

L. Tran/The California Tech

Segway inventor Dean Kamen and President David Baltimore discuss Kamen's campaign to interest high school students in the sciences by starting a robotics competition during their conversation Monday.

Segway Creator Explains Theories Of Student Motivation, Urban Movement

By ROBERT LI

On Monday, Caltech President David Baltimore hosted Segway inventor Dean Kamen for a conversation at Baxter Lecture Hall. Besides creating the Segway, Kamen has over 100 other inventions, mostly medically related, to his name.

Though he never graduated from college, he holds several honorary degrees. Among his other inventions are the Ibot, a human transporter that traverses stairs and can raise the user. He also developed a wearable helicopter.

Kamen is also the originator of the highly popular FIRST robotics competition. The conversation lasted 90 minutes and focused on two subjects: Kamen's involvement

with FIRST and his latest invention, the Segway.

In explaining his rationale for starting FIRST, Kamen discussed his views on the education crisis facing America. Unlike the prevailing view, Kamen believes that the problem facing education is as he put it, "not a supply issue but a demand issue".

Citing statistics showing that the American per capita spending on education is equal that of Germany and Japan combined, Kamen stated that we are failing to educate our children not because there aren't enough books or teachers but because there is a cultural barrier steering students away from wanting an education.

According to Kamen, "it's hard to believe a 17-year old can't read

or do basic math because he never had access to a book in his life". That 17-year old is failing, Kamen argues, because the media and the culture around him is telling him to spend his energies on becoming an NBA star or, failing that, flip burgers at McDonald's. In neither case would that 17-year old need an education.

To solve this demand problem, Kamen went to the boards of several large companies in 1993 and asked them to promote science and engineering education in schools.

Furthermore, Kamen said to the companies that he didn't want ineffective methods such as "putting a plastic model of a paramecium in the basement" or showing films of kids having "fun" doing science. Instead he wanted to emulate the same successful advertising methods that convinces millions of kids to "dribble a ball four hours a day" in the hope of getting into the NBA.

To do this, Kamen asked that the companies put in front of kids the

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BoC Stats Show no Rise In Honor Code Crimes

By DIANA LIN

The Board of Control (BoC) has recently compiled some statistics about cases the organization has handled over the past few years. Data shows that the number of convictions has stayed relatively constant.

It is important to note that these are not academic years, but term years for the BoC board which runs from the beginning of second term to the end first term the following year.

Specifically for the previous BoC secretary's term which ran from second term of 2001 to end of first term last year, there was a total of

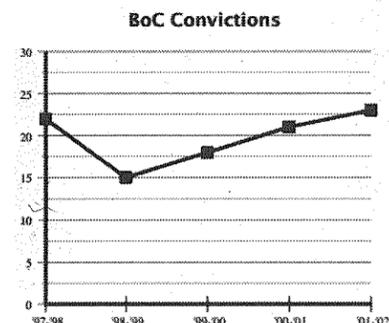
35 cases—24 convictions, of which the dean of students upheld 23, along with six cases dismissed by the chair and five by the board.

This is not a very true representation because often, reported cases will be dismissed without being recorded if the president and secretary investigate the situation and find no basis to suspect that misdemeanor has been committed.

The Honor Code runs at the very heart of the Caltech education system, so that it is very important to check up on how well both the faculty and student body are holding up to the Honor Code's lofty ideals.

The BoC has been taking diligent and forceful measures to pound the importance and consequences of the Honor Code into its each of its freshmen class. At orientation week at Astrocamp this year, pre-frosh spent a long hours discussing the honor code, the process for judging cases, and defining the gray lines between collaboration and cheating.

The freshmen class has been



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Author Entertains With Stories, Political Humor

By CHRISTINE CHANG

After an enthusiastic introduction, Al Franken strolled out onto the stage in a dark blazer and light blue button-down shirt, stopping in front of the wooden podium constructed in the middle of the stage. With a deadpan face, he casually leans against the podium and delivers his humorous take on a quotation by Secretary of the Defense Donald Rumsfeld.

The rest of the night continued the same way as Franken, interrupted various times by laughter and applause from the audience, discussed his liberal take on the Bush administration, Iraq and the upcoming election in Beckman Auditorium on October 22.

This former Saturday Night Live writer humorously jabbed at George W. Bush and the administration, beginning with the loss of 2.5 million jobs during Bush's years in office. "When he said he was against nation-building, I didn't know he meant only our nation," Franken said in his speech.

Franken then went on to discuss the rhetoric used by the Bush administration during the war on Iraq. Impersonating both Vice President Dick Cheney and a Pakistani cab driver, he joked about the original

name of Bush's plan, which was "Operation Infinite Justice," while still incorporating jokes about Bush's intelligence. "Satire is protected speech, even if the object of the satire does not get it."

From there, Franken discussed being sued by FOX Network. When he heard he was being sued by FOX for satirizing their motto of "Fair and Balanced," Franken said he was thrilled for the free advertisement of his book.

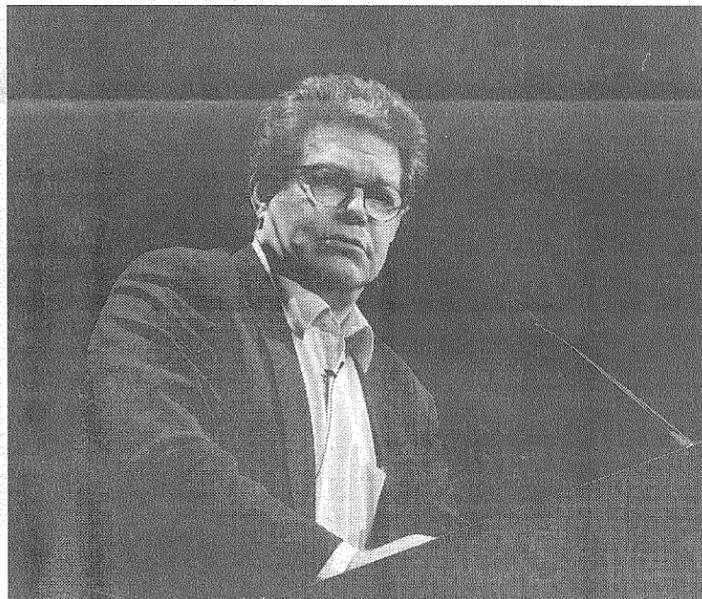
Cracking a smile for the first time during the night, he detailed how FOX was literally laughed out of the court and he comically created a new motto of "Wholly without Merit" for the network.

Ending his humorous anecdote, Franken continued by speaking about the myth of liberal bias in the media, around which his new book, *Liars and the Lying Liars Who Tell Them... A Fair and Balanced Look at the Right* is structured.

"[Talking about the liberal bias] is like asking if the problem with Al-Qaeda is using too much oil in their hummus," Franken said.

He pointed out that there is a strong, right-biased corner of the media with the agenda of supporting the Republican party. As ex-

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D. Kortal/The California Tech

Al Franken pauses during his address to an overflowing audience in Beckman Auditorium Wednesday.

Pasadena Approves Permits for Water Storage Tank, North Field Parking Lot

By K. SZWAYKOWSKA

In mid-November of this year, excavation will begin for a three-story underground parking structure that will be built underneath the North Field. The structure will hold up to 700 cars and is being put up in anticipation of a new Astrophysics building, which in turn will replace an existing parking lot.

Hopefully, the underground parking structure will also ease the tight parking situation in the south of the campus. The project to build the parking structure underneath the North Field is an amendment to a previous "master plan," according to which the parking structure would be built underneath the tennis courts.

This earlier version was abandoned, however. It included moving the tennis courts and the campus houses adjacent, in a domino-like effect which, according to Bradley Smith, one of the project man-

agers, would "have too much impact on our neighbors" and would be too expensive.

The new plan, by contrast, puts a big emphasis on having little effect on its surroundings. The parking structure will be completely under the North Field, except for two ramps which will give cars access inside and some openings to vent the first underground level.

