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# THE CALIFORNIA TECH

VOLUME XCVIII, NUMBER 14

PASADENA, CALIFORNIA

FRIDAY, JANUARY 24, 1997

## Caltech astronomers take infrared pictures of a black hole

BY CALTECH MEDIA RELATIONS

Sophisticated imaging techniques applied on the Keck Telescope have uncovered a new structure in a nearby active galaxy.

The image and associated research are being presented today at the semi-annual meeting of the American Astronomical Society. Alycia Weinberger, a doctoral student in physics at the California Institute of Technology, and her collaborators have used the computer-intensive technique of speckle imaging and the 10-meter W. M. Keck Telescope atop Mauna Kea, Hawaii, to image the nucleus of NGC 1068.

This galaxy, found in the constellation Cetus at a distance of about 50 million light years, reveals a bright active nucleus at infrared wavelengths.

This nucleus has long been thought to harbor a black hole as its central engine and, because it is bright and nearby, has been intensely studied by astrophysicists.

The accompanying false color image shows an elongated structure, which is over 100 light-years across, centered on a bright point-like infrared nucleus. In contrast, the bright disk of the galaxy NGC 1068 is over 30,000 light-years across at visual wavelengths.

Made at a wavelength of 2.2 microns, Weinberger's near-infrared image has the capability to reveal structures which are only 12 light years across. This is an extremely small distance by galactic standards, as small as about three times the distance between the Sun and its nearest stellar neighbors. Although taken from a ground based

observatory, this image has resolution as fine as what the Hubble Space Telescope achieves in the visual part of the spectrum.

The space telescope does not currently have an infrared camera, but is scheduled to receive one in 1997. The elongated feature discovered by the Caltech group has not been seen in Hubble's optical images.

There are two very interesting aspects of this image. First, the image is elongated, and second the axis of the emission points in a different direction than previously observed visual emission. The near-infrared light used to make this picture typically traces the distribution of hot dust and cool stars.

However, in NGC 1068, it is very unlikely that there could be dust 100 light-years from the central black hole which would be hot enough to produce

the observed emission. Rather, Weinberger says, it is likely that the observed extended near-infrared light is from stars. Furthermore, since it points in a different direction, this newly resolved infrared emission is likely to come from an entirely different source than previously observed visual emission.

It has long been proposed that stellar bars are a way of funneling material to an active nucleus. As gas moves in a non-circular distribution of stars, such as what may be seen in Weinberger's image, it is forced into orbits likely to take it near the central black hole. This provides a continuous mechanism for "feeding" the central engine.

"The significance of this research is that it finds a brand-new feature in

SEE BLACK ON PAGE 2

## Career and Funding Trends in Science and Engineering

BY SAMSON TIMONER

About 140 people came to the first meeting of E100, "Entrepreneurial Development", a new course started by Professor John Baldeschwieler. While the phenomenally high attendance has since dropped off to around 100 people, it is still one of the most popular optional courses at Caltech. Perhaps even more astonishing than the attendance is the fact that it is attracting both undergraduates and graduates in almost every division at Caltech including physics, electrical engineering, biology and chemistry.

The fact that this course attracts so many people from such a wide background suggests a new trend in student interests. Why are so many people interested in entrepreneurship? Also, starting a new course requires vast amounts of effort. What is driving Dr. Baldeschwieler to make such an effort?

To answer these questions, I interviewed Professor Baldeschwieler. He believes that fundamental changes in the job market for scientists and fundamental changes in the availability of funding for basic research have taken place. These changes are driving an era of small high-tech busi-



PHOTO BY ROBERT PAZ

Baldeschwieler grins over success of E100.

nesses. Here are some excerpts from that interview:

**Q:** Starting a new class is a huge amount of work. Why were you willing to make the effort?

**A:** For a number of years, it has been apparent to me that the career opportunities for graduates from the top US technical universities have changed a lot. A decade ago, I would bet we placed more than half of our Ph.D. graduates into academic jobs and probably more than half of our Caltech undergraduates into graduate programs leading to Ph.D.'s, with the expectation that they would be going into university teaching and

research. The situation has changed a lot. Those jobs are much more difficult to find. There is a large pipe-line of people that are in various, agonizing holding patterns. These people are often in recurring post-doctoral fellowship positions — sometimes two, three, or four post docs — they may be well into their thirties before they finally settle on something. For those that do get an academic position, finding research funding is agonizing. The expectations that they would be able to carry on ba-

SEE E100 ON PAGE 7

## On Pins and Needles

BY MYFANWY CALLAHAN

As part of Wellness Week, Yvonne Farrell, from Emperor's College of Traditional Oriental Medicine, gave a brief explanation of acupuncture and herbalism.

Since the early seventies when an American journalist came back from China raving about the effects of acupuncture, respect for this style of medicine has been growing in the United States. Many swear by the results they get from being pricked by needles and drinking special teas.

Traditional medicine of this sort has been practiced in China for over two thousand years. Although it may be a new phenomenon in the United States, the methods have withstood the trial of time in their home country. Whereas Western doctors are trained to think of medicine in a very compartmentalized and scientific fashion, Chinese doctors adopt a holistic approach.

The woes for which we turn to a doctor, a psychiatrist, or a religious leader, all are treated by the same system in China. This medicine focuses on maintaining a balance in the body, and can correct small imbalances before they result in a full-fledged disease.

Traditional medicine is not desirable in some cases such as appendicitis or orthopedic surgery, but it can be extremely helpful in conjunction with Western science. Western doctors can perform sur-

gery with their best technology, while Chinese doctors assist the patient in a speedy recovery and proper healing. A cancer patient may go to the best hospital in the area for chemotherapy, then turn to an herbalist to reduce the side effects of the treatment. In many cases, the best results are obtained when Oriental and Western medicine work in conjunction with each other.

SEE WELLNESS ON PAGE 2

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# The Outside World

by Myfanwy Callahan

**KHARTOUM, SUDAN -** A rebel offensive began two weeks ago in an effort to destroy the Sudan's Islamic regime, long criticized by the U.S. for supporting terrorism. The rebels now claim that they have killed hundreds of government troops and pushed to within 40 miles of a key hydro-electric plant.

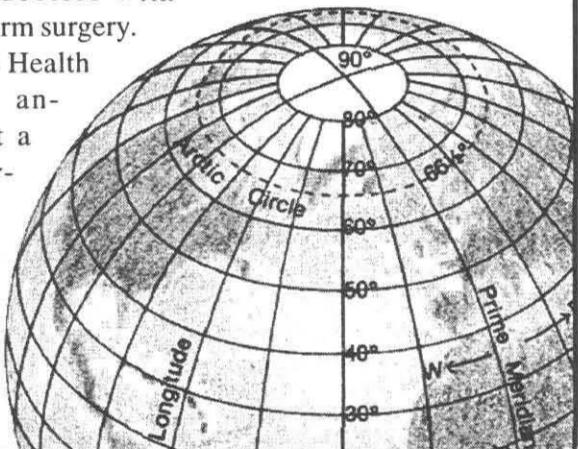
**LIMA, PERU -** Twenty Tupac Amaru rebels still hold hostages inside the Japanese Ambassador's residence in Peru. Tuesday, police threw stones and bottles at the residence and dumped garbage on the lawn to taunt the terrorists, but they made no response.

**PARIS, FRANCE -** The French Order of Doctors now strongly recommends that doctors with HIV not perform surgery. Last week the Health Ministry announced that a French surgeon had inadvertently infected his patient with HIV. HIV-positive doctors

could continue in general practice or administrative duties.

**WARSAW, POLAND -** Poland is turning its military over to civilian control in order to meet the conditions to join NATO. However, the commanding general, Gen. Tadeusz Wilecki, is resisting this reduction of his authority. The military will now report directly to the Defense Minister.

**WASHINGTON, D.C. -** The House ethics committee concluded its investigation into Rep. Newt Gingrich's unethical use of charity money to promote Republican support. A vote of 395-28 overwhelmingly decided to fine Gingrich \$300,000 for the offense.



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**Sky Dayton**

Founder of EarthLink Network

Sky Dayton founded EarthLink in 1994, at age 23. He also cofounded Cafe Mocha, a popular Melrose Avenue coffeehouse, and Dayton Walker Design, a high-tech computer-based advertising design company in Studio City, California. EarthLink Network is a nationwide Internet service provider specializing in fast, simple and direct Internet access for individuals and businesses.

**Thursday, January 16**

**106 Eudora Spalding**

**5:00 pm**

# NEWS

## BLACK HOLE: AAS presentation

CONTINUED FROM PAGE 1

this galaxy. And even more, this new feature may provide observational evidence for a theoretically predicted means of channelling material to the black hole on very small scales," Weinberger says. The image is by no means detailed enough to show the in-fall of the matter itself, Weinberger stresses. For this, one would need a resolution of less than a light-year, and there is currently no way to make such finely detailed pictures.

