



Hakulau

Fall 2010

Engineering Contributes to Prestigious Solar Power Competition

Imagine living in a house where the appliances, hot water, climate control and even home entertainment is powered by energy harnessed from the Sun. If this sounds like the science fiction of *Star Trek* or like a page taken from NASA's plans to colonize Mars in the distant future, think again.

Earlier this year, the U.S. Department of Energy (DOE) selected the University of Hawai'i at Mānoa and Honolulu Community College (Team Hawai'i) as one of 20 collegiate teams to compete in the 2011 Solar Decathlon, an international design-build competition

to construct a solar-powered house that is affordable, energy efficient and attractive. Ohio State University, Purdue University, University of Illinois at Urbana-Champaign, Tongji University (China), Ghent University (Belgium) and the University of Calgary are some of the other teams selected for the competition to be held on the National Mall in Washington, D.C.

Team Hawai'i is led by Associate Professor David Rockwood from the School of Architecture, Associate Professor Weilin Qu and Assistant Professor David Garmire from the College of Engineering, as well as representatives

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Interior view



Exterior view

Engineering Awarded \$2.5 Million Renewable Energy Grant



Anthony Kuh and some of his REIS team members

In April, the University of Hawai'i at Mānoa College of Engineering, with the support of Hawaiian Electric Company, was awarded a \$2.5-million American Recovery and Reinvestment Act stimulus grant from the U.S. Department of Energy to train students and current workers for emerging jobs in clean and renewable energy technologies in the electric power industry.

Officially titled, "Integrated Education and Research in Clean Energy and Island Sustainability," the project is a major component of UH Mānoa's Renewable Energy and Island Sustainability (REIS) program. Led by Electrical Engineering Chair and Professor Anthony Kuh,

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A Message from the Dean



Peter E. Crouch

As I reflect on this past year, we at the University of Hawai'i at Mānoa College of Engineering have much to be thankful for and proud of as we enter the holiday season:

Our students continued to do well in national competitions, including being selected to participate in the prestigious 2011 Solar Decathlon competition. Five of the university's 20 Regents Scholars have enrolled in engineering and we have two ARCS scholars. Our faculty continued to excel, both in the classroom and in the field. Assistant Professor Brian Bingham was recognized as one of the country's leading young engineering educators, Professor Magdy Iskander was honored with a Regents' Medal for Excellence in Teaching and a group led by Professor Anthony Kuh landed a \$2.5 million renewable energy grant. Our alumni and friends of the College continued their generous support in masses at both the annual banquet and at "Holmes" coming.

I would like to thank each and every one of you for your unwavering support of the College. As we move toward year's end, I wish you and your families a joyous holiday season and look forward to working with you in 2011.

Aloha!

Peter E. Crouch
Dean

Solar Power Competition continued

from the Shidler College of Business and Honolulu Community College. UH Alumni and members of the professional community are also involved as sponsors, advisors and contributors.

"The competition will be fierce with the traditional engineering powerhouses like Purdue, Illinois and upstart Tongji in the mix," said Dean Peter E. Crouch. "However, I believe with its links to the U.S. Department of Energy and Asia, Team Hawai'i will be right in the hunt."

The Team Hawai'i entry will include advancements in composite materials, photovoltaics, building-integrated heating and cooling systems, hydroponics and a novel house design tailored for Hawai'i's tropical climate.

Applications for the competitions were rigorously evaluated by panels of engineers, scientists and experts from the DOE, American Institute of Architects, National Association of Home Builders, U.S. Green Building Council, and the American Society of Heating, Refrigerating and Air-Conditioning Engineers. Teams selected demonstrated the viability, efficiency, innovation of designs, as well as the ability to raise funds and assemble a team to successfully complete the project.

Currently, the UH team now has about 10 months to take the cutting-edge designs and construct the house. Leading the way is Justin Carland, a graduate student in electrical engineering, who was recently named project manager for Team Hawai'i.

"This project is extremely complex with many moving parts and people involved – it will be a challenge to keep things on track," said Carland. "Primarily, my job is to make sure that the architects, engineers and fabricators are all on the same page to ensure that the house is completed and gets to D.C. on time."

Although the university will receive \$100,000 from the DOE to help defray some of the project expenses, the team is still in need of monetary support and in-kind donations of goods or services.