Above-ground elevator buildings will have red tile roofs and stone bases and are designed with what Brad Smith describes as a "pavilion feel" that will fit aesthetically with the parklike surroundings.

The top of the parking structure will be channeled and sloped for water drainage which will allow the North Field to be replaced when construction is complete (the field is expected to be ready for use by the end of next year; the surrounding buildings will remain open throughout construction). Overall, the changes should be only mini-

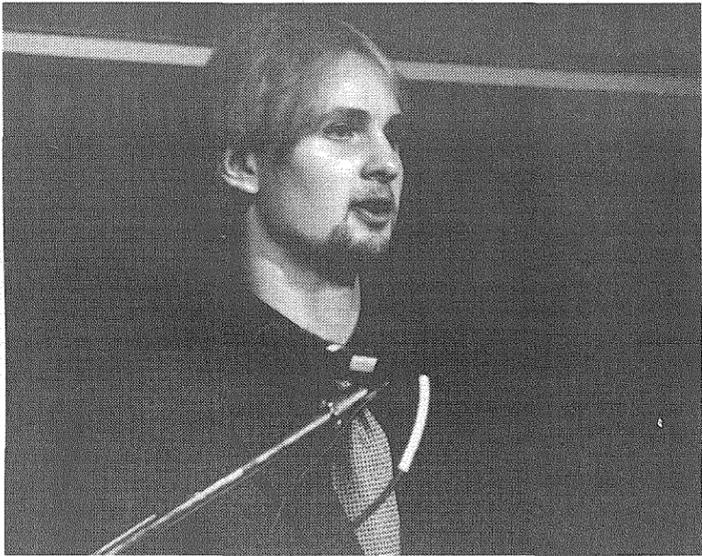
mally noticeable.

Changing the old plan has delayed construction of the structure. When a package of amendments to the original "master plan" was proposed to the city of Pasadena in January, different changes were stalled and it was not until the parking structure was proposed in a separate amendment plan that its construction was approved.

Now, all the permits except those for construction are ready, the project is currently in bidding to contractors and it is predicted that the structure will be complete in time for the beginning of the school-year next fall.

Together with the parking structure, a new thermal energy tank is being constructed underneath the North Field to provide the Caltech campus with cold water. It will be a large (50 feet deep, 100 in diameter) concrete structure supported from the inside by columns, where

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D. Korta/The California Tech
Board of Control Chairman Galen Loram has done extensive work this year to uphold the Honor Code.

BoC Talks Invoke Mixed Emotions From Freshmen

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responding to this week's BoC talks differently. Royal, a freshman, says she really likes the Honor Code and believes it is very informative the way the BoC has taken extra steps to make sure exactly what the rules are and have the guidelines explained.

Others, however, are sick of being lectured and intimidated. Some "feel insulted" by the BoC talks. "They make such a big deal about how much they trust us, but they don't." The Honor Code should be something naturally expected of students. Why should there be this false trust in the integrity of the students? ask some.

Some say there is a growing number of violations of the Honor Code and feel the quality of the community is going down, but BoC secretary, Harris Nover, does not agree.

"People generally have a pessimistic view," but the data says otherwise.

Generally, the number of cases investigated by the BoC goes up around the end of second and third term when students are really burnt out and feel like they are slipping under the tremendous workload that makes them sometimes just crash and break the Honor Code.

Students here may often times feel like a hamster on wheel, as problem sets and quizzes and exams deadlines roll by everyday without any end in sight. This may be a depressing image, but should make our individual goals all the more brighter, loft, and worthy of our efforts. But we cannot reach the stars if we do not have hearts, minds, and consciences of gold.

Kamen Predicts Replacement of City Cars, Cites Urbanization, Pollution

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science and engineering equivalents of a Michael Jordan; highly successful people that will inspire them to want an education.

With this in mind, Kamen came up with the FIRST robotics competition. In this competition, each company sponsors a school (preferably inner-city) and has its scientists and engineers work with kids in that school in a fun and challenging project.

This competition would not only be enjoyable for the kids but would expose them to the successful lives of the people they are with and create a demand for a science and engineering education.

Since its first year, FIRST has become more and more popular. Experiencing a 50% growth rate every year, FIRST changed from holding the contest in a high school gym with 28 teams in the first year to having 800 teams worldwide in 23 regionals and a championship to be held this year in the city of Atlanta. Last year, the championships were held at the Houston Astro-dome.

Switching topics to the Segway, Kamen described his motivations for making it and addressed some common concerns about the device.

According to Kamen, the Segway was born out of a desire to create a mobility device for disabled people that would allow them to travel around while standing up, a position that Kamen believed would be more "humane" and allow disabled people to integrate better with their environment.

Using solid state gyros (more sensitive than the inner ear) and computers to interpret the signals (faster

than the brain), Kamen and his team built a prototype of such a system.

When the prototype was built, Kamen began to think about wider uses for it. After doing some research, Kamen realized that more than half of the world's population now lives in cities and that in the next 20 years, the rate of urbanization, especially in Asia, will be such that the equivalent of a new Manhattan will be built every 6 weeks.

To Kamen, cars could not exist in such an urban environment. Out of place due to their size (85% of the real estate space in a city is devoted to cars) and their environmental impact, cars are totally unsuited to cities.

Furthermore, Kamen believes that cars dehumanize cities by reducing buildings to "pods of steel" that people shuttle between and that cars make cities unsafe because no one is walking the streets anymore. Kamen believes that a new form of urban transportation, namely the Segway, is suited to the urban cities of tomorrow.

Kamen then proceeded to talk about some of the criticisms that the Segway has drawn. On the issue of safety and in response to the San Francisco's banning of the Segway on sidewalks, Kamen humorously asked a rhetorical question: If cities ban a 250 lb. Segway traveling at 12 mph on a sidewalk then why don't they ban a 250 lb man from running at that speed?

On the issue of Segways making people exercise less, Kamen said that he is selling transportation and not exercise equipment. Of course riding a bicycle is better, Kamen says. It's faster, cheaper and you get exercise. However, 99% of the

people clearly aren't willing to ride bikes and don't want to walk either. Why not, then, give them a Segway instead of having them drive cars and polluting the environment?

Concluding his conversation, Kamen believes that the current dependence on the car is unsustainable in terms of both the environment and the infrastructure. Kamen says that in 20 years something will replace cars in cities. Whether that thing will be the Segway or something else he doesn't know. However, change is coming.

