

President's report

It starts here

<http://www.universityofcalifornia.edu>

UC: Serving California through education, research and public service

Vol. 13, No. 1, Sept. 2003



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

UC luminaries honored ... *Lawrence Livermore National Laboratory* director emeritus and physicist *Edward Teller*, legendary *UCLA* hoops coach *John Wooden* and *UCLA* professor emeritus *James Q. Wilson* received Presidential Medals of Freedom, the nation's highest civilian honor. Along with nine other award recipients, including master chef *Julia Child* and Oscar-winner *Charlton Heston*, *Teller*, *Wooden* and *Wilson*, were recognized at the White House for their exceptional meritorious service to the nation.

UCSD appointment ... *UC* President *Richard C. Atkinson*, in consultation with President-designate *Robert C. Dynes*, announced his intention to appoint *Marsha A. Chandler* as acting chancellor of *UC San Diego*, pending approval by *UC* regents at their September meeting. *Chandler's* appointment would be effective Oct. 2, the date current chancellor *Dynes* becomes the 18th president of the *UC* system. A renowned scholar of public policy and organizational behavior, *Chandler* has served as *UCSD's* senior vice chancellor for academic affairs – *UCSD's* chief operating officer, the campus's second-ranking executive officer – since 1997, overseeing all phases of academic planning, programs and personnel.

Total recall ... There's no shortage of things to read about the upcoming recall election. But it's hard to find what's truly useful among the daily torrent of hand-wringing op-eds and celebrity puff pieces. Fortunately, the librarians at *UC Berkeley's Institute of Governmental Studies* have waded through the sludge to find the worthwhile resources, and they are posting relevant texts and links to a Web site, www.igs.berkeley.edu/library/htRecall2003.html. The result of their labors is one-stop access to all that a seriously curious voter might want to know, such as the history of the recall in California; the legal basis for it (with links to the relevant sections of the state constitution and elections code); links to recall-related Web sites that major media have established; and selected newspaper and journal articles that include informed analysis and commentary.

Court victory... Microsoft Corp. improperly put patented Web browser technology into its Internet Explorer, helping the computer giant to win critical market share from rival Netscape Navigator, a federal jury ruled. In the U.S. District Court in the Northern District of Illinois, Eastern Division, the jury found Microsoft infringed a patent owned by the *University of California* and licensed by Eolas Technologies Inc., and awarded the two \$520.6 million in damages.

HEALTH AND NUTRITION

National mapping effort ... *UC San Diego* will lead an ambitious national effort to produce a detailed understanding of the structure and function of lipids cellular fats and oils implicated in a wide range of diseases, including heart disease, stroke, cancer, diabetes and Alzheimer's disease. The five-year, \$35 million grant from the National Institute of General Medical Sciences will support more than 30 researchers at 18 universities, medical research institutes and companies nationally. The principal investigator of this collaboration is *Edward Dennis*, professor of chemistry and biochemistry in *UCSD's* division of physical sciences and school of medicine. With the knowledge from this effort, more effective drugs can be designed to combat heart disease and other diseases.

Asthma damage ... *UC Irvine* biomedical engineer *Steven C. George*, one of the first U.S. scientists to create three-dimensional living lung tissue, has received a \$1.8 million grant from the National Institutes of Health to examine how asthma attacks the walls of the bronchial tubes. *George* will create viable lung tissue similar to that found in bronchial tubes, then simulate the injuries that occur with asthma. The damaged tissue will be analyzed to better understand what causes scarring in the lungs of people with asthma. It's hoped this will help the researchers develop more effective asthma treatments.

Surgeon shortage? ... When you need a qualified surgeon in the coming years, will there be one available? Maybe not, according to a new study by *UCLA* researchers. With an aging population, demand for surgery will increase nearly 50 percent for some specialties by the year 2020. The study predicts shortages for most surgical specialties. Researchers found that surgeries performed predominantly on older adults, such as cataract and heart surgery, will have the highest increase in demand by the year 2020; ophthalmology led with a 47 percent increase in demand, closely followed by cardiothoracic surgery with a 42 percent increase.