Nonetheless, the quality of this image is unparalleled because it relies on the unique resolving power of Caltech's 10-m Keck Telescope and the technique of speckle interferometry to remove the distorting effects of Earth's atmosphere.

With this technique, a series of very rapid

exposures are made of the object, freezing the atmospheric distortions that cause stars to "twinkle." Then the distortions are removed in computer post-processing. As the largest infrared telescope in the world, the Keck Telescope provides the best obtainable resolution.

Weinberger is currently completing work on her doctorate. She will continue doing observations to support this research, a part of her thesis. "It will be exciting to look at NGC 1068 with similar resolution in other infrared wavelengths," she says. "The more information we have across the spectrum the more we'll understand about the nature of this extended emission."

Also collaborating in this research are her thesis supervisor, Gerry Neugebauer, and Keith Matthews, of the Caltech physics department.

## WELLNESS: Chinese medicine

CONTINUED FROM PAGE 1

Chinese medicine is based on three things: Chi, Yin and Yang. Chi is not readily translatable, but to a first approximation it is a life force that exists in all things animate and inanimate. Yin and Yang are symbols of the opposition present in all things.

The Chinese system of medicine also revolves around the idea that the body is supplied by lines of energy, each associated with an organ system. The five organs: heart, liver, lung, spleen, and kidney are also associated with five emotions: joy,

anger, grief, worry, and fear, respectively. An excess or lack of any combination of these factors leads to illness.

After asking about the main complaint, an acupuncturist will ask about other factors in the patient's life. Often times a trouble of the mind manifests itself in the body or vice versa. Then a simple check of the tongue and the pulse completes the analysis. Herbs may be prescribed to fulfill some deficiency or to cleanse the body. These are usually boiled and drunk as teas. Otherwise, acupuncture or a change in lifestyle may be recommended.

Acupuncture is the application of needles to the skin in particular points of the body. These needles are so fine that twenty-five of them could fit inside a conventional hypodermic needle, so one doesn't even feel them penetrate the skin. These are thrust deep enough to hit a "line of energy" in the body, and may be useful to drain or enhance the flow of excessive energy.

Yvonne Farrell is one of the faculty members at Emperor's College of Traditional Oriental Medicine.

### CORRECTION

Feynman did not get his PhD from Bethe, as was stated in last week's Tech. He went to Princeton and his advisor was John Archibald Wheeler.

### JOHN HOLMSTOM

Student Intern  
at Samra University of Oriental Medicine Teaching Clinic

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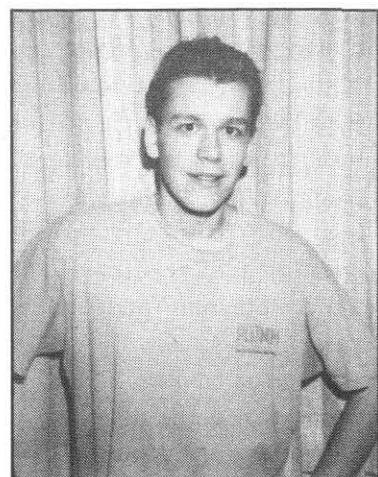
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# Should we bargain with terrorists to save hostages?

BY JOHN HATFIELD



There has been yet another hostage crisis in the world, brought about by revolutionaries in Peru. They took control of the Japanese embassy before Christmas and still remain there, holding hundreds of foreign dignitaries captive. Although this is a deplorable situation, it brings up a familiar problem in this world where many believe their reprehensible terrorist activities are justified in their pursuit of a greater cause.

That problem is: how do we react when hostages are taken?

There are two different approaches to dealing with hostage situations. One is to negotiate and eventually give the hostage takers some of what they want, if it is not too unreasonable (such as allowing the hostage takers free passage to an escape). Negotiators are trying this in Peru. They are continuing communications with the terrorists in hopes of freeing more of the hostages. While

this has resulted in some hostages' release, many more are still held captive as the terrorists and the government continue diuscussion. (The terrorists are demanding the release of some of their confederates already held by the government.)

Of course, the question is, whether this "coddling" of the terrorists will lead to more incidents later. Many countries seem to think so.

Many countries, including Israel and France, take a different approach. If any hostage incident takes place on their soil, they simply react with deadly, lethal force. For instance, when an Israeli plane was hijacked many

years ago, the Israeli government sent in an assault team to liberate the hostages. All of the terrorists were killed, along with, ironically, the brother of the current president of Israel.

These countries believe that this type of response to these situations will discourage further incidents of that type. The question, of course, is whether that type of discouragement is successful.

Although Israel has suffered numerous terrorist incidents, very few if any after the incident described above have included taking hostages. Of course, one may also ask whether it is moral to play dice with the lives of present hostages to save these "future hostages."

These are questions I would urge you to consider and write to your representatives about, as the United States continues to fail to have a clear policy regarding these issues.

I fear all too soon we will be in great need of one.

## LETTERS TO THE EDITORS

Dear Editors,

I am writing in regards to Austin Collins' discussion of the proliferation of public safety laws ("Circle of Fire," 1/17/97). Although I do tend to agree with him that such things ought not to be legislated, I feel that his analysis of why they are legislated is way off base. The fact of the matter is that there is not a constituency of concerned voters pushing to force everyone to do what they do; the source of these laws, as with most everything else in society and government, is fiscal.

Most legislators who have introduced safety belt or helmet laws have done so because they see it as an opportunity to reduce the load on state coffers, and thereby on taxpayers. After all, state governments do provide health insurance subsidies to a fair percentage of their citizens, so anything they can do to keep those citizens from injuring themselves severely (which can cost thousands of dollars in health care expenses) reduces the overall amount of money spent on health care. In this era of shortfalls in budgets, that kind of balancing effect far outweighs personal liberties in the minds of most legislators. To them, forcing all taxpayers to buckle up or wear motorcycle helmets is a means of making sure that those who desire normally to do so do not have to pay for the care of someone who is not concerned with their own safety.

In addition, there is a bonus fiscal impact: By making it illegal to not buckle up, etc., anyone who does not can be fined, funneling money directly into city and state police coffers. Numerous laws with that intent have piled up recently, in which a routine traffic

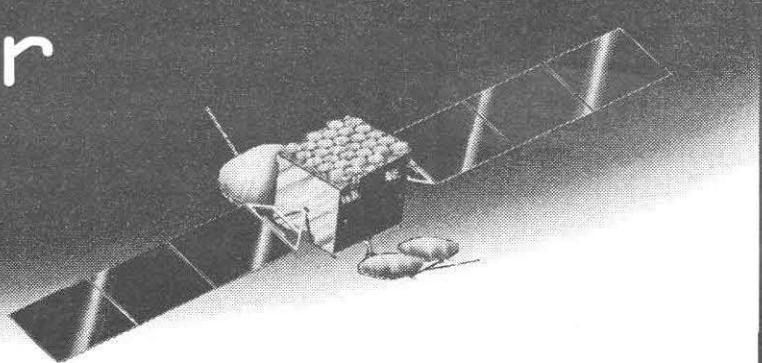
stop can easily yield hundreds of dollars in fines for things that a CHP officer only has to glance at to cite. The recent requirement added to California law that proof of auto insurance be presented upon request of any police officer is a prime example of this—all the officer has to do is ask one additional question during his stop, and he could wind up making an extra \$500 for his precinct.

Of course, this all tends to beg the question of whether the government should be involved in health care or making money off of the foibles of its citizens, but that is a much larger debate into which I will not enter. I just feel that Mr. Collins missed the point by blaming these personally restrictive laws on average people who want to see safety become an integral part of society; rather, these people are convinced by the high-sounding rhetoric of politicians (backed up by the insurance companies that also stand to benefit in lower payouts for accidents and more people forced to purchase insurance that the state requires) that this is in the interest of the public good. In actuality, these laws are put up for vote because the state's officers have mismanaged the tax money they have, leaving them desperate for more, and because the insurance company lobbies pack an enormous wallop. Don't be surprised if, within a few more years, residents of L.A. County are required by law to purchase their own earthquake insurance—it would fit in perfectly with the actions of state and local governments who no longer have the means of keeping their own bureaucracies in check.

MATT GARDNER  
GRADUATE STUDENT

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# Of Babes and Bitches,

# Boys and Men

BY CHERISH BROWN



If you walk through the houses and find a group of men discussing women, usually you'll hear the words "babe" and "bitch" used as descriptors instead of colleague or friend. These two words are the basic stereotypes of Caltech women. The "babe", of course, is not interested in a serious relationship, is good looking, and doesn't get offended by sexual innuendoes. These are the "sluts" because they won't settle down, they've been in more than one relationship or reject all relationships.