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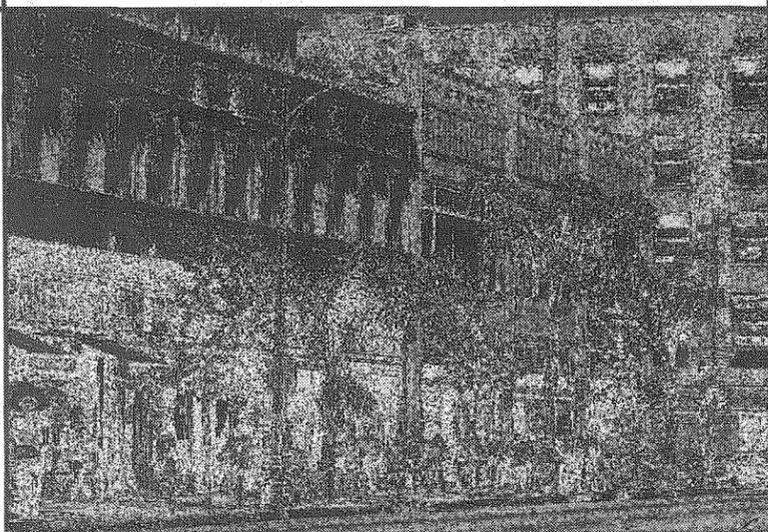
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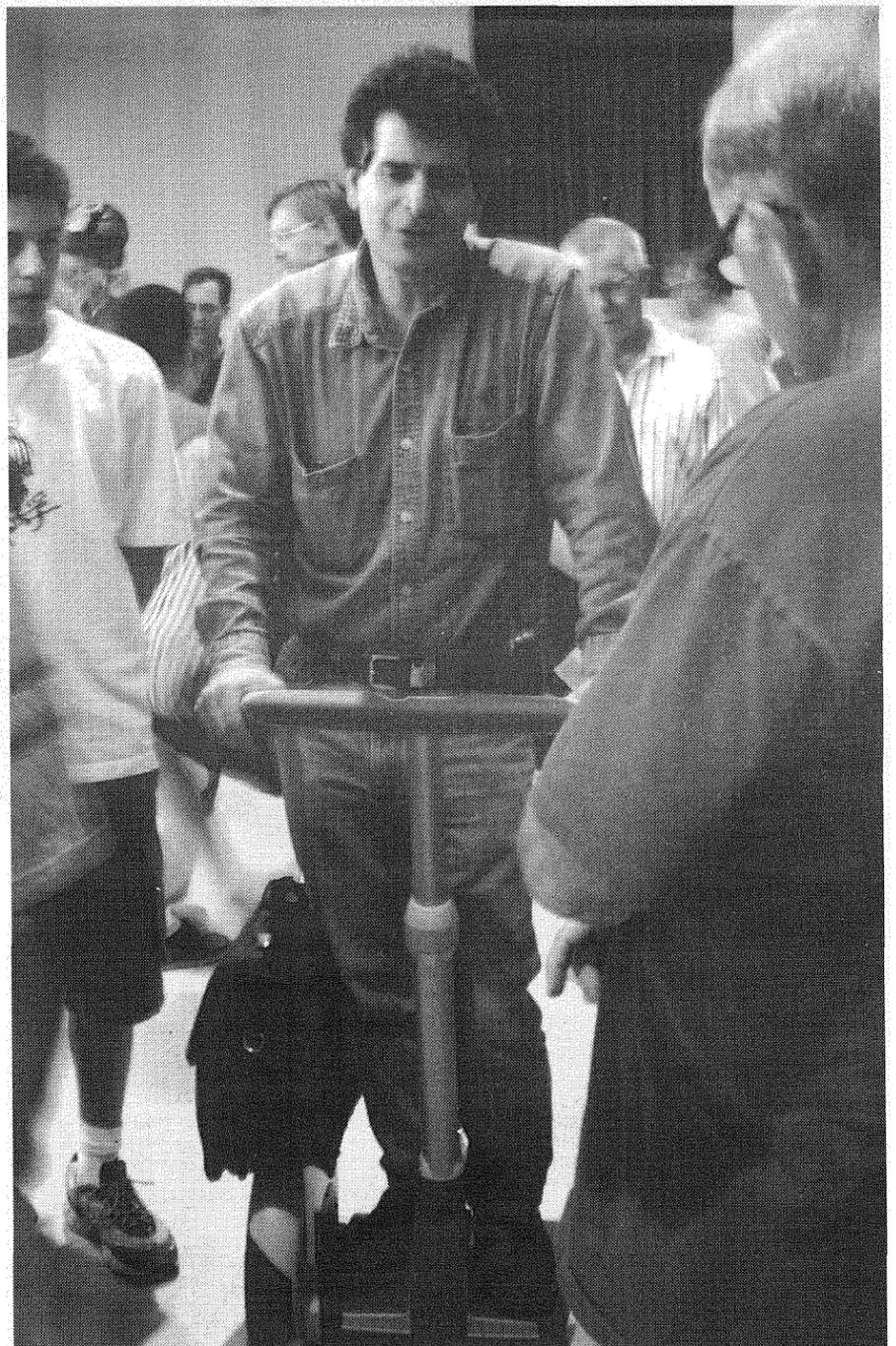
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Dean Kamen demonstrates the use of the Segway Human Transporter to some of the audience members that gathered to see him.

Caltech, Swine Flu and Phytoplankton

Student's Catalogue of Viruses, Good and Bad, Through History

By ROBERT LI

During President Baltimore's mini course in virology (Viruses, viruses, viruses in the Watson lecture series a couple of weeks ago,) the question arose about what viruses "are good for"?

One answer was that one good thing about viruses is that they are responsible for beautifully variegated flowers, including tulips. Their beauty had a great impact and led to economic bubble not unlike the one we have just lived through.

Tulips were brought to Holland in 1593 from that exotic place, Constantinople, via Vienna, by Professor Carolus Clusius, who grew them to investigate their use for medicinal purposes. His neighbors got pretty envious when they saw the gorgeous displays in his gardens and wanted some of the pretty posies for themselves, but the Prof refused to share.

They were for research only ...Of course what could not be obtained became ever more appealing, bulbs were stolen from the good (?) Professor and over the next 1/2 of a century tulips invaded the Netherlands.

The country caught a bad case of tulipomania. The trade in tulips became completely out of hand. Enormous sums were spent, fortunes were evaporated for the sake of tulip bulbs, for example "Semper Augustus" a variegated kind like those which were shown at the lecture.

I read on the web that another, only slightly less prized, tulip, a "Viceroy", was sold for "Two lasts of wheat, (a last is 2 wey I understand, although definitions varied that's reckoned as having meant about 2 tons, or 60 fotnal, or 80 bushels, or 640 gallons) four lasts of rye, four fat oxen, eight fat swine, twelve fat sheep, two hogsheads of wine [commonly, a hogshead = 63 gals.], four tuns of beer [commonly, a tun = 252 gals], two tuns of butter, one thousand lbs. of cheese, a complete bed, a suit of clothes and

a silver drinking-cup..." I don't know what a "Viceroy" tulip looked like, the pictures I found were kind of monochrome.

"Semper Augustus" on the other hand had blooms, white with flames of red...to my uneducated eye similar to what Dr. B showed during his talk (to see one, go google "semper augustus") .Tulip bulbs got to be traded on stock markets all over the country. Charles Mackay, LLD is quoted as saying in his 1840 book on "Extraordinary popular delusions and the madness of crowds" "people...rushed to the tulip marts, like flies around a honey-pot".

That bubble (I almost wrote bubble) burst in 1637 making rich those who had sold their bulbs in time. So what were the viruses good for? Increase the net beauty of our surroundings and so give pleasure to many, is to be weighed against the ruin of many a burgher.

Another way viruses intersect with money has to do with the fact they are responsible for causing many diseases. It is not unusual these days to fault pharmaceutical houses for making money at the expense of the sick and even the poor, by charging what seems to be exorbitant prices for the drugs which keep AIDS patients alive.

Now, that is serious business being the victim of AIDS. I can imagine wanting to take all possible precautions to avoid infection, you know, wearing condoms and having frank talks with one's partner. But if one gets infected I can see being eager to accept even a steep price (for those who can) to escape an altogether too certain fate.

But why spend money on the Flu, against which many of us were vaccinated last week? It is so common that we almost have lost fear from it. Why should it be that a disease which so often only causes a few days of discomfort, precipitate such massive inoculation campaigns?

The reason of course is that flu, like SARS, can be deadly. It kills some 20,000 people a year in the US alone in an average year. In

1918 however 20-40% of the world population became sick, half a million people died of the flu in the US and there were more than 20 million deaths world wide. Much, much worse than SARS, about which fears are more vivid. The reason we need to be vaccinated against flu each year is due to its biological peculiarities. It puts on a fresh coat each year and so each year our immune systems need time to conquer it anew.

The flu virus comes in 3 flavors, A,B and C, but regular outbreaks are due to the A type. A flu virus particle has 8 pieces of RNA as its genetic material, surrounded by a lipid membrane, from which two types of protein molecules stick out, some 500 molecules of "hemagglutinin" (so called because it causes red blood cells to stick to each other) and 100 molecules of neuraminidase (an enzyme the function of which we need not discuss here).

These two proteins being on the outside of the virus, are what our immune systems see, as they try to fend off the infection. Although in principle having the flu once should protect us for a long time (the immune system remembers a long time) we need a new shot each year. That's because there are 9 versions of the hemagglutinin named H1...9, although only 3 are in viruses which commonly affect people. There are 2 versions of neuraminidase (N1,2) that are found in viruses which infect people.