Hazardous exposure ... Workplace exposure to dust or fumes may account for as many as five million cases of emphysema, chronic bronchitis and related diseases in the U.S., diseases that have been mainly attributed to smoking, a new *UC San Francisco* survey shows. While smoking still accounts for most of the 16 million cases of chronic obstructive pulmonary disease, the finding that occupational exposure may contribute to the illness in three to five million people strongly suggests a need for better workplace prevention, the researchers say. Chronic obstructive pulmonary disease is the fourth highest cause of death, killing more than 100,000 Americans annually.

West Nile virus ... Relying on tests conducted by *UC Davis*, the California Department of Health Services announced the first evidence of West Nile virus in the state this year. The tests showed that mosquitoes collected in Imperial County near the Salton Sea were carrying the virus. *UC Davis*, with the largest West Nile research and testing programs in the state, is fundamental to the health services' public-health efforts to prevent the spread of the virus.

Inadequate cardiac care ... Researchers have had few clues as to why black women are more likely to die from heart attacks or strokes than white women. But, now a national study led by *UC San Francisco* researchers indicates that the difference in cardiovascular-related deaths may be attributed, in part, to the inadequate medical care black women receive from their health care providers. Researchers found that black women had nearly twice the rate of heart attack and death due to coronary heart disease, and that they were less likely to have adequate blood pressure and cholesterol management and to receive preventive treatment. The findings indicate that one of the things that should guide cardiovascular therapy is people at higher risk should be treated more aggressively.

DEVELOPMENTS AND DISCOVERIES

From lab to market ... As a premier example of homeland security technology moving to the marketplace, *Lawrence Livermore National Laboratory* has signed a licensing agreement with Ortec Products to commercialize the laboratory's RadScout radiation detector and analyzer. Ortec will incorporate the technology in its next generation of advanced portable nuclear detection systems. RadScout was developed within the national laboratory's nuclear weapons division for emergency first responders and inspection personnel who need rapid detection and identification of material to determine the nature and scope of a threat. Weighing about 20 pounds, RadScout features a miniaturized refrigeration system cooling to -280F that eliminates liquid nitrogen cooling for the device's germanium crystal. RadScout measures neutrons and gamma rays emitted by radioactive materials, then analyzes them to identify the sources.

Plant genetics ... The National Science Foundation has awarded *UC Riverside* genetics professor *Tim Close* \$2.4 million for a project that will help researchers access the barley genome to build a fuller understanding of cereal plant traits relevant to agriculture and biology. The project, among other things, will help extend the knowledge of plant genetics to universities and high schools. Several cereal crops of major economic and social importance are members of the tribe Triticeae that includes barley, wheat, rye and triticale. They are a staple for more than 35 percent of the world's population.

THE CUTTING EDGE

Improving fuel efficiency ... Air hybrid cars could bring big fuel savings for city drivers, according to a recent study released by *UCLA* engineers. Experiments based on modeling and simulations showed that the air hybrid engine improved fuel efficiency by 64 percent in city driving and 12 percent in highway driving. The study also suggested that by adopting the air hybrid approach, carmakers could avoid some of the manufacturing costs associated with the more common electric hybrid design. The study, which involved Ford Motor Co. engineers, was conducted for more than a year on an air hybrid vehicle design that uses a camless valvetrain.

Energy award ... The London-based World Technology Network announced that *Lawrence Berkeley National Laboratory's* Environmental Energy Technologies Division has won the 2003 World Technology Award for Energy, in the corporate category. The competition included more than 50 innovative companies and organizations working to create technologies that have a practical application. The projects of the Environmental Energy Technologies Division aim to increase the efficiency of energy use, reduce its environmental effects, provide the nation with environmental benefits, and help developing nations achieve similar goals through technical advice.

Genome project ... By analyzing the genomes of several microscopic ocean-dwelling organisms sequenced at the U.S. Department of Energy's *Joint Genome Institute*, scientists are gaining new insights into how the planet's oceans affect its climate. Comparative studies of four types of cyanobacteria – "photosynthetic" microbes that derive energy from sunlight, just like plants – were conducted by researchers at the Walnut Creek-based institute, which is managed by the University of California. Cyanobacteria are important in part because of their ability to turn sunlight and carbon into organic material. As the smallest yet most abundant photosynthetic organisms in the oceans, cyanobacteria play a critical role in regulating atmospheric carbon dioxide, a chief contributor to global climate change.

