

President's Report

A Report on
Discoveries and
Achievements
at the
University of
California

Volume 10, Number 2, September 2000

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

In the News

Best in the West – Again . . . UCLA Medical Center ranks as the best hospital in the western United States for the 11th consecutive year, according to a *U.S. News & World Report* survey of 2,550 board-certified physicians from across the nation. The center, ranked as the fifth best hospital nationally in the latest survey, is the only Southern California hospital to earn a spot on the magazine's "Honor Roll" rankings during the 11 years *U.S. News* has conducted the survey.

Energy Savings . . . A new public-private research initiative targeting substantial reductions in the \$100 billion spent annually in energy costs for commercial buildings has been launched under the leadership of scientists from **Lawrence Berkeley National Laboratory**. The three-year program will develop new information technologies to design, commission and operate buildings and integrated design techniques to generate energy savings in offices, schools and other structures used in commercial activities.

Distance Learning . . . A new recipient of a master's degree, *Steve Canby*, is the first graduate of an innovative degree program in computer engineering with specialization in network engineering, offered jointly by **UC Santa Cruz's Jack Baskin School of Engineering** and **UCSC Extension**. All of the courses required for the degree are offered in the Santa Clara Valley through UCSC Extension. A pair of high-tech classrooms, one at UCSC and another at the extension facilities in Cupertino, enable a professor at one site to teach two classrooms of students 25 miles apart simultaneously.

Bioengineering Building . . . The **UC San Diego Jacobs School of Engineering** has broken ground on the Powell-Focht Bioengineering Hall, a \$34 million, 105,000-square-foot facility designed to promote an environment in which research, education and technology transfer are closely linked. It is the first academic facility on the UC San Diego campus to be funded almost entirely by private gifts.

Maya Lin Commissioned . . . Internationally acclaimed architect and artist Maya Ying Lin, known for designing the Vietnam Veterans' Memorial in Washington, D.C., has been commissioned to design an outdoor plaza and main entrance for **UC Irvine's School of the Arts**. The plaza and entrance will serve as the unifying design element for the entire School of the Arts complex, which is undergoing a major renovation. The new plaza and entrance is estimated to cost \$3 million.

BioControl to the Rescue . . . A tiny, stingerless parasitic wasp is being released to combat the glassy-winged sharpshooter. Entomologists from **UC Riverside** and colleagues found the natural enemy of the sharpshooter in Mexico and embarked on a seven-month breeding and quarantine effort. The glassy-winged sharpshooter and Pierce's disease have already wiped out between \$12 and \$14 million in grapevines in the Temecula area (Riverside County) and are threatening a region in central California that produces \$2.8 billion each year in wine, raisins and table grapes.

Swords Into Dialysis . . . Lawrence Livermore National Laboratory is working with the Avangard Electromechanical Plant in the closed Russian city of Sarov to finalize details on a collaboration that would have the Russian plant manufacture kidney dialysis supplies and equipment. The Russian plant would employ people and facilities formerly used to manufacture nuclear weapons.

Health and Nutrition

Reduced Risk . . . A new animal study led by **UCLA** neuroscientist *Greg Cole* bolsters the theory that ibuprofen could help millions of people avoid or delay the onset of Alzheimer's disease. Cole points out that numerous population surveys have found a much lower rate of Alzheimer's among arthritis patients who regularly use ibuprofen and other anti-inflammatories.



Marijuana and AIDS . . . A study by **UC San Francisco** researchers has found that patients with HIV infection taking protease inhibitors do not experience short-term adverse virologic effects from using marijuana. Researcher *Donald Abrams* reports the project was the first attempt to study the effects of marijuana in people with HIV and one of the most comprehensive studies about the effects of marijuana on the immune system.

Anti-tumor Agent . . . A novel family of anti-cancer compounds called acylfulvenes, discovered by two **UC San Diego** scientists more than 10 years ago from toxins of the poisonous jack-o'-lantern mushroom, is showing promise as a highly effective chemotherapy agent. The encouraging clinical results specifically deal with irifulven — a drug candidate derived from the acylfulvene compound family — found to be particularly effective in shrinking tumors associated with pancreatic and ovarian cancer.

