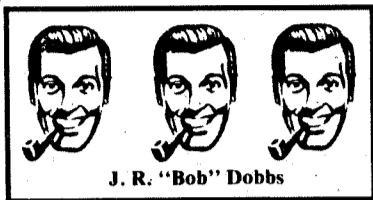


NOTICE:

Next week's edition of the finest paper in God's universe will only contain candidate statements and (maybe) Bloom County. In a surprise move at the last ASCIT meeting, Dwight Berg, like a giddy schoolgirl, giggled, "Sure, I'll edit next week's paper!" His enthusiasm melted the hearts of ASCIT officials who were pleased as punch to let him do it. After next week, *Tech* editorship will be vacant.



THE CALIFORNIA TECH



Volume XC, Number 12

Pasadena, California

January 13, 1989

Gamma-rays detected

From Balloon

[OPR]—Using a sensitive gamma-ray camera hanging from a balloon floating 120,000 feet over Alice Springs, Australia, a team from Caltech has observed a very bright gamma-ray object *near* but not at the center of our galaxy. The results were announced on Wednesday at the annual meeting of the American Astronomical Society in Boston.

The authors of the paper are Walter R. Cook, a Caltech electronic engineer; graduate student D.M. Palmer; Thomas A. Prince, associate professor of physics; staff scientist S.M. Schindler; graduate student C.H. Starr, and Edward C. Stone, Jr., professor of physics and vice president for astronomical facilities.

The gamma-ray source has been tentatively identified with a previously known X-ray object with the designation 1E1740.7-2942, and which appears at least 340 light years from the galactic nucleus. (The uncertainty about the object's exact location is due to the fact that it may be in front of or behind the galactic center.) "It's been known for some time that there is a great deal of gamma-ray emission in the region of the galactic center, but we haven't been certain whether it was due to one object or many, or whether the emission was coming directly from the galactic nucleus or from just nearby," said team leader Thomas A. Prince. "I suppose that most astronomers would have guessed that the bulk of the gamma-ray emission is coming directly from the galactic nucleus, but our observations clearly show a single source located 0.7 degrees—at least 340 light years—away from the nucleus."

The object emits copious amounts of radiation in the energy range from 30 to 200 keV, an energy range including hard X-rays and soft gamma rays. This object is only slightly less luminous than the

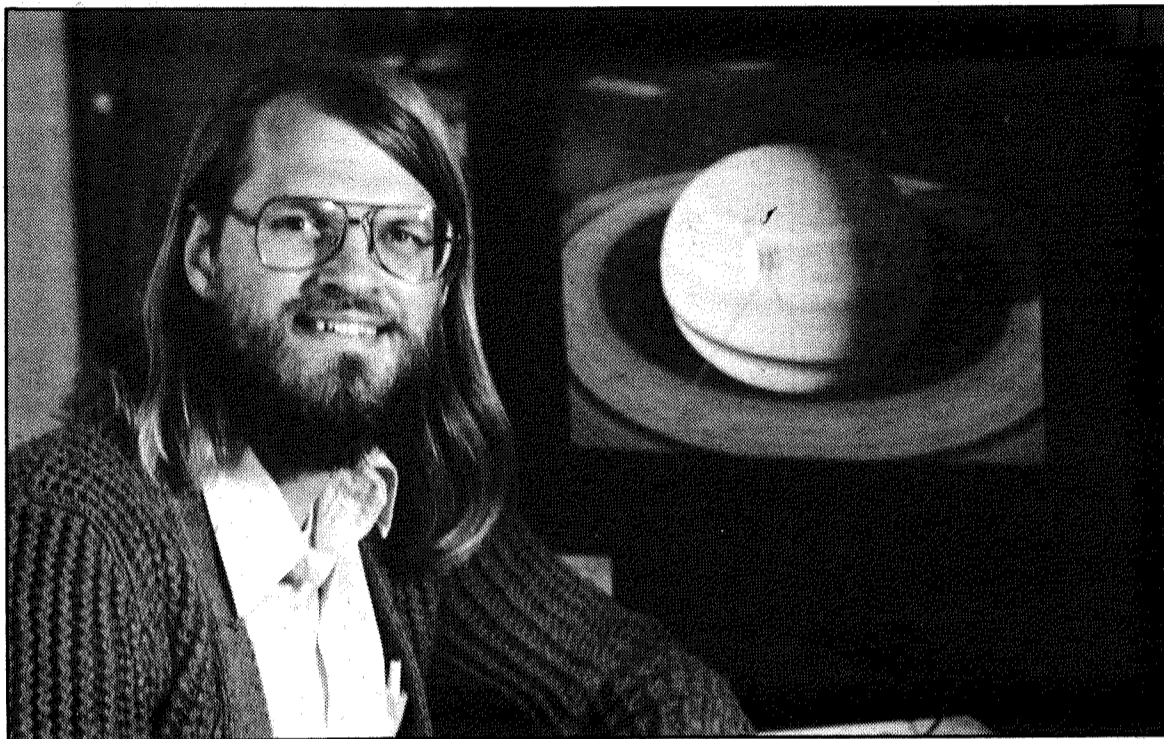
brightest galactic object known at those energies—Cygnus X-1. Cygnus X-1 is believed to be a binary star system in which one of the objects is a black hole.