PLANET AND ENVIRONMENT

Relief for reefs ... Coral reefs, once the prolific producers of seafood stocks and tourism income, are reeling from the effects of overfishing and pollution. Now comes global climate change. *UC Davis* researcher *Rick Grosberg* and other marine experts offer a grim prognosis for coral-reef survival and prescribe a rigorous round of therapy. Among the scientists' recommendations: 30 to 50 percent of all coral reefs should be designated as no-fishing zones to preserve the long-term variety and abundance of reef plants and animals and greenhouse gas emissions must be reduced.

Offshore platforms ... California's offshore oil and gas platforms act as de facto marine protected areas for some overfished species and serve as a home to a variety of fish and invertebrate organisms, say *UC Santa Barbara* scientists. Biologists *Milton S. Love*, *Donna M. Schroeder* and *Mary M. Nishimoto* explain that the invertebrate organisms attach to the beams providing habitat for the fish. Love says that few of the many dozens of natural reefs that were studied harbored the large numbers of young rockfish that platforms do. He calls the platforms huge reefs and explained that they are better nurseries than nearby natural reefs. Off California there are 26 of these platforms, with 23 in federal waters and three in state waters. The researchers raise the question: what's to be done with the platforms when they are decommissioned?

Wind to whales ... The National Oceanic and Atmospheric Administration has awarded nearly \$2 million to *UC Santa Cruz* to support the ongoing development of the Center for Integrated Marine Technologies, established last year with a \$2 million grant from NOAA. The center has brought together scientists from six partner institutions around Monterey Bay to study the processes that drive California's highly productive coastal ecosystems. A complex web of physical and biological interactions sustains these ecosystems, from the wind that drives the upwelling of nutrient-rich deep water to the great whales drawn to bountiful feeding grounds. The "Wind to Whales" research program refers to the whole network of dynamic interactions that center scientists are working to monitor and understand, focusing for now on the Monterey Bay National Marine Sanctuary.

Powerful supercomputer ... *Los Alamos National Laboratory* has selected Linux Networx for one of the largest Linux clusters ever built, with a theoretical peak of 11.26 trillion operations per second. Called Lightning, the computer supports the advanced simulation and computing program, or ASCI, which helps ensure the safety and reliability of the nation's nuclear weapons stockpile in the absence of underground testing. Lightning is expected to rank among the most powerful supercomputers in the world. ASCI supercomputers run 3-D codes that simulate all the physics involved in a nuclear detonation, allowing researchers to integrate past weapons test data, materials studies and current experiments in simulations of unprecedented size.

INSIGHTS ON SOCIETY

How companies innovate ... Innovations in business borrow existing ideas from different worlds, mix them in new ways and create supportive communities to nurture them to fruition, says *Andrew Hargadon*, an expert in technology management at *UC Davis*. In his new book, "How Breakthroughs Happen: The Surprising Truth About How Companies Innovate," he says that companies can save time and costs in development, exploit existing market infrastructures and reduce the risk of failure when they pursue innovations based on technologies that have already proven successful in other applications.

Defining a conservative ... After studying 50 years of research literature about the psychology of conservatism, *UC Berkeley* researchers and colleagues report that at the core of political conservatism is the resistance to change and a tolerance for inequality. Some of the common psychological factors linked to political conservatism include: fear and aggression; dogmatism and intolerance of ambiguity; uncertainty avoidance; need for cognitive closure; and terror management, say the researchers. The avoidance of uncertainty, for instance, as well as the striving for certainty, are particularly tied to one key dimension of conservative thought – the resistance to change or hanging onto the status quo, they say. The terror management feature of conservatism can be seen in post-Sept. 11 America, where many people appear to shun and even punish outsiders and those who threaten the status of cherished world views, they add.

Successful musicians ... What makes the great musicians great? That's the premise of "The Mastery of Music," a new book by *UC Santa Cruz* lecturer *Barry Green*. Drawing from more than 120 interviews with performers such as Dave Brubeck, Bobby McFerrin, Christopher Parkening and Joshua Bell, Green discusses 10 qualities shared by the world's most successful musicians that make them stand out. He found that true virtuosity requires more than mastery of an instrument and concentration as a performing artist. Green discovers that it also requires a mastery of additional qualities of the human spirit, such as confidence, communication, passion, discipline, courage, and creativity, to take a good musician's skills to the next level.