Link Found . . . UC Irvine medical researchers have found that high blood pressure can be induced — and brought back to normal — by changing levels of highly reactive oxygen molecules called free radicals and nitric oxide, which currently is being studied for its role in cardiovascular disease and other functions in the body. The research suggests that multiple antioxidants in the diet, including vitamins E and C, may help prevent and treat certain types of high blood pressure and reverse oxidative stress.

Developments and Discoveries

Bringing the Heart Together . . . Early in the life of every vertebrate embryo, be it human or hamster, there is a moment when the heart comes together — literally. Scientists at **UC San Francisco** have discovered a molecule that directs the two halves of the primordial heart to join as one. Under the molecule's influence, separate tubes of the would-be heart — primordial heart buds, essentially — migrate toward each other from opposite sides of the embryo, the researchers found. As the two halves join, the rudimentary heart begins to beat.

Unexpected Flare . . . The unexpected observation of a flare on a nearby brown dwarf star has shown **UC Berkeley** and **UC Santa Barbara** astronomers and colleagues that fading stars still have some life left in them. The flare surprised astronomers who expected to see little or no activity on the brown dwarf during a planned 12-hour observation by the Chandra X-Ray Observatory. Instead, after nine hours of seeing nothing, a flare flashed brightly, then faded out over the next two hours. The flare, very similar to the flares on our Sun, is the first ever observed on a brown dwarf.

Synthetic Amino Acid . . . UC Irvine researchers have created an amino acid that can mimic certain binding properties of proteins associated with such diseases as cancer, AIDS and Alzheimer's disease. Researchers hope the synthetic will be useful as a building block for compounds that modulate, mediate or block protein beta-sheet interactions associated with diseases, and lead to the development of drugs for treatment.

Vision Restored . . . UC Davis scientists *R. Rivkah Isseroff* and *Ivan R. Schwab* have restored or improved eyesight in 10 of 14 patients suffering from severe corneal damage, using a new technique in which replacement cornea tissue is grown in a laboratory dish. Ultimately, Schwab says, tissue engineers may be able to produce readily available, "off-the-shelf" cornea replacements that can be easily transplanted into patients with severe cornea damage.

The Cutting Edge

Strange Alloys . . . Researchers at **Lawrence Berkeley National Laboratory** and colleagues have demonstrated that the electronic states of the strange metal alloys known as quasicrystals are more like those of ordinary metals than theorists believed possible. They found that rather than moving around arbitrarily, electrons in quasicrystals travel in "bands" with distinct momentum and energy. Quasicrystalline alloys are durable, stable at high temperatures and make excellent nonstick coatings.

Space Dance Spectrometers . . . Imaging spectrometers developed at **Los Alamos National Laboratory** are among the science tools aboard the new, four-satellite Cluster II mission. Two satellites were launched in July, followed by two more in August. Together, the four satellites, dancing in a tetrahedral formation during their two-year mission, will give three-dimensional views of the near-Earth particle, field and plasma environments.

Nerve Gas Sensor . . . Using a silicon chip and parts from an inexpensive compact disc player, chemists at **UC San Diego** have developed a portable nerve gas sensor capable of detecting "G-type" nerve agents such as sarin, soman and GF. The achievement will enable development of small and inexpensive sensors that could be deployed by soldiers across a battlefield or by police after a terrorist explosion to rapidly detect the presence of nerve agents and track movement of the deadly plumes.

Technological Triumph . . . *R&D Magazine* has included a transportable laser-based air quality measurement device invented at **UC Riverside** among its top 100 most technologically significant new products of this year. The Model 3800 Aerosol Time of Flight Mass Spectrometer allows scientists to capture and immediately analyze the size and content of the aerosol particles in the air we breathe, whether they be salts, ice, smoke, exhaust, dust or other matter.

