

California's Recall Election Makes New State History

By CHRISTINE LEE

Everybody probably knows who played the robot in *Terminator*, but does everyone know how the recall works? Never a moment without controversy, the California recall election has finally ended. However, the voters are perhaps as puzzled as before. What is a recall and how does it work? To answer that question, here are some useful facts:

On October 10, 1911, a special election under the governor Hiram Johnson enabled California voters to recall state-elected officers, enact state laws and constitutional amendments by initiative, and repeal state laws by referendum. Ever since then, there have been 31 recall campaigns against the governor but none had succeeded.

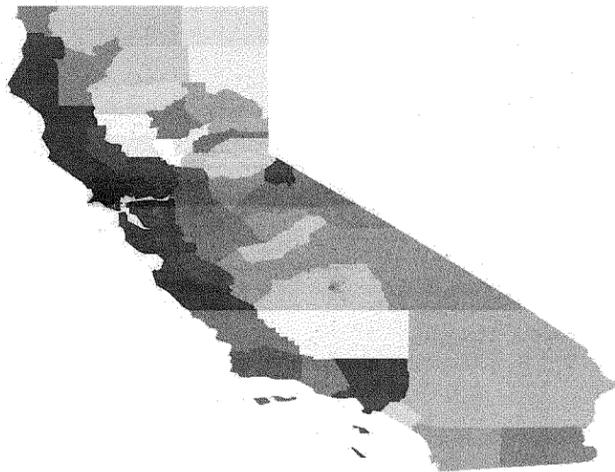
A recall procedure is similar to a proposition. However, the main difference between a recall and a proposition is that a recall requires more signatures. For a proposition, one only needs 5% of the voters' signatures who voted in the last election; for a recall, 12% of the

voters' signatures who voted in the last election for the office are needed. In particular, 897,158 signatures were needed for the qualification to recall Davis.

To start a recall, proponents must draft a petition stating reasons for the recall and get the approval from the Secretary of State. The state constitution sets no criteria on recalls. Davis recall organizers accused the governor of "gross mismanagement of California finances."

After the petition has been approved, the proponents have up until 160 days to collect the required number of signatures. These signatures will be collected and verified by the county officials and reported back to the Secretary of State. After the signatures are collected, the Secretary of State has 10 days to verify the tally to the lieutenant governor, and in turn, the lieutenant governor has 60 to 80 days to call a special election. The cost of a special election is estimated to be between \$20 million to

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K. Bartz/The California Tech

Gray Davis' performance in the recall election Tuesday. The darker gray represents greater support for the deposed governor.

Biographer Maddox Unravels Mysteries of Dark Lady of DNA

By ROBERT LI

Award-winning biographer Brenda Maddox made an appearance at Caltech last Tuesday to give a lecture about her new book, *Rosalind Franklin: The Dark Lady of DNA*. To a full audience at the Beckman Institute Auditorium, Maddox talked about the life of and the controversy surrounding one of the key participants in the 1953 discovery of the structure of DNA.

Born in 1920 and dying in 1958 of ovarian cancer, Rosalind Franklin's lifespan of only 37-years nevertheless allowed her to make important contributions to three different areas of science: the nature of coal and charcoal, the structure of DNA, and the nature of the tobacco mosaic virus and RNA. Rosalind was born to a very wealthy Anglo-Jewish family and entered Cambridge in 1938.

During World War II, Franklin studied the efficient use of coal and published five papers before the end of the war. In 1946, she moved to Paris to do research in X-ray crystallography and over the next four years Rosalind found herself enjoying the French lifestyle immensely.

She realized, however, that to do serious research she would have to return to England. In 1950, Rosalind accepted an appointment at King's College in London to work in John Randall's lab on the structure of biological fibers.

While she made significant discoveries at King's College including making an X-ray diffraction plate of the B form of DNA that elucidated many of the molecule's physical properties, Rosalind's time at the college was very unpleasant.

Disliked by the other scientists and involved in a bitter dispute with Maurice Wilkins, Randall's second in command, over her role at the lab, Rosalind left for Birkbeck College at the end of 1953 to head a group studying viruses. She worked in this area until her death, publishing 17 papers and laying the foundation for structural virology.

Rosalind Franklin's most well known contribution to scientific history was her so-called "Photograph #51," an exceptionally clear X-ray diffraction image of the B form of DNA. Using this photograph, Franklin determined that the B form is a helix of 2, 3 or 4 strands in which 10 base pairs were sepa-

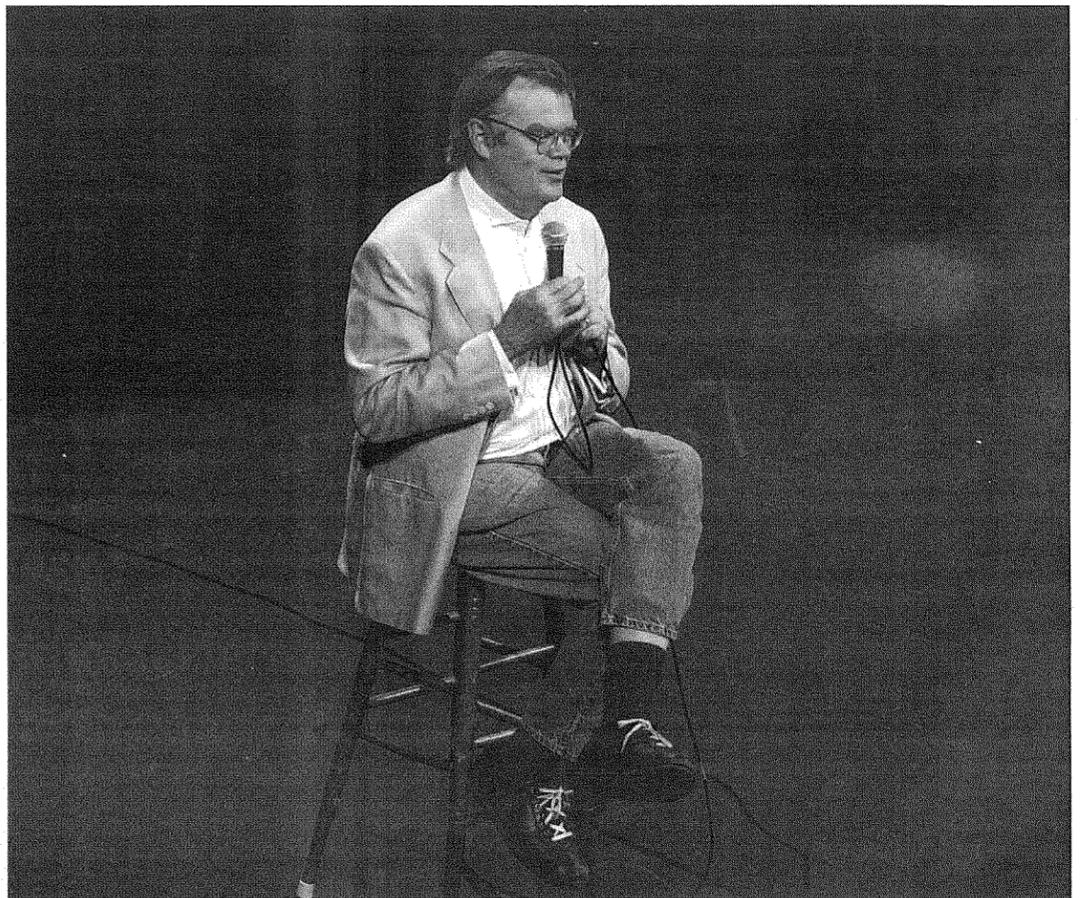
rated by 3.4 angstroms.

When James Watson, under controversial circumstance, got a chance to look at the photograph, it gave him the impetus to finish his work with Francis Crick on the structure of DNA and publish their seminal paper in the April 25th, 1953 issue of *Nature*.

Watson, Crick and Wilkins received the 1962 Nobel Prize for their work. Although Nobel Prizes are not awarded posthumously and only three may share a prize, nevertheless left unmentioned at the ceremony was Rosalind Franklin's contribution to the discovery of DNA's structure. This omission would become the focus of a longstanding controversy.

In 1968, Watson fanned the flames by publishing *The Double Helix*, a personal account of 1951-1953 and the race to discover the structure of DNA. In that book, Watson portrayed Rosalind as a shrewish and disagreeable woman who played a minor role in the chain of events that led to the discovery. In an infamous quote, Watson wrote, "Momentarily I wondered how she would look if she took off

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D. Korta/The California Tech

Comedian, author, and story teller Garrison Keillor recites poetry during his talk in Beckman Auditorium Monday. Keillor just released a new book, *Love Me*.

Author, Comedian Garrison Keillor Captivates Audience With Anecdotes

By DIANA LIN

Last Monday evening, under the gold glittering ceiling of Beckman Auditorium, Garrison Keillor deftly weaved an atmosphere of humor over an adoring audience. Long before the hour arrived, the campus was buzzing with excitement and filling with visitors.

Most widely known as the author of the much loved radio show, *Prairie Home Companion* set in the fictitious city of Lake Wobegone, Garrison Keillor is a storyteller, perfor-

mance artist, and comedian. He has published several books for adults, largely drawn from his own experience and also children's books.

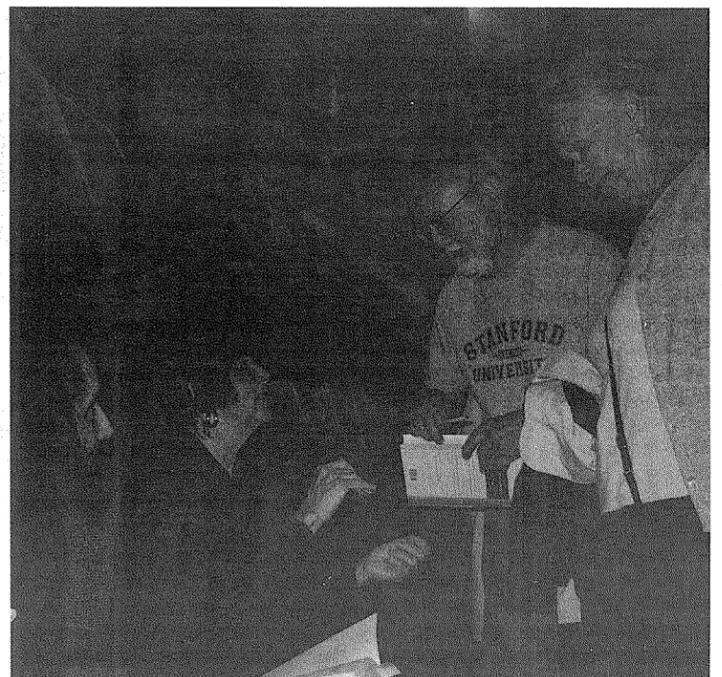
Garrison Keillor was at ease in his khaki suit jacket, blazing red socks, and hands casually stuck in jean pockets, yet he was the embodiment of sophistication and confidence. In his deep soothing voice, he began the night with a series of poetry recitations by well-loved poets, such as Emily Dickinson, Mary Oliver, and E.E. Cummings. Emily Dickinson's poem was about the agonizing price of success. "Wild Geese" by Mary Oliver gently created images of dark, quiet nights in the forests as the background of the human imagination and despair.

