

President's *report*

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The following is a glimpse of some recent achievements by the faculty, staff and students of the University of California and the national laboratories managed by the university.

IN THE NEWS

Math's "Nobel" ... *Terence Tao* became the first mathematics professor in *UCLA* history to be awarded the prestigious Fields Medal, often described as the "Nobel Prize in mathematics." In making the award, the International Congress of Mathematicians cited Tao for his contributions to partial differential equations, combinatorics, harmonic analysis and additive number theory. The organization called Tao "a supreme problem-solver whose spectacular work has had an impact across several mathematical areas." Tao, 31, was 20 when he earned his Ph.D. from Princeton and joined *UCLA*'s faculty that year. He became full professor at age 24.

Books online ... *University of California libraries* will work with Google to digitize books from the libraries' collections. UC has become the latest partner in the Google Books Library Project, launched in December 2004 to digitize books from the libraries of Harvard, Stanford and Oxford universities, among others. The digitized books will be searchable through Google Book Search. Readers will be able to freely read UC's public domain books, including many of the treasures in historic and special collections.

Exceptional campuses ... "UC schools continue to rule," *Washington Monthly* proclaimed in its second annual rankings of national universities and liberal arts colleges, published this month. Four UC campuses are ranked in the Top-10: *UC Berkeley* (2nd), *UCLA* (4th), *UC San Diego* (6th) and *UC Davis* (10th). UC's other general education campuses placed in the top 75. *Washington Monthly* evaluated universities and colleges on how well they benefit the nation, measuring how a college or university perform as an engine of social mobility, how well they fostered scientific and humanistic research, and how well they promoted an ethic of service to the nation. The *Monthly*'s top pick: MIT.

Boosting faculty ... *UC Merced*, which has just kicked off its second year, has added 23 new professors. The breadth of their interests and experience will significantly expand research capabilities and academic programs through the growth of new courses and majors, officials say. All but one of the new profs joined the campus at the rank of assistant professor (the exception is an associate professor). Active faculty, including administrative faculty, now totals 85.

HEALTH AND NUTRITION

Enhancing memory ... Drugs made to enhance memory appears to trigger a natural mechanism in the brain that fully reverses age-related memory loss, even after the drug itself has left the body, according to researchers at *UC Irvine*. The drugs, ampakines, were developed in the early 1990s by UC scientists to treat age-related memory impairment and may be useful for treating a number of central nervous system disorders, such as Alzheimer's disease and schizophrenia. They do so by boosting the production of a naturally occurring protein in the brain necessary for long-term memory formation.

Babies' lungs ... *UC Davis* researchers have described in unprecedented biochemical and anatomical detail how cigarette smoke damages the lungs of unborn and newborn children. Smoke exposure causes significant damage and lasting consequences in newborns, says UC Davis professor *Kent Pinkerton*, adding that the results from the study are further proof that secondhand smoke's effects on children are not minor, temporary or reversible. The 2006 Surgeon General's Report on secondhand smoke estimates that more than 126 million residents of the U.S. age 3 or older are exposed to secondhand smoke.

Fighting obesity ... The U.S. Department of Agriculture's Agricultural Research Service in August dedicated a new \$25-million laboratory and office building for the agency's Western Human Nutrition Research Center at *UC Davis*. The 49,000-square-foot structure sits on two acres on the campus, enhancing collaboration with UC Davis faculty. The research center's team of 85 scientists, technicians and other specialists includes experts in nutrition, exercise physiology, chemistry, immunology and related disciplines. The researchers specialize in exploring new and healthful ways to fight obesity, America's No. 1 nutrition problem.

DEVELOPMENTS AND DISCOVERIES

Brain development ... *UC Santa Cruz* researchers and colleagues have discovered a gene that has undergone accelerated evolutionary change in humans and is active during a critical stage in brain development. Although the scientists have yet to determine the precise function of the gene, the evidence suggests that it may play a role in the development of the cerebral cortex and may even help explain the dramatic expansion of this part of the brain during human evolution. The discovery received widespread media coverage.

Flood-tolerant rice ... A gene that enables rice to survive complete submergence has been identified by a team of researchers at the International Rice Research Institute in the Philippines and at the *UC Davis* and *Riverside* campuses. The discovery sets stage for new rice varieties that can withstand flooding, thus overcoming one of agriculture's oldest challenges and offering relief to millions of poor rice farmers around the world. Developing and cultivating new varieties is expected to increase food security for 70 million of the world's poorest people.

Sour taste ... A team headed by biologists from *UC San Diego* has discovered the cells and the protein that enable us to detect sour, one of the five basic tastes. The scientists suggest that this protein is also the long-sought sensor of acidity in the cerebrospinal fluid. The study reports that each of the five basic tastes is detected by distinct taste receptors, proteins that detect taste molecules, in distinct cells. *Charles Zuker*, a professor of biology at UCSD who headed the study, says the research has shown that all taste qualities are found in all areas of the tongue, in contrast with the popular view that different tastes map to different areas of the tongue.