"We have a unique opportunity to showcase the University of Hawai'i in a national and international arena with this competition," added Dean Crouch. "However, Team Hawai'i needs the generous support of our alumni, corporate partners and the community to accomplish this endeavor."

To learn more about the project, offer support or to make a donation, please visit the Team Hawai'i website at www.solar.hawaii.edu. Or contact Associate Professor David Rockwood at (808) 956-8430 or via email at rockwood@hawaii.edu.

Two Doctoral Students Receive ARCS-Honolulu Awards

Engineering doctoral students James Baker and Kenneth McKell both received \$5,000 to further their research as recipients of the 2010 ARCS-Honolulu awards.

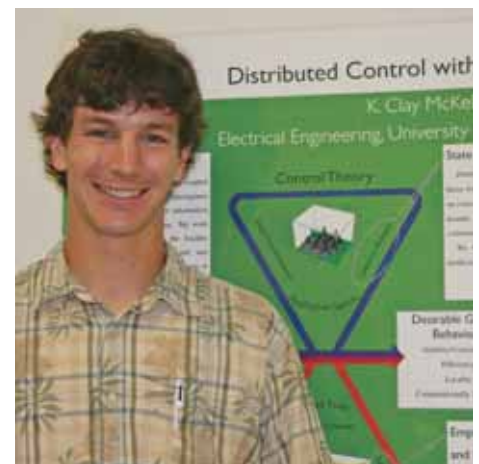
Baker received the Bretzlaff Foundation Award in Engineering and is working on a compact high frequency antenna for use with surface wave radar in the Hawaii Center for Advanced Communications (HCAC). A retired, decorated Marine, Baker worked as an applications engineer for National Instruments and as an aircraft test engineer for the Navy. He received his BGS in history from the University of Kansas, BS in electrical engineering from the University of Utah and MS in systems engineering from Johns Hopkins University. Baker manages HCAC's teacher outreach program.

McKell received the ARCS Shelagh Kresser Award in Engineering and is working on merging distributed control theory (which uses algorithms to dictate the actions of agents in networks) with game theory (used in mathematics and economics to predict and describe the outcome of self-controlling entities) to design a distributed control system. Currently in electrical engineering at UH Mānoa, McKell received both his BS and MS degrees in mechanical engineering from UCLA.

The Achievement Rewards for College Scientists (ARCS) Foundation provides scholar awards to academically outstanding U.S. citizens studying to complete degrees in science, medicine and engineering.



James Baker



Kenneth McKell

Renewable Energy Grant continued

REIS seeks to establish a prominent national and international program in renewable energy at the university. UH Mānoa will use these funds to create a multi-disciplinary program of formal courses and hands-on research experience in clean energy technologies, renewable energy production, energy storage, integration and smart grid technologies.

“This funding from the U.S. Department of Energy will enable UH Mānoa to play a key role in the education and research in developing clean energy technologies in Hawai'i and the United States,” said Professor Kuh. “We are delighted to have a proactive partner like Hawaiian Electric to help us develop this ambitious program.”

Utility companies like Hawaiian Electric will benefit from better informed consumers, educators and a future workforce trained in renewable energies. In addition to creating a pipeline to support the integration of new wind, solar, wave and smart grid technologies,

the project aims to enhance the training of the existing workforce in these areas.

“This is a natural alliance because UH Mānoa has always been the leading source of our engineers and other team members,” said Dick Rosenblum, president and CEO of Hawaiian Electric Company. “With today's intense transformation of the utility industry to renewable energy and energy efficiency, this effort is very timely.”

The \$2.5 million federal contribution will be matched by nearly \$280,000 in funding and support by UH Mānoa. Final details of the project will be discussed in the near future.

“I would like to congratulate Professor Kuh, his team and Hawaiian Electric on a job well done,” said Dean Peter E. Crouch. “With this initiative, we are poised to begin education and training programs for a new generation of engineers focused on a broad range of clean energy technologies.”

