UC SANTA CRUZ

REVIEW

2020 vision

Great minds shaping the future

Spring 2010
Big Ideas

They’re at our core.

If you’re like most UC Santa Cruz alumni, some of your strongest memories are of your college core course—new ways of looking at the world, dynamic discussions, close collaboration between students and faculty.

We’ve revitalized this hallmark of UCSC to address the complex issues of our times, embrace new approaches, and refine traditional ones.

Be a part of it again. Visit ucsc.edu/news_events/generaleducation.

The next network

Engineering professor J. J. Garcia-Luna-Aceves hopes to spark a revolution in networking that will change cyberspace from a destination you go to through your PC to an overlay on existing reality.

Making a cappella sing

A Cappella Records—started by student entrepreneurs—specializes in simplifying licensing and royalty accounting so that a cappella albums can be quickly and efficiently placed into digital marketplaces.

State of confusion

Can California’s fiscal mess be fixed? If so, how? Review asked two politically connected alums—one on the left, one on the right—for their prescriptions for our state’s financial ills.

Galaxies far, far away

The groundbreaking work of UCSC astronomers has already revealed the most distant galaxies ever seen. Their latest project will gather enough new information to occupy scientists for years.

The Spring 2010 Review contemplates “2020 vision”

As we begin this new decade, we look forward into the next 10-year span with stories illustrating how UC Santa Cruz will help build a bridge to the future.
FROM THE EDITOR

We're back.

You may have noticed that you haven't received a Review magazine in the mail for awhile. That's because we suspended publication of our print version after the winter ’08–’09 issue because of budget challenges, though of course our digital version after the winter ’08–’09 issue because of budget challenges, though of course our digital

However, we've reallocated funding to this important publication because we understand the value of the printed word, of keeping in touch with our community, and of telling our story—sharing the extraordinary advances and accomplishments made by our programs and our people.

We've changed the paper we use to a thinner, lighter selection that's less expensive. This way we use less paper—appropriate for a campus with high environmental ideals—and also save money.

But there are other, more substantive changes.

We've done some work to make the magazine cleaner, bolder, more relevant, both in design and in content. In this issue, you'll read about how our people will help shape the next decade: An engineer...

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$21 million grant will help "make science real"
A multidisciplinary team of UCSC environmental scientists won a $2.1 million grant to link graduate students and Watsonville-area high school teachers to develop innovative approaches to teaching math and science with hands-on research and projects in environmental sciences.

The five-year project, funded by the National Science Foundation, involves professors and grad students in the departments of Environmental Studies, Ecology and Evolutionary Biology, and Education and is known as Santa Cruz-Watsonville Inquiry-Based Learning in Environmental Sciences, or SCWIBLES.

"It's a tremendous opportunity for hands-on learning," said Watsonville High School Principal Murry Schekman. "It will make science real for our students."

It will also provide teachers with research experience and the practical tools that help bring science alive to their students, Gilbert said. "They are educating the next generation of potential scientists, professionals, and leaders in the growing local green economy."

UCSC among top in geosciences
In a survey of the top institutions in geosciences, UC Santa Cruz ranks 18th in the world. The ranking reflects the quality of UCSC's research in geosciences and its influence on the field.

The survey was conducted by the British publication Times Higher Education (THE), using data provided by Thomson Reuters from its Essential Science Indicators database. The analysis looked at scientific papers published in peer-reviewed journals during the period from January 1999 through June 2009. The rankings were based on the number of citations per paper, a measure of the impact a paper's findings have on the field.

"The ranking by citations per paper (impact) seeks to reveal 'heavy-hitters' based on per-paper influence, not mere output," explained an article accompanying the rankings, published in THE in November 2009. In this study, the category of "geosciences" includes atmospheric research and oceanography as well as geology and Earth sciences. At UCSC, this would include research conducted in the Department of Earth and Planetary Sciences and the Department of Ocean Sciences.

Architect honored for environmental accomplishments
Frank Zwart, UC Santa Cruz campus architect and associate vice chancellor for physical planning and construction, was selected for the prestigious College of Fellows of the American Institute of Architects (AIA). The honor came as Forbes magazine online cited the UCSC campus as one of the most beautiful in the world.

The AIA cited Zwart, who retired April 1, for combining elements of conservation, beautification, land use regulation, and transportation through professional and administrative expertise.

"Frank's expertise in identifying and collaborating with architects who have the sensitivity to realize our campus vision has resulted in one of the most beautiful campuses in the world," said Chancellor George Blumenthal. "That UCSC's rich natural environment has been more important than individual buildings in creating a campus identity is a lasting testament to Frank's talents and efforts."

Zwart graduated from Cowell College in 1971 with a bachelor's degree in mathematics. He earned his master's in architecture from Princeton University, then returned to campus in 1988 after working with architectural firms in Princeton, Los Angeles, Santa Monica, Aptos, Philadelphia, and Carmel.

"To have had the opportunity to continue UCSC's long-standing tradition of sensitive collaboration between thoughtful architects and a spectacular environment has been both a privilege and a pleasure," said Zwart.

Grateful Dead Archive garnering the limelight
The Grateful Dead Archive at UCSC’s McHenry Library continued to garner widespread attention with feature articles in Atlantic Magazine, Rolling Stone and a cover story in the New York Times arts section.

In the March issue, Atlantic senior editor Joshua Green spotlighted music professor Fred Lieberman and the academic and scholarly impact of the archive across the arts, management, and business. A select exhibit from the archives went on display March 3 at the New York Historical Society. The New York Times weighed in a week later with a story on the archive's historical impact and value.
The next network

The next “Big One” has finally hit the San Francisco Bay Area. A massive earthquake has left entire city blocks in ruins. There is no water or electricity. Disaster recovery teams are roaming the city, but coordination is nearly impossible, as many of the cell phone towers have toppled. • Halfway across the globe, a group of soldiers are separated from their platoon in a crumbling building and are surrounded by enemy forces. They attempt to radio their commanding officer for backup only to hear static, and the war-zone equivalent of a dropped call. • In both of these instances, the answer to the quintessential question of the wireless age—“Can you hear me now?”—is a dangerous and terrifying “no.”