Without pause, Keillor made the transition to anecdotes and passages from his book, *Love Me*. He told a large variety of stories and jokes that drew laughter, reminiscence, and reflection from listeners. But

his central message through all of this was for everyone to get out and experience the world around them. He tried to focus his message specifically to Caltech students in the room, although the hall was mostly filled by older adults. He warned of becoming stuck in problems and digging a deeper and deeper hole of woes. And although everyone laughed at his ridiculous stories of young men and women who throw away their lives for short-term relationships, the stories made everyone look deeply into his own problems.

Garrison Keillor then answered questions from the audience. Many enthusiastic fans asked him about his life, such as why he quit writing for the *New Yorker* and why he returned from Denmark. He replied that he stopped writing for the *New Yorker* when the new editor tried to change the image of the magazine

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L. Tran/The California Tech

Author Brenda Maddox signs autographs for fans and readers after her talk last Tuesday in Beckman Auditorium about her new book, *Rosalind Franklin: The Dark Lady of DNA*.

Professor Anneila Sargent Selected Darwin Lecturer

By MARYN NELSON

PASADENA, Calif. - Anneila Sargent, a professor of astronomy at the California Institute of Technology, has been selected to be the Royal Astronomical Society's (RAS) 2003 George Darwin Lecturer.

Sargent will give the society's George Darwin Lecture later this year and will contribute a written version of the lecture to the society's journal, *Astronomy and Geophysics*.

Recipients of the lectureship award are selected from a slate of nominees by the RAS awards committee, which looks for "a distinguished and eloquent speaker in a field of astronomy." As the chosen lecturer, Sargent will talk about the origins of other planetary systems to an audience of professional astronomers, geophysicists, and advanced amateurs.

Sargent looks forward to traveling to London for the lecture, which will be held on December 12 at the Royal Astronomical Society's home, the historic Burlington House in Piccadilly.

Created in 1820 with the purpose of promoting astronomy and physics, the RAS has resided in the Burlington House since 1874.

Sargent has been a fellow of the RAS for many years, and earned the honorary title of associate in 2001. Her husband, Caltech's Bowen Professor of Astronomy Wallace Sargent, was the 1987 George Darwin Lecturer.

Anneila Sargent earned her Ph.D. in astronomy from Caltech in 1977, and has since become a faculty member, the director of the Owens Valley Radio Observatory, and the director of the Michelson Interferometry Science Center.

Her contributions to the field of astronomy have been acknowledged with numerous honors including NASA's Public Service Medal in 1998. Sargent was selected as the University of Toronto's 2003 Graham Lecturer and the University of Pennsylvania's 2002 Selove Lecturer. In addition, she served as the 2000-2002 President of the American Astronomical Society.

Schwarzenegger Storms California In Astounding Special Election Victory

By KEVIN BARTZ

Outgoing California Gov. Gray Davis failed last week in his bid to defeat an unprecedented Republican-led recall effort, losing 55% to 45% in a statewide vote that replaced him with Republican actor turned politician Arnold Schwarzenegger.

Internet news sites called the election for Schwarzenegger as early as Tuesday afternoon, while the major news network waited, per courtesy, until the polls closed at eight p.m. The new governor-elect led all replacement candidates with 48.7% of a vote which, contrary to concerns that it would be a slim plurality, represented a clear mandate.

Final returns gave Schwarzenegger a comfortable lead over second-place finisher Democratic Lt. Gov. Cruz Bustamante's 32% and Republican State Sen. Tom McClintock's 13%.

Introduced after his victory by Tonight Show comedian Jay Leno, the same man to whom Schwarzenegger first announced his candidacy, the Terminator star

focused on statewide unity, long a theme of his campaign. "I want to be the people's governor," he said in an acceptance speech. "I want to represent everyone. Tomorrow, the hard work begins."

Schwarzenegger survived a barrage of last-minute harassment allegations from former co-workers who claimed the actor groped them on movie sets anytime from the mid '70s to as recently as 2000.

Despite a cacophony of warnings from left and right—Democratic Attorney General Bill Lockyer threatened to investigate and McClintock said Schwarzenegger

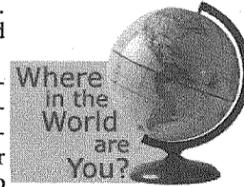
may be unfit for office—the millionaire actor's surprise campaign proved resilient enough for victory.

Republicans worried in the weeks leading up to the October 7 election that the more conservative McClintock would siphon away enough votes from Schwarzenegger to give Democrat Bustamante

the plurality needed for victory. An early L.A. Times poll placing the governor-elect behind Bustamante and McClintock at third with 18% fed Republicans' fears.

But after a battery of top state Republicans, from party chairman

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Study Says Look to Soil to Determine Hydrogen Impact in Earth Atmosphere

By ROBERT TINDOL

Two months after a pivotal study on the potential impact of a future hydrogen economy on the environment, further evidence is emerging on what would happen to new quantities of hydrogen released into the atmosphere through human activity.

In an article appearing in the August 21 issue of the journal *Nature*, a group of researchers from the California Institute of Technology and other institutions reports results of a study of the atmospheric chemical reactions that produce and destroy molecular hydrogen in the stratosphere. Based on these results, the report concludes that most of the hydrogen eliminated from the atmosphere goes into the ground, and therefore that the scientific community will need to turn its focus toward soil destruction of hydrogen in order to accurately predict whether human emissions will accumulate in the air.

The researchers reached this conclusion through careful measurement of the abundance of a rare isotope of hydrogen known as deuterium. It has long been known that atmospheric molecular hydrogen is anomalously rich in deuterium, but it was unclear why. The only reasonable explanation seemed to be that atmospheric hydrogen is mostly destroyed by chemical reactions in the air, and that those reactions are relatively slow for deuterium-rich hydrogen, so it accumulates like salt in an evaporating pan of water. If correct, this would mean that oxidizing atmospheric trace gases control the natural hydrogen cycle and that soils are relatively unimportant.

The Caltech group discovered that one of the main natural sources of atmospheric hydrogen—the breakdown of methane—is actually responsible for the atmosphere's enrichment in deuterium. This result implies that reactions with atmospheric oxidants are relatively unimportant to the hydrogen cycle, and that uptake by soils is really in the driver's seat.

This issue is important because of the potential for a future hydrogen economy to leak hydrogen into the air—a scenario explored in the earlier study published in *Science*. Such leaks of hydrogen seem likely

at present, and if they occur must either be mitigated by some natural processes that destroy hydrogen, or else the leaked hydrogen will accumulate in the atmosphere. If the latter, this hydrogen would inevitably find its way into the stratosphere and participate in chemical reactions that damage the ozone layer. The key to predicting how this chain of events will unfold is knowing what natural processes destroy hydrogen, and to what extent they might counteract increases in human emissions.

Hydrogen is a highly reactive element, but the question of when and where it reacts, and under what circumstances, is difficult to know precisely. This question is simplified in the stratosphere, where it's easier to single out and understand specific reactions.

According to John Eiler, an assistant professor of geochemistry at the California Institute of Technology and an author of both the new paper and the June paper in *Science*, the new data were gathered from air samples gathered in the stratosphere with one of the high-flying ER-2 planes operated by the NASA Dryden Flight Research Center in the Mojave Desert. The ER-2, a reconfigured U-2 spy plane, is part of NASA's Airborne Research Program and is crucial to atmospheric chemists interested in directly collecting stratospheric samples for air-quality research.

The air samples that were collected in the ER-2 in various locales show that there is an extreme enrichment of deuterium in stratospheric hydrogen. "We wanted to look at hydrogen in the stratosphere because it's easy to study the production of hydrogen from methane separate from other influences," Eiler explains. "It may seem odd to go to the stratosphere to understand what's happening in the ground, but this was the best way to get a global perspective on the importance of soils to the hydrogen cycle."

With precise information on the deuterium content of hydrogen formed from methane, the researchers were able to calculate that the soil uptake of hydrogen is as high as 80 percent. It is suspected that this hydrogen is used by soil-living microbes to carry on their biological functions, although the details of this process are poorly under-

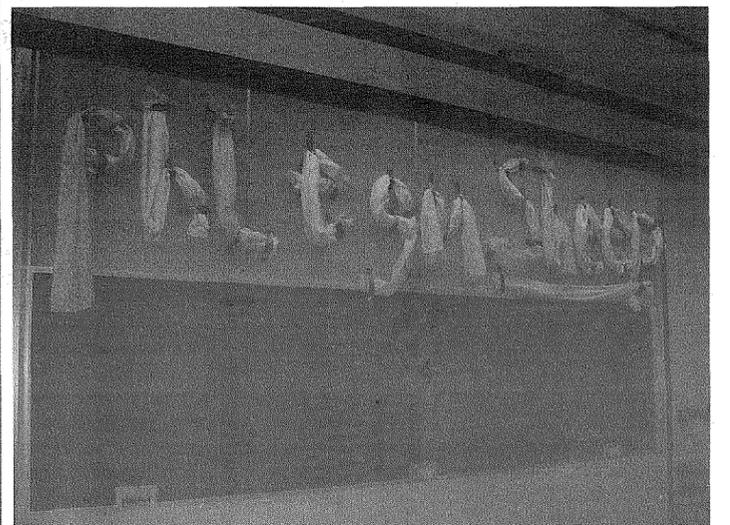
stood and have been the subject of only a few previous studies.

It seems likely that the hydrogen taken up by soils is relatively free of environmental consequences, but the question still remains how much more hydrogen the soil can consume. If future use of hydrogen in transportation results in a significant amount of leakage, then soil uptake must increase dramatically or it will be inadequate to cleanse the released hydrogen from the atmosphere, Eiler says. "An analogy would be the discovery that trees and other plants get rid of some of the carbon dioxide that cars emit, but by no means all of it," he says. "So the question as we look toward a future hydrogen economy is whether the microbes will be able to eat the hydrogen fast enough."

