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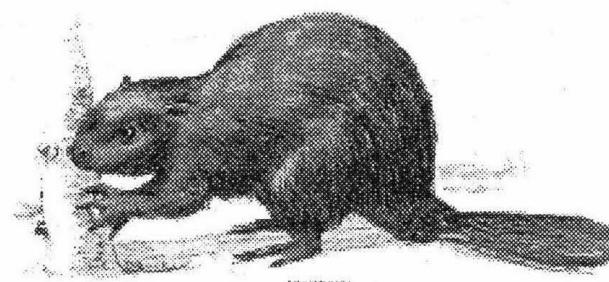
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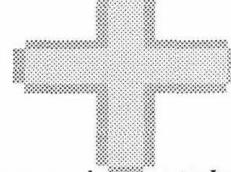
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The California Tech

VOLUME CI, NUMBER 13

PASADENA, CALIFORNIA

JANUARY 21, 2000

TRANSMETA UNVEILS NEW TECHNOLOGY

BY DAVE GUSKIN

After months of secrecy, Silicon Valley start-up company Transmeta made an announcement to the public this last Wednesday declaring their company focus and product. Designed as a successor to Intel's x86 processors, Transmeta's Crusoe is a revolutionary replacement for this generation of computing alternatives. The processor is optimized for laptops, featuring an impressive power management system known as LongRun.

Transmeta's announcement, made by CEO David Ditzel and other key company executives, highlighted the benefits of the new low-power, high-speed architecture. The cross-platform nature of the processor's architecture was showcased via a Quake 3 match, involving the triple fragging of Linux creator Linus Torvalds (playing on a Transmeta Linux box) by another employee (playing on a Transmeta Windows box).

Transmeta intends to sell two versions of the processor, a higher speed mobile solution for computer geeks clocked at 700 MHz and a lower speed 400 MHz version for everyone. Sales are expected to start relatively soon.

The new processor uses a revolutionary software-on-hardware approach. The core hardware component is fundamentally different from an Intel chip, using a newer, smaller instruction set. The key piece of the puzzle is CMS, or Code Morphing Software, which translates standard x86 instructions into faster-executing code for the core processor. Because the software can keep track of what it translates, programs can be run much faster after an initial execution.

"We think this will change the direction of microprocessors and mobile computing," commented CEO David Ditzel.

Anxious to utilize the new technology, press all over the country (and especially online) quickly seized upon the opportunity to inform the public of a possible next step in computer technology.

And yes, it runs Windows.

Superstring conference comes to Tech *Physicists flock to Caltech for eats, drinks, merriment*

BY SERENA DINIEGA

Last week, many of the top minds in theoretical physics could be seen wandering around campus, listening to lectures, debating fundamental theories, and enjoying the California weather. Also, many Caltech undergrads could be seen gawking at the physicists. The reason: the "String Theory at the Millennium" conference.

Sponsored by the CIT-USC Center for Theoretical Physics, this year's conference successfully reviewed old and new developments in String Theory, while speculating on future developments. Held from January 12th through the 15th, the conference featured many illustrious speakers, including 1999 Physics Nobel Prize winner Gerardus 't Hooft of Utrecht and the well-known Steven Hawking of Cambridge, as well as Caltech's own Hirosi Ooguri, John Schwarz, and Edward Witten. The over 300 attendees

to the conference were mostly post-doctorates and professors from various corners of the earth, but it did include a few graduate students from Southern California. The conference also attracted a few Caltech students, who woke up early Saturday

the role Caltech has played in String Theory. Schwarz, a conference organizer as well as one of the speakers, has researched this field since coming to Caltech in 1972. He sees String Theory as a "growth area" for Caltech and is optimistic that the

strings and membranes (branes) and their mathematical and physical properties to explain everything from a unification of kinematics and dynamics to the initial conditions of the universe. The current theory uses branes as the fundamental particles of the universe, which in turn form strings.

Currently, Schwarz thinks research has entered a "boom period," in which he and his colleagues are making significant progress toward the final answer. However, while he is optimistic that theoretical physicists will eventually find the TOE, he does not see it happening in the near future.

While Schwarz will admit that when we find TOE the effect will be cultural rather than practical, he believes the theory will be an "intellectual edifice" of "very beautiful construct." A complete String Theory would definitely be awe-inspiring and change the way people view the universe.

morning to try to get into the lectures and catch a glimpse of Hawking any way possible. After testing "alternative" entrances to the lecture hall, the students finally found a kind of official who let them enter.

That the conference was held at Caltech (even in the face of the dangers posed by undergrads, like Moles with silly string) is a fitting testament to

number of post-doctorates in this field will increase. This would increase the role Caltech plays in this "intellectual revolution," which he sees as comparable to quantum mechanics.

This "intellectual revolution," which began with the Superstring Revolution of 1985, is a large step in the search for the Theory of Everything [TOE]. String Theory uses

Zubrin speaks of Mars

BY JUSTIN KAO

"If you want to go to Mars in thirty years, you can't do it. If you want to go to Mars in twenty years, you can't do it. But if you want to go to Mars in ten years, that's possible." Seemingly paradoxical, this statement exemplifies Dr. Robert Zubrin's innovative and practical approach to the settlement of the red planet. It is contrary to conventional wisdom, unexpected, and surprisingly sensible.

Speaking to members of the Skeptics Society, Mars Society

PLEASE SEE MARS ON PAGE 2



Though last night's lunar eclipse was partially blurred by cloud cover, the photo above displays the eclipsed moon for those skywatchers unable to see for themselves.

Dean Albee leaves Caltech *Grad Student Dean left legacy*

BY DANA SADAVA

After sixteen years of service, Dean of Graduate Studies Arden Albee has announced that will step down in the summer.

Albee has taught in the Division of Geological and Planetary Sciences since 1959. While fulfilling his duties as Dean, he teaches a full course load, and additionally maintains positions as lead project scientist for the Mars Observer mission and as chairman of the

House Committee for the Atheneum. He is also an associate editor for the Annual Reviews of Earth and Planetary Sciences.

In regards to his reasons for stepping down, Albee said, "It just seemed like an appropriate time."