UC Santa Cruz engineering professor J. J. Garcia-Luna-Aceves is hoping to change that through a multidisciplinary look at the science, technology, and even social side of networking. If he and his colleagues succeed, the benefits would quickly trickle into our everyday lives, not only eliminating cellular “dead zones” in our cities but helping create a world where mobile video chat becomes commonplace, our myriad devices link up seamlessly, and smart objects communicate with each other, and with us.

• In this vision, cyberspace shifts from a place you go to through your personal computer, to an overlay on top of our existing reality where the information you need is proactively delivered right to you, wherever you are.

Story by David Pescovitz | Illustration by Dave Cutler
**Rethinking networking**

To look so far into the future requires Garcia-Luna-Aceves to gain a deep understanding of the past.

“We’ve been designing wireless networks the same way we design wired networks,” Garcia-Luna-Aceves says. “As a result, they don’t work as well as they could. So we’re re-thinking networking from the ground up.”

While wireless networks, from cell phone services to WiFi, have become nearly ubiquitous in the last decade, their underlying network technology dates back to the 1960s. It was then that the United States Department of Defense funded development of the ARPANET (Advanced Research Projects Agency Network), the predecessor to today’s Internet.

For the ARPANET, and the Internet, their original purpose was to work effectively, the network had to share information with any other node. All information is treated the same way, and transmitted with the same likelihood of success. Indeed, the ARPANET’s architects developed protocols and systems that provided for just that, and the Internet of today still runs on their innovations.

The rub is that while those protocols are well-suited for wired networks, they fall short when you clip the cables.

For starters, wireless networks have lower bandwidth than the fiber-optic lines that are the main arteries of the Internet. Meanwhile, the layouts, or topology, of wireless networks are constantly changing as people and devices move between cell towers, for example, or the radio channels are sullied by interference, making them less reliable.

The social factor

According to Garcia-Luna-Aceves, the first step in addressing these issues is to strip away all the technology and reconsider what is meant by a network in the first place. Historically, researchers have focused solely on improving communications networks by developing new protocols and methods for routing data around uniformly, just as the creators of the Internet did. Indeed, Garcia-Luna-Aceves and UCSC engineering colleagues Hamid Sadjadpour and Katia Obraczka recently led a multi-university project called Dynamic Ad-hoc Wireless Networks (DAWN) to develop and test new routing protocols to increase the capacities of wireless networks.

For example, the network could be smart enough to pre-fetch information that a user may want and then hold it until it’s needed, using the network more efficiently. For the user, the data would be right there instead of having to point, click, and wait. Of course, determining what to store, and for how long, is no small feat for a computer algorithm.

And no matter how smart the software, a network, Garcia-Luna-Aceves explains, is much more than the digital technology behind the curtain. A network is also the people who use it, and the information that’s flowing across it. Those social factors and information demands should be taken into account when building wireless networks where almost every resource—from bandwidth to battery life—is at a premium.

“The notion that we need to enable everyone to talk one-to-one with everyone else, and maintain the routes to all these sites and nodes that we never use, is a big problem,” Garcia-Luna-Aceves says. “So now we are studying how the flows in a network result from common interests and needs.”

This idea is somewhat akin to the concept that you don’t build highways to everywhere—less-traveled-to destinations are best served by small roads.

Currently, the researchers are exploring how to map a social network on top of a network infrastructure. For example, in a military setting, there’s a chain of command, which is a form of social network. The next network needn’t require that every device be able to talk to every other device. Meanwhile, many military communication systems require a great deal of bandwidth, which also must be accounted for in the network architecture.

“Only by figuring out the social network and information network overlays can we start talking about increasing the capacity of the network and delivering quality information to the users,” Garcia-Luna-Aceves says. “One of the challenges is to develop a mathematical theory of network communications that encompasses the whole range of networks, including wireless networks, in a holistic way.”

Going ad-hoc

The Network Sciences Institute at UCSC is funded by the U.S. Army Research Laboratory through a new 10-year, $35.5 million grant for the Communications Networks Academic Research Center, a collaboration involving Pennsylvania State University, UCSC, UC Davis, and other organizations. The army is particularly interested in the mobile ad-hoc networks that can be deployed in places where there is no mobile infrastructure.

In these systems, there are no central nodes in the network. Rather, each device passes data from one to another, bit-by-bit, until it reaches its final destination. Of course, a similar approach could be used to establish robust communications in disaster areas or even regions where wireless infrastructure was never built.

“J. J. has always found a way to address critical military needs, such that the U.S.’s national security can be increased, but his work has also found relevance in commercial environments,” says James Freehyster, director of advanced systems development for Raytheon BBN Technologies, based in Cambridge, Mass. “From my perspective, his ability to operate in both spheres is unique.”

These kinds of ad-hoc wireless networks are also a key foundation for next-generation sensor networks, consisting of tiny wireless transceivers outfitted with sensors for myriad applications such as environmental monitoring, diagnosing a building’s structural integrity, or reducing energy consumption in the home. For example, a wireless smart thermostat in your house might link with temperature, motion, and sunlight monitors in every room to automatically create micro-climates that keep you comfortable while also lowering your energy bill.

Outside of your house, pervasive networks could provide access to a variety of location-enabled services, where restaurant reviews or local news is delivered in context through “augmented reality” applications that are much more elegant and accurate than today’s early offerings. Your cell phone, tablet computer, and digital camera could link automatically to a wall-size display or office printer as you pass by, or instantly interface with the entertainment system in your car. This is the transformation in networking that Garcia-Luna-Aceves is hoping to spur.