The research was funded in part by the National Science Foundation. Bruce Doddridge, program director in the NSF's division of atmospheric science, said, "This carefully conducted research investigating the natural chemistry of sources and sinks affecting the abundance of molecular hydrogen in the troposphere results in the most accurate information to date, and appears to account for the tropospheric deuterium excess previously observed. "A more accurate molecular hydrogen budget may have important implications as global fuel technology shifts its focus from fossil fuels to other sources," Doddridge added.

The lead author of the paper is Thom Rahn, a former postdoctoral scholar of Eiler's who is now affiliated with Los Alamos National Laboratory. The other authors are Paul Wennberg, a professor of atmospheric chemistry and environmental engineering science at Caltech; Kristie A. Boering and Michael McCarthy, both of UC Berkeley; Stanley Tyler of UC Irvine; and Sue Schauffler of the National Center for Atmospheric Research in Boulder, Colorado.

In addition to the NSF, other supporters of the research were the Davidow Fund and General Motors Corp., the David and Lucile Packard Foundation, the NASA Upper Atmosphere Research Program, and the National Center for Atmospheric Research.



Courtesy of M. Betancourt
As part of the Ruddock House Hassle Week, Fleming shower curtains were "borrowed" and used to write this message in Baxter Lecture Hall on Tuesday Night.

Prof. Brennen Recipient of Japanese Fluids Award

By MARYN NELSON

Christopher Brennen, professor of mechanical engineering at the California Institute of Technology, is the first non-Japanese recipient of the Fluids Science Research Award, given by the Japanese Fluid Science Foundation.

The foundation was created in 1947 by Professor Fukusaburo Numachi and is currently managed by the Institute of Fluid Science at Tohoku University in Sendai, Japan. Tohoku University was founded in 1907 as the third Imperial University of Japan, and is among the most prestigious science and technology institutions in the world.

Brennen, author of *Cavitation and Bubble Dynamics*, published in 1995 by Oxford University Press, is an international expert in cavitation and multiphase flows. His contributions to the field of rocketry have greatly benefited the development of the U.S. and Japanese space programs. Brennen has traveled to Tohoku University's campus in northern Honshu on several occasions throughout his career, and is a familiar contributing collaborator at the Institute for Fluid Science.

Brennen looks forward to traveling once again to the university on December 11 to receive his award.

Originally from Belfast, Northern Ireland, Brennen earned his master's and doctoral degrees from the University of Oxford, and has been a Caltech faculty member since 1969. The honors and awards that Brennen has garnered throughout his career include the 1992 Fluids Engineering Award of the American Society of Mechanical Engineers, and last year's Fluids Engineering Award of the Japan Society of Mechanical Engineers.

Additionally, Brennen served as a United Nations consultant to India in 1980 and chaired the 4th International Symposium on Cavitation in 2001.

In response to the award, Brennen emphasizes Tohoku University's continued role in improving international relations. It was the first school in Japan to admit international students. In awarding his accomplishments within the field of mechanics, says Brennen, "In part they are recognizing my contribution to international cooperation."

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Council on Undergraduate Education Tackles Exam, Homework Schedule

By KATHRYN HSU

Freshmen on campus may not have noticed, but there have been a few faculty and administrators working hard to make their lives easier.

Under the direction of Vice Provost Dr. David Goodstein, the recently formed Council on Undergraduate Education (CUE) has been putting forth efforts to resolve common complaints about undergraduate education. In the weeks prior to the beginning of the school year, this CUE worked to not only spread the due dates for core curriculum homework throughout the week, but also to ensure that there were virtually no schedule conflicts between freshmen core courses, their recitations and humanities.

Finals for freshmen should also be less stressful than in the past, when math, physics and chemistry finals were all due within a 24-hour period. The CUE and Goodstein have managed to extend the due date for grades in these courses, allowing these finals, for the first time, to be due on three separate days.

Furthermore, Goodstein and the CUE have lobbied to make the CS 1 final a limited time examination, rather than a marathon infinite time test as in past years. The CUE worked to make this all happen before the freshmen even arrived at Caltech.

The CUE itself has rather unusual origins. During the search for a new Vice President of Student Affairs a couple of years ago, the recommendation for a Dean of Undergraduate Studies was made. Such a dean would theoretically be responsible for making sure the undergraduate academic programs ran smoothly.

Many of our peer institutions (Stanford, MIT, Harvard) already have such a position set aside for its students. However, determining whether or not Caltech was similarly in need of a Dean of Undergraduate Studies proved to be difficult.

To investigate this question further, last spring a committee headed by Professor Andrew Ingersoll was convened. At that point, a group of students and faculty determined that the best course of action was a cautious one. Instead of agreeing to immediately institute a new Dean of Undergraduate Studies position, it was decided that key members of the faculty, administration and undergraduate student body were to meet regularly to assess the state of Undergraduate Studies.

This group's chair was to act as a

trial Dean of Undergraduate Studies to assess the need for the extra position. Goodstein volunteered to act as chair of this new committee. When asked why he would agree to take on what will surely be a time-consuming role, he states that "for a long time, [Provost] Koonin and I felt that someone in the administration should be responsible for the undergraduate education here."

And so the CUE was assembled. In its present state, it includes not only Dr. Goodstein, but also the faculty chairs of several important committees: the chairs of the Core Curriculum Steering, Core and UASH are on the CUE. Vice President Margo Marshak, Dean of Students Jean-Paul Revel, MOSH Cathy Jurca and David Levy from the registrar's office hold positions as well. The ASCIT BoD is currently searching for students to fill a number of spots on this council.

Of course, Goodstein still has a number of issues he'd like the CUE to tackle. In particular, the Vice Provost has advocated a number of goals directed toward improving the quality of teaching at Caltech.

First off, he has encouraged the Provost's office to earmark funds for to expanding the Caltech Project on Effective Teaching, an existing program founded last year by a group of concerned graduate students. This project entails holding workshops in which new professors, postdocs and graduate students can work on improving their teaching skills.

Additionally, the CUE is looking into creating a uniform teaching evaluation form for the entire Institute, which would allow better, more efficient feedback to professors about their courses than the current system of division-specific forms. Finally, Goodstein and the CUE will be working towards making core course recitation sections taught by faculty in residence rather than undergraduates or graduate teaching assistants in order to increase contact between new students and senior professors.

One of the more ambitious goals of CUE is to rework the advising system. Goodstein has noted that the current advising system "breaks down at many points" and fixing these points will certainly be difficult given the sometimes wildly different schedules of faculty and students.

Other issues to be examined include resolving common scheduling conflicts encountered by upperclassmen and increasing teaching resources (classrooms, labora-

tories and demonstrations) available for faculty and instructors. The CUE will also address, when appropriate, any other major problems and complaints that should arise.

Though these are all optimistic visions for undergraduate education, these goals will be difficult to attain without the presence students on the CUE. "The administration and faculty have put together a body with some punch; any student who cares at all about Caltech education should be willing to participate," says Goodstein. So, if you are concerned with the state of your schooling here, the CUE is providing you with an excellent opportunity to make a difference.



Dance Troupe Fall Classes. There will be eight classes in each professionally-taught dance series. All classes meet in the Braun Gym multipurpose room. No special clothing or shoes are required for the beginners' classes. To attend classes, simply show up with a Caltech ID or gym membership card. RSVPs are needed for the bellydancing class (Kathy.Kelly@caltech.edu). To be added to our mailing list, please e-mail troupe@caltech.edu. For more information, see our website: troupe.caltech.edu

Hip-Hop for Advanced Beginners Thursdays, 9:30-10:30 PM, starts 10/9
Professional Instructor: Collette Sibal
Trial class fee: \$5

Caltech students full term fee: \$30 (\$3.75 per class!)
Other Caltech community members full term fee: \$40 (\$5 per class!)
Beginning Bellydancing Saturdays, 12:45-1:45 PM, starts 10/4
Professional Instructor: Leela
Trial class fee: \$5
Caltech students full term fee: \$30 (\$3.75 per class!)
Other Caltech community members full term fee: \$60 (\$7.5 per class!)
CLASS SIZE IS LIMITED so RSVP to Kathy.Kelly@caltech.edu
Beginning Ballet Wednesdays, 10-11 PM, starts 10/8
Instructor: Julie Liu
FREE!
Advanced Ballet Mondays, 10-11:30 PM, starts 10/6
Instructor: Catharine Larsen
FREE!

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In a scene from the Humphrey Bogart classic *Casablanca*, the members of the movie's famous love triangle ponder their situation.

Classic *Casablanca* Retains High Rating; Critic Continues to Enjoy Bogart Role

By HARRISON STEIN

Casablanca: Watch as if it were the Last Time

If you're a girl, the odds are you're going to love *Casablanca* no matter how much your significant other complains. For all the guys, I promise *Casablanca* is a fantastic movie worthy of its ranking as the American Film Institute's second highest rated movie in American film history. Sure, *Casablanca*'s plot might seem rather generic now. But even after 61 years, *Casablanca* is considered the best on-screen romance of all time (The American Film Institute rated *Casablanca* #1 on its list of 100 Years 100 Passions) and it contains the most famous love triangle outside of the final season of *Friends*.

The Oscar-winning story is expertly told, and when you combine it with an excellent cast, you get movie magic. The irreplaceable Humphrey Bogart stars as Rick Blaine, the owner of Rick's Cafe Americain in 1940's Casablanca, Morocco. He humorously stumbles across two letters of transport that allow those living in Casablanca to escape to Lisbon, Portugal, an asylum free of Nazi rule.

Rick, a self-reliant, caustic, and broken man has no use for these letters until former lover Ilsa (the stunning Ingrid Bergman) waltzes into the Cafe Americain with her husband Victor Laszlo, a French

patriot and underground leader. The heartbroken Rick laments, "Of all the gin joints in all the towns in all the world, she walks into mine." Years ago, Ilsa jilted Rick after a passionate affair in Paris and worst of all, gave no explanation.

Naturally, Rick and Ilsa rekindle their lost love, and he develops a major dilemma--which two people should get on the plane to Lisbon? Should he steal Ilsa from Victor who already has his hands full with the Nazis, or should he exhibit some uncharacteristic altruism, not to mention courage, by letting Victor and Ilsa board the plane together? This all leads to the legendary airport scene where Rick makes his decision resulting in the movie's most famous exchange.

