examined the behavior of fuel in a fuel-injection technique common to liquid-fueled gas turbines.

Masuda was one of 33 students eligible for the award and his research is among the first to examine the behavior of such fuel sprays at temperatures and pressures similar to those found in practical gas turbines. He plans to pursue a master's degree in mechanical engineering through the UC Irvine Combustion Laboratory.

Rebecca Shupe, a mechanical and aerospace engineering graduate student, recently received NASA's prestigious Graduate Student Researcher Program award. Shupe was ranked first in the NASA Glenn Research Center for her project entitled, "Noise and Flow-field of Nonaxisymmetric Dual-stream Jets." She will be conducting research at the NASA Glenn Research Center on jet noise reduction fundamentals, in addition to continuing her research at UC Irvine with faculty advisor, Dimitri Papamoschou, professor of mechanical and aerospace engineering.

UC Irvine's Lean Dynamics Team Race Away with Most Innovative Car

Extreme gravity racing competition allows student engineers the opportunity to design and build their own race car

UC Irvine's "Lean Dynamics" extreme gravity racing team, comprised of four graduate students and seven undergraduate students, was presented with the "Most Innovative Car" award for their newly designed gravity series race car entered in the 2006 "Extreme Gravity Racing - Challenge at Malibu" competition held this July.

Organized by Don MacAllister and sponsored by Greenlight Financial Services, the event featured high-tech, futuristic race cars powered by gravity. Weighing no more than 350 lbs. each, including the driver, these vehicles were able to reach up to 50 mph down Tuna Canyon Road, which was dominated by sharp turns and steep straight-aways.

Supervised by Michael McCarthy, professor of mechanical and aerospace engineering, the UC Irvine team constructed an innovative steering system, allowing the center of gravity to move towards the inside of the turn. This steering made the race car more stable, and gave additional control to the driver, which allowed the car to turn at higher speeds without slipping. To ensure the car's safety features, as well as its reliability and durability, the team tested their design in challenging conditions, including collision and brake failure.

Lean Dynamics raced alongside some of the top car designers in the world, including Ferrari with Pininfarina, Mazda, Honda and Daimler–Chrysler Pacifica.

Scholarship :

The Henry Samueli School of Engineering would like to congratulate all students who received their degrees at the 41st annual commencement ceremony on June 18, 2006. The School would also like to recognize the following undergraduate students who received engineering scholarships during their student careers at UC Irvine.

Beall Family Scholarship
Sherjeel Dheda, Summa Cum Laude, 2003-04
Elmahdi Erraji, 2003-04
Mahya Farnia, Summa Cum Laude, 2003-04

Christine Jones Memorial Scholarship
Cynthia Mescher, 2004-05

Conexant Systems, Inc. Scholarship
Asdrubal Ibarra, 2005-06

Gregory Bogaczyk Memorial Scholarship
Cynthia Mescher, 2004-05

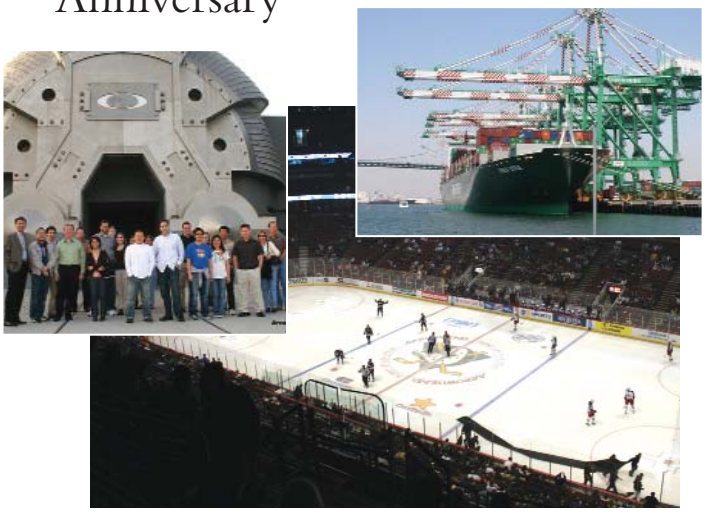
Haggai Memorial Scholarship
Michael Shimasaki, Cum Laude, 2005-06

Henry Samueli Endowed Scholarship
Ryan Douglas, Cum Laude, 2002-06
Paul Ha (graduated in fall '05), 2001-05

LINC Biomedical Engineering Scholarship
Katherine Blevins, 2005-06
Bobak Mosadegh, Cum Laude, 2005-06

Pardoen Memorial Scholarship
Cynthia Mescher, 2005-06
Michael Hunsuck, Summa Cum Laude, 2005-06

Engineering Alumni Advisory Council Celebrates First Anniversary



The Samueli School's Engineering Alumni Advisory Council (EAAC) celebrated its one-year anniversary this August, marking their first year milestone of meetings and activities created to specifically help strengthen and support the School's growing alumni community. Comprised of alumni from all areas of industry and expertise, the Council has worked to develop new programs that appeal to the diverse engineering alumni population.

The EAAC kicked-off 2006 with a March trip to the Arrowhead Pond. Twenty-five engineering alumni and guests watched the Mighty Ducks of Anaheim face-off against the Colorado Avalanche, enjoying an afternoon of ice hockey and a chance to meet and greet fellow Samueli School alums.

In April, the group invited alumni to visit the Oakley factory in Foothill Ranch, touring the company's state-of-the-art eyewear design center, testing and manufacturing sites, as well as Oakley's indoor amphitheater, complete with surround sound technology.