Industrial innovation ... *Lawrence Livermore National Laboratory* researchers captured seven awards for developing advanced technologies with commercial potential in *R&D Magazine's* top 100 industrial innovations worldwide for 2005. The laboratory garnered more of the R&D 100 awards than any other institution, tying its previous record. *Los Alamos National Laboratory* won five awards and *Lawrence Berkeley National Laboratory* won four. In the 2005 competition, Department of Energy laboratories received a total of 41 R&D 100 awards, often dubbed the "Oscars of invention."

Coral death ... Bacteria and algae are combining to kill coral — and human activities are compounding the problem. *UC Santa Barbara* scientists and colleagues have discovered an indirect microbial mechanism whereby bacteria kill coral with the help of algae. Human activities are contributing to the growth of algae on coral reefs, setting the stage for the long-term continued decline of coral. Coral reefs support numerous species of animals and plants and many species that remain undiscovered to science. These ecosystems are particularly important to humans because they support abundant fisheries.

THE CUTTING EDGE

Eye-care telemedicine ... Using new telemedicine software, optometrists at *UC Berkeley* are working with doctors at community clinics in California's Central Valley to provide eye exams for thousands of low-income diabetic patients. Since September 2005, when the project launched, 13 clinics have received retinal cameras and an image management program developed at UC Berkeley's *School of Optometry* for storing and transmitting patient information and diagnostic images. The equipment allows doctors to take high-resolution photos of patients' retinas and send them electronically to optometrists at UC Berkeley for interpretation and diagnosis. *Jorge Cuadros*, a clinical professor of optometry and the driving force behind the project, says optometrists are finding sight-threatening retinopathy in about 10 percent of the patients.

Small-scale tech ... *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 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, LifeChips will focus on the study of micro and nanotechnology as it applies to life sciences.

Strong fiber ... *Los Alamos National Laboratory* has licensed its carbon nanotube technology to a new commercial partner, CNT Technologies Inc. of Seattle. The ultrastrong, lightweight carbon-nanotube fiber, branded SuperThread by CNT, can have better properties than steel for many applications and could soon be the primary substance from which airplanes, automobile parts and sports equipment are made. Initial tests show that SuperThread is pound for pound (for the same weight) 100 times stronger than steel and less than one-fortieth the weight.

PLANETS AND THE ENVIRONMENT

Environmental boon ... A new *UC Berkeley* report finds that returning California greenhouse gas emissions to 1990 levels by 2020, as envisioned by pending global warming legislation, can boost the annual Gross State Product (GSP) by \$60 billion and create 17,000 new jobs by 2020. The study finds that the gains could be even larger — \$74 billion in annual GSP and 89,000 new jobs by 2020 — if climate policies are designed to create direct incentives for California companies to invest in new technology. *David Roland-Holst*, UC Berkeley adjunct professor of agricultural and resource economics and author of the report, notes that climate action can be profitable.

Ocean occurrence ... Gas escaping from the ocean floor may provide some answers to understanding historical global warming cycles and provide information on current climate changes, according to a team of *UC Santa Barbara* scientists. Remarkable and unexpected support for this idea occurred when the scientists observed and videotaped a massive blowout of methane from the ocean floor of the Santa Barbara channel. An important piece of the global climate puzzle may be explained by understanding bubble-plume processes during blowout events.

Marine microbes ... *UC Santa Cruz* is one of six partners in a new interdisciplinary science and technology center that will focus on the microbial inhabitants of the sea. Funded by a five-year, \$19 million grant from the National Science Foundation, the Center for Microbial Oceanography Research and Education is based at the University of Hawaii at Manoa. The scope of the center will allow an approach across disciplines that has not been possible before, from the molecular scale of genomes and genetics to the global scale of ocean modeling, says *Jonathan Zehr*, a professor of ocean sciences who will lead UCSC's participation in the center.

INSIGHTS ON SOCIETY

Multi-tasking ... Multi-tasking affects the brain's learning systems, and as a result, we do not learn as well when we are distracted, report *UCLA* psychologists. Multi-tasking adversely affects how we learn, says *Russell Poldrack*, UCLA associate professor of psychology and co-author of the study. The study shows that to the degree you can learn while multi-tasking, you will use different brain systems. To improve your memory, pay attention to the things you want to remember, Poldrack says.

Childhood obesity ... A *UC San Francisco* researcher has determined that a key reason for the epidemic of pediatric obesity, now the most commonly diagnosed childhood ailment, is that high-calorie, low-fiber Western diets promote hormonal imbalances that encourage children to overeat. *Robert Lustig*, a professor of clinical pediatrics at *UCSF Children's Hospital*, says that food manufacturing practices have created a "toxic environment" that dooms children to being overweight. Overweight children tend to become overweight adults, which puts them at greater risk of high blood pressure, heart disease and stroke.