So why is *Casablanca* so good? The film has one of the wittiest screenplays ever, and "Here's looking at you, kid," "We'll always have Paris," "I think this is the beginning of a beautiful friendship," and "Kiss me as if it were the last time" are among the many quotes that have been repeated endlessly.

Dooley Wilson plays Sam, Rick's loyal piano player, and contributes to the splendid soundtrack. Wilson's rendition of "As Time Goes By" is remarkable and helps show insight into Rick and Ilsa's former romance. Although Wilson's part is small, it is one of the first significant African-American roles in a major motion picture.

The rest of the supporting cast, while not spectacular, is more than serviceable. Claude Rains is hilarious as corrupt French captain Louis Renault (in the funniest scene of the movie, Renault is forced to close down Rick's cafe because of "excessive gambling," and then turns around and collects his winnings). Paul Henreid gives a stirring performance as Victor, the man caught in the middle of an impossible love triangle. And although Ingrid Bergman seems lost during some of her scenes with Bogart, she makes up for it with an extremely moving final scene.

And finally, Humphrey Bogart proves that he is the quintessential leading man of his era by stealing every scene with a perfect blend of wit, intelligence and heart. Rick Blaine's metamorphosis is unbelievable, but Bogart makes it look natural. Although he somehow did not win an Oscar for this role, it is one of the best you'll ever see.

Movies from other generations might have been superb at the time, but they often decline as time goes by. Every once in awhile, a movie manages to buck the trend and become an all-time classic. For the 1940's, and possibly the 20th Century, *Casablanca* is that movie. Believe me, there's a reason everyone loves it.

**** out of **** and then some



E. Adams/The California Tech

MOSH and Humanities Professor Cathy Jurca serves on the newly formed Council on Undergraduate Education (CUE), along with other faculty members. CUE has already been working vigorously to ensure frosh core classes and due dates for problem sets do not overlap.

Dean Offers Advice to New Class: 'Pass/Fail, Frosh' Ponders Tough Questions on Universe, Friendship

By JEAN-PAUL REVEL

Week one at CIT. Well this is it, the academic year '03-04 has been launched starting with the first for what is to be an annual event, a Convocation in Beckman Auditorium to welcome all incoming students.

Dr. Marshak, the VP for Student Affairs was the emcee, with President Baltimore and Provost Koonin reflecting on how science is done and the Drs. Goodstein, Vice Provost and Archivist respectively, introducing the giants on whose shoulders we stand.

And from there we went to Astrocamp. The skies were clear, revealing that the Milky Way was still reassuringly arching overhead. Aren't we small puny creatures, imbued of our self-importance but such tiny mites in the Universe?

We now know of 117 planets orbiting other stars, but have not identified any which might resemble Earth, they are too small to be detected. Just looking up to the deep dark sky certainly makes one think it likely there must be some, perhaps inhabited by creatures longingly looking for us.

Speaking of little green creatures, Mars was a disappointment. There were high hopes that it would be a stupendous sight, what with close approach only a few weeks ago. It was indeed very large but a complete bust when viewed through the telescope.

Well, we can always turn back to the wonderful images from Mars Global Surveyor (MGS, push the JPL button on the Caltech home page) and there will hopefully be more excitement, later this year, what with three probes aimed at different regions of the planet.

The probe launched by the European space agency, will be first to release its lander, Beagle 2, in mid December (wonder what Darwin would say of this Voyage?) Next to arrive are the twin American probes

which will release the rovers Spirit and Opportunity. Among many activities they'll analyze minerals at locations where the images produced by MGS suggest that there had been water. If there is water could life be (have been?) far behind?

At least we could have a conversation with Martians, with only 14 minutes delay each way, better than trying to converse with the putative inhabitants of the small (0.1 Jupiter mass) planet, discovered last May, orbiting HD49674, some 133 light years away.

The talent show was refreshingly different, with House skits a little less arcane for a change. In truth I still have not figured out what the

"For many... with a little work, the Houses do end up being a family away from home."

mostly nonsensical house skits achieve, except perhaps to remind everyone that there are houses, while avoiding anything that might be interpreted as breaking rotation rules. But why would a house want to make itself memorable for nonsense?

I enjoyed the duet of Kathy and Rick Wilson and the violin bravura of virtuoso Leyan Lo, to name just two of the outstanding performances. I thought the boat races extraordinary, from the engineless barge Hindenburg, launched by the camp staff and a wonderfully appropriate counterpoint to Prof. Shepherd's explosive lecture, to some of the best boats I have seen in my Camp career.

And after a great dance it was back to the lowlands with newly made friends and a better understanding of what challenges would have to be met at Caltech and more

importantly, clues as to what to do about them.

You have now passed the gauntlet of rotation and will even have moved for the last time this year. Congratulations if you found the match of your wishes.

As envisaged by the students deputized by the Board of Trustees to plan for the organization of student life (this took place in 1932 as the South Houses were being built), your House is supposed "to supplement the intellectual development with a cultural and social development not possible where the student's social contacts are limited, or where his living, lounging or dining accommodations do not reflect this atmosphere."

You'll excuse me please if I smirk a little, being skeptical of achieving all these lofty goals, although for many and with a little work, the Houses do end up being family away from home. It will require skill and sensitivity to make the house not just great for you but also for the nerd next door and the jock in the next alley. It will be difficult not to be sucked into all the fun activities and opportunities for dissipation that will come your way.

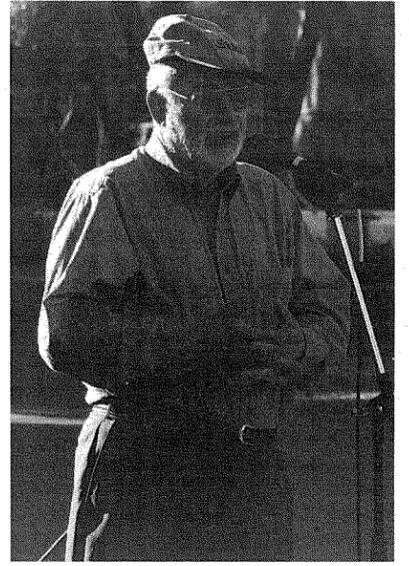
Don't let yourself be intimidated into doing anything that makes you feel uncomfortable or uneasy. Yeah, you are now on your own to a greater extent than you have ever been and you are on Pass/Fail, Frosh, but that's not a license to do as little work as possible. I am sure you'll remember the skit in Challenges and Choices and the voices of the panelists on "How to succeed." Take the opportunity to learn how to pace yourself, while "piffing" is still the way of life for you. Study and do your work in a timely manner.

I have heard on the news (BBC, October 1) that timeliness is in fashion and has even caught up with Ecuador. On October 1st, it was reported, church bells tolled, sirens blared, radio announcers counted

off the seconds, the country's President and the Mayors of each little town, all the residents (well almost) made ready to synchronize their watches at high noon. So get yourself in the Ecuadorian spirit!

Now for those of you who did not land in the House of your dreams remember, remember... you just made a bunch of friends out of strangers with whom you had nothing but a bus ride and an IQ in common (sorry twins, who share so much more, I have to simplify a little). Where things are not what you'd like them to be, you can work at helping develop a better fit. Reflect on the fact that some day almost all of you will find that unique person who'll become your life's partner.

But truth be told, the "one and only" will be picked from the small subset of people that you have met. Don't you think there is likely other "only's" who never did enter the



picture? What will determine the success of the relationship is your willingness to work at maintaining a reciprocally satisfying liaison. This applies to people and also to your House. It will come to approximate the House of your dreams, if you work on having it happen.

A bientot

Irish Singer Sponsored By Folk Music Society

By REX MAYREIS

Pasadena, CA-Irish songstress, Fil Campbell, will appear at Caltech on Friday, October 17 at 8:00 PM. The performance will be in Winnett Student Lounge, on the Caltech campus in Pasadena.

From Rostervor, County Down, in Northern Ireland comes Fil (pronounced as "Phil") Campbell, a fine and contemporary song interpreter and songwriter. She studied music at Queens University in Belfast and has worked with Van Morrison, opened for Elton John and performed in many festivals throughout Europe.

She's a versatile singer with a delicate voice, whose singing runs the gamut from fun and sassy to mournful to romantic. She plays guitar and has three albums to her credit including her most recent, *Beneath the Calm*.

On this quick tour of the United States, she will be joined onstage by her husband Tom McFarland, who very tastefully punctuates her songs with hand drums, including the Bodhran (Irish drum), African Djembe, Latin American congas, bongos and various shakers.

Campbell has been a music enthusiast her entire life and her career began at age five with her first performance in Belleek, Ireland, her hometown. Working as a publicist in the 80s, she promoted some of the biggest names in Ireland, in-



Courtesy of www.filcampbell.com

Irish singer Fil Campbell will perform at the Winnett Student Center this Friday, including Bolshoi Ballet, Queen and Bob Dylan.

In recent years, Campbell and her band have been touring the UK and Europe, showing off their unique style and eclectic portfolio of songs. The band made history in May 1998 when it was the first band to ever play in Belfast's Parliament buildings. The band was opening for Elton John as part of a celebration for the signing of the Good Friday Agreements.

Campbell and her husband also run a summer camp for aspiring teenage singers.

You Can Take my Chong Bong When You Pry It From my Cold, Dead Hands

By LIBIN ZHANG

"People selling drug paraphernalia are in essence no different than drug dealers. They are as much a part of drug trafficking as silencers are a part of criminal homicide."—John Brown, acting DEA chief.

Strangely enough, even as John Brown and the rest of the Drug Enforcement Agency are cracking down on online sellers of drug paraphernalia, I can still buy silencers on the Internet. At impactguns.com, a Gemtech silencer can be purchased for under \$400. The site states that: "You won't believe how much fun it is to shoot a gun with a silencer (or suppressor). Do your community a favor and reduce noise pollution today."

Of course in California, only Class 3 dealers and Class 2 manufacturers, and not individuals, may own them, but once I get around a simple geographic inconvenience and some background checks I too can be 'a part of criminal homicide.'

The makers and sellers of tobacco accessories are continuing to be arrested by the DEA, while John Brown is hypocritically indifferent to the legal sale of silencers across the country. There is sadly no National Bong Association to provide campaign contributions.

On October 9, Actor-comedian Thomas B. Kin "Tommy" Chong reported to a minimum-security federal prison near Bakersfield, Calif., to begin a nine-month sentence. He was sentenced in Pittsburgh on September 11 for conspir-

ing to sell bongos and other drug paraphernalia on his website Chongglass.com. Tommy Chong is the latest and most high profile casualty of Operation Pipe Dreams, a DEA program against drug paraphernalia distributors and the pipemaking industry.