The rest of us are not so affectionately known as "bitches". We may get offended at sexist jokes, don't like being glommed, and may be more interested in getting schoolwork done than sating the sexual drives of the men

around us. Either way, bitch or babe, we're responsible for the men's behavior toward us. In an effort to catalogue Caltech women, a male student will act insanely juvenile and spew slang dealing with sex and genitals. Eventually, we give up and put bumper stickers on our cars saying "So Many Boys, So Few Gentlemen".

When I read the Dean's Corner last week, I saw a great thing about to unfold. But instead, the dean didn't tell the boys to shape up. He didn't tell them to take responsibility for their own behavior: he reiterated the old saying "Boys will be boys", thereby excusing them. I was very disappointed.

I want to know how long it will be before someone stands up and says that this sexist, objectifying, and obnoxious behavior is simply wrong, sometimes illegal, and will not be tolerated at Caltech. Male students treat many of the women here like toys or sex objects, yet much of the time, they get away with

it, often under the guise of boy-like humor.

Even some of those supposed to act as role models, such as the faculty, administrators, and house officers, condone these actions by refusing to take action or behaving the same way. I sincerely hope it is only because they don't know that this will continue as long as the men feel there are no objections.

Some women also allow this stereotyping to continue. Rather than defending other women, they either don't speak out, fearing very real repercussions, or they condemn the women who feel insulted and humiliated. They are afraid these women will give all female students a bad name because they supposedly lack the traits necessary to become a scientist.

\*\*\*

Such objectification of women is not specific to Caltech, nor is it manifested solely in verbal form. Our society in general has a history of expecting women to toler-

ate or accept sexist behavior despite the fact that we suffer so many consequences.

The strongest example of these consequences occurred with the death of Jon Benet Ramsey, a "Little Miss" beauty pageant-winner. A friend sent me a message saying Jon Benet's parents shouldn't have dressed her like a woman of "questionable morals" because they were asking for trouble. I told my friend that neither a six-year-old girl nor her parents would ask that she be sexually assaulted and murdered. Regardless of how she was dressed or used by her parents, she didn't do anything to deserve her fate. She was the victim, not the perpetrator.

Why is the objectification of women viewed as the woman's fault or responsibility? Even in gorilla clans, a male gorilla who attempts intercourse with an unwilling female is punished by the entire group. The male gorilla is the perpetrator; the female is the victim.

Human cultures, or at least male-dominated human cultures, justify the exploitation and victimization of women. In our society, if a woman conforms to male standards, then she won't get hurt. Women should be quiet and compliant or men might attack them. Why is it the woman's fault if a man can't control his behavior?

The reality is that men behave badly because they know they can get away with it. One in three college men admits he would rape a woman if he knew he could get away with it. The popularity of rohypnol ("roofies") is soaring because it does allow men to get away with rape by rendering the victim unconscious. Research shows that one in twelve college men already admits to having committed acts which meet the legal definition of rape.

So, as long as "Boys will be boys" and others close their eyes, we will be "bitches and babes" and keep searching for the gentlemen.

apart?!"

Ridiculous, isn't it? By putting up a mildly believable personification of our skepticism and debunking it in dramatic style, it seeks to convince people. *The X Files* does the same thing, except it has a multi-million dollar budget, teams of market researchers, and a horde of writers. They earn their money, too, as so many of you watch the show.

So many of you watch every week, as the symbol of rational objection to stupid ideas (Scully) is gradually shown the error of her ways by the embodiment of the paranormal (Mulder). Sure, it's fun to imagine what that type of world might be like. It's not fun, however, to have to actually live in a world where people are increasingly willing to buy that type of conspiratorial nonsense.

The bottom line is that there are far more people now susceptible to ideas like the supposition that the government is hiding aliens from us than there were before the show started. Are you one of them?

It really is that simple.

*Cyrano:*

*So, this is your revenge?*

*Compte de Guiche:*

*Take it to mean I serve my King and vent my spleen.*

-Rostand

"One Flame a Week - My Promise To You."

BY AUSTIN COLLINS

This week's column was originally going to be the second in a series on excessive legislation. Specifically, it was going to deal with licenses and registration fees. However, something this weekend so marked itself with the need for a good flaming that I was forced to postpone that column until another week.

So, without further ado, this week's topic is: *The X Files*.

That's right, *The X Files*. That television show on Fox that a good 80% of you are slaves to. Listen to some of the stuff I've heard since *The X Files* became so popular:

"I hate it when problem sets are due on Monday, because it distracts me while I'm watching *The X Files*."

"I'd like to start the camping trip early this week-

end so we can be back in time for *The X Files*."

"Wow, this sucks. I'm going to have to re-schedule my plane ticket. My flight is during *The X Files*."

"Are we going to be back from the fencing match in time to watch *The X Files*?"

"She was upset because I wanted to watch *The X Files* before we went out."

I've not attributed the quotes to their rightful owners, for obvious reasons. That reason, being obvious to those of you watching *The X Files* regularly, is of course fear that the "Military Industrial Entertainment Complex" (an actual quote from Mulder in *The X Files*) might silence these more notable examples of the systematic lowering of IQ's their show is undertaking.

In that one segment of quotes alone, you see people

put *The X Files* ahead of 1) School 2) The Great Outdoors 3) Money (it's EXPENSIVE to re-schedule a plane ticket!) 4) Athletics and 5) Women.

However, if there is a place on this wonderful planet of ours where obsessions are evident, it is most certainly the California Institute of Technology. So what makes this obsession different? Its detrimental effect on society.

In order to truly enjoy a work of fiction, one must engage in what Coleridge (I think it was he) called "a willing suspension of disbelief." Makes good sense: if I want to enjoy a Greek tragedy properly, I'd better darn well forget for a moment that there really is no mighty Zeus attempting to foil my plans at every turn. *The X Files* asks, and receives, something quite different from its viewers. Instead of a "suspension of disbelief," it induces an "assumption of belief."

This is a critical distinction. In watching a Greek tragedy, at the end of the performance I am no more willing to believe that there are a set of temperamental gods out there than I was at the beginning of the performance. My disbelief was only temporarily suspended; such is not the case with *The X Files*. With every episode, a sizeable portion of the viewing

audience becomes just a tad bit more inclined to think that there are aliens out there. Hidden by the government. Conducting experiments for the benefit and/or harm of humankind. Going to Caltech. Stealing the comics sections from the paper every Sunday morning.

It's all a load of crap. By addressing it in a pseudoskeptical fashion, with the end conclusion always illustrating the folly of the "straight man" (straight person in this case, I guess) in the episode *The X Files* endeavors to gradually erode the rational resistance people have to ideas like "The Government Conspiracy."

It reminds me very much of a pamphlet handed out my freshman year outside of Sloan, involving proof of God's existence. In the pamphlet was a cartoon, depicting a 'scientist' being questioned by a man in a gleaming white suit. The man in the white suit then questioned this personification of science with supposed physical impossibilities that had been observed. His crowning question, the one that caused the scientist to break out into a sweat and cry out, "I . . . I . . . I DON'T KNOW!" was "We all know that like charges repel. Yet the nucleus of an atom is made entirely of positive charges. So, Doctor, why doesn't all matter simply fly

apart?!" Ridiculous, isn't it? By putting up a mildly believable personification of our skepticism and debunking it in dramatic style, it seeks to convince people. *The X Files* does the same thing, except it has a multi-million dollar budget, teams of market researchers, and a horde of writers. They earn their money, too, as so many of you watch the show.

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It really is that simple.



# I may not be a smart man, but I know who Stephen Hawking is

BY JAIDEEP SINGH

It happened almost a week ago. The day started off as usual. I got up around 3 in the afternoon as I usually do. Having already missed all my classes for that day, I decided to go check my mail. This is of course pointless since I don't get anything except for those mass mail flyers which are really just handed out to give you false illusions of contact with the real world.

Why would my parents send me anything anyway? It is quite obvious which son they prefer. My name loosely translated means "a lamp," while my brother's name means "The King." After having my hopes dashed yet again, I sat down by the Olive Walk to read the all important memo from our beloved Dean concerning the addition of underwater basket-weaving as a P.E. class next year.

Although I was greatly engrossed in the memo, something enticed me to look back.

To my surprise, I saw an elderly man on wheelchair. The memo beckoned my eyes back. However, for some inexplicable reason, I was forced to look back at the man in the wheelchair. Upon further inspection, I noticed it was motorized. This was of great comfort to me because the mysterious man in the wheel chair

that I was not going to understand it. Typically, I go for the gist of the material. This talk, however, was different.

I usually understand the individual words that make up the lecture. However, minutes into the talk, words I had never knew existed were thrown at me. At this point, my mind began to wander.

