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A UC SAN DIEGO ALUMNI PUBLICATION

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WIZARD IN
WOOD

January 2009
Volume 6,
Number 1



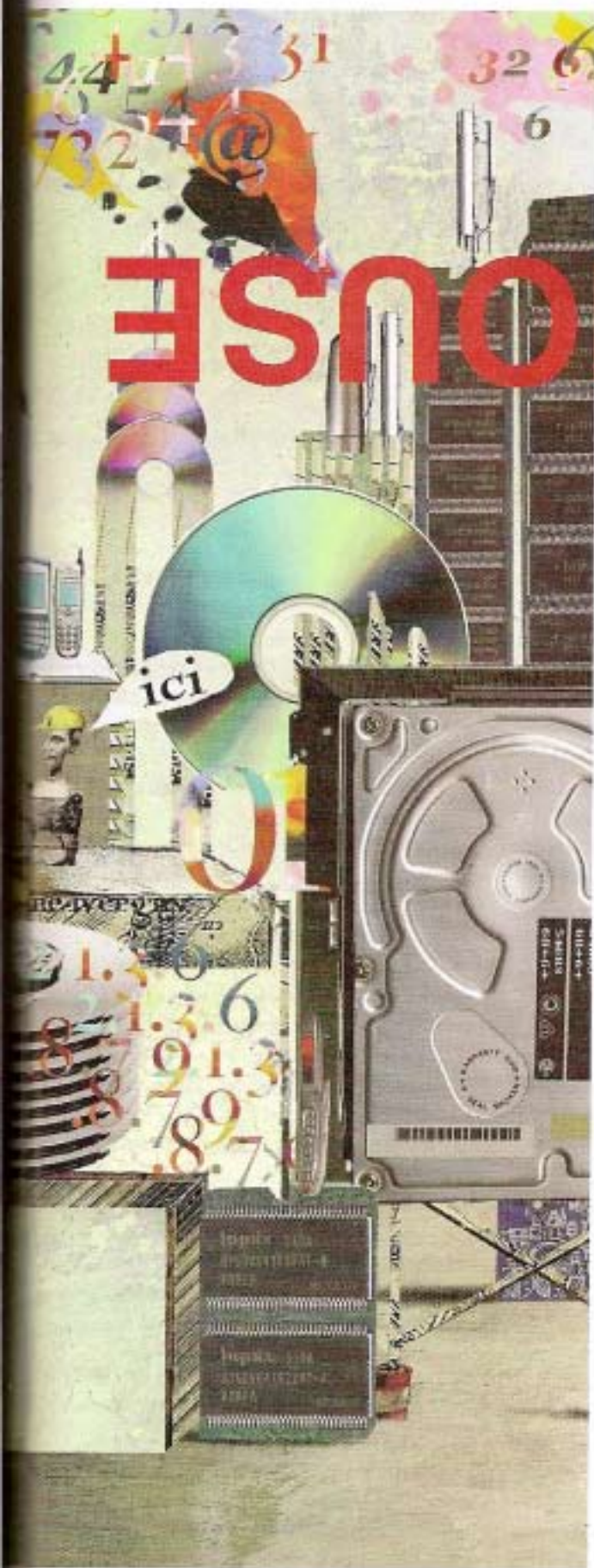
A Triton
Astronaut



UC San Diego has become

one of the drivers of the San Diego economy.

Innovation never goes out of style.



TRITON POWERHOUSE

Joan O'C. Hamilton

Each month, about one million women try out new hair and makeup options based on David J. Kriegman's input. That's a startling amount of influence for an electrical engineer who describes himself as a "typical guy" who frankly can't tell Maybelline's Red Dawn from Revlon's Raisin Rage lipstick shades.

Professor Kriegman's UC San Diego laboratory invented a complex technology that teases apart the physics of how light interacts with different surfaces to create or remove gloss in a digital photograph. This pioneering technology led Kriegman and Satya Mallick, M.S. '04, Ph.D. '06, to found a company called Photometria Inc., in 2007, which has since created a make-over web site called Taaz.com. There, women like 19 year-old San Diegan Kacey Burr upload their own photograph and experiment with more than 4,000 branded makeup products as well as hairstyles and even colored contact lenses with a few strokes of a computer mouse. "Being able to try out shades like this makes me more likely to wear different colors on a regular basis," says Burr. And advertisers love that, thanks to Taaz, she can ask for their products by name.