In February, a major operation closed head shops and distributors around the country and raided Chong's business Nice Dreams Enterprises. Around 55 people were arrested at the time, and Chong was arrested later.

Chong's website claimed all pipes for sale were "for legal blend and tobacco use only." However, he pleaded guilty to all charges. He also admitted to hawking drug paraphernalia during nation-wide promotional appearances and said he got carried away with the fictional persona.

However, he says that he has quit smoking pot and wanted to use his celebrity status to fight drug abuse. Assistant U.S. Attorney Mary Houghton countered that Chong achieved fame by glamorizing drug use and trivializing law enforcement in his films, and used his characters to promote his business.

Of Chinese and Scots-Irish ancestry, Tommy Chong was a guitarist of the 1960s sextet Bobby Taylor & the Vancouvers. He and Cheech Marin achieved world fame with a series of semi-improvisational comedies, such as Cheech and Chong Up in Smoke (1978) and various semi-sequels. The comedy duo, always playing perpetually stoned

hippies, ceased making movies during the 'just say no' era.

Now, I'm as conservative as the next guy, but if the Powers-That-Be achieve their goals, the Americans who still dare to believe in libertarianism and that smoking various herbal substances is a person's own business shall be forced to crudely fashion smoking pipes from faucets and plastic honey bears like Brad Pitt in 'True Romance'. Drug use rates will not be adversely affected.

In an era of budget deficits and terrorist threats, it seems logical that the American government should dedicate all of its resources to root out terrorists instead of fighting small American businesses. Instead, 55 pipesellers and Tommy Chong have been removed from our streets.

Does Ashcroft not have better things to do? Where are Osama and Saddam Hussein? And please do something about those silencers on the Internet.

Fortunately, www.freetommychong.org has a self-explanatory petition. The same judge Arthur Schwab who sentenced Chong has set an October 16th hearing on a request to release Chong while an appeal goes through the 3rd U.S. Circuit Court of Appeals. Good luck, man.

Actor Tommy Chong and friend in better times. Tobacco pipes corrupt our children's moral fibre and weaken our resistance against Communism.



Courtesy of L. Zhang

During one of their many on screen appearances, Tommy Chong expresses his dissatisfaction with co-star Cheech Marin.

National Human Genome Research Institute Awards New \$12 Million Grant to WormBase

By ROBERT TINDOL

The Caltech-led WormBase project, an ongoing multi-institutional effort to make genetic information on the experimental animal known as *C. elegans* freely available to the world, has been augmented with a new \$12 million grant from the National Human Genome Research Institute. The money will be distributed over five years for ongoing work on the genome database, which since its inception in 2000 has become a major resource for biomedical researchers as well as biologists attempting to better understand individual genes and how they interrelate.

According to Caltech biology professor Paul Sternberg, leader of the project, WormBase has already succeeded in making available online the complete genome sequence (100.2 million base pairs) of the nematode, plus an almost complete sequence for the closely related organism *C. briggsae*, as well as genes for some 20 parasitic nematode species. In addition, the project makes available a huge amount of experimental data pertaining to the nematode.

The completed sequences will be vital for an emerging research effort that includes the new double-strand RNA interference technique for understanding a gene's function, and the fruits of the sequencing effort are already apparent. There are now 23,000 such experiments in WormBase, along with 280,000 DNA expression ("chip") microarray observations, as well as detailed information on the expression of more than 1,600 of the worm's 20,000 genes.

"For the future, researchers will look at interactions between genes, which means that there are 20,000-squared possibilities for the inter-

actions of two genes alone," says Sternberg. "Also, our future effort will include working with similar databases of the genomes of other organisms, such as the mouse, fruit fly, and yeast, for shared software and shared conceptual vocabularies.

"The ultimate purpose is to allow medical researchers to get the information more easily," he adds.

The human-worm connection may seem tenuous to people outside biology, but it is known that the two organisms have similarity in about 40 percent of their genes. A very realistic motivation for the funding of genome sequencing of other organisms has been to provide data for comparisons of genes that are of interest in the quest to better understand human disease. Thus, a cancer researcher who discovers that a certain gene is expressed in cancer cells can use the WormBase to see if the gene exists in nematodes, and if so, what is known about the gene's function.

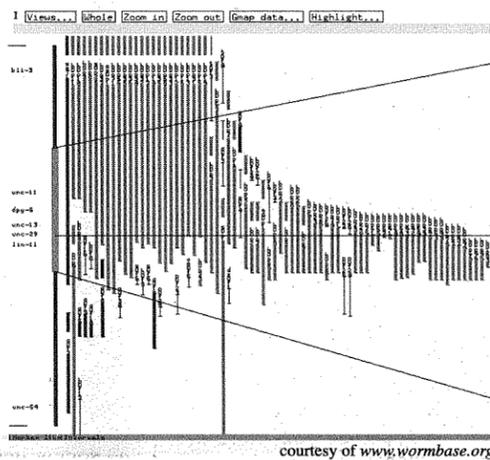
Exploring the fundamental relationships between genes from species separated by hundreds of millions of years of evolution is expected to be a cornerstone of 21st-century biological innovation. Improved knowledge of how a gene is expressed in one species—and as time goes on, how two or more genes interact—will provide new approaches for dealing with human disease and will almost certainly be the foundation for some important

medical advances.

The role of WormBase in 21st-century medicine will continue to be as a resource for knowledge. Already the wormbase.org site is fully searchable in a number of ways, including by genes, cells (the nematodes have only 959, and all are clearly understood and clearly visible under a microscope), and biological processes, as well as by names of researchers.

Information in WormBase comes from teams at the two centers that sequence the *C. elegans* and *C. briggsae* genomes—a team at the Sanger Institute, in England, led by Richard Durbin, and one at Washington University, led by John Spieth. The innovative software used to display the information in WormBase was developed by Lincoln Stein of the Cold Spring Harbor Laboratory, where the WormBase Web server is located.

Fourteen individuals at Caltech are currently involved in the WormBase project, including nine biologists and three computer experts.



This is an example of a genetic map, taken from the WormBase data base.

Proud Students, Faculty Celebrate Coming Out

By JUAN GARCIA

Why in the world would anyone ever want to come out of the closet? It's not for the cute nicknames that people come up with for us ('faggots,' 'biological errors,' 'sexual deviants'). It's certainly not for perks and benefits (same-sex couples can be denied hospital-visitation rights for sick/dying partners or their children). And lord knows it's not for our health (October 7th marked the 5th anniversary of Matthew Shepard's brutal murder).

Then why, given all these discouragements, would any sane person ever come out? Because it's important to do so and the rewards can far outweigh the penalties. To understand this, one need only look to a very famous advertising campaign:

Front row tickets to see Madonna in concert (again): \$300
Matching hers & hers flaming motorcycle helmets: \$230
Queer as Folk: 2nd Season DVD

Collection: \$120
The freedom to be yourself: priceless

There are those who cite National Coming Out Day as a gratuitous flaunting of the 'homosexual lifestyle.' After all, there is no National Being Straight Day is there? To these critics, I argue that there is, it's just taken for granted. Every day that a heterosexual couple is able to get married, adopt a child, or hold hands in public without fear is a celebration of heterosexuality.

In honor of National Coming Out Day (Oct. 11th), as testimony to the presence of the gay, lesbian, bisexual and transgendered community at Caltech and perhaps as an inspiration to those who have yet to or are in the process of coming out, I (as Queen of the Caltech Student Pride Association) present to you a list of out and proud Caltech/JPL students, faculty, staff and alum.

- Chris Adami, Faculty Associate
- Mark Barton, Staff, LIGO
- Martin Basch, Graduate Student, Biology
- James Chakan, Graduate Student, Physics
- Shelley Diamond, Staff, Biology
- Juan Garcia, Undergraduate, Engineering and Applied Science
- Eitan Grinspun, Graduate Student, Computer Science
- Isaac Hilburn, Undergraduate
- Bethany Joy, Undergraduate, Environmental Engineering
- Nir Krakauer, Graduate Student, Geochemistry
- Brian Meehan, Graduate Student, Chemistry
- Jim O'Donnell, Geology Librarian
- Nick Papadakis, CNS Staff Member
- Kevin Parkin, Graduate Student, Aeronautics
- Ray Prado, Assistant Director, Undergraduate Admissions
- Jess Reynolds, Undergraduate, Mechanical Engineering
- Robert Robertson, Undergraduate
- Chris Rutherglen, Undergraduate, Physics
- Kerry Sieh, Professor of Geology
- Robert Southworth, Graduate Student, Computer Science
- Julius Su, Graduate Student, Chemistry
- Daniel Taylor, Biology Librarian
- Jaap Weel, Undergraduate Student, Physics

Asian Population 'Ghettoized'? Social Rift Develops Between Communities

By TOM FLETCHER

Progress on Undergraduate Education

Vice-Provost Goodstein delivered his report on his efforts to improve undergraduate education to the faculty board. His full report will be posted soon on oof.caltech.edu. His work as head of the Council on Undergraduate Education (CUE, you can sign up for it by SAC 33) came out of the overwhelming demand of students at last year's Student Faculty Conference for some oversight of the undergraduate curriculum.

In a short time, Goodstein has already attacked scheduling conflicts by sitting down all of the freshman core professors and jointly working to avoid any conflicts. At the same time, they also collaborated to make sure homework for different classes was due on different days. The next trick will be to make sure that not all of the finals are due on the same day (Wednesday) of finals week. This will require some doing, but will hopefully be accomplished.

The CUE grew as a compromise between professors who saw no need for a dean of undergraduate education and those who felt it was necessary. While this debate is still open and heated, Goodstein was met with nothing but praise and congratulation by the faculty at the meeting. Prof. Antonsson went so far as to say that what Goodstein had done had never been imagined before at Caltech.

I have personally been very impressed with what Professor

Goodstein has done and hope that you all chime in with your academic concerns, assistance, and praise. Remember, he will only know what issues need to be worked out if the students on the CUE tell him what needs to be resolved.

Who I Met With This Week

The faculty board meeting was the big event of the week. The new health insurance plan was reviewed and appears to be quite comprehensive and well-designed; to the point that other states' legislatures are now copying our student health insurance plan. Remember, if you have any problems with your health insurance, make sure to report them so that we can advocate for you. At oof.caltech.edu, you can find the faculty health committee and email those with the ability to fix things.