Easier Alzheimer's Diagnosis . . . Diagnosing Alzheimer's disease may become easier with the help of imaging studies from the San Francisco Veterans Affairs Medical Center, which is affiliated with **UC San Francisco**. Using a variation on magnetic resonance imaging, the researchers report they can differentiate between Alzheimer's patients and healthy people, and between Alzheimer's and vascular dementia, a disease with similar symptoms. Researchers hope the technique might be used eventually to detect the degenerative disease at an earlier, more treatable stage.

Bio-Analyzer Test . . . A hand-held biological detector under development by **Lawrence Livermore National Laboratory** scientists will be field-tested by Food and Drug Administration inspectors on seafood imports, used by health workers to analyze blood samples in rural Africa, and evaluated by emergency services that would be the first to respond to a bioterrorist attack. The analyzer was originally developed for the Department of Defense and the intelligence community to detect biological agents that might be used on the battlefield or in a bioterrorist attack.

Genome Draft . . . **UC Santa Cruz** researchers have created a powerful new computer program that they used to assemble a "working draft" of the human genome. In addition to performing a critical analysis of the human genome data, the project's results have been posted on a UCSC Web site so that biomedical researchers worldwide can search the working draft for particular genes or DNA sequences of interest to them.

Planet and Environment

Oak-Tree Killer Identified . . . **UC Davis** researchers report a swimming, two-tailed fungus with an appetite for oak bark is probably to blame for the death of thousands of trees in coastal California and warn that the deadly microbe could spread to other oak forests. Researcher *David Rizzo* says the fungi move around by spores that can easily travel in infected wood and soil, on bicycle and car tires, hikers' shoes and animals' feet. He urges the public to not move wood from the coast into the Sierra Nevada, and cautions that during the rainy season, spores will be most abundant.

Unleashing a GENIE . . . A computer program called GENIE (for GENetic Imagery Exploitation) is helping environmental restoration scientists at **Los Alamos National Laboratory** create high-resolution maps of the destruction caused by the Cerro Grande wildfire. The sophisticated image analysis technology allows scientists to pinpoint small stands of burned trees, track watershed damage and create detailed maps of new vegetation.

Condor Concerns . . . Current releases of captive California condors into the wild probably will fail unless changes in the program are made soon, according to a new study by **UC Berkeley** researchers and colleagues. They report that captive rearing techniques are producing excessively tame condors that pose threats to humans, and the released birds are at constant risk of death by lead poisoning from eating carcasses contaminated with bullet fragments — the primary cause of the extinction of wild condors in the 1980s.

Terrestrial Life Clues . . . **UC San Diego** scientists analyzing some of the oldest-known rock on Earth have discovered, for the first time, details about the evolution of oxygen and ozone in the planet's early atmosphere — two key ingredients that permitted and recorded the expansion of terrestrial life. Besides improving knowledge about the ancient atmosphere, the finding has implications for improving the understanding of long-term atmospheric events, such as global warming.

Lessening Danger . . . There is less chance of a major earthquake on the Northern Hayward Fault in the Bay Area than previously thought, reports **UC Berkeley** researcher *Roland Bürgmann*. Researchers from **UC Davis** and **Lawrence Berkeley National Laboratory** also participated in the study. Bürgmann and his colleagues concluded that the deep portions of the fault steadily slip at about the same rate as the surface does. This means the rocks deep below the surface in the northern portion of the fault aren't locked and building up strain that could be released in a catastrophic quake.

Insights on Society

Smoking, Fire and Death . . . Each year, more than one billion smokers throughout the world light more than 6 trillion cigarettes. Based on a worldwide study of smoking-related fire and disaster data, **UC Davis** epidemiologists have shown that smoking is a leading cause of fires and death from fires globally, resulting in an estimated cost of nearly \$7 billion in the United States and \$27.2 billion worldwide in 1998. Fires cause 1 percent of the global burden of disease and 300,000 deaths per year worldwide.

Quality Bureaucracy . . . Federal bureaucrats are more responsive to shifts in political winds and better prepared for their jobs than commonly supposed, according to the longest running study ever conducted of the federal bureaucracy. **UCLA** researcher *Joel A. Aberbach* says that whatever the problems of the federal government, there is scant evidence that they are fundamentally related to the quality or morale of the senior career civil servants who serve it.