“The network and technology should disappear so that it operates seamlessly in the background to deliver services the users actually want,” Garcia-Luna-Aceves says. “Only then will we have a revolution in networking.”

David Pescovitz is co-editor of the popular blog BoingBoing.net and a research director at Institute for the Future, a nonprofit forecasting think tank in Palo Alto.
Two UC Santa Cruz students are meshing art, business, and the Internet to forge a new musical venture: the first all-digital, all a cappella label.

By Matt King

Chris Crawford and Jesse Avshalomov are two very inspiring music nerds who have accomplished a most unusual feat: They’ve turned their obsession into a revenue stream and escaped the drudgery of a day job before they’ve even left campus.

The plan?
Make you a huge fan of a cappella music.

Crawford and Avshalomov are the founders of A Cappella Records, the first all-digital, all a cappella label, devoted to a musical genre that uses only voices as instruments.

“People have these notions of a cappella, that it’s something you only do in college—like ultimate Frisbee,” Crawford says of his favorite music. “That’s not the case anymore. It continues to grow, and we keep coming across some real gems that have mainstream appeal but have been pushed off to the side because they have the a cappella label.”

If the notion of making a killing in a cappella seems far-fetched, consider these facts:

In May 2009, an a cappella-ish version of the Journey song “Don’t Stop Believin’” went to the top spot on the iTunes chart.

In June 2009, a bunch of UCSC students went viral on YouTube with an a cappella cover of a Saturday Night Live rap spoof.

Last winter, an a cappella version of American Idol, called The Sing Off, fared well on NBC.

This summer, a musical version of Glee, the Fox hit TV show about high school singers, is touring the country.

That sounds like a huge latent market the label will be the first to exploit.

“The biggest segment of the market,” Crawford says, “is people who would not say they’re an a cappella fan, but we’re able to prove to them that they like an a cappella cover.”

Since A Cappella Records launched in May 2009, it’s sold more than 10,000 digital downloads, and business is growing 25 percent a month.
The Glee bump

Most of the credit for the sudden surge in interest goes to Glee, which for two seasons has serenaded millions with the sounds of contemporary vocal music.

The music on Glee isn’t technically a cappella, but it feeds the same sensibilities of complex harmonic structures and joyful noise, what Crawford calls “epic choral.”

“What Glee has proved to us is that there is a market for really good, primarily vocal covers,” he says.

‘People have these notions of a cappella, that it’s something you only do in college—like ultimate Frisbee. That’s not the case anymore.’—Chris Crawford, cofounder, A Cappella Records

Indeed, since A Cappella Records launched in May 2009, it’s sold more than 10,000 digital downloads, and business is growing 25 percent a month. Today, it counts more than 500 songs in its online catalog, and that should double in six months.

The business plan is a simple one: license music from already-produced CDs and distribute the songs internationally over the Internet.

At a dollar a pop, the label and the artist each earn 30 cents. The value to artists comes from A Cappella’s handling of complex legal issues, like the licensing of cover songs and ongoing royalty payments associated with digital sales, which are different than LP or CD sales. A Cappella’s founders say the complexity of the digital marketplace keeps a lot of music out of iPods and earbuds.

“It’s such a barrier to entry,” Avshalomov says. “The perquisite knowledge to do it properly is at a really high level, and if you do it wrong you run the risk of committing a copyright infringement, which could be really expensive.”

Partners in success

A Cappella is a four-man venture. Ryland Hale (B.M. music, Cowell ’08) and Ross Mourey, a music education major out of UCLA, are the other partners.

Crawford, 22, will graduate in June with a degree in music and business; Avshalomov, 26, is finishing his master’s in performance.

When the movie Napoleon Dynamite was in theaters, he and a friend made “Vote for Pedro” shirts and pocketed $5,000.

“I realized there was all this money to be made in pop culture on the Internet,” he says. Now the goal is to “create something solid, something in the real world, something with actual structures and an office.”

Planning the business

They’ve honed their approach through the campus’s annual business plan competition. Last year, they made it to the semifinals, and this year they have advanced to the finals with a revised version of their plan. The winning team gets $18,000 and meets with potential investors.

The contest is emblematic of the interdisciplinary environment on campus, where students can dabble in anything that catches their interest and turn a hobby into a remunerative passion.

“At UCSC, it’s discovery who you are, explore, and everything will work out,” Crawford says. “It’s so creative and inspiring.”

“I’ve yet to meet a professor there who does not go out of their way to help students whenever possible,” Avshalomov adds. “There also seems to be an uncommon balance and camaraderie among the faculty, across what is often a bitter divide in other schools.”

In all, there are five groups on campus now. That doesn’t compare to schools in the Ivy league, but UCSC is up and coming, with shows that draw as many as 300 customers and groups that travel constantly to perform at other campuses.

The oddest thing about the founders of A Cappella Records is neither of them is a member of one of UCSC’s a cappella groups.

That’s because Chris Crawford is more into arranging and composing, and when Jesse Avshalomov matriculated several years ago, the school’s then-palla cappella scene didn’t appeal to him, so he went with opera.

But things have changed. In the last year, two a cappella groups have been established, one all-female and one all-male. In all, there are five groups on campus now. That doesn’t compare to schools in the Ivy League, but UCSC is up and coming, with shows that draw as many as 300 customers and groups that travel constantly to perform at other campuses.

“arlier than schools like Berkeley, but I don’t think that detracts from our talent,” says junior Ian De Borja, a member of Cloud 9 and a founder of brand-new Trouble Alliance. “Everyone’s good; I love watching everyone perform.”

Here’s the rundown on the five groups and how to catch their acts:

Cloud 9: pop-rock from Jackie Wilson to Lady Gaga; 14 co-ed members; www.cloud9acappella.com

Acquire: 18 co-ed members; www.acquiremusic.org

Isang Himig: affiliated with the Filipino Student Association; 18 co-ed members; www.isanghimig.wordpress.com

The High Tones: pop-rock from The Beatles to Destiny’s Child; 11 female members; www.hightones.org

The Trouble Alliance: pop with a barbershop flair; 8 male members; no web site yet.