Hakulau

Hakulau, “to make drawings or plans” in Hawaiian, is the newsletter for the College of Engineering at the University of Hawai'i at Mānoa. It is published twice a year by the Marketing and Public Affairs Office, 2540 Dole Street, Holmes Hall 240, Honolulu, Hawai'i 96822 and is circulated to the over 6,500 alumni and friends of the College of Engineering. If you have comments, suggestions, news, even an address change, please contact us at (808) 956-7584 or e-mail hakulau@hawaii.edu.

College of Engineering

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Dean

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Ray Elected ASCE Fellow

Civil and Environmental Engineering Professor Chittaranjan Ray, was recently



Chittaranjan Ray

elected a Fellow in the American Society of Civil Engineers (ASCE). Professor Ray specializes in water quality engineering, with an emphasis in the areas of surface and groundwater flow, transport, saturation

and interaction. He also serves as the interim director of the Water Resources Research Center at UH Mānoa. Ray has been with the college since 1997.

ASCE Fellows are distinguished practitioners, educators, mentors and leaders, whose careers have contributed significantly to the civil engineering profession. This prestigious honor is held by fewer than five percent of its members. ASCE has over 144,000 members worldwide.

“We are thrilled that Professor Ray has been bestowed this prestigious honor by the ASCE,” said Dean Peter E. Crouch. “He is an outstanding instructor, researcher and a valuable member of our engineering team.”

EPA Awards Ray, Collaborators with \$897,225 Grant

Professor Chittaranjan Ray is part of a consortium with the University of Illinois and Stanford University that was awarded an \$897,225 grant by the Environmental Protection Agency to examine carbon sequestration in deep-saline reservoirs in the U.S. Midwest.

Carbon sequestration is the injection of carbon dioxide into deep geologic formations to “trap it” and reduce greenhouse gas emissions. Because of the possibility of the carbon dioxide infiltrating and contaminating drinking water aquifers, Professor Ray’s research is aimed at methods to protect them.



George Kuo displays his slack key talents



Chef D.K. Kodama serves it up with a smile.



Robert Akinaka, Tammy Mori, Glenn Nohara and Dave Matlin

New Name, Same Great Event

The name may have changed, but homecoming is rapidly becoming a much-anticipated tradition for the College of Engineering. Now in its third year, “Holmes” coming brought over 700 alumni and friends back to Holmes Hall on November 10 for an evening of food, fun and friendship.

Under cloudy and humid Manoa skies, guests were soothed by cool drinks and delicious fare of award-winning chef D.K. Kodama’s popular eateries d.k. Steakhouse and Sansei Seafood Restaurant & Sushi Bar. Chef Kodama, who has participated in all three celebrations, is himself becoming a tradition with “Holmes” coming attendees.

In addition to the karaoke and poker tournaments, a new basketball free throw contest was added to kick the excitement level up a notch. To cool things down, guests were treated to a slack key guitar performance by UH Mānoa engineering alum George Kuo, who doubles as a civil engineer for the Honolulu Board of Water Supply.

“We have definitely started an engineering tradition here at UH Mānoa,” said Dean Peter E. Crouch. “I’m already looking forward to next year’s event.”

Cheng, Holm-Kennedy Retire



Edmond Cheng



James Holm-Kennedy

Civil and Environmental Engineering Professor Edmond D.H. Cheng and Electrical Engineering Professor James W. Holm-Kennedy recently retired from the College. Cheng and Holm-Kennedy have been with UH Mānoa since 1969 and 1976, respectively.

“We are always sad to see members of our engineering family leave us,” said Dean Crouch. “But we wish professors Cheng and Holm-Kennedy the best on their much-deserved retirement.”

UH Mānoa Places Third in CanSat Competition

UH Mānoa engineering students Christopher Ho, Robert Kim and Charlemagne Pascual, under the guidance of faculty advisor Trevor Sorensen, took home third place at the 2010 CanSat Competition held this past June in Amarillo, Texas.

Sponsored by the American Astronautical Society and the American Institute of Aeronautics and Astronautics, the international design-

build competition was to successfully keep a raw egg intact from launch to recovery. This year's mission required the design of a carrier/lander system that did not deploy a parachute, para-foil or similar device. Teams with successful landings, were then judged on other criteria including weight of the lander and best prediction of landing coordinates.