A search committee will form shortly to appoint a new dean. Caltech policy encourages members of its own faculty to be administrators rather than hiring outsiders trained in administration.

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Opinion

The Sanctity of Science

BY JAMES G. INGALLS, PHD,
WITH MEMBERS OF THE CALTECH
PROGRESSIVE COALITION

"...From now on institutions for learning and research will more and more have to be supported by grants from the state. Is it at all reasonable that the distribution of the funds should be entrusted to the military? To this question every prudent person will answer: 'No!'"

-Albert Einstein, 1947

Today President Bill Clinton will visit our campus to announce the fiscal year (FY) 2001 science and technology budget. Caltech has been ranked the top undergraduate educational institution in the United States, and is one of the most competitive centers for science and technology research in the world. As the representative of US political leadership addresses its technical leadership on the benefits of science and technology research, it is important to acknowledge also the destructive uses for some of this research.

The "ivory tower" insulates us from many of the consequences of our work, so perhaps we don't realize that 40% of the research conducted at Caltech is publicly funded by either the Defense Department or the Department of Energy (DOE) for military purposes. For example, Caltech is a member of the Accelerated Strategic Computing Initiative, which oversees the DOE-sponsored \$19 million Center for

Simulating Dynamic Responses of Materials. Scientists and engineers who receive funding from this Center are creating a "virtual shock physics laboratory" whose main goal is to simulate the detonation of high explosives.

But Caltech is not unusual in its pursuit of military-financed research. In 1998, the Clinton Administration boasted of its commitment to civilian research and development (R&D), which at \$170 billion over 5 years was at its highest level ever. Yet over 50% of the FY 1999 R&D budget was for defense research. More importantly, even though the total defense R&D spending declined by 0.4% during the 1998-99 period, destructive programs such as "weapons activities" were enhanced (19.5%) at the expense of constructive programs like "environmental restoration and waste management," which was cut by 37%. During the same period, the budget function with the largest decrease in R&D spending was space research and technology, which lost \$200 million.

This parallels the overall spending profile of the US Government. In FY 2000, the only Cabinet-level US department to get an (inflation-adjusted) funding increase over the previous year was the Defense Department (an increase of 12%). President Clinton signed the Defense Authorization Act on 15 October, allocating \$289 billion for the military. While total international military spending

decreases, US military spending increases.

The US military budget is more than 5 times that of Russia, and it is more than 19 times the combined spending of Cuba, Iran, Iraq, Libya, North Korea, and Sudan (the Pentagon's "7 most likely adversaries"). Furthermore, the US is the world's largest arms exporter, supplying 36% of the world's arms deliveries during the period 1989-1998. The consequences are devastating. For instance, decades of US arms sales to Indonesia enabled that country to illegally and brutally occupy the territory of East Timor. Twenty four years of domination and hundreds of thousands of dead and disappeared Timorese later, and finally East Timor is an independent state, no thanks to US weapons.

Scientists are rewarded financially when their research supports military goals, but we fool ourselves if we expect such work to not be harnessed for destructive purposes. US scientists ushered in the nuclear era, and now the US is one of the few countries which refuses to ratify the Comprehensive Test Ban treaty. According to opponents of the treaty, "nuclear deterrence" is more important than peace and safety. At any rate DOE's nuclear weapons programs and scientists remain funded.

We can speak dispassionately of "stress wave propagation in an elastomer binder," but perhaps someday Caltech's "virtual

shock physics laboratory" will be used to study shrapnel propagation in human skin, such as occurred during the NATO airstrikes against Yugoslavia. More than 1,100 cluster bombs, "the most savage weapons of modern warfare," according to BBC Correspondent John Simpson, were dropped on Kosovo and Serbia by the US last spring. Condemned by international humanitarian organizations (they violate the Geneva convention because of their indiscriminate nature), when cluster bombs explode they send 200,000 "bomblets" of shrapnel over a wide radius. Cluster bombs have a 5-30% failure to detonate rate. Lodged in the ground, unexploded bombs act as landmines. In the first month after the NATO airstrikes, about 150 Kosovars were killed or injured by "land mines or unexploded ordnance," including cluster bomb fragments.

In the Persian Gulf, over 1,200 Kuwaitis were killed in the same fashion, and they weren't even the "enemy"! Ironically, the Clinton Administration withdrew from the 1997 international negotiations to ban landmines.

The results of US military spending permeate the international landscape. No human being is untouched by the US military apparatus. Perhaps the most painful exposure is being had in Iraq, where since the December 1998 "Desert Fox" operation, the US and allies have flown a total of 28,000 sorties

and expended over 1,800 bombs and missiles in strikes against 450 separate targets in Iraq. Current contingency operations in Iraq are estimated to entail annual costs of about \$1 billion. And on the ground, the deadliest "weapons of mass destruction" have proven to be the economic sanctions insisted on by the US, which are crippling Iraq's social infrastructure.

As you listen to President Clinton today, think about phrases like "I only do basic science" or "I'm just doing what they tell me." Can you truly say your work will not be used for destructive purposes? Recall Alfred Nobel, the inventor of dynamite who was horrified by the violent uses of his invention and later dedicated his royalties to a foundation for peace. Are scientists like Nobel, Einstein, and Caltech's own Linus Pauling doomed to extinction?

THE CALIFORNIA TECH

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Of Tiles and Trilobites

BY JON FOSTER

Quick: which building on campus has trilobites on the lanterns by its entrance? You could run around campus attempting to discover this nugget of information, but it might be more efficient to check out "Caltech's Architectural Heritage: From Spanish Tile to Modern Stone", by Romy Wyllie. Chances are you wouldn't really save much time, though, since the book makes for wonderful browsing and can be hard to put down.

The book tells the story, in both words and pictures, of how Throop's original little campus developed through the influence of many architects such as Betram Goodhue (who developed the overall look and feel of campus) and Gordon Kaufman (who designed, among other

things, the south houses and the Athenaeum). It also explains some less ideal parts of campus, such as how, in the 1960's, abominations such as Millikan Library were allowed to be built.