I thought about how certain words are just plain funny. One such words which captures the epitome of that idea is spatula. Just say the phrases "Nice spatula!" or "How is your spatula doing today?" It for some reason is inherently funny.

This meandering of mine was brought to a standstill when Hawking said "perturbation." For some reason my friend and I both started to laugh. Then Hawking said it again. We laughed some more. Something about the way his computer synthesized the word "perturbation" had struck a funny bone.

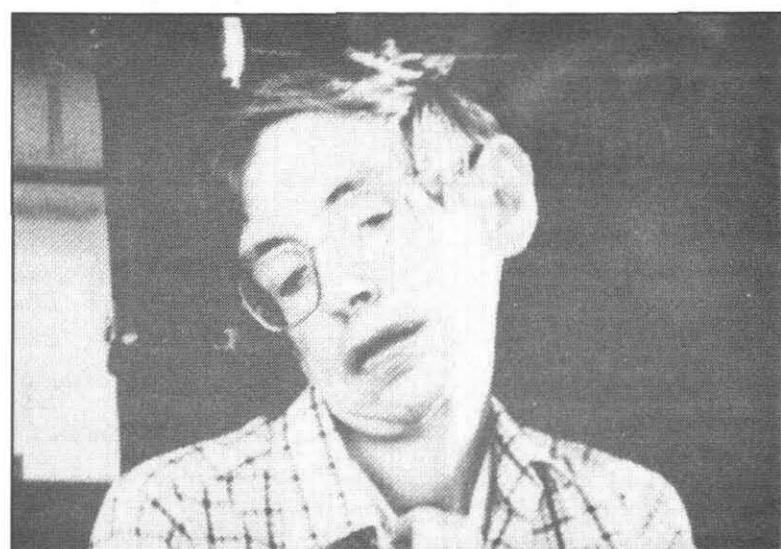
After almost laughing up a lung at the use of the word

*The attendant at the counter was Stephen Hawking in a Taco Bell uniform, holding a spatula.*

therefore had greater facility to negotiate the aptly named pebbles o' death. I do find it strange that a herd of people are following him....

The next day is a day full of excitement. The great Stephen Hawking is to give a technical talk on some naked stuff and I got to go to Taco Bell.

Now, I thought to myself on my way to the lecture hall



Stephen W. Hawking

"perturbation," I promptly dozed off. It was indeed a very strange dream I had.

I was at a Taco Bell. I was at the front of a very long line at the counter. The attendant at the counter was Stephen Hawking in a Taco Bell uniform, holding a spatula. He kept on asking what I wanted. However, I could not promptly answer, because I could not decide between a beef fajita wrap and a steak fajita wrap, which is strange because I am vegetarian.

Upon explaining this di-

lemma of mine to the attendant, he unleashed unto me a flurry of invectives and profanities. Being quite taken aback, I awoke from my dream to realize the end of his lecture.

As is customary, I applauded with all my might, making it known to the world that since I could not do my part in understanding the lecture I would compensate by applauding louder than anyone in my section. With that I declare to the whole world that I may not be a smart man, but I know who Stephen Hawking is.

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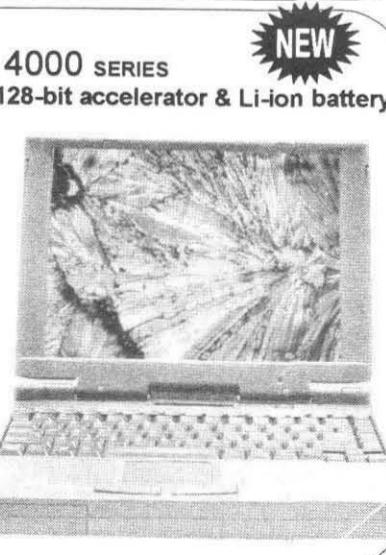
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# ✓ ASCIT Election 1997 ✓

## ASCIT PRESIDENT

### Kohl Gill

Hello, my name is Kohl Gill, and I'm running for President of ASCIT. A job like this brings a lot of responsibility. I've taken on responsibilities in my House, Ricketts, as a member of our Social Team and as a Treasurer. As far as ASCIT goes, I was Ricketts' representative to the Academics and Research Committee (ARC) before becoming the current Director of Academic Affairs, and chair of the ARC. As the DAA, I was responsible for the 1997 CLUE and, yes, I'm the one that keeps bugging you to write your reviews. I've served on a few committees, the most (read: only) active ones being the ASCIT Board of Directors (as DAA), and the Curriculum Committee.

Wow. That looks like a lot, but probably doesn't mean very much to you unless you or anyone you know has done some of it. Well, in my spare time I'm a junior, a Physics major, a Scurve, as I mentioned. I've done a little research, but still don't know if that's what I want to do when I leave Tech. If you want or need to know more about me, you can ask.

I will tell you this, though: I really want to be ASCIT President. I think CIT is a place with a lot of sharp people, among the students, faculty and the administration, and I'd like to see some good work done.

There's plenty of work to do. Besides the day-to-day business of ASCIT, alienated alumni, disgruntled faculty, and that darned van of ours (I miss it, too.), yes, besides all that, we have new issues: Avery, Frosh-on-Grades, and the new Core, that we have to monitor closely, if we're to make sure

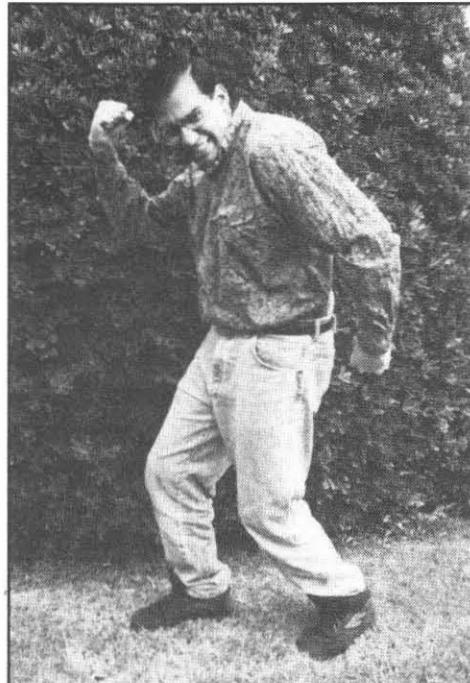


PHOTO BY SHAY CHINN

the changes we're making are for the better.

And that's why I'm making this statement—not because I want to out-shine the other candidates (granted, there is Maria, but somehow that's just not the same.), but to let you know I need your help to do this job. That means everything from dropping me a suggestion when you see me on the Olive Walk, to letting me eat at your House and chatting with me when I'm there, to taking some real time to read a memo or fill out a survey that I send you; you *must* do it, or my job becomes nearly impossible.

With that in mind, I ask that you elect me your ASCIT President.

Oh, and I already get the ASCIT doughnuts.

Kohl Gill  
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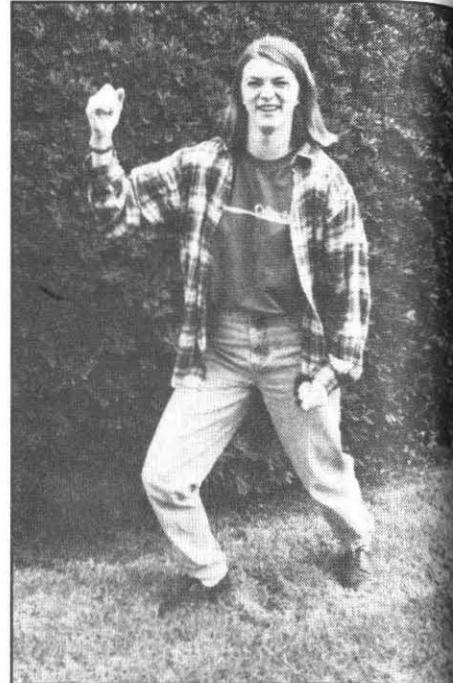
## ASCIT VICE PRESIDENT

### Maria Satterwhite

I thought for quite a while about what to write in this statement, and I don't feel that what I have to say can be effectively summarized in a couple hundred words and in a few minutes of your time.

I could tell you why I think the honor system is an amazing part of life at Caltech, but you already know that the honor code is a great thing. I could tell you about all of the things that I want to see happen at Caltech in the next year, but that is a constantly evolving list. I would also hope that list would be mostly based on what the undergraduate community as a whole wants and not on my personal agenda.

I could also give you a list of my qualifications and try to convince you that I am a better choice than "NO," but I don't think that the things that make a candidate qualified for an office can be summed up in any election statement. I have served as BoC Chair for the past year and was a BoC Rep at Large for the year before that, but I don't think that this experience is what makes me qualified to serve as BoC Chair. What really matters is whether or not I have the motivation, the enthusiasm, and the ability to do this job for the next year. I'm not sure



whether I have the abilities that it takes to do an excellent job as BoC Chair, but I think that one of the things that I have learned over the past year is what those abilities are, and that discovery is a large part of the battle.