LOOKING TO THE FUTURE

Nurturing the arts ... *UC Davis* and St. HOPE Public Schools have forged a partnership for arts education at Sacramento High School. The campus will support a school of arts, one of six curriculum areas that will comprise the new charter school. With uncertain funding for the arts, the partnerships will provide a model for keeping the arts as a vital part of high school education. Participating from *UC Davis*: the Robert and Margrit Mondavi Center for the Performing Arts, the School of Education and the division of Humanities, Arts and Cultural Studies.

Grain-size robots ... *UC San Diego* chemists have developed minute grains of silicon that spontaneously assemble, orient and sense their local environment, a first step toward the development of robots the size of sand grains that could be used in medicine, bioterrorism surveillance and pollution monitoring. *Michael Sailor*, a professor of chemistry and biochemistry at UCSD, and *Jamie Link*, a graduate student in Sailor's laboratory, says the vision is to build miniature devices that can move with ease through a tiny environment, such as a vein or an artery, to specific targets, then locate and detect chemical or biological compounds and report this information to the outside world. Such devices could monitor the purity of drinking or seawater, to detect hazardous chemical or biological agents in the air or even to find and destroy tumor cells in the body.

Hardened by zinc ... Scientists often look to nature for inspiration in the search for ways to make new materials. A new study of the clamworm, an intertidal creature, shows that it has jaws made partly of zinc, making them strong, stiff and tough, fundamental properties by which all materials are evaluated. The research began with questions by scientists at *UC Santa Barbara* and the Argonne National Laboratory and evolved into an international project. *Galen D. Stucky*, a materials chemist and professor in UCSB's department of chemistry and biochemistry, notes that the study of how nature makes hard materials, their structure and function, may eventually yield information that help scientists make lightweight, flexible materials ranging from more durable tires to protective coatings.

KUDOS

Librarian honored ... *Margaret Mooney*, head of the government publications department at the *UC Riverside* libraries, is a recipient of the prestigious American Library Association Hoduski Award for 2003. Mooney was recognized for her pioneering work in automating the check-in and the cataloging process for U.S. Depository materials and her

major role in developing Infomine, one of the first library-originated Web-based information services. Mooney has been with UC Riverside since 1978.

Nursing excellence ... *UC Irvine Medical Center* has received the prestigious Magnet Designation for nursing excellence, a distinction conferred by a subsidiary of the American Nurses Association. Only three hospitals in California have received the honor. The Magnet Program provides national recognition to health care organizations that demonstrate sustained excellence in nursing care. The accolade underscores the medical centers' nursing team's dedication to high-quality compassionate care, research and education.

Guinness record ... Who holds the land-speed record for sending data over the Internet? *Los Alamos National Laboratory* collaborated with researchers from the California Institute of Technology, European Organization for Nuclear Research, or CERN, in Geneva, and Stanford Linear Accelerator Center to set the record that the Guinness World Record-keepers recently certified as official. Using off-the-shelf personal computers, the team blasted a trillion bytes of data from California to Switzerland a whopping 2.38 billion bits, or 2.38 gigabits, per second. By comparison, a typical telephone modem connection transmits data at less than 56,000 bits per second. At that speed, computer users could send full-length DVD movies to each other from halfway across the world in less than 20 seconds, or the entire Library of Congress in 14 hours.



President, University of California

Compiled by Strategic Communications/University Affairs. For more information, call (510) 987-9200 or look under "UC Newsroom" on the UC Office of the President home page: www.ucop.edu

President's report

It starts here



To learn more about UC research discoveries, and other news from UC campuses and national laboratories, please visit:

UC Berkeley www.berkeley.edu/news/

UC Davis www.news.ucdavis.edu/

UC Irvine today.uci.edu/releases/index.html

UCLA www.newsroom.ucla.edu/

UC Merced www.ucm.edu

UC Riverside www.newsroom.ucr.edu

UC Santa Barbara www.ucsb.edu

UC San Diego ucsdnews.ucsd.edu/

UC San Francisco media.ucsf.edu/ucsf/newsitem.nsf/New+Press+Release?OpenView

UC Santa Cruz www.ucsc.edu/news_events/press_releases/01-02/default.asp

Lawrence Berkeley National Laboratory www.lbl.gov/Science-Articles/News-Releases.html

Lawrence Livermore National Laboratory www.llnl.gov/llnl/06news/news.html

Los Alamos National Laboratory www.lanl.gov/worldview/news/releases/index.shtml

UC system www.universityofcalifornia.edu