Resplendent with pictures, the most interesting parts of the book are the ancient concept sketches and pictures, showing

'For instance, did you know that the South Hovses originally included a tower rising out of Blacker Hovse?'

what campus used to look like, and what it was supposed to look like. For instance, did you know that the south houses originally included a tower rising out of Blacker Hovse? Another fascinating part is the small section at the end that shows a concept sketch for the new biology

building planned for North Campus, and talks a little about other changes planned for campus.

Much of the beauty of Caltech's campus comes from the enclosed and convoluted little nooks and crannies, many of which are adorned with sculptures or fountains. Perhaps you

wonder who designed that water fountain you pass by everyday on your way to Physics, or want to know when the "whirling blades o' death" were built. Sometimes the symbolism of a little decoration over a door or archway will not be immediately obvious; Wyllie's book will al-

Mysteries of architecture explained

most certainly contain the answer.

At times, the text is a little boring, but that is more a fault of the subject than of the writer. Much of the book takes the form of outlining "who gave how much when" information which might be interesting if you have a particular question, but does not generally hold your attention for many pages. This is a coffee table book, ideal for flicking/browsing. It is also a good resource for questions about campus.

The book is \$40, which, although cheaper than most textbooks, is still a bit expensive for many college students. Still, if it saves you many a sleepless night by telling you that Arms Laboratory has trilobites on its lanterns, it might be worth it.

Features

MARS: ZUBRIN DESCRIBES PLAN FOR PROTOTYPE

CONTINUED FROM PAGE 1

and the Caltech community at large, Zubrin impressed this hard-nosed audience with his lively presentation of Mars Direct, a plan to go to Mars cheaply, safely and quickly. Not that Zubrin should have a hard time, given his credentials. A former senior engineer at Lockheed Martin, Zubrin is now president of Pioneer Astronautics and founder of the Mars Society, which, since its founding convention in 1998, has already started work on the Mars Arctic Research Station, a privately funded field test of Mars exploration equipment and procedures. Furthermore, the Mars Direct plan, developed by Zubrin and Richard Wagner, has been adopted in modified form by NASA as the best way to get humans to Mars if politicians ever decide to fund it.

As Zubrin explained last Sunday in the Baxter Lecture Hall, the primary obstacle to a manned mission to Mars is not technology or money, but politics. Zubrin pointed out that a mission to Mars must be quick enough to produce results before political will evaporates. Dubbing the thirty-year \$450 billion spaceship conceived by Bush's Space Exploration Initiative the "Deathstar," he dismissed conventional overblown and overpriced ideas in favor of going to Mars in a "tuna can" and "living off the land" for propellant to return home.

Despite these radical state-

ments, Zubrin's plan for Mars was conservative and practical when it came to technology and finances. He devoted a large portion of his talk to the technical details of Mars Direct, emphasizing the use of time-tested technologies and off-the-shelf parts.

The Mars Direct plan involves a two-step approach to a landing on Mars. First, an unfueled Earth return vehicle is launched directly to Mars, with assembly while in orbit around Earth. Once on Mars, the ship could synthesize methane and oxygen, using hydrogen brought from Earth and a small nuclear reactor for power. (Zubrin showed a slide of a full-scale prototype here, built for virtually nothing in aerospace terms-\$47,000.) By making the return fuel on Mars, it is possible to bring 6 tones of hydrogen for 108 tones of fuel, reducing the \$450 billion "Deathstar" plan to a \$20 billion one, which is only about twice the cost of an Apollo mission.

In Zubrin's conception, eighteen months after the first launch and if the Earth return vehicle lands successfully, four humans could be sent to Mars in a one-way habitation module that orbits Mars and lands, eliminating the need for a more expensive, multi-part reusable spaceship. The astronauts could then stay for a year and a half, getting around on vehicles powered by methane and oxygen produced in situ, and return home in the Earth return vehicle, leaving behind

virtually everything they brought to Mars. Zubrin outlined how a series of Mars missions, each landing within rover distance of each other, could build a continuous human presence on a large area of Mars.

According to Zubrin, the most difficult component technologically will be the Saturn V class heavy lift capability required to launch the Earth return vehicle and the habitation module. However, this can be built with current technology. He showed a plan for a heavy lift vehicle built from space shuttle hardware-four space shuttle main engines attached to a space shuttle external tank and two solid rocket boosters. One of these would be capable of delivering 45 tones to Mars orbit, and two would suffice for the entire mission.

Zubrin stated that the only thing preventing people from being on Mars by 2010 is political support. \$20 billion over ten years is less than 20% of NASA's current budget a year. Zubrin pointed to Mars Pathfinder's record-breaking popularity online (there were more Pathfinder web page hits than votes in the last presidential election) as evidence of the public's support and noted all that is needed now is "building reputability" for Mars exploration. Says Zubrin, "On to Mars!"

For more information, see www.marssociety.org (The Mars Society), and mars.caltech.edu (Mars Society of Caltech/JPL).

Julia Salas: #1 Rebounder

Techer leads in NCAA rebounds

BY CHRIS HUGHES

Division II at 12.5.

Salas also is tied for the best single-game rebounding performance in the NCAA this season, regardless of gender or division. She grabbed 30 rebounds in last Saturday's (January 8) 53-42 home victory against American Indian College of Phoenix. The only other player in the NCAA, male or female, to grab 30 boards in a game this season was Mike Daniels of Columbia Union (Men's Division II), who pulled down 30 against Goldney Beacon on Dec. 30.

NCAA Division III basketball leaders are released each Thursday on the NCAA's internet site (www.ncaa.org/stats). The Beavers' remaining schedule appears below. Note: This release as well as information on Caltech athletics is also available on the web at www.athletics.caltech.edu.

Game Schedule

HOME GAMES IN BOLD CAPS

played at Caltech's Braun Athletic Center,
located at the corner of Wilson and California.

Admission to all Caltech athletic events is free.