In the end, I think that the only thing that really belongs in this statement is simply that serving as BoC Chair and ASCIT Vice President for the past year has meant a great deal to me, and that I want the opportunity to try to do my best to serve the community in this way for the next year.

Thank You,  
Maria F. Satterwhite



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Since then, there have been lectures on the different types of patents, legal issues in patent law, licensing agreements and organizational choices for a business. The course will touch on many of the issues a start-up will face such as legal issues, funding issues, management choices and the process of going public.

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# E100: Techers choose entrepreneurship over academia

CONTINUED FROM PAGE 1

sic research in interesting, fundamental, challenging areas have changed a lot.

Also, the chance to work in research laboratories of large companies has changed. The most dramatic, of course, are IBM and Bell Labs which used to take a fair cut of our best graduates. These companies have restructured, reorganized and scaled down. Many of them [the companies] are still left with more people in research than they can afford to support. For these reasons, jobs in research in large companies are also tough to find.

Government labs are in the same position. At Department of Energy labs, which have very high quality research programs, including Los Alamos, Livermore, and labs like SLAC and Brookhaven; at defense labs such as the Naval Research Lab; and at the Bureau of Standards: it is very, very tough to find a position.

There are not a very large number of opportunities in these traditional places.

The interesting point is that there losses have been more than made up in new entrepreneurial startups. We see opportunities, of course, in all kinds of computer based hardware and software ventures, also in bio-technology. There is a real shift. What I have observed at Caltech is that what the students perceive and demand is very different than what it used to be. The faculty changes more slowly and the curriculum changes more slowly than our base of student customers. The students are ahead of the curve in the sense of recognizing that they should know something about the way businesses, in particularly small businesses, work.

That is likely to be the place where many of them will go. And, it is not only the existing new ventures but the ones they will start themselves. You have a community of students and postdoctoral fellows here who are independent and very smart, many of whom would much rather work for themselves; sell their ideas to a different set of customers.

So that is my underlying driving force...I see a lot of students who are interested in starting ventures. And, it seemed to me that there are series of rudimentary matters that are useful to understand; it is not good if you are utterly clueless. If you have just a rudimentary familiarity with some business basics, even to know the issues exist, it seems to me you are in a much better position to judge the viability of a project. If you take a position with a small

startup — and these are outrageously unstable — your expectation has to be that your chance of success is finite and that you may be switching jobs frequently. Therefore, you can expect that the compensation package will be different. You may get paid a competitive salary, but there is huge uncertainty. Usually the trade off is that you get a share of equity in the company. You then participate in the success of your work in a way that you never would in a university or in a large company. You

have a chance to have a huge financial success and that is traded off with the possibility that the company may vanish without a trace. Many more vanish than become financial successes. It seems to be that it is important to have some understanding of how a small company is structured, what the equity is likely to be worth, what a reasonable deal looks like. Those are all things that you should have a little bit of exposure to beforehand.

**Q:** You talked about career opportunities. You also talked about the trends in funding. Do you see those trends continuing for a very long time?

**A:** Yes. Definitely. I think that the forces at work are very fundamental. The basic finances

their labs over the last two decades — in some cases gotten rid of them — at some point in the not too distant future, I would think those companies are going to realize that by chopping off those labs, they are going to be running out of high tech products. They may end up restarting those labs.

**A:** Could be. I hope that's

*For a number of years, it has been apparent to me that the career opportunities for graduates from the top US technical universities have changed a lot.*

right. There is a cyclic nature to the funding of research by most companies. But, some things have changed in a fundamental way for the companies. Their competition is truly global. The kind of economic structure that they face has changed in a fundamental way. There is not as much leeway to support basic research, certainly. The difficulty is that a company that supports basic research finds it difficult to capture the benefits of the work. It may benefit society or the country or the world as a whole. But, the economics of the company are determined by what they can capture in terms of competitive products.

**Q:** You suggested that because of global competition, research in companies is changing in a fundamental way. Would you elaborate on what you mean?

**A:** There are smart people all over the world. Many of them have a chance to work in places where the cost structure is different and more competitive. You also have places where the labor is cheap but there isn't the necessary high standard of skills. But, there are places that have both low costs and high standards of skills; places like Eastern

Europe and lots of Asian countries. It changes the balance in my view. Not only in the US, but more dramatically in Western Europe and in Japan where the structure of built in benefits was supportable in previous decades. I don't think it will be anymore.

You are familiar with the fact that social benefits are so extraordinary in Germany, for example, that it is almost as beneficial to not work as to work. There are large unemployment levels. The real work is being done by "guest laborers" who are delighted to work for a fraction of the cost of a native German. The benefits are weighing down the whole structure. The US is ahead of this curve. We went though our ver-

sion of this a decade ago. Over the next decade, I think Western Europe is going to go through some really tough times.

**Q:** Moving back to the students. Many of them are not in a position to start a business. Certainly not in the near future. Would you say that the information that you are presenting in this course would be useful even for those who have no intention of becoming entrepreneurs?

**A:** Absolutely. As I expect, the majority of our students will end up in a business environment. Understanding the economics of the company they work for is utterly critical to their success. As I mentioned, part of an employment package is almost always a share of equity in the company and compensation come in the form of options. Understanding what those things are and what they are worth can make an enormous difference in making smart decisions.

**Q:** If you look at recruiting at Caltech. I still find that we are dominated by large companies.

**A:** Is that really so, are the positions really there? I can imagine that the large companies appear domi-

nate because they come to campus to recruit. But are the positions really there? Of course, the recruiting for small companies

occurs in very different ways. It is almost always through personal contact. People are aware of your work through publications and presentations; their needs are quite specific and they want someone who has the skills to fit in a particular project.

For example, I used to always have visits from Dow, Dupont, Union Carbide, GE, Bell Labs,..., two or three times a year for each company. I haven't had such a visit in the last two, three years. The large companies used to work with individual faculty members to provide grants. Through such grants, they would get to know individual students so that when the students had worked their way through a graduate program, they would be ready to go to work for the large company.

**Q:** Three years ago when I was a freshman and the Entrepreneur Club started, the attitude towards business at Caltech when Professors were involved, at least as I saw it, was a hush-hush situation. I can think of a couple of situations where Professors declined to talk to the Entrepreneur Club. Do you think that attitude has changed somewhat?

**A:** I suppose it has. A University changes slowly, that is

probably a good thing. You don't want to respond to every up and down. The way we prepare the students should reflect the skills they will need to survive and learn. I think business skills are important and we should do what we can to provide some instruction.

**Q:** So you would argue that what is driving the creation of the Technology Transfer Office and the creation of this course is simply reality meeting Caltech.

**A:** That's right. There is another dimension of the reality which is the financing of institute operations. There will presumably be funding feedback to Caltech from successful ventures based on research that has been done here and from involved successful graduates who will have the means to provide gifts to the institute. That is all part of the long term investment.

**Q:** One final question. How do you comment if a purist were to say that the job of a Caltech professor is to do the best research they can, to stay out of the business world?

**A:** I think that is much too narrow. Certainly in the sciences

and engineering, an important part of what we do is involved in applications with social benefits. The reason research at universities is supported by the public is

*The way we prepare the students should reflect the skills they will need to survive and learn.*

it is expected that what we do will result in outcomes of value. So I think that having a faculty that is knowledgeable in outside activities is critical...

The institution is not well served if its faculty is not engaged in what is going on beyond the institute. This happens in lots of different ways. It happens through consulting. It happens through advisory boards for the government. To the extent that this has some effect on guiding research choices, I think it is well worth the effort. You have to work on problems that are important. It is often hard to define that. But certainly, products and services that contribute social benefits have a pretty strong case. Caltech sits in the fabric of the rest of society. It must do things that have value — it is very arrogant to think that we should be a privileged group of people. It could be argued that what we do is so fundamental that they should just let us do it. That may be partly correct, but not 100%.

Dr. Baldeschwieler is the founder of a half dozen companies including NeXstar Pharmaceuticals Inc. and Combin Inc. (recently acquired by Incyte Pharmaceutical Inc.).

*You have a community of students and postdoctoral fellows here who are independent and very smart, many of whom would much rather work for themselves; sell their ideas to a different set of customers.*

of the federal government represent a huge driver. One simply can't continue with large deficits where the principal parts of the budget are uncontrollable 'entitlements'... The budget is under enormous pressure. Entitlements now represent a majority of the budget. And these expenditures are required by law. Social Security, Medicare, ... expenditures that not only don't change but are indexed. You have a constantly shrinking total budget and the discretionary part of that is less than a third of the total. Any cuts have to come against the discretionary piece and research is in that part of the budget.