New combinations arise all the time by a reassortment, facilitated by the fact that N and H are encoded on a different piece of RNA. So for example a H3N1 virus has been isolated from a pig infected simultaneously by a Swine Flu virus (H1N1) and the so called Hong Kong virus (H3N2), which caused a pandemic (world wide epidemic) in 1968.

In addition, mutations in the H gene result in further variations: for example the H3 molecules which were in the 1968 Hong Kong strain,

differed by 18 aa from the original 4 years later. and by 29 aa 7 years later, giving the immune system something new to chew on.

New strains spread rapidly in places where people congregate and have significant economic impact through absenteeism. So labs around the world coordinate their effort in identifying what virus types are around and each year decide which are most likely to create havoc in the next season.

The divined mixture of A B and C is then inoculated into chicken eggs enough to produce some 8 million doses of virus, from which the actual vaccine containing "killed" virus, will be made. If they guessed right the inoculated persons will have made antibodies ahead of time, which will neutralize infectious virus when the individual is exposed. (if you care you can read much more at "cdc influenza".)

Intrinsically that's neither good nor bad, what does count is the "use" we make of things. The influenza, other viruses and other disease causing organisms, like those responsible for measles, tuberculosis, etc. paved the way for geopolitical changes, such as the conquest of Mexico by Cortes who was helped by smallpox to which the Aztecs had not been previously exposed to. That might have been wonderful for the Spaniards and the viruses, but of course the Aztecs would not see it that way. Worse yet of course was the practice we engaged in to hand out to American Indians blankets which had been used with smallpox patients.

It seems, not surprisingly, that what Viruses are good for, obviously depends on the uses we (and nature) put them to. But viruses may play other roles yet. It turns out that sea water contains 10-100 million virus particles, viruses which seem to attack Phytoplankton, the lowest rung in the ocean food chain.

Did it hurt? Mine did not badly at all. A small unpleasantness compared to the Oh I have the flu I am under the influence of euphemism for being sick with the flu...deal with the in-

fecting virus, if they guessed wrong, well....

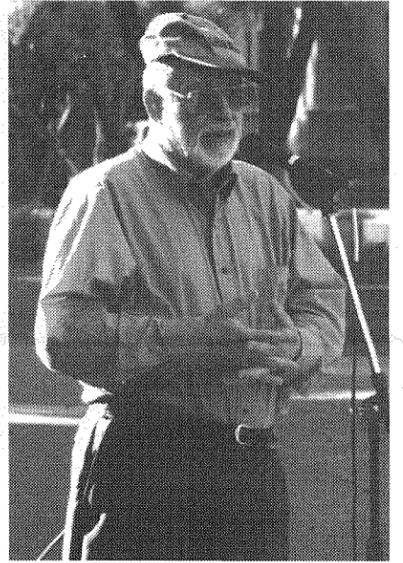
In 1976, there was a swine flu scare. That's because viruses recovered from some soldiers at Fort Dix were of the H1N1 type the same type that had caused the 1918 killer and a strain which had not been seen for many years, meaning that few people would be immune. There was an all out effort to protect as many people as possible, but luckily that virus did not spread.

So viruses are known by the type of H and N they display. The Spanish flu of 1918 mentioned above was of subtype H1N1.

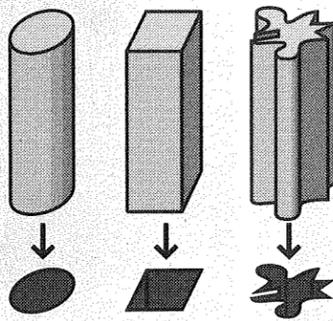
For the virus to invade a cell, the H molecule has to be split into 2 subunits and the cleaved H can then bind to cells and allows the virus to enter the cell where it multiplies and eventually bursts out, infecting more cells. The body's defense is to raise antibodies against the virus type it encounters.

Usually the virus is resytricted to the respiratory tract, because it has a protease that is very effective in splitting H. Influenza type A is a virus of birds, but it can also infect pigs, horses and people, which requires further effort in creating vaccines.

So there you have it; viruses' influence on human affairs. I hope you got your shots to protect you from the influence.



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Staking Middle Ground In House Murals Debate

By TOM FLETCHER

I thought I would start this week by relating to you a conversation a member of the ASCIT BoD (not me) had with two rather well-off alumni. It started cordially, but quickly focused on the subject of donating money for the student houses.

The two alumni love the school and would be willing to donate money to worthy projects, but do not feel that donating money to building new houses would be a wise investment. Their fears revolved around the houses being rapidly trashed and their money being wasted as beautiful new buildings were degraded into tenements.

As I mentioned last week, I don't think this is actually the case in the slightest. I'm confident in our ability to not destroy the houses, as we have not destroyed newer off-campus properties.

But we need to make them understand this. When asked if a written pledge from the house governments would suffice to allay concerns these concerns, the alumni (to my surprise) both said yes.

I am still a little unsure why they would put money behind a pledge that no one who will live in the houses would have signed, but they believe that our house cultures are strong enough that, once signed, respect for the pledge would continue on to future generations.

I've been thinking about how we structure such a pledge, to assuage the concerns of donors but still preserve our traditions. A simple "we won't break stuff" will not suffice, nor will it protect what we value.

Off the top of my head, there are a few sticking points that we should

address right off the bat that may need consultation with student affairs as this project progresses.

First, old alumni don't like murals. It's a harsh, blunt point. Things have changed, as have the house cultures, but their norms for behavior have not. As long as the walls are painted, they are not happy.

In a future house that they donate money for, I propose the following compromise. When the building is designed, certain walls are designated for containing murals. For example, as a new Rud-dock House is designed, the central stairwell will have an astronaut designated for it.

"Old alumni don't like murals. As long as the walls are painted, they are not happy."

Other spaces in the house, for preservation of old murals or future ones, will be similarly designated. Undesignated walls will not be okay to paint and will remain blank and Flemingsque forever.

I think this is a reasonable middle ground that acknowledges the artistic endeavors of students past and future, while still doing something to ensure that the wishes of the donors are respected.

Second, we need to find ways to preserve traditions that have previously damaged houses by designed the new houses such that this won't happen. If members of your house like to sit on the roof and overlook the courtyard, maybe theirs should

be a non-tile roof so that doing so does not mean destroying the roofing.

If your house likes throwing things on the roof, perhaps one part of the roof of the house could be built in such a way that it is not destroyed as a result of this. We can write these stipulations into a pledge. We consider some house activities very important to us and we would like the houses to be built with some regard for these and to be built robustly enough to hold up to them.

I hope your interest is piqued by this. Action can take place at either an interhouse level, or just within your own house. If you can get your house to sign on to such a pledge, maybe development can start raising money to rebuild your house first.

What it really comes down to is this: of the many fundraising items included in this campaign, the student houses are not the highest priority item. When you add the reluctance of donors to fund new houses, development just stops trying as hard as they might normally. The process to get us better living conditions has stalled. If we want new houses to live in anytime in the future, we will have to take the initiative.

Whom I Met With This Week

My meeting with Margo Marshak this week dealt with some of the topics above and the proposed campus center. I, along with Jeremy, met with committee that is working on gathering data on the campus center (that poll that was donut) to discuss what the poll showed us.

The committee will soon be releasing a table of the information so it can recommend options for the new campus center. A billiards, darts, arcade room may be featured!

I also met with Jane Curtis to discuss some of the ways to make life

on campus healthier. We could not devise any amazing solutions for sophomores except to be there for them, but we did look at ways to make the coffeehouse food healthier.

We are going to look into ways to add more vegetable options, like tempura or crunchy veggie platters, or maybe just a rice cooker. She will also be looking into ways to use a better cooking oil to make the food less greasy and how we can use spices to add flavor, so that we can cut down on the extensive use of fat (cheese, meat, grease) to make the food there tasty. Any input or suggestions can be directed to her.