Wed., Jan. 19	CLAREMONT-MUDD-SCRIPPS	5:30p.m.
Fri., Jan. 21	WHITTIER	7:30p.m.
Thu., Jan. 27	SOUTHWESTERN	7:30p.m.
Fri., Jan. 28	CAL LUTHERAN	7:30p.m.
Tue., Feb. 1	at La Verne	7:30p.m.
Thu., Feb. 3	LIFE BIBLE	7:30p.m.
Tue., Feb. 15	LA SIERRA	7:30p.m.

the Hurricane

by Jeff Braun

In the history of film, hundreds of movies have been made about professional sports. Recently, movies about baseball, basketball and hockey have been very successful at the box office. The Hurricane is another such film, but not in the traditional sense. While Rubin "Hurricane" Carter is a professional boxer, this movie really isn't about boxing; instead, it is the true story of a wrongly convicted man, and his struggle to free himself from the walls of Rahway State Prison.

The story begins with Carter as a young boy, playing with friends near a waterfall. After a violent encounter with an older man, Carter is jailed until age 21. He uses his prison time to develop his fighting skills, turning his body into a weapon.

Upon his release, Carter moves up the ranks of the welterweight circuit, eventually becoming world champion. How-

ever, shortly afterward, he and a friend are questioned by police regarding a triple murder. Despite having solid alibis, the two men are convicted of the crime, and each receives three life sentences.

The story really begins here, as Carter writes his life story in a book entitled *The Sixteenth Round*. Years after its publication, Brooklyn teenager Lesra Martin bought and read the book. Lesra is so moved by the incredible story that he contacts Carter in prison. He and his caretakers, convinced of Carter's innocence, embark on a journey to overturn his conviction. Their efforts reveal new evidence, and the case is brought before a federal court. Here, Carter's lawyers present their argument, and with the new evidence, gain Carter's permanent release from prison.

Reviewing the story, it is

amazing to think that it could be true. It is certainly surprising that such a prominent public figure could be wrongly convicted. However, the movie has one major problem: it just isn't that exciting. To begin, the plot was almost fully revealed in the movies' trailer. This made the film fairly predictable, as we are sure of Carter's initial downfall and eventual vindication. Aside from this point, even the movie's small moments contained no element of surprise. You might think its legal battle would pack the excitement and suspense of Joel Schumacher's *A Time to Kill*. After all, the case was riddled with racially motivated inconsistencies that came forward as the movie progressed. Somehow the filmmakers failed to capitalize on the story's complexity, and left me wondering how such a controversial case could be utterly devoid of excitement.

This is not to say that the movie had no redeeming qualities. Particularly impressive was actor Denzel Washington, who plays the role of Rubin Carter almost perfectly. His performance was both passionate and convincing, such that you might

actually believe he is Carter. I would even go so far as to call his performance a candidate for an Academy Award, and this alone may make the movie worth watching. The film's supporting actors were equally impressive, adding to its genuine feel. Overall, the movie was well cast, making it a biographical success. However, in the end, this movie lacks the surprise it needed to hold this reviewer's interest. Its overall sense of predictability failed to keep me excited. The effect of this movie is similar to that of Michael Mann's *The Insider*. Despite a shockingly true story, both movies failed to maintain viewer interest through the legal intricacies involved. It is disappointing to see Carter's story presented such that we find ourselves hoping for the movie's end. Carter's release was so plainly obvious that the last half hour was truly a chore to watch.

If you appreciate a strong acting performance as the sole reason to see a movie, Denzel Washington will not disappoint you. However, based on its overall merit, I cannot recommend this film to even the most tolerant moviegoer.

OW
BY KATHARINA KOHLER

Washington: The discussions to resolve the issues between Israel and the Palestinians are going to resume on Friday. Arafat, the Palestinian leader, described the meeting as fruitful and productive. The deadline for the framework to the final accord which is due in September. The most important issues that are discussed are the borders, water rights and control of Jerusalem. Clinton said that both sides will have to accept that neither of them will get everything that they wanted.

The Americas: The Earth's shadow was expected to paint the moon red and other strange hues Thursday night, but bad weather threatened to spoil the show in some regions. The first total lunar eclipse in 2000 should be widely visible in the Western Hemisphere. The same processes that make a sunset red will likely make the face of the moon look reddish-orange during the eclipse.

✓ ASCIT Election 2000 ✓

"The President shall be the official representative of the Corporation, and he shall preside at its meetings. He shall be chairman, without vote unless a tie occurs, of the Board of Directors and a member of the Executive Committee. He shall have ultimate responsibility for proper observance of all responsibilities delegated to members of the BoD."

-- Article IV, §3, ASCIT Corporation Bylaws

"The Vice President shall, during absences of the President, assume the duties of that office. She shall act as chairman of the Board of Control. She shall assist the President in coordinating the policies and activities of the Associated Students. Her primary responsibility shall be to insure the continuance of the Honor System among the students."

-- Article IV, §4, ASCIT Corporation Bylaws

Tim Crosby

If elected ASCIT president, I will be just like Baldeep.

I will cut funding for old campus institutions, and give money to clubs that have almost no membership. I will spend money only on parties that I want to attend, and sponsor none to which I don't want to go. I will think up useless pet projects and allocate large amounts of funds for them.

I will display blatant nepotism when appointing ASCIT positions that pay money.

I will give small gifts (such as engraved mini-maglites) to random people, while saying that ASCIT doesn't have enough money to sponsor important clubs.



I will pay for my meals with ASCIT money, either by getting food at the BoD meetings, or by taking Publications people out to dinner at fancy restaurants.

I will promise to provide doughnuts every Friday. But I will go back on my promise. I will only have them when I

feel like bothering.

I will be so apathetic that I won't do even those projects that I thought up myself.

I will loudly and frequently proclaim my dislike for both BoD meetings and my job.

Vote Tim. Vote Baldeep. Vote apathy.



Derek Shannon



I'm Derek Shannon, and I've served as your ASCIT Freshman Director-at-Large for the past year.

In that time, I've gained an incredible amount of knowledge about staying alive in ASCIT--for example, never question the budget allocation for Baldeep's harem, or you will be sore for a week. But I've also learned a lot about making ASCIT a positive force in the lives of Caltech students.