The head of the art committee, Pietro Perona, also made some announcements at the meeting. The school is working on getting replacements for the cancelled Vectors sculpture. They are considering a number of rotating exhibits around campus. The art committee has also secured MHF money to hire an artist-in-residence to create art for Caltech and hold workshops with students. If you want to spend your free time working with a professional artist on projects, keep your eyes open and contact your student representative on the art committee, Jacki Wilbur.

More Missed Opportunities
Last week, I wrote about

Caltech's response to Ward Connerly's diversity lawsuit. This week, I think I'd like to address a growing problem that, despite its lack of legal ramifications, is hurting our campus. I'm talking about the rift in the student population between the Asian and non-Asian student communities.

A walk through Avery last year caught my attention, so I ran some simple statistical tests (H0: proportion of off-campus housing used by Asians = proportion of Asian students, HA: proportion off-campus > proportion of student body). I got significance for my tests at a p-level of 0.001, which is two orders less than the standard 0.1 used in social science research.

What does this indicate? For one, it is statistical proof of a profound disconnection in the student body. The houses, for whatever reasons, appear to fail a large fraction of the students (almost half of the freshmen class!). Meanwhile, a fraction of the class is systematically cordoning itself off from the rest of the student body, and we all suffer from the lack of interaction. More qualitative proof: one of nine BoD members was Asian ("underrepresented" minorities outnumber them!), zero of nine members of the IHC are Asian. I do not know what I would find in the Y excomm, but I'm willing to guess similar or slightly better results. The point is simple: despite making up an enormous fraction of the Caltech undergraduate body, Asian students seem to participate in student life and the student community (by which I mean the houses) at disappointingly low

rates.

What we appear to have is almost two discrete student bodies, one that represents the traditional Caltech community and lifestyle, another that is effectively "ghettoized" in, admittedly better, off-campus housing. At present, the system seems to be working okay, but this separation does manifest itself by having an impact on the honor code, student life, and the unity of the student body.

Of course, what we need to recognize is that no one marched all the Asians off campus, or burned their ballots to prevent them from electing representatives. This is a mutually accepted situation by both sides.

What I want to start discussing, and getting people to think about, is first, how can we bridge this gap? Why are we willing to perpetuate this system? What can be done to bring the two communities closer together? I assure everyone that the school, student body, and individual would benefit from more diverse in-

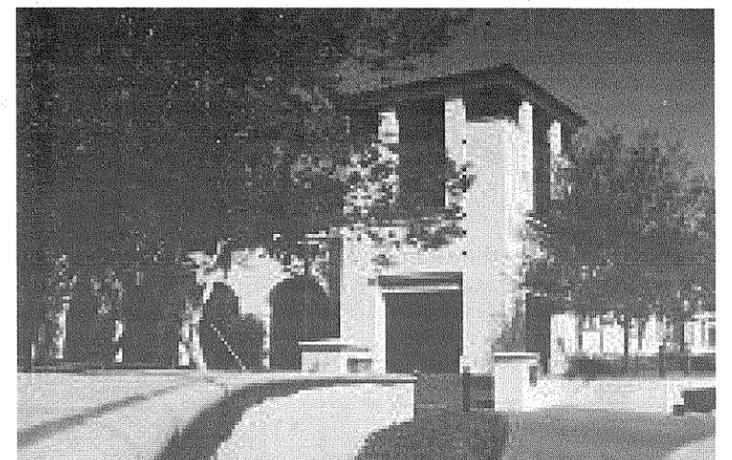
teraction and a uniformly shared student culture and set of values. Now that I have brought the problem into the open, I ask you all to think about it, and see what you can do to make it better.

We Are Scientists Are Coming!

Get psyched! We Are Scientists are coming on October 25th to play Saturday night! We're ironing out the details of where they'll play, but they're coming! Undergrads, grad students, rocking professors, staff, come hang out and listen to We Are Scientists! If I haven't piqued your interest yet, check out their website for music and humor: <http://wearescientists.com/>

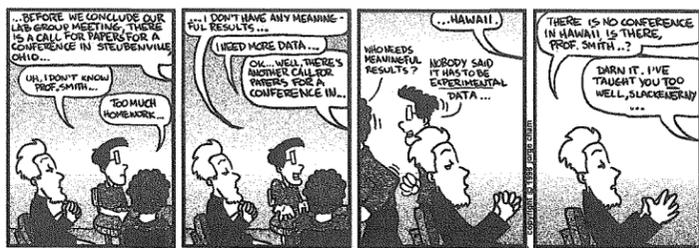
Peace out Caltech,
Tom Fletcher

PS: What do Ken Lay, Gov. Arnold, and President Baltimore have in common? You tell me: <http://www.consumerwatchdog.org/utilities/rp/rp003709.pdf>



Courtesy of www.caltech.edu

ASCIT President Tom Fletcher alleges that segregation of Asian students into off-campus housing is a growing problem.



NEWTON'S THREE LAWS OF GRADUATION

Though famous for his seminal work in the Mechanics, Isaac Newton's theories on the prediction of a doctoral graduation formulated while still a grad student at Cambridge remain his most important contribution to academia.

FIRST LAW
A grad student in procrastination tends to stay in procrastination unless an external force is applied to it.

This postulate is known as the "Law of Inertia" and was originally discovered experimentally by Galileo four years before Newton was born when he threatened to cut his grad student's funding. This resulted in a quickening of the student's research progress.

Galileo's observations were later perfected by Descartes through the application of Weekly Meetings.

Before Galileo's time, it was wrongfully thought that grad students would rest only as long as no work was required of them and that in the absence of external forces, they would graduate by themselves.

(From Encyclopaedia Britannica)
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NEWTON'S THREE LAWS OF GRADUATION

First published in 1679, Isaac Newton's "Procrastination: Umataradid Principia Mathematica" is often considered one of the most important single works in the history of science. Its Second Law is the most powerful of the three, allowing mathematical calculation of the duration of a doctoral degree.

SECOND LAW
The rate of a doctoral process is directly proportional to the flexibility & affect by the advisor and inversely proportional to the student's motivation, m.

Mathematically, this postulate translates to:

$$a_{grad} = \frac{flexibility}{motivation}$$

$$a = F / m$$

$$\therefore F = ma$$

This Law is a quantitative description of the effect of the forces experienced by a grad student. A highly motivated student may still remain in grad school given enough flexibility. As motivation goes to zero, the duration of the PhD goes to infinity.

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NEWTON'S THREE LAWS OF GRADUATION

Having postulated the first two Laws of Graduation, Isaac Newton the grad student was still perplexed by this paradox: If indeed the first two Laws accounted for the forces which delayed graduation, why doesn't explicit awareness of these forces allow a grad student to graduate?

It is believed that Newton practically abandoned his graduate research in Celestial Mechanics to pursue this paradox and develop his Third Law.

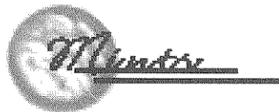
THIRD LAW
For every action towards graduation there is an equal and opposite distraction.

This Law states that, regardless of the nature of the interaction with the advisor, every force for productivity acting on a grad student is accompanied by an equal and opposing useless activity such that the net advancement in thesis progress is zero.

Newton's Laws of Graduation were ultimately shown to be an approximation of the more complete description of Graduation Mechanics given by Einstein's Special Theory of Relativity's theory.

Einstein's theory, developed during his graduate work in Zurich, explains the general phenomena that, relative to the grad student, time slows down to nearly a standstill.

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Continued from Page 3, Column 4

SURF Party! The Caltech community is invited to gather for cake on Friday, October 17, from noon to 1:30 PM on San Pasqual Mall to celebrate a quarter century of undergraduate research and student achievement through SURF!

SURF Seminar Day, Saturday, Oct. 18th from 9 am to 5 pm. Presentations begin at 10 am. Students will present and discuss their summer research projects. To register, please go online at <http://www.hypatia.caltech.edu/surf-sem/>. A schedule of presentations will be posted on the SURF website at www.surf.caltech.edu. For questions, please contact Norma Davalos at 626.395.2885 or email her at sfp@caltech.edu.

The Everhart Lecture Series selection committee is seeking applications and nominations for the 2003-2004 lecture series. The Everhart Lecture Series is a forum to encourage interdisciplinary interaction among graduate students and faculty, to share ideas about recent research developments, problems and controversies, and to recognize exemplary presentation and research abilities. Lecturers discuss scientific topics at a level suitable for graduate students and faculty from all fields while addressing current research issues. Each fall, three graduate student Everhart Lecturers are selected to present their work to the Caltech community. Speakers receive a \$500 honorarium and recognition at graduation. This prestigious honor is sponsored by the Graduate Office and the Graduate Student Council. For more information, visit www.its.caltech.edu/~els or e-mail els@its.caltech.edu. The deadline for applications and nominations is Monday, October 20. Selections will be made by December.

Aero Association of Caltech (Caltech Flying Club). Want to learn to fly? AACIT offers aircraft rental and flight instruction, and organizes fly-outs and flying related activities. For more information visit our web page www.its.caltech.edu/~aacit or contact Eric Fechter at fechter@its.caltech.edu.

The Seminar on Science, Ethics, and Public Policy (SEPP) has been renamed: Caltech Humanities presents **Seminar on History and Philosophy of Science (HPS)**. 20 October 2003 (4:00 pm 25 Baxter); Michael Arbib (USC), "From Monkey-like Action Recognition to Human Language: An Evolutionary Framework for Neurolinguistics"

Please note the following Munro seminars as well:
 17 October 2003 (4:00 pm 25 Baxter); Jonathan Israel (Institute for Advanced Study, Princeton), "The Radical Enlightenment"
 7 November 2003 (4:00 pm 25 Baxter); Gideon Yaffe (USC), "The Government Beguiled Me, and I Did Eat: Responsibility and the Entrapment Defense"
 Seminars on the Caltech campus are open to the community at no charge. For information, contact Moti Feingold at 626-395-8696 or feingold@hss.caltech.edu

Caltech is offering **Guitar Classes** for the fall term on Tuesdays starting October 7. Beginning 4:30-5:30 p.m., Intermediate 3:00-4:00 p.m., Advanced 5:30-6:30 p.m. in the Student Activities Center (SAC) Room 1. Classes are free to Caltech students, and staff is space permits. The instructor is Darryl Denning. For more information, contact him at ddenning@caltech.edu or x. 2923.