Lastly, some students and myself were hosted by Cathy Jurca to have dinner with new faculty, to introduce them to Caltech undergraduates. I talked at length to two, Professors Kunicova and Schneider. They both seemed quite interested in student work and what we do here, as undergrads and when we graduate. I would like to welcome them both to campus and hope you get a chance to meet them and the

other new professors, soon.

Opportunities to Improve

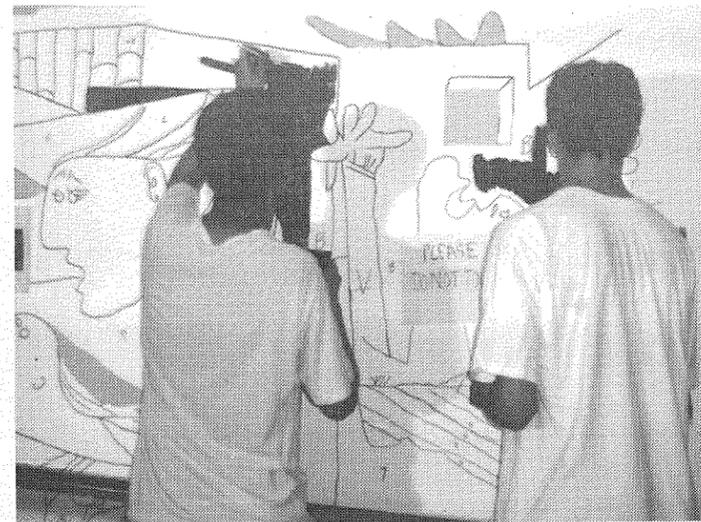
I've spent a long time already discussing the houses and I'm running out of space, but I do not want to stop saying some of these things. Why do a significantly larger fraction of Asian students move out of the houses? What component of the design of the housing system turns them off to the idea of living on campus so much?

When we start proposing new designs for the houses, it would be a shame if this silent almost-majority is excluded from the discussion. Are the doubles problematic? Co-ed bathrooms? Not enough kitchen space? House cultural norms like noise levels?

I do not know the answers to these questions, but it would help if we started to think about them as a student body. Peace out Caltech,

Tom Fletcher

P.S. Hope you enjoyed We Are Scientists! We are working on the next band.



Courtesy of L. Zhang

Juniors Libin Zhang and Abe Fetterman complete their mural, a replica of Picasso's *Guernica*, with painstaking attention to detail. Some students think that these murals should be preserved in new houses.

SATURDAY, NOVEMBER 1ST

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*Eligibility requirements exist. No purchase necessary. Oak Tree and Santa Anita Park reserve all rights. See official rules at Santa Anita Park.



A Night of Romanian Culture: "Back to My Roots" 6:30 PM - 9:30 PM, Baxter Lecture Hall. Through music, discussion, and written materials, the Association of Romanians at Caltech (ARCA) hopes to introduce the Caltech community to Romanian culture. There will be a concert, performed by a band of internationally acknowledged Romanian musicians, at 7 p.m., followed by a reception and informal discussion with the artists. Information: www.its.caltech.edu/~arca/events.html.

Caltech Ballroom Dance club invites you to join us to learn the popular, flashy, sexy **American Tango!** The series of four classes taught by professional instructor, Andre Fortin, begins on Nov 6 and runs on Thursdays (except Thanksgiving) until Dec 4. Time: 7:30 - 9:00 pm, Place: Winnett Lounge, Cost: Students- \$20 for series or \$6 / class and Nonstudents- \$28 for series or \$8 / class Refreshments will be served. No experience or partner necessary!

Try **Caltech Ballroom Dance** team classes in **International Style Quickstep!** These classes will focus on form and style, in addition to learning exciting new moves. While we welcome beginners in this competitive-style class, practice outside the class is strongly recommended. This series of four classes taught by professional instructor Andre Fortin begins on Nov 6 and runs on Thursdays (except Thanksgiving) until Dec 4. Time: 9:30 - 10:30 pm, Place: Winnett Lounge, Cost: \$3-\$6 / class depending on attendance. No experience or partner necessary!

On March 12 and 13, the Dance Troupe will present the first ever **Caltech Dance Show** presenting the dance talents of the Caltech community. We are eager for a wide variety of dance styles; so, auditions will be open to all members of the community.

The first part of the process will consist of a written proposal. Choreographers will submit information describing their

intended piece's music, theme, style (country of origin if applicable), and staging (likely number of dancers, lighting concepts, etc). The point of the proposals is to get people to start working on their dance pieces. Proposals will be due on November 17 and are available at <http://troupe.caltech.edu>.

There will be an audition in early Winter quarter where the dancers for each piece will perform; costumes will not be required at this stage. For more information, contact Robin Deis (deis@its.caltech.edu). More details will be provided as the year progresses. We look forward to giving Caltech a chance to showcase its dancing talent.

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!

Caltech is offering **Guitar Classes** for the fall term on Tuesdays starting October 7. Beginning 4:30-5:30 p.m., In-

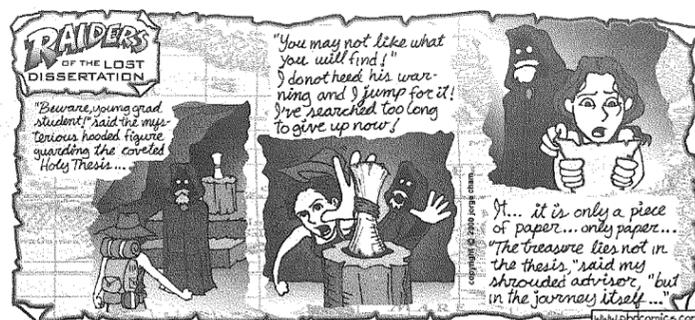
termediate 3:00-4:00 p.m., Advanced 5:30-6:30 p.m. in the Student Activities Center (SAC) Room 1. Classes are free to Caltech students, and staff is space permits. The instructor is Darryl Denning. For more information, contact him at ddenning@caltech.edu or x. 2923.

Scholarships:

The Financial Aid Office has applications and/or information on the following as well as additional undergraduate scholarships. All qualified students are encouraged to apply. Our office is located in the Center for Student Services M/C 110-87.

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, \$1,000 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; be a U.S. citizen; be able to attend the Measurement Science Conference on January 16, 2004 in Anaheim. Submit an application before November 28, 2003. Applications are available in the Financial Aid Office.

The Air Force Reserve Officer Training Corps (AFROTC) offers 2 year to 3.5 year scholarships in all majors. The scholarships are generally capped at \$15,000 per academic 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/.



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He's Still Got It: Tarantino Delivers Winner in Kill Bill

By HARRISON STEIN

Very few directors could have gotten away with *Kill Bill*. The film is intensely violent, thin on plot and frequently preposterous. In addition, the original picture was so long (reportedly more than three hours) that it had to be chopped into two, a cheap marketing ploy to double Miramax's revenue.

Fortunately, Quentin Tarantino is the perfect director for this bizarre material and *Kill Bill Volume One* is about as clever, entertaining and stylish a movie you'll see this year.

For the non-movie buffs, Quentin Tarantino is a very meticulous director who releases a movie about once every five years. He struck gold in 1994 with *Pulp Fiction*, a deliciously intelligent crime film that also had one of the premiere screenplays of our time.

The amazing thing about *Kill Bill* is that it succeeds despite having none of Tarantino's patented witty dialogue. Whereas *Pulp Fiction*'s script made it an instant classic (who could forget John Travolta and Samuel L. Jackson discussing how the Quarter Pounder is called a "Royale with Cheese" in a Paris McDonalds), *Kill Bill* breezes through its ninety-minute runtime by relying on ostentatious battle scenes and a captivating plot.

The story begins with a shot of "The Bride" (Uma Thurman), bloodied and beaten in her bridal dress. Soon thereafter, a terrifying figure wipes the blood off her face with a napkin that displays the ominous word "Bill", before firing a bullet into her skull.