A cappella is finding a voice at UCSC

“I tried to model the label after Motown,” Crawford says, “because the coolest thing about Motown is that whenever there was a release, you had an idea of what to expect. Motown had a sound, it had an identity.

“I thought, ‘Wouldn’t it be cool if a cappella had a label, and when there’s a new release coming out from A Cappella Records, you know what to expect and get excited about it?’”

Matt King is a freelance writer living in San Jose.
State of confusion

Can California’s fiscal quagmire be solved? If so, how?

Review asked two politically connected alums—one on the left, and one on the right—for answers to our state’s problems.

Whether you’re left, right, center, or anywhere in between, all sides can agree on one thing: California’s political and budget process is a mess, with profound effects on all of us.

Just look around: a $21 billion deficit on top of a $42 billion deficit last year.

State programs have been slashed; education funding has suffered; people have lost jobs, homes, and dreams. At the University of California, the pain has translated into budget cuts, fee hikes, furloughs, and protests. How did we get into this crisis and how will we get out?

Two UC Santa Cruz graduates from opposite ends of the continuum examine the Golden State’s tarnished political and fiscal systems and offer prescriptions for the future. You may be surprised by their insights—despite divergent political viewpoints and different paths on this assignment, they arrive at a similar conclusion.

John Laird is a 1972 Stevenson College graduate with honors in politics. He served as budget chair during his six years in the California State Assembly. Earlier, he was a city councilman and mayor in the City of Santa Cruz. He lives in Santa Cruz.

Tim Morgan, a 1970 graduate of Cowell College in politics, was treasurer of the Republican National Committee from 2007 to 2009. From 1996 to 2008, he was California’s Republican National Committeeman, and for 15 years chaired the Rules Committee of the California Republican Party. He was chief Republican consultant for the California Senate Elections and Reapportionment Committee in 1987-1988. Born and raised in Santa Cruz, Morgan maintains a Santa Cruz-based law practice.
State of confusion

Morgan:
The Golden State is hurtling at warp speed toward the black hole known as sovereign default, the same financial crisis menacing Greece. No state in the Union has ever been in this position before, and no one is completely sure what it would mean for a state to default on its obligations. But we know it isn’t good.

The chronic imbalance in the state’s budget, producing the current $21 billion deficit for 2010–11, and approximately $50 billion (and growing) in unfunded public pension obligations, reflects decades in which the state has bent to the will of special interests and continued to promise more than it could ever deliver. As enormous as the unprecedented spending has been, it is a mere down payment on all the promises made to date.

Voters made two strong efforts to alter course and put the state on a sound financial footing at the height of the tax revolt in the 1970s. The first was Proposition 13, which strictly limited increases in property taxes except on sale or transfer. State voters passed it soundly in 1978.

The second was the Gann Initiative, which voters approved by nearly 75 percent in 1979. It limited increases in annual state spending to a base limit, adjusted for increases in population and inflation. The school worker lobby severely weakened the Gann spending limit in 1988, persuading 50.9 percent of the voters to approve Proposition 98, ostensibly to benefit local schools. Then in 1990, Proposition 111 was sold to the voters as a way to eliminate freeway congestion. It finished the job and rendered the spending limit essentially meaningless.

Over the last two decades without the spending limit, state spending has increased much more rapidly than personal income. And notwithstanding increasing taxes to one of the highest levels in the country, the state has incurred a structural deficit requiring even higher levels of debt. California has created one of the worst business environments in the country, resulting in loss of business investment and jobs to states with lower tax and regulatory burdens.

Shortly after California abandoned the spending limit, Colorado voters passed the Taxpayer’s Bill of Rights, which operates very much like the Gann limit was intended to. In contrast to California, state spending in Colorado has grown at roughly the same rate as the private economy. From 1993 to 2007, real per capita state spending grew 28 percent, while per capita GDP grew 30 percent. So a spending limit can work, even in a state regarded as open and progressive as Colorado.

The only course open to California voters now is a form of electoral self-defense, to be exercised through the initiative process. Voters should reinstate a spending limit and adopt a California version of the federal Hatch Act, to prohibit state and local government employees from engaging in partisian political activity. Such a limitation on electioneering, first implemented by Thomas Jefferson, would do much to restore fairness to our politics, by ending the dominance of public employee groups whose interests are manifestly self-serving.

We should also return to a part-time legislature as we had until 1966. This alone would save billions—some in salaries, but more in the cost of new legislation that would never see the light of day. A permanently sitting legislature is an invitation to plunder by special interests, just as an open Henhouse is to foxes. We need to limit the time available for mischief making.

Laird:
California State government is dysfunctional and suffers from an absence of the leadership necessary to fix it. This year’s continuing state budget crisis makes the case.

Faced with a $21 billion budget gap for 2010–11, Governor Schwarzenegger has proposed protecting public education from the brunt of cuts along with a bailout measure to ensure that California spends less on prisons than for higher education. On its face, a good direction. In reality the governor balanced his proposed budget with almost $7 billion later this summer, and he is positioned to say it’s someone else’s fault.

Faced with an even larger budget gap last year, a Field Poll showed voters wanted no cuts to the biggest parts of the budget and supported tax increases only if they were on someone else. The fact is that over the last decade Californians have been receiving a service level that’s higher than they have been paying for, with the reality that the state must either cut services, increase revenues, or do some combination. The current situation can’t continue.

We need real leadership, yet the governor is not providing an honest budget discussion, and efforts to reform California’s broken government are stalling. The general agreement that reform is needed is matched only by wide disagreement on what it should be.

My own view is that we need some basic reforms to California’s political and budgetary process. Last year the voters took the first step by approving a new way for state legislative districts to be drawn, but there are many other necessary fixes.