The Caltech Women's Center is located at 265 Center for Student Services. Our mission is to promote the advancement of women in science and engineering. The Women's Center works to support the central research and educational mission of Caltech, while providing students, postdoctoral scholars, staff, and faculty--women and men-- with opportunities, programs, and services that address gender issues and promote success, equity, and safety. Some of our programs include Academic and Professional Development; JUMP, the JPL Undergraduate Mentoring Program; Women Mentoring Women; Technical Tours Series; and Seminars and Workshops. Coming up on September 30 is the Graduate Women's Discussion Group. October 7, we will host "Rosalind Franklin: The Dark Lady of DNA," Lecture and Book Signing with author Brenda Maddox. For a full list of programs and services, visit our webpage at www.womenscenter.caltech.edu.

On Wednesday, October 15, Dr. David Baltimore, President and professor of biology at Caltech, will give an Earnest C. Watson lecture, entitled "Viruses, Viruses Viruses." Beckman Auditorium, parking located at 332 South Michigan Avenue, Pasadena. 8 p.m. Admission: free. Call toll-free 1 (888) 2CALTECH (222-5832) or (626) 395-4652 for information.

Satirist and author **Al Franken** will read from his new book, *Lies and the Lying Liars Who Tell Them...A Fair and Balanced Look at the Right*, on Wednesday, October 22, at 8 p.m. in Beckman Auditorium. This even is part of Caltech's Voices of Vision series. Franken trains his subversive wit

directly on the contemporary political scene. Timely, provocative, and funny, *Lies* is becoming one of the most talked about book of political humor in 2003. Franken is the best-selling author of *Oh, the Things I Know!*, *Rush Limbaugh is a Big Fat Idiot and Other Observations, Why Not Me?*, and *I'm Not Good Enough, I'm Smart Enough and Doggone It, People Like Me!* A book signing will immediately follow the reading. Presented in collaboration with Vroman's Bookstore and Caltech's Words Matter series. This event is open to the public, free of charge. Parking for Beckman Auditorium is located on Michigan Avenue south of Del Mar Boulevard in Pasadena. Call toll-free 1 (888) 2CALTECH (222-5832) or (626) 395-4652 for information.

Scholarships:
 The Air Force Reserve Officer Training Corps (AFROTC) offers 3.5-, 3, 2.5-, and 2 year scholarships in all majors. The scholarships are generally capped at \$15,000/year towards tuition and fees, with an annual book allowance of \$480 and \$200/month stipend during the school year. Full-time student status, AFROTC program involvement, and a minimum of 2.5 cumulative GPA is required to be eligible. For more information visit www.usc.edu/afrotc/.

The Measurement Science Conference (MSC) has established a scholarship to fund students in an Engineering, Science or Quality Assurance degree program. The scholarship program places emphasis on experience or accomplishments related to the application or advancement of measurement science technology. To be considered for one of five, \$1000 scholarships, individuals must: have completed at least 24 units of upper division courses in an Engineering or Science Degree Program or five courses in a Masters Program in Quality Assurance; have an overall grade point average of 3.2 or greater; a U.S. citizen; be able to attend the Measurement Science Conference on January 16, 2003 in Anaheim; submit an application before November 28, 2003. Applications are available in the Financial Aid Office.

The John Gyles Education Awards of \$3000 are available to full Canadian or American citizens who are studying all areas of postsecondary study. A minimum GPA of 2.7 is required. Criteria other than strictly academic ability and financial need are considered in the selective process. Filing dates for mailing applications in 2003 are **April 1, June 1 and November 15, 2003**.

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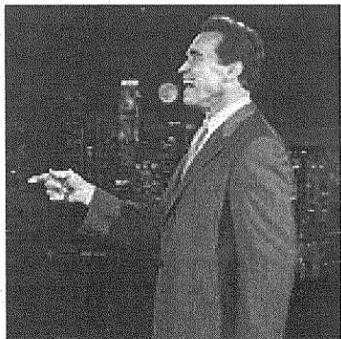


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Eleventh Hour Decisions Pose Problem for Arnold

Continued from Page 2, Column 5



Courtesy of www.thestar.com

Governor-elect Arnold Schwarzenegger after his Tuesday victory.

Duf Sundheim down to the vast majority of the Republican caucus in the State Assembly, went public to endorse the action star, Schwarzenegger had no trouble winning "with one McClintock tied behind his back," to quote the words of San Diego House Rep. and recall bankroller Darrell Issa.

On the Democratic side, Davis took a surprisingly conciliatory tone in defeat. "This state has been very good to me," said the ousted governor in his concession speech. "I am calling on everyone in the state to put the recall and the divisiveness behind us and do what's right for the state of California."

Unity may be tough to come by, however. From San Francisco, where 80% voted "no," to Kern County, where 76% voted "yes," county returns in this election were markedly split, both from north to south and from the coast inland. Schwarzenegger's support was similarly divided, ranging from his 62% in Kern to just 19% in San Francisco.

Moreover, there remain battles to

be fought. Schwarzenegger, who will take office once state officials certify the results, has requested that Davis refrain from signing legislation in his final weeks as governor. Still, Davis is widely expected to allow more than 200 lingering bills to become law and perhaps make as many as 100 appointments before he leaves office—quite a mess to clean for the man who promised Leno he'd "go to Sacramento and clean house."

Schwarzenegger may also face a new, Democratically led recall effort if he fails to meet expectations. After Tuesday's election, Democratic party executive Bob Mulholland said he'd give the new governor 100 days; after that, he left open the possibility of following what he called the Republican precedent of recalling officials the populace dislikes.

In the meantime, Schwarzenegger has assembled his transition team, a 65-member hodgepodge group that runs the ideological gamut from Republican businessman Bill Simon to San Francisco Mayor Willie Brown. Other curious selections include Democratic L.A. Mayor James Hahn, conservative lesbian Tammy Bruce and philanthropist-about-town Eli Broad, whose millions financed Caltech's Broad Center.

"The transition committee I am announcing today is a distinguished group of men and women who share my commitment to restoring California to greatness," Schwarzenegger said at a press conference to introduce the team. The governor-elect is expected to take office later this month.

GPS Measures Tectonic Plate Strains; Higher Risk in Lower Gravity Regions

Continued from Page 8, Column 5

have greater gravity and topography anomalies, and are also more likely to have earthquakes.

Though this account provides a basic explanation for a rather complicated and unintuitive phenomenon, it is a simplified view, and Song and Simons would like to do more work to refine the details of the relation between the gravity field and large earthquakes.

The gravity anomalies the team considered take a long time to build up, and change very little over timescales up to at least 1 million years. Short-term events such as earthquakes do change the gravity field as the earth's plates suddenly move, but those variations are small compared with the long-term anomalies, which are on the order

of $4 \times 10^{-4} \text{ m/s}^2$.

Because topography and gravity variations persist over periods of time much longer than the typical time between earthquakes, 100 to 1,000 years, large earthquakes should be consistently absent from areas with large positive gravity anomalies, say Song and Simons.

"This study makes a strong connection between long-term tectonic behavior and short-term seismic activity," says Simons, "and thereby provides a class of new observations for understanding earthquake dynamics."

Though no one can tell when or where the next major earthquake will occur, Global Positioning System measurements can show where strain is accumulating. Simons hopes to use such measurements to

test the prediction that areas with high gravity will have low strain, and vice versa.

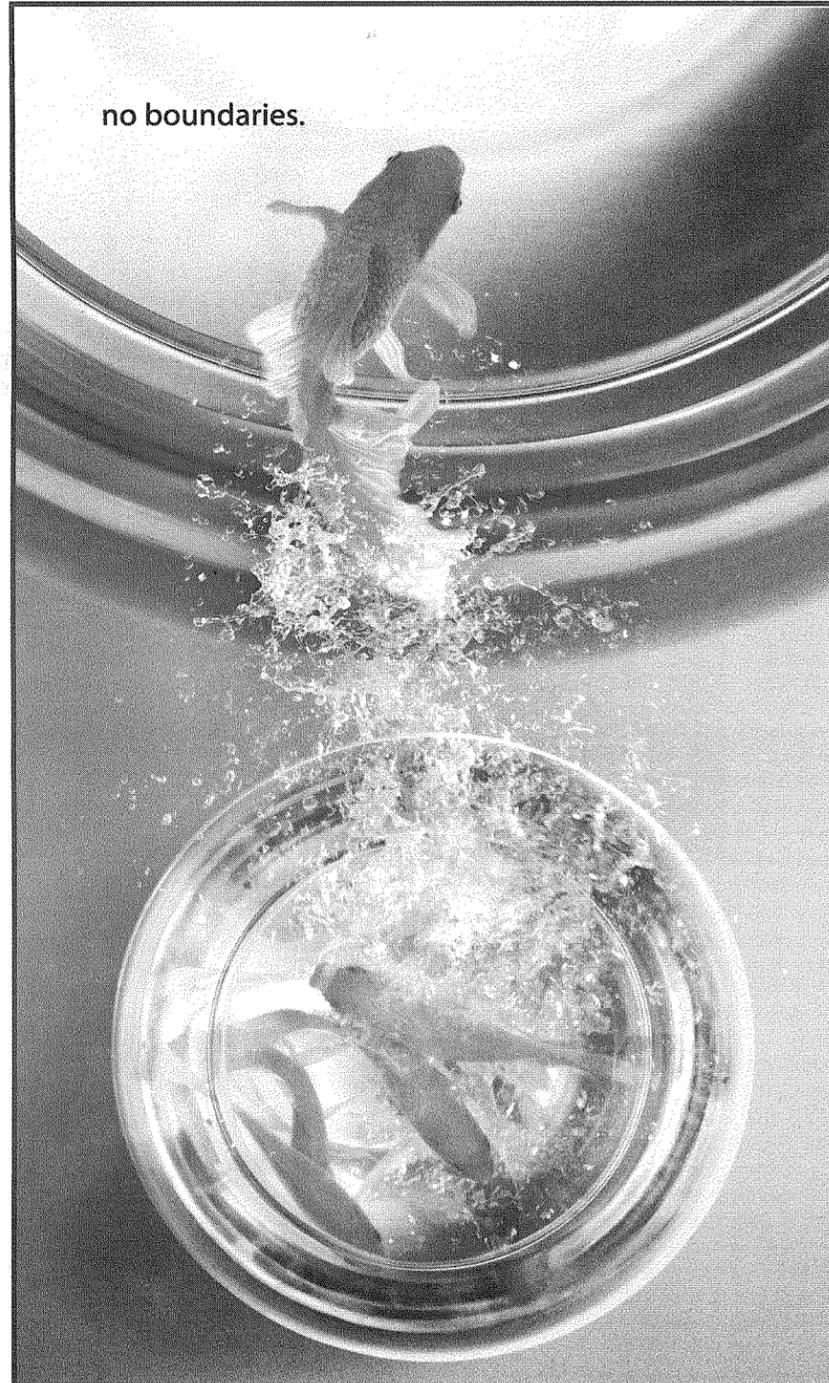
The team points out that although large earthquakes occur where gravity and topography are low, there are low-gravity areas in subduction zones with no seismic activity. Furthermore, the research concentrates on subduction zones, and so makes no predictions about other types of faults.