2010 CanSat Results

First Place

International Institute of Information Technology (India)

Second Place

Queen's University (Canada)

Third Place

University of Hawai'i at Mānoa

Fourth Place

University of Nebraska

Fifth Place

University of Michigan

Engineering Nabs Five Regents Scholars

This fall, the College of Engineering was proud to have been selected as the school of choice for five Regents Scholars.

Regents scholarships are awarded to 20 outstanding freshmen each fall. To qualify for this scholarship, awardees must earn a 3.5 cumulative high school GPA and

achieve a combined score of at least 1950 on their SAT or a 29 on their ACT. They must also show remarkable extracurricular achievements. Scholars receive a full tuition waiver for four years of undergraduate study, \$4,000 a year and a one-time travel grant of \$2,000

Regent Scholars	Discipline
Corey Chang	EE
Julian Cheng	EE
Aaron Sewake	CEE
Jennifer Taguma	CEE
Jonathan Torigoe	ME

New Computer Engineering Degree Launched

This fall, the inaugural class of students enrolled in the UH Mānoa College of Engineering's new bachelor of science degree in computer engineering embarked on their new journey. The new degree offering gives students interested in pursuing careers in computer software design, hardware manufacturing and robotics an option to remain in Hawai'i for their undergraduate college education.

"We are very excited about the addition of computer engineering to our degree offerings," said Dean Peter E. Crouch. "We are now better positioned to attract students to the College in an important area of engineering for Hawai'i."

The computer engineering degree program is collaboratively taught by faculty from both the College of Engineering's Department of Electrical Engineering and the College of Natural Sciences' Department of Information and Computer Sciences. Curriculum is devoted to computer hardware and software, computer organization and architecture, computer security, software engineering, computer networks and Internet technology, embedded systems, computer-

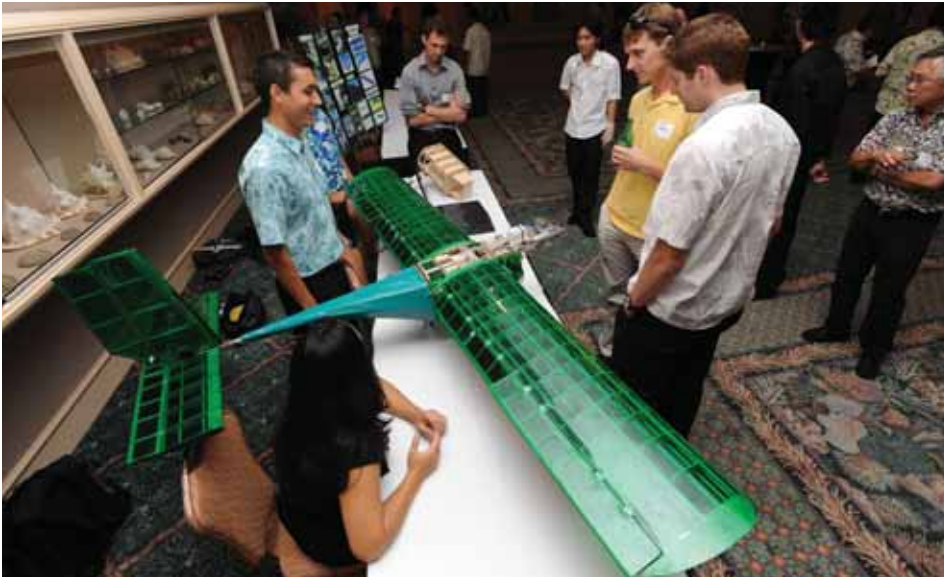
aided design, multi-core and parallel computing and wireless networks.

"Computer engineering is a combination of both electrical engineering and computer science," said Alan H. Teramura, interim dean of the College of Natural Sciences. "It made perfect sense to combine our expertise from both colleges to create this exciting new degree offering at UH Mānoa."

Prospective candidates interested in obtaining a computer engineering degree must submit a completed application to the UH Mānoa Admissions and Records Office. Applicants for admission to UH Mānoa as freshmen must also submit their official Scholastic Aptitude Test (SAT) or American College Test (ACT) scores and high school transcripts. Prior to applying, students should have taken algebra, trigonometry, analytic geometry, physics and chemistry.

For additional information regarding the computer engineering degree curriculum requirements, visit the Department of Electrical Engineering website at <http://www.ee.hawaii.edu>.