The budget gap is in large part due to voter-passed state initiatives that earmark budget dollars for a new purpose without bringing new money to the table. Every time such a measure is passed, it squeezes whatever else is in the budget. Almost 85 percent of the state’s general fund revenue comes from two sources—sales tax and personal income tax—that swing wildly with the economy. It is hard to make a five-year projection on the budget when the revenue system is designed to react to fluctuations in the economy and makes it almost impossible to predict even next year’s situation.

In 1990, California voters approved one of the strictest term-limits laws in the nation. As a result, we have a legislature with no institutional memory. After being elected to my third Assembly term, there were 37 new Assembly members in an 80-member body. The largest economic meltdown since the Great Depression is no way to provide the on-the-job-training for almost one-half the State Assembly.

And the two-thirds budget approval—a system shared only with Rhode Island and Arkansas—has been a major cause of legislative gridlock. In budget matters, California should respect majority rule.

Put these with hundreds of millions of dollars in special interest spending on elections and campaigns—and the view that you have to be wealthy to serve at the top—and you see the fix California is in.

If we are going to meet the challenges of a diverse state that is a giant economic engine fueled by public investment, we need to amend the initiative process to pay-as-you-go, bring stability to the revenue system to adequately project future budgets, tweak term limits for longer service in each house, allow for majority rule, and design a campaign finance system that puts people before special interests.

Proposition 13 has survived all attacks against it, both electoral and judicial. As a result, homeowners are protected against local officials’ predationary raids on home equity and can know, with certainty, what it will cost to remain in their homes when they buy them. This has also had the benefit of limiting increases in local government spending.

Proposition 13, time for leadership and reform

John Laird

Time for leadership and reform

Other reforms are also needed. First, unions should be prohibited from spending member dues on political causes without specific written permission from their members. Each one of these recommended changes is designed to protect Californians against selfish special interests, which have sapped this state of its vitality and are propelling it to certain destruction. Proposition 13 has survived all attacks against it, both electoral and judicial. As a result, homeowners are protected against local officials’ predationary raids on home equity and can know, with certainty, what it will cost to remain in their homes when they buy them. This has also had the benefit of limiting increases in local government spending.

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At a time when it seems that the only thing we hear about books is the fact that they will soon be obsolete, and that readers are becoming an endangered species, it’s a rare and glorious thing for a community to come together to recognize the value of poetry and to encourage participation in its many joyful manifestations.

By naming a poet laureate, the community made an unequivocal declaration that poetry is a vital artistic pursuit that should be encouraged and applauded.

Poetry’s primary function is to speak about things for which there are no words. Poetry offers us a chance to articulate pain that ordinary speech cannot express; joy that surpasses our capacity to explain; or love that resists reduction to mere words. This paradox is one of the things that keeps poetry alive in every age and in every culture.

In an increasingly secular age, poetry is also a place where things of the spirit may be freely investigated or extolled without the constraints of one or another orthodoxy. For the poet, poetry offers a life of inexhaustible possibility. It’s a humbling art, because we wrestle most often with our failures—every poet knows that his or her best poems could be even better. Poetry is hard work, but it is labor touched by grace. Human beings were made to sing—a place where things of the spirit may be explored without the constraints of one or another orthodoxy.

For the community determined that we should have a poet laureate than the fact that any individual was honored with the position. This is really about recognizing poetry and the art of the word. I’m flattered to have been chosen for the post, of course, but I’m nothing more than a stand-in for all the wonderful poets who live here.

I came to Santa Cruz 40 years ago with the explicit intention of becoming a poet. I studied at UCSC with William Everson, Stephen Kessler, and many other marvelous writers and teachers, and I was blessed with the friendship of Morton Marcus, Joe Stroud, Jim Houston, and an army of brilliant and generous poets and writers. This place has made me what I am. It has nourished me as an artist and as a person, and it’s a privilege to now have a chance to give something back to the community that has given me so much.

—Gary Young, humanities lecturer

Ryan Shannon, philosophy and politics senior at College Eight, ponders questions most 22-year-olds don’t: Should medical professionals be actively involved in torture? Is it wrong for a woman to auction her virginity in order to pay off a debt that was fraudulently incurred in her name?

For the community that has given me so much.

The UCSC community pushes you to ethical thought,” he said.

He became involved in the Ethics Bowl team his senior year, bringing a thoughtfulness, work ethic, and the ability to look at an issue from all angles to the group, said Robertson, a graduate student who was a big-firm litigator before he came to UCSC. But Shannon’s love of philosophy isn’t reserved only for competition. He uses it in his own life, too.

“From an ethical point of view, if you don’t step back and reflectively look at what you are doing in life, you may act unethically and hurt your own purpose,” Shannon said.

So, for instance, when he worked as a campaign field organizer for Barack Obama and found himself focusing on poll numbers and donation amounts while demanding volunteers work harder, he realized his mistake. A philosopher would see the faithful volunteers not just as the means to an end, he said, but the end themselves.

Shannon even takes a philosophical approach to the sport of Brazilian Jiu-Jitsu, citing Aristotle’s admonition to lead a healthy, well-rounded life as a reason for practicing the martial art.

While Shannon’s most immediate plan was a seven-day backpacking trip through the Mojave Desert, he said he is headed for law school and a career in environmental policy, which he believes is crucial for the survival of people and the planet. He also suggested a new government post: “How about a national philosopher laureate?” he said.

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Student profile Ryan Shannon: A life philosophy

Editor’s note: In January, humanities lecturer Gary Young was named the first-ever poet laureate of Santa Cruz County.

The job of the poet laureate is to advance and enliven the art of poetry in the county. Young will act as an advocate for poetry, literature, and the arts, and contribute to Santa Cruz’s cultural legacy through public readings and participation in civic events.

Here, he offers his thoughts on why poetry, seemingly becoming a lost art in this digital day and age, is in fact integral to expressing the human condition—in sorrow and in joy, in anguish and in love, in abandonment and in faith.