Making the most of ASCIT is hard work--every project requires careful balancing of the views of those concerned, and listening isn't enough--leadership and initiative are essential to getting the job done. I have these abilities, and my experience on the Board of Directors and as editor of the

Undergraduate Research Opportunities Handbook has taught me how to apply them to our student government.

Here are a few things I would do as ASCIT president: (1) Ensure prompt publication of ASCIT...er, publications; (2) Hurry up and set up a distribution system to make ASCIT's video library available to everyone, while bringing ASCIT Friday night movies back for free using the digital projectors already available around campus; (3) Increase ASCIT support for student clubs--this can be done without any extra expenditures just by ensuring that clubs receive money that has already been promised them--ASCIT funding is currently set up to make it harder for clubs to get all their money; (4) End the Rus-

sian aggression against Chechnya. I know that I failed to live up to my previous campaign promise to free Tibet, but c'mon, cut me some slack: I *was* able to bribe enough border guards to allow the 17th Karmapa to escape oppression in Tibet and reach safety in Dharamsala, India. Compared to that, Chechnya's a piece of cake.

I'll do my best to serve you as ASCIT president and I'd appreciate your vote.

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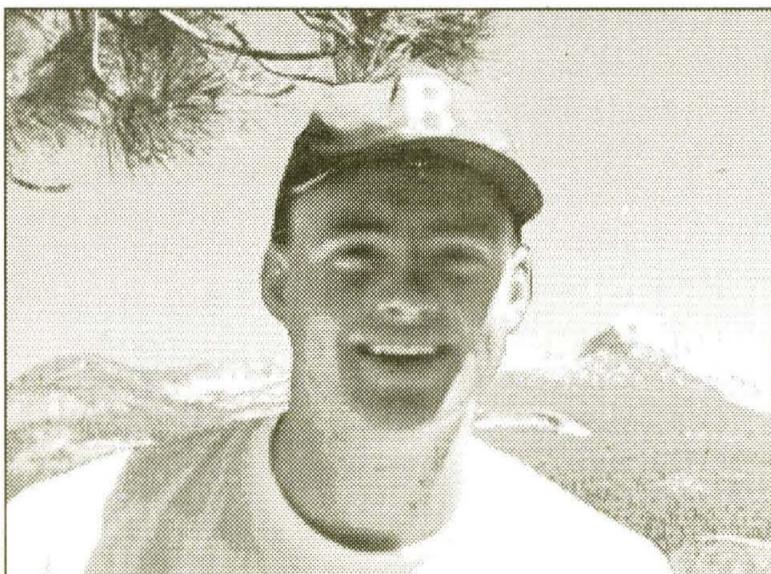


PHOTO SUBMITTED BY DEREK SHANNON

Laura Brogoch

Lately there have been several elections where people lost to NO. I am writing this statement to convince you to vote for me instead of NO in this election. You may wonder, 'Why is it important to have anyone be the BoC chair?' Well, This is a job that someone has to do. The BoC chair investigates every possible honor code violation that gets reported, and, with the secretary, decides if the case merits a full Board hearing. This person also has to direct Board meetings, and report the outcome of cases to the Dean and any other involved parties.

The next question is naturally, 'Why is Laura qualified for this position?' I have been a member of the Board of Control for the past two years, since I was a frosh. The first year I was a rep-at-large, and this past year I have been the Lloyd house rep. I have also done several preliminary investigations and acted as chair in one case. This gives me a good understanding of how the Board works and the additional

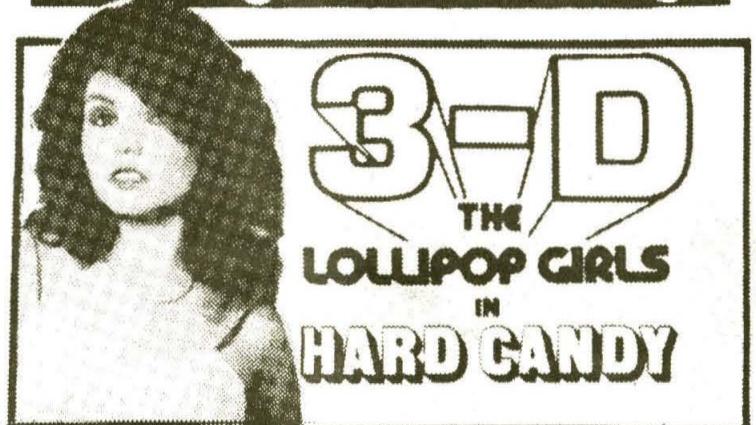
duties of the chair. Electing people who have been on the Board before also creates year-to-year continuity of decisions, which many people have stressed the importance of at open business meetings. A new duty that the BoC chair will get this year is sitting on the routing committee that decides if cases go to the Board, the CRC, or some other group. I've been involved with the creation of the CRC so I know what types of cases are intended to be the responsibility of the Board and which the CRC will handle. More importantly, I know the philosophy that went into the creation of the CRC, and the long term goals of how it will interact with the BoC. I know that I am qualified to be the BoC chair.

So... Vote for me! I will do a better job than NO ever could. The honor system is one of the best things about Tech, and I want to be a part of making it work.



At last, the 3-D comedy that takes it off and throws it at you!

Seeing is believing!



THE Only MIDNIGHT PLACE TO BE!

Starts Fri. Jan 21

FRIDAY and SATURDAY MIDNIGHT

Laemmle's Playhouse 7

667 E. Colorado Blvd. (626) 544-6500

NO ONE UNDER 18 ADMITTED

people

a.k.a. patrick

Stanford, 1995 BS in CS

Space came to pc Order in 1995 after graduating from Stanford. In addition to his role as developer, Space is a gourmet pastry chef. What does he have to say about the extensive pcOrder kitchens? "I used to be a huge fan of roast beef and spinach on toasted focaccia buns with french vidalia onion dressing, but then they started stocking the freezer with Mississippi Mud ice cream sandwiches and my world changed overnight." His current project involves pcOrder's product content management.

pcO infosession:

pcO interviews:

pcO at the career fair:

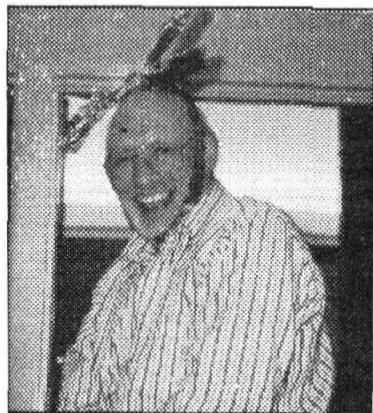
pcO infosession:

pcO interviews:



pcorder inc.

pcOrder is a leading provider of Internet-based e-commerce technology and content solutions designed to enable the computer and office supply industry's suppliers, resellers and end users to buy and sell computer products online. The company, based in Austin, Texas, provides industry content and applications that allow leading computer companies to create new revenue opportunities and efficiencies through e-commerce.