Engineering Banquet Reaches 10-Year Milestone



One of the many student projects on display that evening

In 2000, Ronald Ho's vision of a College of Engineering alumni banquet finally made its way from the drafting board to reality with just over 200 attendees. Over the years, attendance has steadily grown and this year was no exception as over 700 alumni and friends attended the 10th annual banquet held on April 21st at the Hilton Hawaiian Village's Coral Ballroom. Over \$100,000 was raised for the College's programs that evening.

In addition to the in-depth briefing on Mauna Kea's Thirty-Meter Telescope Project by guest speaker Jerry Nelson, guests were treated to the popular question and answer session with students, the soothing piano stylings of Kit Samson and the numerous student project displays.

Be sure to mark your calendar for next year's banquet scheduled for April 14, 2011.

The evening was highlighted with the presentation of two special awards:

Distinguished Alumni Award:

Bert K. Oyama (BSEE '73), technical fellow, Northrop Grumman Corporation's Space Technology Sector.

Oyama is one of only 25 other employees in the division to hold the title, which signifies the highest level of technical expertise in the field. In a 30-plus year career, Oyama has forged a reputation as one of the country's leading experts in analog and digital circuit design. In 2003, he was inducted into the Space Technology Hall of Fame for developing the Monolithic Microwave Integrated Circuit technology for applications both in space and on Earth.



Distinguished Alumni Award: Bert Oyama



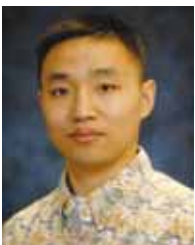
Distinguished Service Award: Robert Akinaka

Outstanding Service Award:

Robert Y. Akinaka, chairman of Akinaka & Associates, Ltd.

Akinaka co-chaired the UH Mānoa College of Engineering Centennial Homecoming Celebration in 2008, which successfully raised \$150,000 for the college. He was also instrumental in leading the effort to establish the Dr. Arthur N.L. Chiu Endowed Scholarship in Civil Engineering, which has over 300 donors and has raised over \$130,000 for deserving students. Akinaka is currently a member of the UH Mānoa College of Engineering Dean's Council and has unselfishly given his time and energy to various engineering organizations including ASCE, Hawaii Society of Professional Engineers and the American Water Works Association.

Yan Doubles Up on Grants



Tao Yan

Tao Yan, assistant professor of civil and environmental engineering, was awarded two grants this year. In June, Professor Yan received a Program Development Grant Award from the UH Mānoa

Sea Grant Program for his project to develop various low-cost geofilters and to test their effectiveness to remove bacteria from stream waters in Hawai'i. The following month, he received a \$120,000 grant to study irrigation and human health by the United States-Israel Binational Science Foundation. Professor Yan and his Israeli colleague Cytryn Eddie will study how human activities like irrigating fields with reused wastewater affects the

development of antibiotic resistance in soil and its effects on human health.

"We are pleased that Professor Yan's environmental research is being recognized locally and internationally," said C.S. Papacostas, civil and environmental engineering chair. "He is one of our promising young faculty members and we can expect to hear more from him in the future."

XE Pledge Project Aids UH Mānoa Children's Center

While most students spent their Spring Break on the beach, on a trip or just hung out, members of the UH Mānoa chapter of Chi Epsilon (XE), the national civil engineering honor society, were hard at work on a sidewalk construction project at the UH Mānoa Children's Center.

Under the guidance of XE Pacific District Councilor Randy Akiona and XE Faculty Advisor Phillip Ooi, new pledges and current members joined together to construct forms and expansion joints, pour concrete, level and finish the sidewalk.



"It was a lot of hard work, but it was a win-win for everyone," said Professor Ooi. "The initiates and members came together as a team and demonstrated practicality, character and sociability – three of the four pillars of Chi Epsilon along with scholarship."

Bingham Named a Top Young Educator



Brian Bingham, an assistant professor of mechanical engineering, has been selected as one of the nation's most innovative young engineering educators by the National Academy of Engineering (NAE) and

Brian Bingham

will participate in the organization's second Frontiers of Engineering Education symposium, December 13-16, in Irvine, California.