Poetry by Gary Young

Last night I dreamed about a bobcat, and this morning I found one sleeping beneath the persimmon tree. I was almost close enough to touch him when he woke, fixed me with his eyes and disappeared into a thicket. The air was damp with last night’s rain.

The matted leaves cushioned my steps, and persimmons blazed in the branches of the tree like a hundred suns. I don’t know if the cat appeared because I dreamed of him, or if I dreamed of him because he was so near. (From Bear Flag Republic: Prose Poems and Poetics from California, Greenhouse Review Press/Alcatraz Editions)

Faculty profile Gary Young: Why poetry matters

Ryan Shannon, philosophy and politics senior at College Eight, ponders questions most 22-year-olds don’t:

Electronic media dominate so much of our conversation, poetry offers a little island where words are still holy. William Carlos Williams said it best in “Asphodel, That Greeny Flower”:

It is difficult to get the news from poems yet men die miserably every day for lack of what is found there.

It’s much more important that our community determined that we should have a poet laureate than the fact that any individual was honored with the position. This is really about recognizing poetry and the art of the word. I’m flattered to have been chosen for the post, of course, but I’m nothing more than a stand-in for all the wonderful poets who live here.

I came to Santa Cruz 40 years ago with the explicit intention of becoming a poet. I studied at UCSC with William Everson, Stephen Kessler, and many other marvelous writers and teachers, and I was blessed with the friendship of Morton Marcus, Joe Stroud, Jim Houston, and an army of brilliant and generous poets and writers. This place has made me what I am. It has nourished me as an artist and as a person, and it’s a privilege to now have a chance to give something back to the community that has given me so much.

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Galaxies far, far away

Using a new camera on the Hubble Space Telescope, astronomers at UCSC are making breakthrough discoveries about the distant universe.

The most distant galaxies ever seen appear in this image taken last year by the Hubble Space Telescope. The faintest objects (circled above and enlarged in the grid at right) represent primordial galaxies, the digital imprints of starlight that left those galaxies just 600 million to 700 million years after the Big Bang and traveled across the universe for 13 billion years to reach Hubble’s detectors.

Like everyone else, UCSC astronomers are forced to live in the present. But with the help of the Hubble Space Telescope, they are peering further and further into the past.

“We’re asking one of the grandest questions of existence: where do things come from?” says David Koo, professor of astronomy and astrophysics.

The groundbreaking work of UCSC astronomers has already revealed the most distant galaxies ever seen. Their latest project will gather enough new information about the distant universe to occupy scientists for years, bridging the gap between current instruments and more powerful telescopes planned for the future. Now two decades old, Hubble is in the last stage of its life, but a new instrument, the Wide Field Camera 3 (WFC3), has given it unprecedented abilities—and UCSC astronomers are exploiting it to discover new galaxies, exploring the universe as never before. “Hubble is now more powerful than it has ever been in the past,” says Koo. He’s on a team led by professor of astronomy and astrophysics Sandra Faber that will use a record amount of observing time on Hubble, opening the telescope’s eyes to the universe for two months.
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Rich science
Astronomers installed the WFC3 during Hubble’s last servicing mission in May 2009. The camera takes pictures in visible wavelengths as well as ultraviolet and the near-infrared, which have wavelengths that are shorter and longer, respectively, than what our eyes can see.

“This camera is incredibly powerful—a red-sensitive camera that’s taking pictures in ways that we couldn’t before,” Faber says. “The science we’ll study is extremely rich.”

Professor of astronomy and astrophysics GarthIllingworth is already demonstrating the power of this new camera, leading a team that has discovered the most distant galaxies yet. Because light from these distant galaxies takes billions of years to reach Hubble’s mirrors, the telescope acts as a time machine, providing astronomers with pictures of the cosmos as it was billions of years ago. The deeper Hubble looks into space, the farther it gazes into the universe’s 13.7 billion-year history.

“When we first saw the data, we were just astonished at the quality,” Illingworth remarks. “We were doing things that would’ve been impossible with the old cameras on Hubble.”

The new camera is 40 times better at finding these early galaxies than the previous one. This is thanks to the Hubble Ultra Deep Field (HUDF), a small patch of sky about one-and-a-half degrees on a side that contains a few billion galaxies. The HUDF, the researchers discovered galaxies from just 600 million to 800 million years after the Big Bang.

That initial data set contains the most distant pictures ever taken in visible wavelengths—reaching back to 900 million years after the Big Bang—and by combining it with the deepest-ever infrared images of the universe from Illingworth’s WFC3 survey of HUFF, the researchers discovered galaxies from just 600 million to 800 million years after the Big Bang.

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“Surprisingly, these early galaxies were very blue,” Illingworth says, suggesting a lack of dust and perhaps of the heavier elements that were later forged in stars like our Sun. The astronomers also discovered that the 600- to 800-million-year-old galaxies were already forming stars 300 million years prior, much closer to the time when the first stars in the universe were born.

“That’s a remarkable result,” he says.

These first galaxies filled the universe during a period called reionization, when all the hydrogen gas in the cosmos somehow became ionized, its electrons stripped away by some source of ultraviolet light. The identity of this source has been a long-standing mystery, and studying these galaxies may provide much-needed clues: is there enough bright ultraviolet light that escapes from these galaxies? Are there enough galaxies to begin with?

Hubble’s last hurrah
While Illingworth’s HUDF survey focused on three small areas in the sky with the deepest-ever near-infrared images, Faber’s upcoming project covers a spectacular 70-times-larger area deep over five well-studied regions.

“Their perfectly complemented, deep and wide,” Illingworth says. “They go hand in hand.”

Faber’s survey will also stretch back to 600 million years after the Big Bang, snapping pictures of galactic nurseries and compiling a census of these infants to see how they grow and what sorts of environments surround them.