Dean's Corner

Noble CIT

by Jean-Paul Revel

Last Saturday evening the Caltech Faculty celebrated its most recent winner of the Nobel Prize at a Gala dinner and reception. Ahmed Zewail, the Linus Pauling Professor of Chemical Physics and Professor of Physics, was the latest Techer asked to travel to Stockholm for a December 10th encounter with the Swedish King and Queen. That date is ostensibly chosen because it is the anniversary of the death of Alfred Nobel, the inventor of Dynamite, who started the whole thing. It struck me as a rather dismal excuse for pomp, pageantry and recognition. Come to think of it, could keeping this date have something to do with the fact that SAS needs to fill the seats of its planes at this time of year? After all, while the Swedes might need cheering up in the dark days close to the winter solstice, a resident of sunny Southern California must have a very good reason to travel to cold and dreary Stockholm.

Since 1901, 32 people of our ranks, Caltech's very best, have

the mechanisms by which chemical bonds are made, or broken.

made the trip over the years, to claim their Nobel or Crafoord prizes. (The Crafoord celebrates some of the areas of science not recognized by the Nobels). Four other Caltech chemists besides Zewail have been inducted to this pantheon of scientific super achievers. Speaker after speaker at the dinner alluded to how Zewail, and over the years, some 150 students and colleagues, managed to forge a way to "Femtoland." He came to Caltech as an Assistant Professor, in 1976, fresh from a post doc at UC Berkeley. Within a very short time (very appropriate considering his research) he received tenure. He has earned many accolades and prizes both for the research that he directed and his teaching. It is poetic justice that the Pauling Professor ended up emulating the person after whom his chair is named. One of the most beautiful feathers in Linus Pauling's beret was his work on the nature of the chemical bond. Appropriate, is it not, that the work which brought Zewail this latest recognition has to do with a clearer understanding of

Being able to study the movement of atoms in molecules certainly would have been a fanciful daydream in Pauling's heyday. Zewail's "camera" as it is often described, could not have been made in Pauling's day. The femtosecond "shutter speed" needed to freeze the action is achieved by first exciting a molecule by laser irradiation, following which a weaker laser pulse at an appropriate wavelength, detects the original molecule or the reaction products. By varying the timing of the pulses it becomes possible to study how long it takes for the irradiated molecule to acquire a different configuration or to breakdown altogether. The interval between pulses can be varied by adjusting the path of one beam but is expressed in femtoseconds (10 to a power of -15 seconds). As one of the speakers at dinner pointed out, a femtosecond is to a second as a penny is to the National Debt.

Not everyone could fit into the main dining room, so there were tents set up all around the Atheneum, with monitors allowing all to hear and see what was going on at the podium.

The tents added color. I for one kept on expecting a camel to poke its nose in. Before and after the dinner, the Caltech President, the Chairman of the Faculty, the heads of the Divisions who claim Zewail as their own, friends and colleagues, reminisced, toasted, and otherwise feted the guest of honor. The audience was treated to a video of part of the award ceremony, and to a clip of the good professor receiving the Order of the Nile from President Mubarak. (I guess I have that right, I could not read the subtitles. My failing.)

Zewail's prize is a fabulous achievement but may have laid the foundation for yet another award! As reported in the Egyptian newspaper, El-Ahram, he went to bed on Monday (Oct 11th) with a cold, but was cured by Tuesday morning, having received the traditional early phone call from Stockholm. This cure for the common cold may not be available to the common man, but with a bit more research . . . who knows! "In Zewail's own words: "I must tell you that after this call, it seems like the virus is killed. I recommend the Nobel Prize for anyone who has a cold." In fact the Nobel Prize might be good even for someone without a cold. From a crass standpoint, besides the honor, the Prize this year was worth nearly \$106 million, so it looks like it was an excellent alternative to "So you want to

be a Millionaire?" hoi polloi's way to achieve this status. I hope many of you, the students, and many of us, your mentors, will make contributions to humankind worthy of such kudos and be paid guilt money.

The web site for the Swedish Academy (www.nobel.se) is a good source of information. What you will not find there are the songs of which Prof. Tombrello performed that evening. He asks that you figure out the original version of the songs on your own.

Excite! for Zewail with his laser bright
Has flung a beam that puts atoms in flight:
And Lo! The Searcher from Egypt has caught
The Nobel in a Noose of Light.

Ahmed when young did eagerly frequent
Linus Pauling and heard great Argument
About chemical bonds; but
Won his own Prize and is content.

The pulsed laser writes; and having with
Moves on: nor all sagacity nor wit
Shall lure it back to de-excite
Nor all our tears reassemble each small bit.

Come, fill our cups, and raise voice to sing
This winter no discontent to bring:
The Bird of Time has but a little way

The molecules don't last
In his laser blast.
As femtoseconds fly
Quantum mechanics rules apply.
And time goes by.

It's still the same old story:
A hope for Nobel glories,
To catch the committee's eye.
Stockholm only welcomes winners,
His time came by.
Here's looking at you, Ahmed Tom

A bientot!