LOOKING INTO THE FUTURE

Improving health ... UnitedHealth Group has contributed \$10 million to support developing new medical and health science education programs at the University of California. Over a three-year period, the funds will be divided equally between *UC Riverside* and *UC Merced* for feasibility studies and other activities necessary to establish medical and health science education programs at the two campuses, including building educational capacity by hiring teaching and support staff to establish research, course work and classes for future programs.

Nursing shortage ... By 2012, every region in California will face a shortage of registered nurses, according to a new report from *UC San Francisco's Center for California Health Workforce Studies*. Unless policies are enacted to address the problem, by 2030 most of northern and central California will not have the nurses to fill 30 percent of RN positions, Los Angeles will need enough RNs to fill 20,000 full-time-equivalent vacancies, and the state's northernmost counties will lack 40 percent of the registered nurses they need.

Promoting college ... In each of the next five years, *UC Merced*, and West Hills College Coalinga (Fresno County) will each receive \$325,000 to help improve the college-going rate of Central Valley students. UCM *Chancellor Carol Tomlinson-Keasey* and West Hills Chancellor Frank Gornick said the grant, made by the U.S. Department of Education, will fund academic support centers, tutors, faculty collaborations and summer bridge activities that will help more students earn college degrees. In the Central Valley, between 12-14 percent of adults have college degrees, compared with 29 percent statewide.

KUDOS

NEA fellowship ... *Cindy Schuster*, a *UC Irvine* graduate student who teaches Spanish and Portuguese, has won a \$10,000 fellowship from the National Endowment of the Arts for her work in literary translation. She is translating from Spanish an anthology of 12 short stories by the late Argentine journalist, writer and political activist Rodolfo Walsh (1927-1977).

Stellar honor ... A minor planet orbiting the inner part of the main asteroid belt has been designated Markthiemens to honor *Mark Thiemens*, dean of *UC San Diego's division of physical sciences*, whose work has focused on meteorites. The minor planet center at the Harvard-Smithsonian Center for Astrophysics, the clearinghouse for naming Earth-orbiting bodies, said Thiemens' asteroid was discovered in 1979 in Australia. It's the second major scientific honor Thiemens, a professor of chemistry and biochemistry, has received this year. In April, he was one of three UCSD professors elected to the National Academy of Sciences.

Innovation award ... The *University of California* has been recognized for its ground-breaking work in scholarly communication by the Scholarly Publishing and Academic Resources Coalition. The Washington, D.C.-based organization cited UC as a leader in helping scholars and researchers regain control of their published work, while exploring innovative means of scholarly communications. It noted the pioneering work of UC's *California Digital Library*, which has formed an electronic publishing alliance with *University of California Press*.

Hurricane response ... The Environmental Protection Agency has recognized members of the *Los Alamos National Laboratory Integrated Reachback Center* for their monitoring and characterization of chemical and radiological hazards during hurricanes Katrina and Rita by presenting them with an Award for Excellence. The Integrated Reachback Center was activated 48 hours prior to Hurricane Katrina making landfall, providing analysis and simulations of storm surge and impacts to critical infrastructure.

INVESTING IN EDUCATION

Helping students ... The AT&T Foundation has announced it will provide a three-year, \$1.5 million grant to the *Mathematics, Engineering, Science Achievement (MESA)* program to increase the number of educationally disadvantaged students who are college-eligible and major in a math, engineering or science field. The funding will be used to create new program centers in the San Francisco Bay Area and San Diego. Administered by the *University of California*, MESA works with the Cal State system and California's community colleges, independent colleges and 300 schools to provide math and science curriculum, group study courses, academic planning and mentoring. MESA serves over 21,000 disadvantaged students in California.

Learning tools ... More than 150 incoming freshmen who participated in the *Summer Bridge* academic support and leadership development program at *UC San Diego* received a new tablet laptop computer, printer and accessories to use during the time they are enrolled as UCSD students, thanks to a \$700,000 grant of Fujitsu technology products and services. UC San Diego and *UC Irvine* were the only two campuses in the UC system selected to be recipients of the grant program, which involves the donation of \$30 million worth of Fujitsu products and services to community-based and nonprofit organizations nationwide in education, health-care, arts and the environment. UC Irvine received a \$578,000 grant.

Stem cell research ... Sue J. Gross and William H. Gross have contributed a \$10 million gift to *UC Irvine* to support stem cell research. Two million dollars of the gift will be immediately allocated to support the *Stem Cell Research Center* at UCI. The remaining \$8 million will come to the university as a matching gift in support of the construction of a proposed Stem Cell Research Center building. Bill Gross is founder and CIO of the Newport Beach-based international investment firm PIMCO.

Tibetan Buddhism ... *UC Berkeley* will establish a distinguished professorship in Tibetan Buddhism, thanks to a \$1 million endowment from the Khyentse Foundation. The addition of a faculty member specializing in Tibetan Buddhism is important for the newly reconstituted Buddhist studies program at Berkeley, plus it will also strengthen Asian studies on campus more generally, and enrich such related disciplines on campus as religious studies, art history and linguistics. The faculty member appointed to the professorship is expected to begin teaching in fall 2008.



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