We later learn that The Bride (her real name is never revealed) was a member of the Deadly Viper Assassination Squad, led by Bill (his face isn't shown in Volume One, but we know the actor is David Carradine), until she left to get married and raise a family.

However, for some reason, Bill and four of his Assassination Squad cronies decide to ambush her wedding, leaving the whole party for dead, including her husband and, presumably, her unborn child.

Amazingly, The Bride wakes up four years later and decides to exact revenge on the remaining members of the Assassination Squad, starting with O-Ren Ishii (Lucy Liu) and Vernita Green (Vivica A. Fox). The other three members of Deadly Viper, including Bill, are left for Volume Two.

The chronology of this film is completely distorted, as we see the Bride kill Vernita in the movie's second scene, which is also the last event in the timeline. The battle is very humorous because it occurs in Vernita's house and when her daughter returns from school, the two combatants hide their knives

behind their backs.

Tarantino could have made a very typical revenge movie, but instead creates an homage to a number of film genres, including samurai and anime. In fact, the most peculiar scene of a most peculiar movie is a 15-20 minute interlude about O-Ren Ishii's rise to power, completely in anime.

Due to its subject matter, this scene likely would have landed on the cutting room floor if it weren't animated, but I found it simply mind-boggling. Tarantino is not a professional animator, but he flaunts his fantastic knowledge of film by creating this sequence.

No, *Kill Bill* is not a perfect film.

The acting is rather thin as Uma Thurman's character is one-dimensional, Lucy Liu seems rather bored and Vivica A. Fox has about ten minutes of screen time.

Despite the big-name cast, this is Quentin Tarantino's film and you can tell he loved filming every second of it. The violence is very gratuitous and there's a scene where eighty-eight people are slain, but it's all very fun and expertly filmed. Still, this movie is not for the weak at heart.

It's impossible to give this picture a complete grade, since it's only half-finished. It ends on a cliffhanger that is exciting but contrived. However, for all its faults, I guarantee that *Kill Bill Volume One* is a fun experience and after ninety minutes of non-stop, action galore, you will be clamoring to see Volume Two.

*** 1/2 of ****

Rebuilding the Caltech Community Beating Defeatism: Communication Central to Systemic Repair

By ALEX SHIM

There is a very interesting phenomenon that occurs at Caltech. Every year, students come in as highly enthusiastic, motivated people who are energetic about their social life and classes.

Then something, possibly the workload, possibly the social atmosphere, starts to chip away at their motivation, wear away their enthusiasm, until what is left is the traditional, jaded Techer.

The most terrible part is the most important lesson that Caltech ingrains into us, that we are helpless to change anything. Moreover, if we are annoyed yet powerless to change anything, we are left in this lamentable state of unhappiness mixed with a certain apathy towards anything that might remedy any grievances we might have. The consequence is that most of us dwell in inaction, wanting more out of life, but unable to overcome this vast wall of hopelessness.

In fact, not only do we believe ourselves incapable of overcoming this barrier, as in institution we barely conceive of trying to free ourselves from our circumstances.

Consequently, given that Caltech is a relatively small university, we cannot afford to have so many people not doing anything. The very idea behind Caltech education is having a small institution of the brightest, most interested students in the nation interacting with the most exceptional science and technology faculty in the world.

I came here because Caltech has a 3 to 1 student faculty ratio and, according to *U.S. News and World Report*, it allocates more funds to education and research than any other college. I came here because we are supposed to have some sort of student culture, of students working hard and then finding the time

to live during their few hours of spare time. I came here because it seemed like the institution cared about it students.

Apparently, I made a few misleading assumptions. Yet I see no reason why it cannot be such a place; in fact, it seems that many years ago, it was such a place. The workload has not changed in the past fifty years: people used to take a more hands on approach to their education, people used to go off campus more and people used to go out and have fun.

"The truth is, times were better because people made them better. Those times could be now."

I spoke with an alumnus, class of 1990, who told me how much he enjoyed being at Caltech. He would complete his take home examinations at the beach with his friends and then watch the sun set. In comparison, today I have seen people graduate without really going off campus and without getting anything out of their classes.

Why is there such a difference? Simply put, it is this self-defeating attitude that has been thoroughly conditioned into all of us. We do not have to sit in our rooms attempting to repress any thoughts of how life could be better. We came into Caltech much more enthusiastic in pursuit of our goals, but we need not lose that motivation.

Caltech should be the place that we students want it to be; it should be giving us the education and college experience that we desire. It is this effort to further our aims that builds and reinforces a community,

Letters: Fletcher Idiotic, Wettengel Remembered

The Fatuous Fletcher

Dear editor,

I am writing this letter to point out a truth that is inherently obvious to many people around campus: Tom Fletcher is an idiot. Furthermore, he is an arrogant, self-absorbed human being that, contrary to his own inflated opinion, has little to no real leadership ability.

His weekly "fireside chats" neither inspire nor inform, and provide little more than something to ridicule every week in the *Tech*. Every time I read his column I wish for a dull number two pencil to jab into my eye while screaming "You can

be the president, just shut up! Shut up!"

That would be less painful than reading poorly thought out articles about Asian ghettos and trashed houses. And yet, there is hope. In less than two terms Tom Fletcher will no longer be ASCIT president, and with any luck we won't have to listen to him anymore.

Joe Wasem '05

Farewell to Food Maven

Dear editor,

This past Friday, October 24th, was Melissa Wettengel's last day as the Caltech Dining Services (CDS) Student Board Program Manager. While I wish Melissa all the best in the future, I will miss working with her on the IHC Food Committee.

In the past two and a half years that I served on the food committee, she has only missed two or three meetings (quite a feat considering we meet every week!) and has done a remarkable job listening to students and consequently working on improving the board program.

She is one of the few I know who does not delay in responding to emails and addressed problems and concerns as soon as they come up. I would like to thank her for the work she has done.

Melissa's departure was announced very shortly before the fact; I am concerned that the lack of preparation for the transition will hurt students. It is very hard to fill the shoes of the person who ran the board program overnight; I hope that CDS will step up to the task.

Most of all, I hope that when it is all said and done, CDS will maintain open lines of communication with students and the food committee and that Melissa's efforts to work with students and listen to what they have to say will be matched.

Natalia Deligne '05
IHC Food Committee Chairman

If you are a grad student who needs help polishing a thesis, call me:
Ex-JPL tech writer/editor
Jonie St. Henri
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Electromagnetic Radiation Detector Exploits Superconductor Properties

By MARK WHEELER

PASADENA, Calif.—A new and improved way to measure light has been unveiled by physicists at the California Institute of Technology and the Jet Propulsion Laboratory.

The technology exploits the strange but predictable characteristics of superconductivity and has a number of properties that should lead to uses in a variety of fields, from medicine to astrophysics.

Reporting in the October 23 issue of *Nature*, Caltech physicist Jonas Zmuidzinas and his JPL colleagues outline the specifications of their superconducting detector. The device is cleverly designed to sidestep certain limitations imposed by nature to allow for very subtle and precise measurements of electromagnetic radiation, which includes visible light, radio signals, X-rays and gamma rays, as well as infrared and ultraviolet frequencies.

At the heart of the detector is a strip of material that is cooled to such a low temperature that electrical current flows unimpeded—in other words, a superconductor.

Scientists have known for some time that superconductors function as they do because of electrons in the material being linked together as “Cooper pairs” with a binding energy just right to allow current to flow with no resistance.

If the material is heated above a certain temperature, the Cooper pairs are torn apart by thermal fluctuations and the result is electrical resistance.

Zmuidzinas and his colleagues have designed their device to register the slight changes that occur when an incoming photon—the basic unit of electromagnetic radiation—interacts with the material and

affects the Cooper pairs.

The device can be made sensitive enough to detect individual photons, as well as their wavelengths (or color). However, a steady current run through the superconducting material is not useful for measuring light, so the researchers have also figured out a way to measure the slight changes in the superconductor's properties caused by the breaking of Cooper pairs.