Taaz.com represents much more than a busy young woman's handy make-up tool—or even a nifty start-up with a glossy future. It is a powerful example of the efficient transfer of university-generated technology to the public that exists in only a few environments around the nation. It's what happens when you marry the intellectual fire-

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\$7.2 billion, University direct and indirect spending

Served 21,000 inpatients, 476,000 outpatients

UCSD-related startups: 130,000 jobs

power of a world-class research institution with a commitment to helping even first-time entrepreneurs cross a chasm like the one between patented mathematical algorithms and lip liners. "I don't think there is much about UCSD that looks like an average university," says Julian R. Betts, chairman of the Dept. of Economics, who says UCSD's track record in creating start-ups is among the nation's best. "It's a very high-value-added university."

To peg that value more precisely, on Sept. 20, 2008, CBRE Consulting, Inc. of San Francisco released an economic impact report that examined UC San Diego's academic programs, alumni, faculty, research, employment, spending, students and visitors for fiscal year (FY) 2006-07. Not surprisingly, the University's direct contributions to the state and local economy, alone, were impressive: Last year, the University contributed more than \$7.2 billion in direct and indirect spending and personal income to the California economy and generated 39,000 jobs. Now ranked as the 7th public university in the nation by *U.S. News & World Report*, it conferred 6,500 degrees, including many in math, computer science, biology, and engineering. The UCSD Medical Center served 21,000 inpatients and 476,000 outpatients. And as the third largest employer in San Diego County (behind the state and federal government), it has consistently

kept the county's unemployment rate nearly a full percentage point beneath the state's overall levels.

"UC San Diego changes the lives of San Diegans and Californians everyday, through job creation, advanced patient care, disease and drug therapies, service in the local community, and world-renowned research and education," says UC San Diego Chancellor Marye Anne Fox.

UCSD pays more than \$1.1 billion in salaries and wages to nearly 27,000 faculty, staff, healthcare and student workers. In total salaries and wages, purchasing of goods and services, and construction, UCSD spent nearly \$2.5 billion in FY 2006-07, of which \$1.7 billion was spent in San Diego County. Every \$1 in direct UCSD spending generates an additional 92 cents in indirect spending in the county, according to the study.

But it is the economic and social impact of companies with UCSD roots that really demonstrate the University's contributions. UCSD can claim direct lineage to at least 67 companies in California that annually generate revenues of at least \$10.2 billion. On that list, telecommunications powerhouse Qualcomm, started in 1985 by UCSD professor Irwin Jacobs, leads with \$8.8 billion in annual revenues. The total statewide economic contribution from UCSD-related start-up companies is more than \$37 billion annually and

nearly 130,000 jobs. In San Diego County, these companies add approximately \$32 billion in direct and indirect spending and personal income to the economy. From Awarepoint Corp. (26 employees and \$2.5 million in sales) to Zacharon Pharmaceuticals (2 employees and \$140,000 in sales), the report found that corporations in a range of industries from healthcare, to satellite technologies, to high-performance surfboards created nearly 115,000 jobs.

The San Francisco Bay area and Boston's Route 128 were some of the nation's first regional models of entrepreneurialism. They evolved from the rich intellectual property created in top academic institutions such as Stanford, MIT, Harvard, and UC Berkeley. However, it hasn't always been so easy for other locales to copy them. Many institutions' academic cultures were uncomfortable with the more results-oriented world of business.

Almost from the start, UCSD was different. Founded in 1960 around the already existing Scripps Institution of Oceanography, UCSD's relationship to the business community was cordial from day one. Defense contractor General Dynamics Corporation made one of the first large grants to help recruit distinguished faculty. "The University was never entrenched in the old-style academic mindset," notes Joe Panetta, chief executive officer of Biocom, a biotechnol-

ogy industry trade group. Rather, UCSD has consistently worked with local industry and deliberately added to its portfolio of academic and infrastructure assets. That includes everything from individual classes designed to prepare engineers and scientists to start companies and also to be more effective and professional employees, to innovative internship programs.