“Right now, we have a much larger area and we’re going to be able to count these [young galaxies] for the first time very accurately,” Faber says. Also led by co-principal investigator Henry Ferguson of the Space Telescope Science Institute in Baltimore, the newest survey will last at the end of the year and take three years to complete.

Expanding universe
The team also anticipates discovering about a dozen of the most distant Type Ia supernovae, stellar explosions that all appear to detonate with the same amount of energy. The apparent brightness of these supernovae allows astronomers to gauge how far they are, providing a ruler to measure the size of the universe and, most importantly, how fast it’s expanding. In fact, it was this type of Supernova that led astronomers more than a decade ago to discover that the expansion is accelerating, implying the existence of a mysterious force called dark energy.

But, Faber says, we can’t be sure Type Ia supernovae haven’t changed over time, resulting in unreliable measurements of dark energy. For one thing, stars in the early universe boasted fewer heavy elements, possibly leading to explosions unlike those of present-day supernovae.

The expanding universe adds another layer of uncertainty to the calculations, as astronomers’ interpretation of supernova depends on the shape of the universe, which is itself strongly influenced by dark energy. But early on, when the universe was about 5 billion years old, matter was more densely packed together, and so gravity was more important than dark energy. As the cosmos expanded, the space between galaxies grew and the effect of gravity waned while dark energy remained constant and gained influence. So by studying Type Ia supernovae before dark energy held sway, astronomers could compare them to today’s supernovae and better calibrate the cosmic measuring sticks.

In the next decade, several bigger telescopes will come online. The James Webb Space Telescope, an infrared instrument, is slated to launch in 2018. Other ground-based telescopes include the Thirty Meter Telescope in Hawaii—for which the University of California is a partner institution—the Extremely Large Telescope, and the Atacama Large Millimeter Array in Chile.

But once Hubble retires, Faber’s survey will be the last big stockpile of data for at least several years. The database will then help astronomers identify targets to focus on with these larger telescopes, serving as a bridge to the future, Koo says.

“It’s not the culmination or the end,” he says, “but an extremely important next advance.” And UCSC astronomers are leading these two remarkable Hubble projects, whose legacy will stretch into the next decade.

Marva Wos is a 2007 graduate of UCSC’s science writing program. He lives in Pasadena.
In introducing the debate, Senate chair Lori Kletzer called the proposal “historic legislation.” The goal, added vice chair Marc Mangel, professor of applied mathematics and statistics, “is to keep the best part of the narrative evaluation and eliminate some of the things that have become negative.”

Others argued that the latest revision is tantamount to killing the system entirely. UCSC Alumni Association President Amy Eventt (Stevenson ’92) argued passionately for reform, not elimination, and said she “predicts a slow death” for narratives. Politics chair Dan Wirls, one of five voicing the death “by voluntarism.” In the end, dissatisfaction with the status quo across all academic divisions led to the move to make narratives optional. As John Johnson, president of the Graduate Students Association, put it during the February debate: “We want them, but we don’t want to do them.”

Join the conversation at community.ucsc.edu.
Sitting in the San Francisco office of the Institute for OneWorld Health, Nina Grove faced a daunting task. She needed to find a way to manufacture, at a commercial scale, a semi-synthetic version of the drug artemisinin, which is used as part of a combination treatment for malaria. Artemisinin is derived from the wormwood plant. Not only was it costly to produce, but vagaries of weather and supply meant the quantities needed to help fight a disease that kills more than a million people each year wasn’t reliable.

In order to make the drug available to more people, Grove had to orchestrate a unique coalition that included a biotechnology startup, a UC Berkeley researcher, a philanthropic foundation, and a big drug company. If anyone could do the job, it was Grove.

Grove, who graduated from Oakes College with a degree in biology in 1979, had spent 20 years at biotech giant Genentech, helping in the launch of four major drugs in less than 18 months: Avastin for colon cancer, Xolar for asthma, Tarceva for lung cancer, and Rapitiva for psoriasis. It was then, she said, she learned how collaboration, mutual respect, and a goal-oriented process could bring stunning results.

She applied that same strategy to the Artemisinin Project. “My job was to keep everybody moving forward toward a common goal in a collaborative way,” Grove said. With $42.6 million from the Bill and Melinda Gates Foundation, Grove shepherded the project to the point that the drug will soon be produced by the pharmaceutical company Sanofi-Aventis, and with government subsidies, should bring the cost of the combination treatment called ACT down to about $1 per patient.

“This unique approach is one of many that need to happen in the goal to eradicate malaria,” said Grove, who also worked on a project to provide a low-cost treatment for the deadly disease visceral leishmaniasis, which is caused by the bite of a sand fly.

The daughter of Jewish immigrants who left Germany to escape the Holocaust, Grove is now taking time off to spend more time with her family and volunteer in her community, but then will look for her next project.

“I’ve always had the need to help other people,” said the San Francisco resident, “and the most satisfying way I can do that relates to public health.”

Her goal in life is simple. “I want to leave the world a better place,” she said.

—by Peggy Townsend

When Cathy Calfo was in ninth grade, she and some of her fellow students campaigned to have a controversial bike lane installed near their school. Little did Calfo realize that that push for needed change would become a hallmark of her life.

Now 52, Calfo (Merrill ’95, American studies) is executive director of an organization that is working to build a green economy in the United States, which she believes is the way not only to fight climate change but also to put millions of Americans to work.

Along the way, Calfo also has been executive director of the California Democratic Party, run political campaigns, worked as California’s deputy state treasurer, and helped push the investment of $1.5 billion in state pension funds into environmentally responsible companies, green technology, and renewable energy.

“My involvement in politics,” said Calfo, “is rooted in being able to move policies that make things better for people.”