**Q:** But at the same time, the large firms who have cut back



## Dean's Corner

### Honor the system

by Jean-Paul Revel

However, as pointed out in a letter by Professor Lindval, Chairman of the Divisions of Civil and Mechanical Engineering and Aeronautics (quoted in the *little t* for '46-'47) "The enforcement of the Honor System by the students themselves is another outstanding feature which must be maintained in the highest tradition of honesty and fairness. Non-enforcement or unfairness cannot be tolerated."

One of the problems with the Honor Code today is that it is enforced very quietly, with a velvet glove which avoids unwanted attention on the accused or merely suspected. The importance of secrecy was expressed as early as 1910 by President Scherer of the Throop Polytechnic Institute as we were then known, who quotes "President Eliot" (presumably Charles, the Harvard President who did so much to shape American Education) as saying "No publicity should be given to students' offenses or defects, and the record of actual censures and punishments should be made as little condemnatory as truth permits."

This was not always so, as I read in the *little t* for 1944, and also in one dated 1949, which explains that "in an exam... you are urged to stand up immediately and announce to the class that a violation of the Honor System has been observed, without revealing the name of the suspected violator. This method not only shocks the violator but also startles everyone else in the room and makes them aware that the Honor System is really in operation." This seems an odd way of maintaining secrecy (although pains were apparently taken to avoid publicly naming the suspected breaklaw).

Also, the same pamphlet says that the honor code allows students to take exams in private. I guess that, as is the case even now, some exams were taken in class although not proctored.

Be this as it may, I have heard several Professors tell horror stories, usually centered on the fact that there often seem to be no repercussions when they report a

suspected malfeasance. The BoC's actions are conducted in secret so as not to compromise innocents. The Professors, meanwhile, not knowing that any action has been taken in response to their complaint, or noting that the sentence is apparently very mild, often a mere nullification of part of an exam, think the whole thing is a sham. Why should they waste their time, or trust the students?

It is correct that the philosophy behind the actions of the BoC is not to punish. The Honor Code only seeks to neutralize the advantage that a student might have gained by his deeds. This is jarring to many since the Judeo-Christian ethic to which the majority of us adheres and in which we live, is punitive. A common expectation is that the wrath of the Lord will descend on us for breaking the law. The idea of neutralization and protection of the community rather than punishment was supported already by President Scherer who in another quote of Harvard's (?) Eliot in the Bulletin of the Throop Polytechnic Institute of October 1910 says, "college officials should bear constantly in mind the plain fact that most college offenders, even those who commit ordinary crimes, such as cheating or stealing, if considerably and mercifully dealt with, and if not ruined in body, recover themselves completely and turn out to be honest men and good citizens."

So the rack, or the knout, are definitely out. However this does not mean that neutralization is a light burden to carry. It merely shifts the punishment to the perpetrator. It is the weight of knowing that one has broken the confidence of one's peers and others at the Institute, which constitutes punishment. For the sensitive and intelligent, that is in fact a pretty steep burden to carry, one that does not go away as it would if punishment were the expiation for the crime. On this thought...

A bientôt — with more to come on the topic.

*J.P. Revel*

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## n o w hear this.

by Ron Dolette

### Go Horny!

#### Santa Monica Ska Strikes

With the big commercial successes of *No Doubt* and *Sublime*, ska is slowly becoming the new alternative to Seattle grunge. But ska in and of itself is a mixture, a menagerie of swing, reggae, rap, punk, and jazz. Because of this cornucopia, every ska band is different on many levels. Take, for instance *Horny Toad!*, which hails from right around the corner here in Southern California. They've got an eclectic mix of ska and punk and their debut album, "Thirteen," typifies their varied styles.

"New fans are always coming up to us after a show and saying how different we sound, but then they start naming all these groups we remind them of," states lead vocalist Kid Caviar. "We don't mind 'cause we know that we love all types of music and our sound reflects that."

The lead track, "Shiver," sets the stage for a fun time snowboarding, and even includes Caviar doing a pretty cool sounding shiver in the chorus: "Girl, I wanna see you shake." Though the band describes its music as

snowboarding music, like the surf music of the Beach Boys in the 60s, "Thirteen" displays socially aware lyrics, with such modern themes as gangs, the environment, and as the song "Youth" clearly sums up ("Some are educated by professor and book/ Some learn the street from the pimp, the crook.") the sheer variety of young American culture and opinions.

"Thirteen" is a really fun album that isn't really a change so much as a mix. It includes a lot of funk tracks like "Vampire Ska" and a cover of "Brickhouse." Also, there's a lot of heavy guitar riffs in about a third of the album, so the change of pace kind of...well, it leaves something to be desired. However, the album still boasts great songs like "Quicksand" and "Eggplant." There's just a lot of groovin' goin' down on this CD, man....

"A lotta bands sounds the same now," commented Caviar. "In the 80's there were all these bands, ska, punk, whatever—but they each had their own distinct sound. Like now, if a group plays ska, they only play one style of it...we play variations of ska and even invent new types—like we got 'sal-ska'—which is salsa and ska."

If you leave the CD running on the last track, you can hear the concert crowd chanting, "Go horny!" I think that's a pretty good idea. (Rating: **★★★★★**)



Horny Toad!: skankin' the world around.

PHOTO COURTESY HORNY TOAD!

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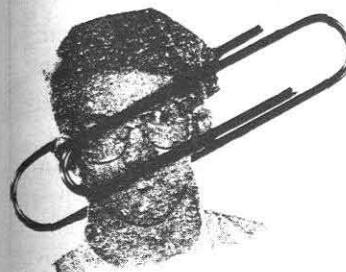
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## ADAM VILLANI: MEDIA GUY

BY ADAM VILLANI

### The Golden Globe Awards

The Hollywood Foreign Press Association (HFPA) handed out their annual TV and Movie awards Sunday. While you may know that Oscars are awarded by the Academy of Motion Picture Arts and Sciences, an association of movieland professionals, it's likely you have no idea who the HFPA is and why they have an awards show. The HFPA is a group of about 85 people who write publicity stuff for foreign magazines (when not on their day jobs) and they have an awards show because it's a free country and they wanted to throw a party with a bunch of Hollywood glitterati.

The reason why people pay a certain amount of attention to the Golden Globes is because they act as a reasonable predictor of the Oscars and help box-office receipts. They get a lot less respect than the Oscars, though, because they aren't voted by professionals and are even more of a popularity contest than the Oscars—in 1981 Pia Zadora got an award after her husband treated the membership to a Las Vegas trip.

So this year, there were a couple of nice surprises. "The X-Files" cleaned up the TV Drama awards and little-known Brit Brenda Blethyn won Best Actress-Drama for *Secrets and Lies*. But the sur-

est sign that the Golden Globes are still the Golden Globes was the hat-trick for *Evita*, which won Best Original Song and Best Picture and Best Actress in the Comedy or Musical category. In retrospect I don't think that in my review of *Evita* accurately conveyed that despite being grand entertainment, the characters seem distant and unconnected and the film itself doesn't really stay with you any longer than a sugar high (which I suppose I should be thankful for, considering the music).

### Ziggens, Action League, Slightly Stoopid, My Superhero, and the Sublime mini-movie at the Alligator Lounge, January 17

This show last Friday in Santa Monica featured mostly bands from around Long Beach, my hometown, along with the premiere of the mini-movie about *Sublime*, the popular Long Beach band whose leader died of a heroin OD last May. *My Superhero* was a pretty decent ska band, remarkable mostly for appearing in blue jumpsuits and having an accordion. *Slightly Stoopid* was really bad, with lame, noisy songs about being jerks. The lead singer of the pop-rock band *Action League* is a good friend of mine from high school, so take it with the appropriate caveats when I tell

you they were the best band of the evening, despite the nearly-inaudible lyrics. *Action League* packed more energy into their 7-song set that most bands would put into a show of twice that length.

*Ziggens* was certainly the most musically talented band on stage, and their drummer was a lot of fun to watch, but as they said in *This is Spinal Tap*, "There's a very fine line between clever and stupid," and *Ziggens* spent a little too much time on the wrong side of that line. Coming out on stage wearing Canadian Mountie uniforms is clever, writing songs about Gilligan and Debra Winger and singing them in a dumb little-boy voice is just stupid.