Finally, the Council completed their first year with a special boat tour around the Port of Los Angeles, one of the largest seaports in the world. Port Engineer and UCI alumna Sue Lai (B.S. '99) led the group on a 90-minute guided tour, where attendees had the unique opportunity to learn about the many physical improvements made to the harbor in order to reduce and minimize environmental impacts on surrounding neighborhoods. They were also able to observe the efforts made by the U.S. Coast Guard to ensure port security.

The EAAC looks forward to another successful year of planning and participating in alumni meetings and activities. If you are interested in joining the Council and learning more about their role, please contact Courtney Billing, assistant director of development, at cbilling@uci.edu or 949.824.8546.

David Dimas Honored With Distinguished Alumni Award

Samueli School alumnus, David Dimas, Ph.D., director of support and training at MSC Software, was presented with a Distinguished Alumni award at the 36th annual UCI Alumni Association (UCIAA) Lauds and Laurels Ceremony.

Dimas received his bachelor's degree in mechanical engineering from UC Irvine in 1978, his master's degree in engineering mechanics in 1979, and his Ph.D. in civil engineering in 1988. Since 1985, Dimas has played an active role in the Samueli School, serving as a lecturer, working closely with students, and assisting with the establishment of the Engineering Alumni Advisory Council. Dimas is also a member of The Henry Samueli School of Engineering's Advisory Board, assisting in the development of strategic relationships with surrounding engineering and business communities.

He also works closely with the School's undergraduates, and established a mechanical and aerospace engineering course (MAE 152), which incorporates the latest computer-aided engineering skills and enables students to test classroom knowledge with real-world applications.

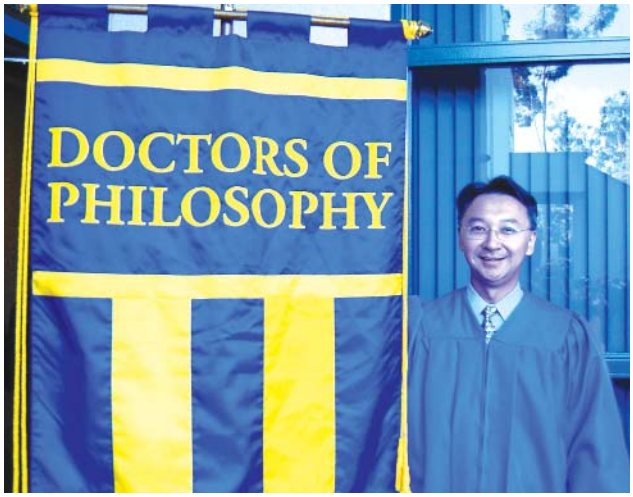
In addition to his dedicated work with UC Irvine students and alumni, Dimas has worked with MSC Software since 1982, and, along with other committed MSC staff, has been instrumental in securing several large software gifts to the Samueli School, valued cumulatively at more than $20 million.

Save the Date:

October 5, 2006

Join the Engineering Alumni Advisory Council for a tour of *Road and Track* magazine's historic Newport Beach facilities. All engineering alumni, family and friends are welcome. For more information, please contact Courtney Billing at cbilling@uci.edu or 949.824.8546.

Sharing in the Commencement Spirit and Celebration



Participating for the second consecutive year, Eric Shen (B.S. '93, M.S. '95), manager of transportation development for the City of Pasadena, carried the Samueli School banner during the 41st annual engineering commencement ceremony held on June 18, 2006. This year marked the third occasion Shen has walked alongside graduating students with a banner in hand, including his 1992 invitation when he was recognized as an outstanding honors senior.

Save the Date:

Homecoming 2007

Welcome back Anteaters! Save the date for UC Irvine's Homecoming, scheduled for Saturday, Feb. 3, 2007, and attend the Homecoming Fun Zone carnival at the Bren Center, complete with free food, fun games, and music. Then root for your UCI men's basketball team as they challenge Cal State Northridge. For more information, or to learn how you can be a part of the Homecoming planning process, please contact Courtney Billing at cbilling@uci.edu or 949.824.8546.

Samueli School Alum Appointed Department Head of Aerospace Engineering and Mechanics at the University of Minnesota

Gary Balas (B.S. '82, M.S. '84), has been appointed professor and head of the Department of Aerospace Engineering and Mechanics at the University of Minnesota. Balas received both his bachelor's and master's degrees in civil engineering and electrical engineering from UC Irvine, and continued his higher education by earning a Ph.D. in aeronautics and astronautics from the California Institute of Technology in 1989.

2006-07 Engineering Alumni Advisory Council Members

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Dave Dimas (B.S. '78, M.S. '79, Ph.D. '88)
Patrick Hong (B.S. '95)
Alex Jordan, (B.S. '07 anticipated)
David Maradiaga (B.S. '00)
Ramin Massoumi (B.S. '94)
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Darryl Sato (Ph.D. '96)
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The Henry Samueli School of Engineering would like to recognize and thank the major donors who supported our School during the 2005-06 academic year.

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A special thank you to our engineering alumni for your support during UC Irvine's 2005-06 Annual Fund campaign. It was our best year to date! Your contributions are greatly appreciated.

CONTACT US

Dean's Office
305 Rockwell Engineering Center
University of California, Irvine
Irvine, CA 92697-2700
(949) 824-4333

Student Affairs
101 ECT
Irvine, CA 92697-2710
(949) 824-4334

Development and External Relations Office
114 Rockwell Engineering Center
University of California, Irvine
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University of California, Irvine
Irvine, CA 92697-2720

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