Cutting Through the Smoke . . . Single-themed, clear messages and youthful spokespersons are keys to successful anti-smoking advertisements targeting teens, according to a **UC Irvine** study. Teenagers do not respond to ads that use adults as spokespeople or stress smoking-related health dangers such as cancer and lung disease, the study found, and messages about the long-term health effects don't work because teens don't expect to become addicted.

Looking to the Future

Nanotube Magic . . . Physicists at **UC Berkeley** have peeled the tips off carbon nanotubes to make seemingly frictionless bearings so small that some 10,000 would stretch across the diameter of a human hair. The minuscule bearings are actually telescoping nanotubes with the inner tube spinning about its long axis. When sliding in and out, however, they act as nanosprings. Both the springs and bearings, which appear to move with no wear and tear, could be important components of the microscopic and eventually nanoscale machines under development around the world.

Molecular Computers . . . A team of **UCLA** chemists has reported significant progress toward the creation of molecular computers with the first demonstration of a reconfigurable molecular switch that works in a solid state at room temperature – a breakthrough that solves one of the obstacles toward the creation of molecular computers that could be much cheaper, smaller and more efficient than today's silicon-based computers.

Kudos

Medal Of Freedom . . . **UCLA** law professor and former California Supreme Court Justice *Cruz Reynoso* has received the nation's highest civilian award, the Presidential Medal of Freedom, at a White House ceremony. He was honored a second time at the John F. Kennedy Center for the Performing Arts in Washington, D.C., with the Hispanic Heritage Foundation's Hispanic Heritage Award in Education.

Himalayan Research . . . *Nigel Allan*, a **UC Davis** geography professor in the **Landscape Architecture Program of the Department of Environmental Design**, has been awarded a Smithsonian Institution fellowship for research in the Himalayan areas of Pakistan, India and Nepal. His research, now in its fourth decade, deciphers the social, cultural and political patterns exhibited in mountain societies and habitat as these areas are incorporated into the nation-state.

Another MacArthur Fellow . . . *Matthew Rabin*, a **UC Berkeley** economics professor whose work integrates psychological research with formal economic models, was one of 25 recipients of a MacArthur Foundation "genius" grant. Rabin, 36, will receive \$500,000 over the next five years with no restrictions on how it is spent.

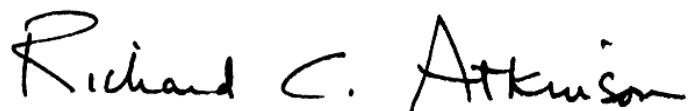
Investing in Education

Principal Leadership Gift . . . Gov. Gray Davis has announced a \$7.5 million private gift to support the **Principal Leadership Institute at UC Berkeley**. The program was initiated this summer to provide leadership training for a new generation of public school principals in California. The donation from Kenneth E. Behring, a Bay Area businessman and full-time philanthropist, will greatly expand Berkeley's innovative program.

Earth Science Gift . . . John V. Croul, co-chairman of the Berh Process Corp., has donated \$6 million to **UC Irvine's department of Earth system science**. It's the lead gift in a \$19.6 million capital campaign to construct an Earth system science research center at UCI. The building, to be named John V. Croul Hall upon completion, will house laboratories, a conference center and offices.

Mother Honored . . . Former **UC San Francisco** resident *Debal Basu*, M.D., has pledged \$1 million to establish the Protiva Bose Cardiology Education Fund in honor of his mother. The fund will provide opportunities for talented individuals from developing countries to obtain training in cardiology and cardiovascular research at UCSF.

Hellenic Studies . . . **UC Santa Barbara** has received a \$500,000 gift to establish an endowed chair in Hellenic studies and provide ongoing support for the study of classical and modern Greek culture. The gift was made by James and Sarah Argyropoulos of Santa Barbara.



President,
University of California

Compiled by University and External Relations. For more information, call (510) 987-9200 or look under "News & Facts" on the UC Office of the President Home Page: www.ucop.edu