The seven year-old William J. Von Liebig Center in the Jacobs School of Engineering, is another novel UCSD asset. It is the first university-based program designed to support researchers in

them with Deepu John, a partner at the local venture capital firm iSherpa. John encouraged them to think about consumer applications in the enormous health and beauty industry. Soon, iSherpa had made an investment and Mallick had joined full-time. Today, the Taaz site has been visited by 2.5 million unique users and the technology now powers a similar tool at the *InStyle* magazine web site. John says the help Von Liebig staffers gave Photometria was important: "UCSD is a visionary university that really helps get a business going." Today, Photometria has

already common in high-tech companies where employees with good ideas yearn to move on and build something from scratch. Enhanced by assets such as the UCSD School of Medicine, ranked 5th in the nation among public medical schools, San Diego is now home to the third largest concentration of biotech companies in the world, and Biocom's membership includes 575 companies. Adds Panetta: "UCSD is a biomedical research powerhouse and has so much critical mass. The investment is always going to go to most inno-

To read the full Economic Impact report go to:

www.ucsdnews.ucsd.edu/EconomicImpact

the critical early "proof of concept" phase of a new business idea (the Massachusetts Institute of Technology's highly regarded Deshpande Center followed close behind). Rosibel Ochoa, acting director, notes "Venture capital is becoming more risk-averse. And yet the university system has a mission to translate discovery to the public. We are an innovation accelerator. Our role is to catalyze or accelerate UCSD innovations to the marketplace." That can mean helping researchers iron out licensing agreements or file patents, or it can even mean providing some funding, mentoring, and introductions to help a kernel of an idea blossom. The Center has received more than 200 proposals and invested more than \$3.8 million in seed grants and advisory services to over 70 projects. These projects have resulted in more than 22 license agreements and helped launch 16 start-up companies. In turn, those start-ups have attracted more than \$78 million in subsequent capital from the private sector and created over 130 new jobs.

Take Photometria. When Kriegman and Mallick first brought their technology to the Von Liebig Center, they thought they had a broad tool for digital photography. But the Von Liebig staff connected


15 employees and half are from UCSD.

Steven R. Hart, B.S. '77, M.A. '80, is co-founder and chief technical officer of ViaSat Inc. a Carlsbad, Calif.-based satellite and wireless communication products company that has been listed among *BusinessWeek's* "100 Best Small Corporations." (Mark J. Miller, B.Sc. '81, M.Sc. '82 was a co-founder in 1986). "I have worked with a lot of universities, but what is different here is that they have made a conscious effort to reach out to industry in ways other universities are now copying," Hart says. And when it comes to recruiting employees, too, Hart says it's hard to beat the combination of San Diego's intellectual capital and physical charms. "If you want to be both innovative and high growth, you need to be somewhere where people want to be and live," he says.

UCSD's longtime leadership in the life sciences has nurtured a thriving industry presence in San Diego. In the late 1970s, for example, the University spawned one of the first and most pivotal biotechnology companies, a diagnostic start-up called Hybritech. Just eight years later, drug giant Eli Lilly bought it for \$400 million, a move that gave momentum to the entire industry. It also echoed the familiar satellite effect

and those will come out of the most innovative clusters."

In tough economic times, budget-cutters are tempted to portray universities as operating in the realm of esoteric or ungrounded flights of intellectual fancy. But this report shows that UCSD is a vibrant and stable source of innovative ideas, jobs, direct revenue to the local economy, and a strong attractor of contract and grant funding from outside the region. In FY 2006-07, University revenues totaled \$2.306 billion, of which approximately 45.9 percent came from sources outside of San Diego County, including the \$546.5 million in revenues from the Federal government (the largest share). Also for that fiscal year, UCSD inventions and patents generated \$25.7 million in income. Those contributions to the economy make UCSD a growth engine.

"This economic impact report demonstrates in hard numbers the powerful benefits created by our campus," says Chancellor Fox, "billions of dollars injected into the economy and tens of thousands of jobs created." 

Joan O'C. Hamilton is a former bureau chief for Business Week magazine, who writes about science, technology and business.