Professor Bingham was selected following a highly competitive nomination and selection process by NAE and will join 52 other early-career faculty members from around the country who are developing and implementing innovative educational approaches in a variety of engineering disciplines. Over the course of the two-and-a-half day event, participants will focus on ways to ensure that students learn the engineering fundamentals, the expanding knowledge base of new technology and the necessary skills to be an effective engineer or engineering researcher.

Professor Bingham specializes in the development of innovative tools to improve the ability to explore, understand and protect the marine environment – including precision underwater navigation, autonomous vehicles and diverse sensors. He received his BS degree in mechanical engineering from the University of Missouri-Rolla and earned both his MS and PhD degrees from the Massachusetts Institute of Technology.

"We are proud of the NAE's recognition of Professor Bingham as a rising young star in engineering education," said Mehrdad Ghasemi Nejhadd, mechanical engineering chair. "We look forward to many more accomplishments and contributions from him in the future."

Fall '10 Career Day

The ground floor of Holmes Hall was again abuzz with discussions between students and employers at the College of Engineering's Fall Career Day 2010 held on October 15th.



Students and employers discuss employment opportunities

Hundreds of students from engineering and computer sciences took advantage of this excellent opportunity to meet with recruiters from 65 participating companies and organizations. Annual participants like R.M Towill Corporation, Naval Facilities Engineering Command and Northrop Grumman Corporation were joined this year by new participants Georgia Tech Research Institute and Absher Construction Company. The half-day event is sponsored by the UH Mānoa College of Engineering and the Department of Information & Computer Sciences.

"I'm especially pleased that we are still getting new companies to participate in our Career Day," said Dean Peter E. Crouch. "It is a real testament to the quality of our students and their growing reputation here and abroad."

Iskander Awarded Regents' Medal



Magdy Iskander

Magdy Iskander, professor of electrical engineering and director of the Hawaii Center for Advanced Communications, was one of 12 UH faculty to receive a 2010 University of Hawai'i Board of Regents' Medal for Excellence in Teaching earlier this year. The award recognizes faculty who exhibit an extraordinary level of subject mastery and scholarship, teaching effectiveness and creativity and personal values that benefit students.

Professor Iskander was recognized for his caring and willingness to spend the time to motivate and excite his students about electromagnetics by making the difficult and esoteric subject fun. He was also noted for his active promotion of STEM education to middle schools in Hawai'i.

Calendar of Events

DEC 2010

Engineering Convocation
December 17

FEB 2011

Spring Career Day
February 18

MAR 2011

Jr. Expo
March 4

APR 2011

Engineering Alumni Banquet
April 14

For more information about upcoming College of Engineering events, please visit www.eng.hawaii.edu/events or call (808) 956-7727.

Team Led by Riggs Awarded \$965,000 NSF Grant



H. Ronald Riggs

An international team of researchers led by H. Ronald Riggs, professor of civil and environmental engineering, was awarded a \$965,000 grant by the National Science Foundation

for a three-year study to improve our understanding of the effects of tsunami-driven debris, such as logs, utility poles and steel shipping containers on buildings and other structures. The team includes Marcelo Kobayashi, professor of mechanical engineering at UH Mānoa, and collaborators from Oregon State University, Lehigh University, Nagoya University and the Port and Airport Research Institute in Japan.

The UH Mānoa-led research team will carry out experiments at the Network for Earthquake Engineering Simulation (NEES) facility at Lehigh to understand the impact of full-scale shipping containers on structural elements. This information will then be applied at the Oregon State NEES Tsunami Research Facility to develop and test the impact of 1:5 scale models of shipping containers, logs and utility poles against a test structure by laboratory generated tsunami waves.

Data from this National Earthquake Hazards Reduction Program project will be archived and made available to other researchers and to the public. This information will help vulnerable communities to understand and design effective countermeasures and

update their building codes to increase tsunami resilience in structures.

UH Mānoa Engineering Reaccredited

As a follow up to the last issue of *Hakulau*, the UH Mānoa College of Engineering received confirmation that its engineering programs have been reaccredited by Accreditation Board for Engineering and Technology (ABET, Inc.), as part of their normal reaccreditation process.

ABET, Inc. is responsible for accrediting some 2,900 programs in applied science, computing, engineering and technology education at more than 600 colleges and universities nationwide.