By applying a high-frequency microwave field of about 10 gigahertz, a slight lag in the response due to the Cooper pairs can be measured. In fact, the individual frequencies of the photons can be measured very accurately with this method, which should provide a significant benefit to astrophysicists, as well as researchers in a number of other fields, Zmuidzinas says.

“In astrophysics, this will give you lots more information from every photon you detect,” he explains. “There are single-pixel detectors in existence that have similar sensitivity, but our new detector allows for much bigger arrays, potentially with thousands of pixels.”

Such detectors could provide a very accurate means of measuring the fine details of the cosmic microwave background radiation (CMB). The CMB is the relic of the intense light that filled the early universe, detectable today as an almost uniform glow of microwave radiation coming from all directions.

Measurements of the CMB are of tremendous interest in cosmology today because of extremely faint variations in the intensity of the radiation that form an intricate pattern over the entire sky.

These patterns provide a unique image of the universe as it existed

just 300 thousand years after the Big Bang, long before the first galaxies or stars formed. The intensity variations are so faint, however, that it has required decades of effort to develop detectors capable of mapping them.

It was not until 1992 that the first hints of the patterns imprinted in the CMB by structure in the early universe were detected by the COBE satellite. In 2000, using new detectors developed at Caltech and JPL, the BOOMERANG experiment led by Caltech physicist Andrew Lange produced the first resolved images of these patterns.

Other experiments, most notably the Cosmic Background Imager of Caltech astronomer Tony Readhead, have confirmed and extended these results to even higher resolution. The images obtained by

these experiments have largely convinced the cosmology research community that the universe is geometrically flat and that the theory of rapid inflation proposed by MIT physicist Alan Guth is a reality.

Further progress will help provide even more detailed images of the CMB—ideally, so detailed that individual fluctuations could be matched to primordial galaxies—as well as other information, including empirical evidence to determine whether the CMB is polarized.

The new detector invented by Zmuidzinas and Henry G. LeDuc, a co-author of the paper, could be the breakthrough needed for the new generation of technology to study the CMB.

In addition, the new superconducting detector could be used to scan the universe for dark matter and in X-ray astronomy for better analysis of black holes and other highly energetic phenomena, in medical scanning, in environmental science and even in archaeology.

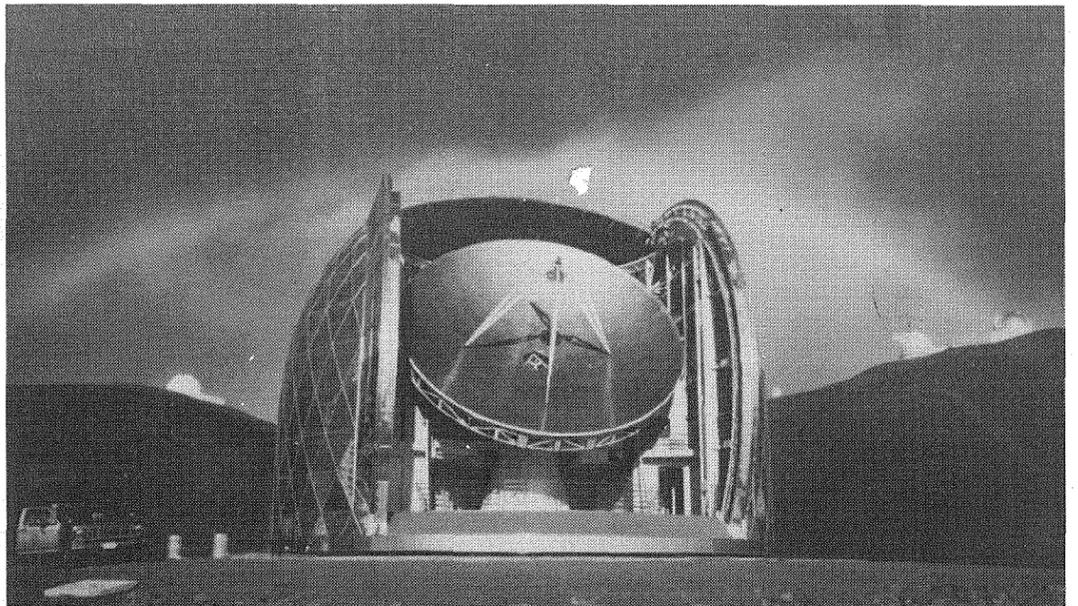
Other Caltech faculty are begin-

ning to investigate these additional applications for the new detector. Assistant professor of physics Sunil Golwala is targeting dark-matter detection, while associate professor of physics and astronomy Fiona Harrison is pursuing X-ray astronomy applications.

The lead author of the paper is Peter Day, who earned his doctorate at Caltech under the direction of condensed-matter physicist David Goodstein and is now a researcher at JPL.

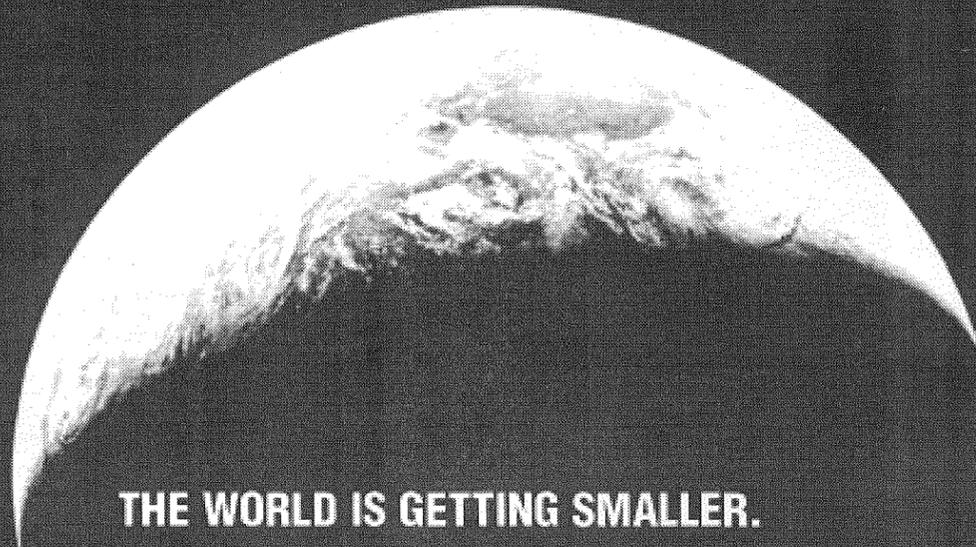
In addition to LeDuc, also a researcher at JPL and leader of the JPL superconducting device group, the other authors are Ben Mazin and Anastasios Vayonakis, both Caltech graduate students working in Zmuidzinas's lab.

The work has been supported in part by NASA's Aerospace Technology Enterprise, the JPL Director's Research and Development Fund, the Caltech President's Fund and Caltech trustee Alex Lidow.



Courtesy of www.submm.caltech.edu

Jonas Zmuidzinas, one of the head researchers on the detector project, does much of his work at the Submillimeter Observatory on Mauna Kea.



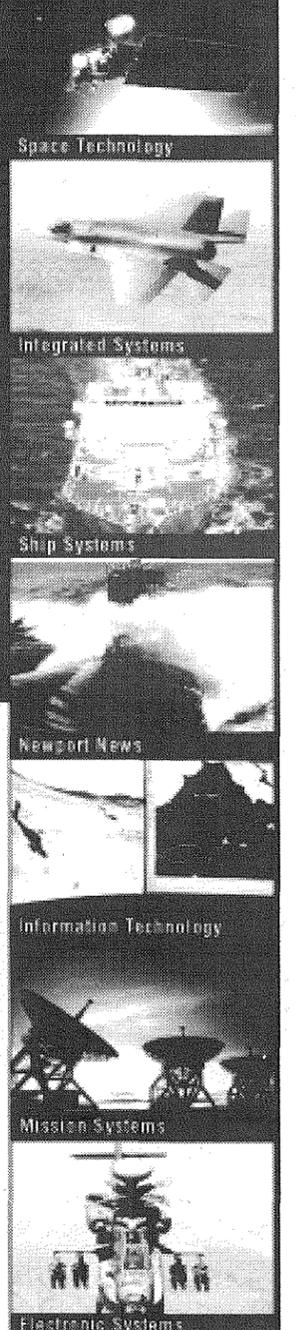
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Franken Criticizes Bush, Right-wing Accusations

Continued from Page 1, Column 5

amples, he cited the Wall Street Journal, among others.