The *Sublime* mini-movie was downright terrible. The first part was a silent home movie in which the members of the band acted out the *Star Trek* episode "Arena," and the second part intercut some passable music videos with monotonous interviews with band members and friends. The entire production, with the possible exception of the music

videos, was made with neither wit, insight, art, or even technical skill. The hardcore *Sublime* fans in the audience screamed in approval at things like the sight of the band leader's Dalmatian, but unless you're intimately familiar with the band's inside jokes and think that the *Sublime* lifestyle (which seems to be sitting around getting drunk and writing "sincere" songs about nothing in particular) is the coolest thing on earth, I can't possibly recommend wasting 30 minutes of your life watching this tripe. Perhaps by the public exhibition of things such as this, we appreciate quality even more.

### Shine

This Australian movie about piano prodigy David Helfgott, who suffered a nervous breakdown in college and only came into the public eye again twenty years later, is a very good film, but it's nowhere near the masterpiece its supporters are touting it as. Unfortunately, I fear that it's also moving into the front of the Oscar race; for all its merit, it's an unchallenging classic feel-good story that has a virtuoso, powerful middle but runs out of steam and story early in the third act. Also unfortunate is that Geoffrey Rush, the actor who plays David as a post-breakdown

grown man, is getting all sorts of accolades, whereas Noah Taylor, who portrays David as an adolescent, is being ignored. Rush's David is good, yet a one-note Rain-Man-style babbling idiot, while Taylor (with roughly equal screen time) has a much more fully realized role, breaking away from his authoritarian father yet teetering on the brink of insanity. The piano competition scene alone is worth the price of admission, and the rest is still better than most studio fare; I just feel that the hype surrounding this movie is a bit unwarranted.

### Mother

*Mother* is both endearing and hilarious; it's the best movie I've seen about parent-child relationships since *Spanking the Monkey*, and while you couldn't pay me to watch *Spanking the Monkey* with my mom in the room, you'll enjoy *Mother* even more with your parents. Albert Brooks (who directed *Lost in America* and *Defending Your Life* and was born with the name Albert Einstein) plays a divorcee who moves back in with his mother to figure out where he went wrong. Debbie Reynolds is perfect as his doting and daffy mom, and has considerable Oscar buzz. This is the first Albert Brooks feature I've seen, and now I want to check out his others.



## Ernest Explains

BY ERNEST TOMLINSON



Dear Ernest --  
Who is this girl?  
-Joe

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## Spring sports

CONTINUED FROM PREVIOUS PAGE

work to improve...I'm looking forward to being part of the team's growth process this year..."

The team is hoping to be more competitive in all their games and especially in conference play. They are hoping this will earn them a measure of respect from their opponents.

## • Track

The Beavers began their season workouts under the guidance of Head Coach Don Bene who is in his second year as track coach. He is assisted by new comer Julie Tingle who will be coaching the sprinters and throwers.

The men's team has two returning seniors, who will be key runners. They are Chris Cary and Karl Thulin. Four key juniors are

## SPORTS

returning as well. They include Brian Barris, Dan Kleiman, Harmesh Lad, and Evan Reed.

The women are short in numbers, but some key returners have experience that will be very helpful to the Beavers. Those returners include seniors Keely Walker and Cailin Henderson, and sophomore Aimee Pierce.

Coach Bene is hoping for the team to perform to the best of its

ability and to have a good season..

## • Golf

The 1997 golf team began its season under the guidance of Head Coach Mike Jackson. He is in his seventeenth year at Caltech and has been coaching for 30 years. He is assisted by Tom Jarrett. Three key players from last year will be returning. Those include juniors Kyle Stickle and Kazu Nakada, and

January 24, 1997

11

senior Clay Kishiyama. Senior Josh Moats will be returning at the end of basketball season. Coach Jackson is hoping to see the team make a gradual improvement over the season.

He also is hoping to finish the season in the middle of the pack in the conference. The team opens with their first match against UCSD and CS Bakersfield on January 27.

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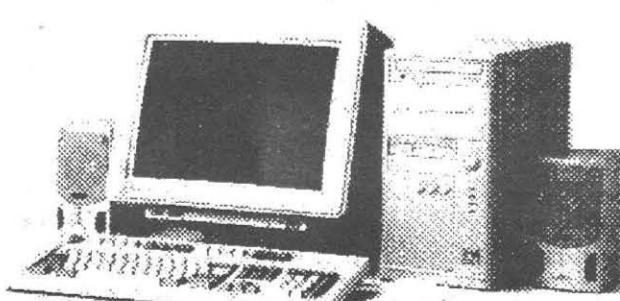
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**Events**

Caltech is sponsoring a one day **Blood Drive** which will be held in the Winnett Student Lounge on Friday, January 24th, between 10:15am and 3:30pm. Please contact Vilia Zmuidzinas via e-mail at [hrdvez@hr.caltech.edu](mailto:hrdvez@hr.caltech.edu) or at extension 6001 for an appointment. Walk-ins are also welcome.

The **Caltech Jazz Bands** will perform at Beckman Auditorium on Saturday, January 25th, at 8 pm. Many female jazz composers will be featured, including Maria Schneider and Toshiko Akiyoshi. Admission is free. For more information contact x4652.

► Club Latino presents **Latin Nights salsa party** this Saturday, January 25th in Dabney Hall. Live salsa and merengue band "Cumbre Latino" begins performance at 9:00pm. Complimentary salsa and merengue lessons offered from 8:00pm to 9:00pm. Refreshments provided.

► On Monday, January 27th, at 9:00pm in Winnett Lounge, **Rob Van de Water** will be speaking on **Creationism**. Mr. Van de Water is a grad student in chemical engineering at UCLA. The CCF welcomes everyone interested in hearing more about this point of view - whether you agree with it or not. For more information contact [reuben@cco](mailto:reuben@cco).

**Oliver Stone** will be speaking on "Film, Chaos, and Mass Delusion," at Beckman Auditorium, at 8 pm, on January 28th. Admission is free. For more information contact x4652.

► Intel Lecture presented by **Dr. Kevin Kahn**, Intel Fellow and Director of the Communications Architecture Lab, "Bringing the Internet home to meet the family: Evolving the delivery infrastructure". This lecture will be held in the Beckman Institute Auditorium at 3pm on January 28th, with refreshments served afterwards. For more information call x6454.

**Dr. Morteza Gharib**, professor of aeronautics at Caltech, will be giving a Watson Caltech Lecture, "Cardiac Fluid Dynamics: Vortices in the Heart." The lecture will be at Beckman Auditorium on January 29th, at 8 pm. Admission is free. For more information call x4652.

► **Voxfire** will give a free concert on Sunday, February 2nd, at 3:30pm in Dabney Lounge. Voxfire is the collaboration of three of the area's most highly regarded interpreters of early and contemporary vocal music. The program will consist of **Medival and Renaissance music**. For more information call x4652.

**John Michael Bishop, M.D.** Professor, Department of Microbiology and Immunology will be giving a William and Myrtle Harris Distinguished Lectureship in Science and Civilization talk, **Plagues and People: The Battle Against Infectious Disease** on Thursday, February 6th, at 4:00 p.m. in the Baxter Lecture Hall, Baxter Building. Refreshments will be served in the Judy Library, Baxter Building, following the seminar. For further information, contact Ingeborg Sepp at 818/395.4087 or [isepp@cco.caltech.edu](mailto:isepp@cco.caltech.edu).

► Caltech's annual **Research Directors Conference** will be held February 6th and 7th in Ramo Auditorium, with presentations and poster sessions from the Electrical Engineering, Computer Science and Chemistry Departments. For schedule and more info, call xt. 6454.

► Dr. Demento will be celebrating his 27 1/2 Anniversary in Beckman Auditorium, on Saturday, February 8th, at 8pm. The show will feature audio, as well as video, selections and guest appearances from Bill Frenzer (*Dead Puppies*), Henry Phillips (*Standing on the Shoulders of Freaks*), and a mystery celebrity artist. Ticket prices for Caltech/JPL faculty and staff are \$19.00, \$16.00, and \$13.00; the price for Caltech students is \$5.00. For more information call x4652.

► The Berlin Philharmonic Woodwind Quintet will be performing at Beckman Auditorium, on Sunday, February 9th, at 3:30pm. This Coleman Chamber Concert features Schuller's Jazz Suite, Barber's Summer Music, Ligeti's Six Bagatelles, Quintets by Carter and Villa-Lobos, and Dedaglia's Brasilien Suite. Prices for Caltech/JPL faculty and staff are \$19.50, \$16.00, \$12.50, \$9.00 for advanced purchases. Beginning

# Mints

► denotes a new announcement.

February 3rd there will be 50 free tickets available for Caltech students at the Caltech Ticket Office. For more information call x4652.