A founding member of Santa Cruz’s Commission for the Prevention of Violence Among Women, Calfo still lives in the city where she went to college. But now, three days a week, she catches a bus and train to the San Francisco office of the Apollo Alliance. There, she oversees a $2.5 million program that has built a coalition of labor, business, and environmental and community leaders to push for an economy that, she said, “is both energy-efficient and equitable.”

The single mother of three sons, Calfo believes that without this shift, not only will the next generation face the environmental consequences of climate change, but also the disappearance of the American middle class, which is being eroded by the loss of blue-collar jobs.

“This is a huge moment, a huge opportunity, if we do it right,” she said.

Some of her organization’s projects include training workers from L.A.’s inner-city to do a green retrofit of city buildings and the establishment of a Green Jobs Corps in Oakland. Part of 2009’s $787 billion stimulus bill also included clean-energy and green-collar job programs inspired by Apollo Alliance policy proposals.

In her own life, Calfo’s desire to provoke change led her to volunteer for an organization that helped homeless teens. Discovering that many of these children had been in the foster-care system, Calfo began to investigate.

Seven years ago, she brought a 3-year-old foster child named Elijah into her life and has now adopted him. “It’s probably the best thing that ever happened to me,” she said.

—by Peggy Townsend

‘I want to leave the world a better place.’—Nina Grove

‘This is a huge moment, a huge opportunity, if we do it right.’—Cathy Calfo

Nina Grove: Helping vanquish some of humanity’s most vexing diseases

Cathy Calfo: An advocate of the green revolution
Alumni in Profile

David Talbot: Innovative energy found at UCSC led to Salon.com

The web magazine Salon.com, the bestseller Brothers: The Hidden History of the Kennedy Years, and an upcoming graphic history book all have one thing in common besides their creator, journalist David Talbot. They each have their roots in Talbot’s alma mater, UC Santa Cruz.

Talbot (Stevenson ’73, sociology) came to the wooded campus in 1969 because it was the only college that would have him. His protests over the ROTC program at the exclusive Harvard Boys School in Los Angeles had so angered the principal, the administrator wrote to every college to which Talbot had applied to advise them Talbot was a “discipline problem” and should not be admitted. Talbot said. Talbot wrote his own letters to the schools; UCSC was the one college that accepted him.

It turned out to be the best revenge for Talbot, who said he fell under the spell of a half-dozen “white-hot and brilliant” professors at UCSC.

“They opened my eyes and got me to think,” Talbot said. They changed his life.

Living in a rambling Chestnut Street Victorian, Talbot became part of a loose collective of students and professors who set out to create a new world. They started a food cooperative and a women’s health clinic.

“It was the spirit of: If it doesn’t exist and needs to exist, we should create it,” said Talbot, who used that same innovative energy to leave the safety of a newspaper job in the mid-1990s and start what was then a grand experiment, the web magazine Salon.com.

Exhausted after 10 years of web life, Talbot retired to write a book sparked by a term paper he had done in college. Brothers, his 2007 examination of the Kennedy presidency and assassination, became a bestseller. It is now being made into a TV miniseries as part of Talbot’s latest undertaking: an independent media production company he formed with his siblings.

“That spirit of jumping into the void and being terrified and exhilarated—all that was familiar to me from my years in college,” Talbot said. “It really shaped my sense of self,” a self that embraces risk as a necessary part of innovation.

Next up for the San Francisco resident is an illustrated “pulp history” of general-turned-peace-activist Smedley Darlington Butler. Devil Dog: The Amazing True Story of the Man Who Saved America will be released by Simon & Schuster this year and has been optioned by director Oliver Stone.

And the first place Talbot heard about the little-known hero? In a study group at UC Santa Cruz.

―by Peggy Townsend

Why we sent our two sons to UCSC

With the mind-boggling array of options available for college-bound high school seniors, why does a parent choose to send his or her child to UC Santa Cruz?

We posed that question to parent Cameron Mashouf of San Jose, who sent his two sons, Nima and Kayhan, to UCSC.

Mashouf, an orthodontist, teaches clinical orthodontics at University of the Pacific. His wife, Marcedeh, has a master’s in civil engineering and now tutors math and science.

Q. Why did you decide on UCSC for your sons?
A. For a number of reasons, but primarily we heard about the quality of education at UCSC from a physician who studied at UC Davis, UCSC, and UC Berkeley. She liked UC Santa Cruz the best of all of these campuses and considered it to be the highlight of her education.

Q. What are they studying?
A. Our older son, Kayhan, graduated in 2006 with a B.S. in molecular, cell, and developmental biology. He is now at Boston University School of Dentistry and will be graduating next month. He will start graduate school in the fall at the University of Colorado, to become an orthodontist. Our younger son, Nima, is studying psychology at UCSC. He is in his fourth year.

A. Q. What has made the biggest impression on you regarding their experience?
A. The quality of education and the support of the faculty and staff have been exceptional. The first-year core courses were particularly helpful, preparing our sons to write well and to become critical thinkers.

Q. How has UCSC prepared your sons for the future in ways that might be different from other schools?
A. Aside from the academics, UCSC has provided our sons with intellectual growth that, in our opinion, surpasses many other educational institutions. The diversity of the student population and faculty, as well as a culture that promotes open-mindedness, have been quite impressive.

Q. Where did you both go to school? How does the UCSC experience compare to yours?
A. My wife went to the University of Tehran for five years, Chicago for two years, University of Illinois for two years, and the University of Chicago for one year. My wife went to the University of Louisville for six years. UCSC is more nurturing and provides a more open-minded atmosphere.

Q. Would you recommend UCSC to others?
A. Definitely. We have grown to love UCSC and constantly brag about it.

For more information about UCSC’s parent programs, contact Frankie Melvin at (831) 459-1770 or fmelvin@ucsc.edu.
Your years at UC Santa Cruz helped shape who you are. What you’ve become. Now, we need your support. Help us ensure that others enjoy the same unique opportunities. The same memorable experiences. Visit giving.ucsc.edu or call 800.933.SLUG (7584) and give back today.