Jean Paul Revel

Jean-Paul Revel
Dean of Students



Caltech Wellness Week 2000

Monday, January 24

Commonly Seen Athletic Injuries
6:30-7:30 pm, Brown Gymnasium Classroom
Scott Stetson, M.A., ATC & Della Lee ATC
Pizza dinner will be provided.
sponsored by Athletics

Challenges & Choices: The Sequel
7:30-930 pm, Olive Walk
A program designed for frosh
Dessert will be served after the program.
sponsored by the Counseling Center

Tuesday, January 25

Good Nutrition for the New Year
12:00-1:00 pm, Winnett Lounge
Karlyn Cobb, R.D.
Refreshments will be provided.
sponsored by the Health Center

Stress Buster Concert
12:00-1:00pm, Dabney Lounge
Lunch will be provided to first 100 attendees.
sponsored by Delores Bing & the Music Department

Wednesday, January 26

Vegetarian for Life
12:00-1:00 pm, Winnett Lounge
Harold Lyman
Refreshments will be provided.
sponsored by the Caltech Y & ASCIT

The Importance of Breast-Feeding Infants During the First Year
12:00-1:00pm, Winnett Club Room 1
Carol Ann Friedman, RN
Refreshments will be provided.
sponsored by the Staff & Faculty Consultation Center

Thursday, January 27

The Psychology of Optimal Experience
12:00-1:00 pm, Dabney Lounge
Mihaly Csikszentmihalyi, Ph.D.
Refreshments provided.
sponsored by the Drug & Alcohol Abuse Prevention Program--A Service of the Student Counseling Center

Red Cross Blood Drive
10:00 am-4:00 pm, both Thursday & Friday
Winnett Lounge
sponsored by the Human Resources

Friday, January 28

Health Fair
11:00 am-2:00 pm, Olive Walk
Enjoy health services, a climbing wall, & freebies.
sponsored by the Counseling Center and Residence Life

Latin Dance Night
8:00 pm-12:00 am, Avery Dining Hall
Refreshments provided.
sponsored by the Caltech Y, International Student Programs, & the Ballroom Dance Club

Saturday, January 29

Day Hike
Transportation provided. Bring your own water and snacks
sponsored by the Caltech Y
Please call Athena Castro at x6163 for more information

Wellness Week is sponsored by Human Resources & Student Affairs
For more information, please call Deborah Southerland (x2961) or Sue Friedman (x3345)

Jump, Jive and Wail with the

Caltech Jazz Bands

William Bing, director

guest artist: composer and trumpet artist
John Daversa

with special guest composer
Ardell Hake

and vocal soloists
Lorena Barba
Kjerstin Easton
Brian Patton

"In the Mood", "Jump, Jive, and Wail", "Basin Street Blues", and additional music by Don Ellis, Ardell Hake, and Charles Mingus

Saturday, January 22, 2000 at 8:00 PM in
beautiful Beckman Auditorium on the
Caltech Campus

for further information,
please call (626) 395-4652

Mints

ANNOUNCEMENTS

Be a part of the earthquake team. The U.S. Geological Survey (on campus) is looking for a part time intern for ongoing monitoring and programming of an automatic, web-based system for gathering post-earthquake shaking and damage data (see <http://pasadena.wr.usgs.gov/ciim.html>). Summer work also possible. More info thru Career Center. Email walk@gps.caltech.edu.

Caltech guitar classes for the winter quarter will meet on Tuesdays in SAC Room I, starting on January 11 as follows: Beginning Guitar Class 4:30 - 5:30 p.m.; Intermediate Guitar Class 3:00 - 4:00 p.m.; Advanced Guitar Class 5:30 - 6:30 p.m. Classical and flamenco repertoires are explored, but 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). Undergrads can receive 3 units of credit. The instructor, Darryl Denning, has an international background in performance, teaching and recording (two of his CDs are available in the Bookstore). Mr. Denning can be reached at 323-465-0881 or by email at ddenning@caltech.edu. The guitar home page is at [www.cco.caltech.edu/~musicpgm/guitar.html](http://cco.caltech.edu/~musicpgm/guitar.html).

Independent Record label looking for part time intern. Duties are based on background skill level. Looking for someone reliable and responsible If you have a resume please send via email to vrichter@netcom.com Please also visit our website <http://vr.dv8.net> to learn more about our company

EVENTS

Eth-Noh-Tec will present a family program on Sat., Jan. 29, at 2 p.m. in Caltech's Beckman Auditorium. Eth-Noh-Tec means the weaving of cultures, East and West, to create new possibilities. Tickets are \$10 for adults and \$5 for children, call 1-888-2CALTECH for 626-395-4652 for more information.

"**Britain's Offshore Islands**" to screen at Caltech, Fri., Jan. 28, 8 p.m. in Beckman Auditorium. Rick Rosefield will narrate this Armchair Adventures travel film. Tickets are \$9.00 and \$7.00, and can be purchased at the Caltech Ticket Office, 332 S. Michigan Ave, Pasadena, and also at Tickemasters. Call 1-888-2CALTECH or 626-395-4652 for more information.

Legendary Broadcaster Walter Cronkite to speak in Pasadena on Jan. 26, Wed., at 8:00 p.m. at the Pasadena Civic Auditorium, 300 E. Green St, as part of the Distinguished Speaker Series. He will present "The Legacy of the 20th Century," and reflect on the historic people and events that have shaped our lives. For more

information contact Kathy Winterhalder, 310-546-6222, or visit www.speakersla.com.

John Schwarz, Harold Brown Professor of Theoretical Physics and **Edward Witten**, Visiting Professor of Theoretical Physics present "String Theory in the Millennium;" and Romy Wyllie, Author of "Caltech's Architectural Heritage" presenting "Caltech's Architectural Heritage" in Airtalk: The Caltech Edition, hosted by Larry Mantle, Wed., Jan. 19, 6 to 7 p.m. on KPPC-FM 89.3. Call ins to 626-793-3667.

Ninth concert of the L.A. Philharmonic's 1999-2000 Community Concert Series, Fri. Jan. 21, Sir Roger Norrington leads the L.A. Philharmonic and vocal soloists in Sir Michael Tippett's oratorio, "A Child of Our Time." This performance is free and open to the public, and takes place at Wilshire United Methodist Church, 4350 Wilshire Blvd., in L.A. For information, call 323-931-1085.