**Caltech Guitar Classes** for the winter quarter will meet on Tuesdays starting January 14th in Room 1 of the Student Activities Center (SAC). The beginning class will be held from 4:30pm to 5:30pm, intermediate class from 3pm to 4pm, and the advanced class from 5:30pm to 6:30pm. Classical and Flamenco repertoires are explored but the techniques transfer to other styles of guitar. The Beginning Class includes a jazz/folk chord system. Classes are free to Caltech students and other members of the Caltech community (space permitting). Undergraduates can receive 3 units of credit if they choose. Private instruction on any level can also be arranged. The instructor, Classical Guitarist Darryl Denning, has an international background in performance, teaching and recording. For further information on the classes or Mr. Denning's new compact disc recording, please call (213) 465-0881 or e-mail Mr. Denning at [ddenning@cco.caltech.edu](mailto:ddenning@cco.caltech.edu).

**From the  
Counseling Center**

Looking for a safe and supportive place to discuss issues such as coming out, being out, dealing with family, coping with a homophobic culture, and being GLB at Caltech? Want somewhere just to make new friends? You are invited to the **Gay/Lesbian/Bisexual Support Group**, which meets on the first and third Tuesdays of each month from 7:30pm till 10:00pm in the Health Center lounge. This is a confidential meeting and attending does not imply anything about a person's sexual orientation—only that he or she is willing to be supportive in this setting. The group usually discusses a particular relevant topic and then moves on to the general discussion. Refreshments are served. If you would like more information, please call x8331.

**Fellowships  
and Scholarships**

All graduate and undergraduate students are invited to enter the **Hyundai 50th Anniversary University and College Student Essay Contest** on one of the following subjects: the Information Society and Humanity; Family and Human Relations in the 21st Century; The Industrial Structure and Occupations of the Future; The Corporation's Roles as a Global Citizen; Sustaining Economic Growth and the Environment in Developing Nations; or Women's Roles in the 21st Century. To enter, complete and submit the online registration form found at <http://www.hyundai.net/contest/welcome.html>. Entries should be written on one of the six themes listed above and be 15 to 20 A4- or letter-size pages in length, double-spaced, in MS-Word or HWP file format. A 2-page essay abstract should also be included. Application deadline will be **February 28th, 1997**.

*From the Dean's Office, 102 Parsons-Gates.*

Caltech students interested in a career-related to environmental public policy and Native American and Alaska Native students interested in careers related to health care and tribal public policy are invited to apply to be named a Morris K. Udall Scholar. The Morris K. Udall Scholarship and Excellence in National

Environmental Policy Foundation operates an educational scholarship program designed to provide opportunities for outstanding U.S. students with excellent academic records and demonstrated interest in, and potential for careers in the fields of environmental public policy, health care, and tribal public policy. All applicants must be a current sophomore or junior pursuing a bachelor's degree on a full-time basis, have an average of at least a B or the equivalent, be a U.S. citizen, U.S. national, or resident alien, have a demonstrated interest in a career in environmental public policy or be a Native American or an Alaska Native and have demonstrated interest in a career in health care or public policy. If you are interested, please contact the Dean of Students Office, 102 Parsons-Gates, for an application. Deadline for receipt of nomination materials to the foundation is **March 3rd, 1997**.

The Dean of Students Office is accepting proposals for the Monticello Foundation Internship and the Robert and Delpha Noland Summer Internships. Three to five Caltech undergraduate women will be given an opportunity to participate in research projects outside of the Caltech community for ten weeks during the summer. Each student will receive a \$3,500.00 stipend. Applicants are required to identify the projects in which they wish to participate. All arrangements with the principal researcher will be the responsibility of the student. There are no restrictions as to where the research can be done, except that it must be outside the Caltech-JPL community. Other universities, commercial labs, or any industrial facility in which the student can arrange to conduct or participate in a research project can be the site for the experience. Each student will be asked to submit a short synopsis of her report to the Deans' Office at the end of the summer. If you are interested, please identify a sponsor for your experience at a research facility for a ten-week period. In a short essay, describe your project, and submit it to the Deans' Office in Room 102, Parsons-Gates along with two faculty recommendations. The Deans would like to know for whom you would be working, where, and if possible some specifics concerning your proposed research topic. Proposals must be received by Monday, **March 3rd, 1997**.

*From the Fellowships Advising and Resources Office, extension 2150, e-mail [lauren\\_stolper@starbase1.caltech.edu](mailto:lauren_stolper@starbase1.caltech.edu):*

The **American Association of University Women** offers a number of fellowships to women who are U.S. citizens or permanent residents, including one year post-doctoral fellowships and special dissertation fellowships. The international fellowship is awarded to women who are not citizens of the U.S. or permanent residents who are engaged in full-time grade or post-graduate study in the U.S. A poster with a tear-off card that allows you to send for an application is posted on our main bulletin board.

*From the Financial Aid Office, 515 S. Wilson, second floor:*

The **College Women's Club of Pasadena Scholarship Foundation** is beginning its scholarship selection for the 1997-98 academic year. To be eligible to apply you must be a woman who is a U.S. Citizen, a sophomore or higher, and have a minimum 3.0 G.P.A. Applications are available from the Financial Aid Office, and must be returned to the Financial Aid Office by **February 7th, 1997**.

The **Korean American Scholarship Foundation** is offering more than 40 scholarships of \$1,000 or higher to full-time students of Korean American heritage enrolled in at least their second year of undergraduate or graduate school. For an application form, write to: Scholarship Committee, KASF Western Region, P.O. Box 486, Pacific Palisades, CA 90272. Applications and supporting documents are due **February 8th, 1997**.

mum G.P.A., must be a sophomore or higher by September 1997, and must be able to document significant financial need. The deadline for submission of completed applications is **April 15th, 1997**.

The **American Society of Naval Engineers** is offering \$2,000 scholarships for academic year 1997-98 to students who are interested in naval engineering. Applicants must be U.S. Citizens, must demonstrate a genuine interest in a career in naval engineering, and must be applying for either their last year as an undergraduate or for one year of graduate study (doctoral candidates not eligible). The deadline to submit applications is **February 15th, 1997**.

The **American Chemical Society** is sponsoring a scholarship program for qualified applicants who want to enter the fields of chemistry, biochemistry, chemical engineering, or other chemically related fields such as environmental science, materials science, or toxicology. To be eligible to apply, candidates must be African American, Hispanic/Latino, American Indian, or Alaskan Native, and must be U.S. Citizens or permanent residents. Applicants must also be full-time freshmen, sophomores, or juniors, majoring in one of the above fields, and must demonstrate financial need. The deadline to submit applications and supporting documents is **February 28th, 1997**.

The American Meteorological Society announces its **AMS/Industry Undergraduate Scholarship Program**. For the 1997-98 academic year, 18 undergraduate scholarships will be awarded. Two categories of students are eligible: 1) Students who are enrolled in a course of study leading to a bachelor's degree in the atmospheric or related oceanic or hydrologic sciences, and 2) students who are enrolled in a program leading to a bachelor's degree in science or engineering. Students in this latter category must demonstrate a clear intent to pursue a career in the atmospheric or related oceanic or hydrologic sciences. Applications and supporting documents are due **February 21st, 1997**.

The **Marin Education Fund** announces the opening of its 1997-98 Undergraduate Grant application process. Applicants must be residents of Marin County, be enrolled at least half-time in undergraduate study, and have a low to moderate income. Applications are due **March 2nd, 1997**.

The **American Women's Club in Sweden** will be awarding a travel grant for study and research in Sweden. To qualify you must be a woman, age 18 or over, and an American citizen. You must also be accepted for a period of study or research at a Swedish educational institution or agency and show evidence of financial need. The completed application and all supporting documents must be received by **April 15th, 1997**.

The Jewish Vocational Service is accepting applications for scholarships from the **Jewish Community Scholarship Fund**. The scholarships are designed to provide financial assistance to Jewish students who are legal residents of Los Angeles County, attending college on a full-time basis. Applicants must have a 2.5 mini-

The **John Gyles Education Fund** is offering financial assistance to students who are Canadian or U.S. Citizens. A minimum G.P.A. of 2.7 is required for eligibility. Criteria other than academic ability and financial need are considered in the selection process. Selected students will receive up to \$3,000. To receive an application, send a stamped (U.S. \$ .32), self-addressed, No. 10 envelope to: The John Gyles Education Fund, Attention: R. James Cougle, Administrator, P.O. Box 4808, 712 Riverside Drive, Fredericton, New Brunswick, Canada E3B 5G4. Filing dates for mailing applications in 1997 are **April 1st, June 15th, and November 15th, 1997**.

► The **Chinese-American Educational Foundation** announces its scholarship program for students of Chinese descent. Eligible students are graduate students or undergraduates who are juniors or seniors, and who will be enrolled full-time in Fall of 1997. Eligible students must also be U.S. Citizens or permanent residents. There are two \$1500 scholarships available for graduate students and seven \$1000 scholarships available for undergraduate students. The deadline to submit applications is **March 31, 1997**.

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