Nonetheless, within a subduction zone known to be earthquake-prone, Simons believes earthquakes are more likely to occur in low-gravity zones. High gravity areas do tend to have few earthquakes. So while the research does not offer a way to predict where earthquakes will happen, it can predict where they won't happen, says Simons.



Courtesy of www.gps.caltech.edu/~alex

Geology and Planetary Science graduate student Teh-Ru Alex Song enjoys a scenic view. Song played a key part in studying the relation between gravitational strength and earthquakes.



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"A Great Day for California": Voters Turn out in Large Numbers for Recall

Continued from Page 1, Column 2
\$30 million.

On the election day, the recall ballot would have two sections. In the first the voters vote yes or no on recalling Davis. If the voter votes yes, then he or she can proceed on the next page to vote for the new governor who will take Davis' place. Only a majority of "yes" on the first part will get Davis recalled. Typically, anyone can become a

candidate by paying a \$3,500 filing fee, or submitting 10,000 signatures. There can be as many candidates as possible.

If Davis gets recalled (which he did), he would be immediately removed from office and replaced by the winner, who serves out the remainder of his term. If it fails, Davis is reimbursed for his election costs and there cannot be another recall election for six months.

This historical California recall is the first time that a recall proposal has ever succeeded. Election officials reported heavy turnout throughout the day, in addition to 2.2 million previously cast absentee votes. Davis was highly disapproved of and Schwarzenegger easily led the rest of the other candidates. Moreover, people also indicated their opinions on matters such as Proposition 54, California's economy, and whether they "approve or disapprove the way G. W. Bush is handling his job as a president."

"This is a great day for California," Governor Davis said, after he conceded to Schwarzenegger when the election had closed, "On this day, in response to a common danger, the people of California rose to their duties as citizens."

Brenda Maddox Discounts R. Franklin Controversies

Continued from Page 1, Column 3

her glasses and did something novel with her hair."

On the flip side, the feminist movement of the 60's and 70's made Rosalind into something of a poster child. Many have claimed that Watson stole outright the structure of DNA from Rosalind and that she was robbed of the credit she deserved by Watson, Maurice Wilkins and the anti-women King's College (which had separate men and women dining rooms at the time).

In *Rosalind Franklin: The Dark Lady of DNA*, Maddox tries to reconcile these two divergent interpretations of Rosalind's contribution to the discovery of the double helix. Maddox attributes Rosalind Franklin's bad treatment at King's College to a combination of her Jewishness and her upperclass background rather than an institutional bias against women. Records

show that during the early 50s, many women served on the faculty of King's College and some even held senior positions.

Rosalind's bitter disagreements with Maurice Wilkins were primarily due to a conflict of personality, Maddox argues, and the transfer of "Photograph #51" to Watson did not involve any malicious intent.

Finally, Maddox raises the interesting point that in 1953, no one besides Watson and Crick knew that there was a race to solve the structure of DNA and that even after the publication of the paper, many scientists, including Franklin, would not appreciate its importance until years later.

Brenda Maddox's other works of biography include *Nora: The Biography of Nora Joyce*, *Life of D.H. Lawrence*, and *Yeats's Ghosts*.

CALTECH CONVENTIONAL WISDOM WATCH



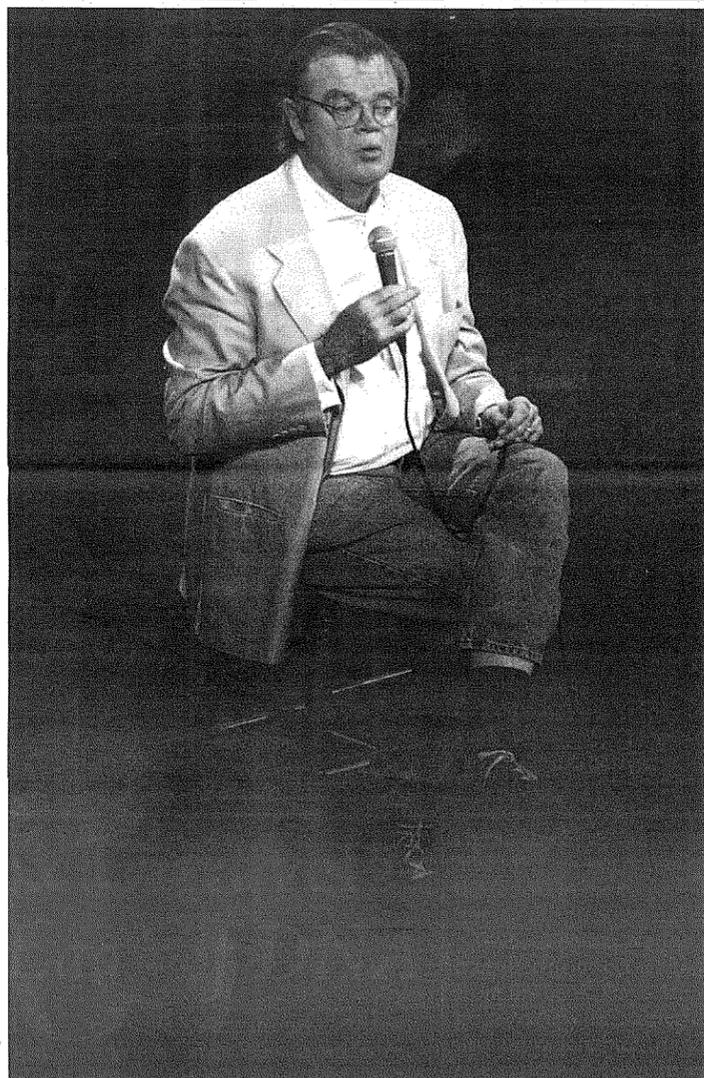
Rotation Ends: Freshman finish their first week at Caltech by finding out what house they end up in. They find an unanticipated *twist* when they arrive at some houses.



California Recall: Arnold Schwarzenegger terminates Gray Davis' second term as governor with his special election victory.



World Series: With the loss of the Oakland Athletics to the Boston Red Sox, California's hopes of a World Series title get put on hold until next year.



D. Kortal/The California Tech

Prairie Home Companion host Garrison Keillor draws a laugh from the audience while relating one of his many anecdotes.

Keillor Advises Aspiring Writers: Experience Life

Continued from Page 1, Column 5

by focusing on celebrities and commercialism. He liked articles that readers fall upon unexpectedly rather than feature stories that promised big inside secrets about famous people. He returned from Denmark because he realized his heart in America and the American philosophy.

His advice to aspiring writers was to write about subjects first-hand. Experience life and write about it, do not write about what others know. His faith in writing stems from his belief that the "writers get the last laugh." He warned however, that writing is "a very lonely job."

The night was a grand success. The only words an old woman

would say of the experience was "I loved it!"

His fans adore him because of his grand imagination and honest astuteness at describing life.

Caltech student, Kim Pependorf '06 shares her admiration for Garrison Keillor, "He's such a great writer. I've seriously laughed and cried till my sides ached at the same story."

Other books by Garrison Keillor include *Happy to Be Here* (1985), *Lake Wobegone Days* (1985) and *Leaving Home: A Collection of Lake Wobegone Stories* (1987). He is 55-years-old and married to violinist Jenny Lind Nilsson.

Song and Simons Study Variations In Gravity Field as Earthquake Predictor

By ERNIE TRETAKOFF

In trying to predict where earthquakes will occur, few people would think to look at Earth's gravity field. What does the force that causes objects to fall to the ground and the moon to orbit around the earth have to do with the unpredictable ground trembling of an earthquake?

Now, researchers at the California Institute of Technology have found that within subduction zones, the regions where one of the earth's plates slips below another, areas where the attraction due to gravity is relatively high are less likely to experience large earthquakes than areas where the gravitational force is relatively low.

The study, by Caltech graduate student Teh-Ru Alex Song and Associate Professor of Geophysics Mark Simons, appeared in the August 1 issue of the journal *Science*.

Until now, says Simons, researchers studying earthquake behavior generally took one of four approaches: 1) analyzing seismograms generated by earthquakes, 2) studying frictional properties of various types of rock in the laboratory or in the field, 3) measuring the slow accumulation of strain between earthquakes with survey techniques, and 4) large-scale dynamic models of earthquakes and tectonics.

Instead of using one of these approaches, Song and Simons considered variations in the gravity field as a predictor of seismic behavior. A gravity anomaly occurs when gravity is stronger or weaker than the regional average. For example, a mountain or an especially dense rock would tend to increase the nearby gravity field, creating a positive anomaly. Likewise, a valley would tend to create a negative anomaly.

Song and Simons examined existing data from satellite-derived observations of the gravity field in

subduction zones. Comparing variations in gravity along the trenches with earthquake data from two different catalogs going back 100 years, the team found that, within a given subduction zone, areas with negative gravity anomalies correlated with increased large earthquake activity. Areas with relatively high gravity anomalies experienced fewer large earthquakes. In addition, most of the energy released in earthquakes was in areas of low gravity.

The team looked at subduction zone earthquakes with magnitude greater than 7.5 since 1976. They found that of the total energy released in those earthquakes, 44 percent came from regions with the most strongly negative gravity anomalies, though these regions made up only 14 percent of the total area.

Song and Simons also compared the location of large earthquakes with the topography of the subduction zones, finding that areas of low topography (such as basins) also

corresponded well to areas with low gravity and high seismic activity.

So why would gravity and topography be related to seismic activity? One possible link is via the frictional behavior of the fault. When two plates rub up against each other, friction between the plates makes it harder for them to slide. If the friction is great enough, the plates will stick. Over long periods of time, as the stuck plates push against each other, they may deform, creating spatial variations in topography and gravity.

In addition to deforming the plates, friction causes stress to build up. When too much stress builds up, the plates will suddenly jump, releasing the strain in the sometimes violent shaking of an earthquake. If there were no friction between the plates, they would just slide right by each other smoothly, without bending or building up the strain that eventually results in earthquakes. So in subduction zones, areas under high stress are likely to

Continued on Page 7, Column 3



Courtesy of www.gps.caltech.edu/~simons

Associate Geology Professor Mark Simons carefully examines a lava flow as it cools.

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