The Winter Festival, sponsored annually by the Pasadena Folkdance Co-op, will be held on Jan. 23, Sun., from 1:30 to 5:30 p.m. at the Scottish Rite Temple, 150 N. Madison (at Walnut). A \$5.00 donation will be requested at the North entrance. Folks are welcome to participate or simply observe, they can wear costumes or not. For more information, contact Sylvia Stachura, 626-300-8138 or Marshall Cates, 626-794-9493.

Music Director Jeffery Kahane and the L.A. Chamber Orchestra

will continue their

"Made in California" season with the gues appearance of the exciting young California pianist Christopher O'Riley on Fri., Jan 21 in Royce Hall, UCLA, and Sat. Jan. 22 at the historic Alex Theatre in Glendale. The concerts will begin at 8:00 p.m. Tickets mays be purchased by calling 213-622-7001 x215, M-F 10:00 a.m. - 4:00 p.m.

Caltech Jazz Bands, under the direction of William Bing, present their annual winter concert, "Jump, Jive, and Wail." This is a free concert and open to the public. Featured on this concert will be guest artist John DaVersa. Concert will be on Sat., Jan 22, 8:00 p.m. at the Beckman Auditorium on the Caltech campus. For more information, call 626-395-4652.

SCHOLARSHIP

The Jewish Loan Association is offering interest-free student loans to qualified individuals for tuition, books and supplies, and living expenses. Applicants must have completed a minimum of one year of undergraduate study and have a 2.5 GPA or above. For further information, please contact the Jewish Free Loan Association at 213-761-8830 or 818-464-3331.

The National Academy for Nuclear Training is offering \$2,500 scholarships to eligible students majoring in nuclear engineering, power

generation health physics, or chemical electrical, or mechanical engineering, power generation health physics, for chemical, electrical, or mechanical engineering with nuclear or power options. Applicants must be U.S. citizens or U.S. nationals, considering a career in the nuclear power industry, minimum GPA of 3.0 as of January 1, 2000, at least one but no more than three academic years of study remaining to graduation, and free of post-college obligations or active military service. Applications are available in the Financial Aid Office. For further information you may contact: National Academy for Nuclear Training Scholarship Program, 700 Galleria Parkway, Atlanta, GA 30339-5957 or via email at nanteap@inpo.org. Entries must be submitted to the Financial Aid Office by January 29, 2000.

The Southern California Chapter of Women in Cable & Telecommunications is offering a \$1,000 Jeanne Cardinal Grant to one outstanding female undergraduate residing in Southern California. Applicants must plan to pursue a career in the telecommunication field, be a junior or senior by January 1, 2000, have a 3.0 or higher GPA, and be active in at least one school approved campus organization or in community service. Applications are available in the Financial Aid Office. Applications are to be completed and sent to: The Southern California Chapter of Women in Cable & Telecommunications, c/o Pamela Drake, Avenue TV Cable Service, Inc., P.O. Box 1458, Ventura, CA 93002. Entries must be submitted to the Southern California Chapter of Women in Cable & Telecommunications by January 31, 2000.

The Asian and Pacific Americans in Higher Education (APAHE) is proud to announce that applications are now available for the 2000-20001 APAHE Scholarship Program. Applicants must be California residents currently attending a California college or university, plan to enroll at least half time in the Fall 2000 term (the award year), and maintain satisfactory academic progress. Additionally, applicants must be 21 years old by September 1, 2000, have undergone special life circumstances and unusual hardships, have a 3.5 or above GPA, and demonstrate active community involvement or volunteer work with Asian and Pacific American populations. To apply, applicants must submit an APAHE Scholarship Application and Statement of Candidacy to the Financial Aid. Applications are available in the Financial Aid Office. Applicants materials must be submitted to the Financial Aid Office by February 4, 2000.

The College Women's Club of

THE CALIFORNIA TECH

Caltech 40-58
Pasadena, CA 91126

recommendation; one picture of applicant take within the last year; and a copy of the student's and parent's 1999 Federal Income Tax returns. Applications are available upon written request by writing to Scholarship Committee, KASF Western Region, 3435 Wilshire Blvd, Suite 2450, Los Angeles, CA 90010 or via the web at www.ksaf.org. Entries must be submitted to KASF by February 15, 2000.

The American Meteorological Society is pleased to invite applications for the 2000-01 AMS/Industry Undergraduate Scholarships in the atmospheric and related oceanic and hydrologic sciences. Prospective candidates from the fields of earth sciences and related fields who intend to pursue careers in the atmospheric and related oceanic and hydrologic sciences are encouraged to apply. The award is based on merit and awarded to students who demonstrate potential for accomplishment in these fields. Applicants must have successfully completed two years of study by August 2000 at an accredited institution with a minimum G.P.A. of 3.0 on a 4.0 scale and be U.S. citizen or hold permanent resident status. The scholarships are available to students who will be juniors in the fall of 2000. The award is renewed for the senior year based on the recipient's performance and recommendation of a faculty advisor. Applications can be obtained from the AMS web site at www.ametsoc.org/AMS. Any questions may be directed to Donna Fernandez, 617-227-2426 x246, dfernand@ametsoc.org; or Stephanie Armstrong, 617-227-2426 x235, armstrong@ametsoc.org. Applications must be submitted by February 25, 2000.

The Dennis W. Cabaret Scholarship Committee is pleased to announce the availability of scholarships for students whose permanent address is in Orange County. Applications must have completed at least one year of college, have a 3.0 or higher GPA, be currently enrolled in an institution of higher education, and clear roots of activism in the Orange County lesbian and gay community. The applicants is advised that the Scholarship Committee may call him or her for a personal interview. Applications are available in the Financial Aid Office. Completed applications should be sent to Dennis W. Cabaret Scholarship, c/o Thomas J. Peterson, 2821 Cassia St. Newport Beach, CA 92660. Entries must be postmarked by February 29, 2000.

To submit an event for the Mints, contact mints@tech.caltech.edu or mail your announcement to Caltech 40-58 Attn: Mints. Submissions should be brief and concise. Email is preferred. The editors reserve the right to edit and abridge all material. Deadline is noon Wednesday. Unless specifies, all mints will run for two weeks.