Furthermore, Franken mentioned the accusation of the conservatives that the Clinton administration did not pay enough attention of finding Osama Bin-Laden. He responded to this by saying that, until 9/11, the Bush administration ignored Laden, thinking that Clinton worried about him too much.

Franken ended his speech with a call to action for the liberals. "There is a tide turning," he said, describing how, everywhere he went to speak, he drew crowds like the filled auditorium that night. He urged everybody to give money or organize for the liberal party.

"These guys [the conservatives] got the money and we have to go after them - in a nice way," said Franken.

After he finished speaking, Franken answered question from the audience about various issues ranging from Michael Moore to Bush's strengths. "I'm still mad at him [Michael Moore] for supporting Nader," Franken said after praising Moore's work.

Franken also criticized Bush's handling of the nation after 9/11, stating that the President did not seize the opportunity to unify the nation, but instead used the outburst of patriotism for his own gain. He cited how the administration cut taxes, failing to support programs which Bush said he would support and leading to deficits.

"Can you imagine what President Gore could have done? Takes your breath away," said Franken.

Quickly switching attitudes, Franken then went on to praise Howard Dean and the way the presidential candidate tapped into anger and raised money on the internet.

When asked, however, who he supported among the current candidates for the Democratic nomina-

tion, Franken stated that he liked Dean, John Kerry and Richard Gephardt, as well as others. He said that he thought five people in the race could beat Bush and he was not ready to endorse anybody at the moment.

Franken then condemned the mainstream media for not standing up against the attacks by the public and the right-wing media about having a liberal bias. "They're just scared. I don't get it," he said. "So what? Just do your job."

Then, one member of the audience asked Franken what he thought the Bush's strengths were. Franken, after a moment of thought, mentioned that Bush had stopped drinking, that he engendered loyalty and that he was clean.

Furthermore, Franken also said that people responded to him as if he was a "normal fella from a normal background," but continued by saying that he did not think of him like that.

Throughout his talk, Franken's words had been punctuated by audience laughter, applause and agreement. The audience responded positively to his words and viewpoints, as well as praising his new book.

"His book is really a message for the media. They really need to start doing their homework. I hope every columnist reads his book," said audience member Dijuna Copley-Woods.

Other audience members also felt that Franken had a valuable message to deliver. "[His speech] was great, sorely needed in an environment where right-wing media blankets everything that comes out," audience member Stewart Lozano said.

Franken has also written best-sellers such as *Rush Limbaugh is a Big Fat Idiot and Other Observations* and *I'm Good Enough, I'm Smart Enough, and Doggone It, People Like Me!!* among many others.

Activist Alumnus Returns to Oppose American Militarism, Iraq Occupation

Militarism Meets 'Globalization' in Address on Foreign Policy



D. Korta/The California Tech

Rahul Mahajan received his B.A. in Mathematics from Caltech in 1992 and his Ph.D from the University of Texas in Austin last year. As an activist since 1994, he's authored over 50 articles and editorials, as well as two books. Mahajan has also served in the leadership of several activism organizations, including the National Network to end war in Iraq. He was invited to Caltech as part of the Social Activism Speaker Series.

He was a Fellow at Harvard's Kennedy School of Government at the Shorenstein Center on the Press, Politics and Public Policy in 2003. His talk was sponsored by the Caltech Committee on Institute Programs in conjunction with Vroman's Bookstore.

This is the first of a series of speeches called "Voices of Vision," in which Caltech will bring speakers with innovative perspectives to speak to the community.

After Completion, Small Changes to Mark Fields

Continued from Page 1, Column 5

5.2 million gallons of water chilled during the night will be stored for use during the day.

It is expected that this will lower the cost of cooling water for use on the campus, as it will be chilled more efficiently during the night, when electricity use is generally lower and can be stored in the tank at a low temperature to be used during the day.

Because cold water becomes an especially important concern during the hot summer months, the thermal energy tank is expected to be completed before the parking structure; it should be ready for use before the summer begins.

Together with the construction of the new parking structure and thermal energy tank, one can expect to see some minor landscaping changes around the campus. Trees in the area that will be affected by the excavation will be replanted in different locations. Traffic signals on California Avenue will be improved to compensate for the changes in traffic resulting from the construction of the large parking structure.

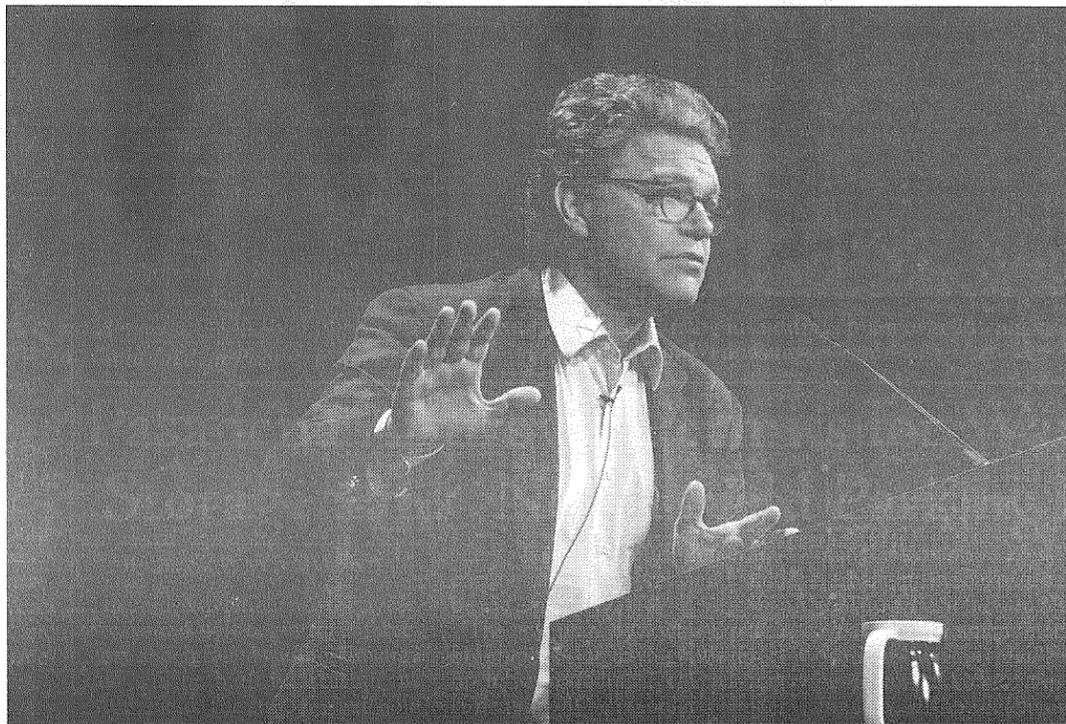
Once the North Field is replaced, the baseball diamond will be put in a new corner of the field, so that players will be able to practice without sun shining in their eyes.

Unfortunately, this also means that a backstop will be put on the side of the field along Braun Athletic Center and it will no longer be possible to take a shortcut across the field to get to the gym. Brad Smith assures us, however, that the backstop will be as nice-looking as possible to make up for this inconvenience.

The cost of the projects is estimated at \$17 million for the parking structure and \$6 million for the thermal tank; the funds are provided by a bond issue done by the Institute last year. Soon, then, the North Field will be nothing but a hole in the ground.

Question of the Week

Do you think the new structure will solve the parking problem?



D. Korta/The California Tech

Responding to a question from the audience, Franken abstains from supporting one of the Democratic Presidential candidates, but remains optimistic that several could oust Bush.

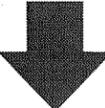
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