"We're not exactly sure what the object we've observed near the galactic center is," said Cook, who delivered the paper at the AAS meeting. "One possibility is that it's a 'stellar mass' black hole similar to Cygnus X-1—one with a mass of 5 to 10 times that of our sun. Another possibility is that it's a neutron star onto which material is accreting."

The object was observed with a special gamma-ray camera that was built entirely at Caltech. It is basically a flared cylinder three meters long and one meter in diameter mounted on a pointing platform. The camera's gamma-ray detector is a large circular plate of sodium iodide crystal 40 centimeters in diameter and 5 centimeters thick. Gamma rays striking the crystal produce faint scintillations of light, which are detected by photomultiplier tubes behind the crystal.

The key component of the camera is its unique "lens," which consists of an array of 175 small, hexagonal, lead blocks, arranged in a pattern that creates a series of apertures through which the gamma rays pass. Each of the apertures in this mask is like the hole in a pinhole camera, creating a separate image of the sky on the sodium iodide crystal. The hexagonal blocks are arranged, or coded, so that a computer can unscramble the faint overlapping images of the gamma-ray source, combining them into a single, more intense image. The entire 300-pound mask rotates at one revolution per minute, causing the view of a source to be turned off and on at every point on the detector. This "chopping" or modulation of the source signal allows

see GAMMA-RAYS page 3



No picture of Doctor James Blinn is complete without gratuitous photos of Saturn.

Photo by James Seligman

Hand o' God removes terms

Makes Sense of Science

by Craig Volden

During one of the algebraic cancellations, I used the 'Hand of God' to take out some terms. Actually I used a drawing of my own hand.

Being a creator is right up Dr. James Blinn's alley, as he explained at Wednesday's Watson Lecture entitled "Making Science Understandable." Now the Associate Director of MATHEMATICS! at Caltech, Blinn spoke of his philosophy toward education, told some anecdotes about *The Mechanical Universe*, his well known computer animations project, and talked about his hopes for the future.

Dr. Blinn was introduced by Professor David Goodstein, with whom Blinn had worked on *The Mechanical Universe*. Goodstein pointed out that Blinn's work thus far could be valued at tens of millions of dollars, but that Blinn's de-

votion toward making science understandable allowed the program to be a success at a lower cost.

Dr. Blinn's devotion to this cause can be seen both in his words and actions. As both his parents were teachers, Blinn quickly came to the conviction that "education is the highest human endeavor." He added that unfortunately our society "thinks nuclear weapons are the highest human endeavor."

"I feel that to learn something, students need many different inputs." Computer animation has proved to be a significant attracting feature, bringing students closer to the understanding of science at various levels.

The Mechanical Universe series has been used in various colleges and broadcast on national television. Thirty-eight 15-minute versions were then made for high schools across the United States. Japan picked up on the idea, and the series, which will be translated and shown in half of all the Japanese high schools.

Blinn sees the learning process as having three levels:

"I don't understand;"

"Okay, if you say so;" and

"Of course, how could it be otherwise?"

By presenting difficult ideas (up through relativity) in a medium that kids relate to, Blinn has seen many students pass to the third level "with much less difficulty than [he] had."

In addition to making things understandable Blinn keeps them interesting and fun. For complicated calculations, he introduces and intriguing technique known as "algebraic ballet," which is even more fun to watch than it is to do the algebra yourself!

Hard to imagine? It's true. With moving variables, lightning bolts, and explosions, Blinn has been able

to solve nearly all of the important proofs in physics, never before able to be tolerated by the viewing public.

Various shapes and animations are used to keep the programs exciting. When asked about his use of the teapot, one of Blinn's favorite shapes (which even provides the answer to the ultimate question of life, the universe, and everything in one episode), he explained that he picked up this shape at graduate school at the University of Utah. Showing Blinn's influence on the industry, many other computer animators have used the teapot shape since.

In addition to having the Hand of God, Blinn was able to bomb Russia from London in one episode, when in a Newton's thought experiment on orbits, a couple of cannonballs didn't quite make it into space.

Other fun ideas of Blinn include the creation of a "19" ball on a pool table collision simulation [or was it "61"?] and a parody called the *Quantum Mechanical Universe*. Another amusing event happened when Blinn wasn't able to claim credit for his computer work on one project, he played trumpet in the background, so his name would be listed on the film.

The Mechanical Universe show on relativity has earned many awards and has gained the title of *THE Show* among students at Tech.

Even though Blinn has completed *The Mechanical Universe*, his devotion remains as strong as ever. He is now working on Project MATHEMATICS! with Professor Tom Apostol. After this mathematical endeavor, Blinn would like to work on computer animations for chemistry and molecular biology.

He, however, classified the future funding of such projects as

see UNDERSTAND page 3

Van Use Discouraging

by Marty O'Brien

A re-evaluation of Caltech's transportation policies has forced ASCIT to change its policy regarding the ASCIT Van, or else lose its status as an insured vehicle under Caltech's self-insurance program. Under a rehashed version of Resolution XII of the ASCIT By-laws, use of the ASCIT Van, as with other institute vehicles, is restricted to use only "in the broad interests of the California Institute of Technology."

The policy re-evaluation was brought about by the set of circumstances involving the death of a Caltech student in an Institute ve-

hicle last summer. ASCIT was told that in order to keep the van insured by the Institute, it would have to enact some policy changes. Due to the problems in finding insurance from a private company for a van with a few hundred drivers (nearly all of them males under 25), ASCIT was forced to make the changes.

The tougher new regulations may prove discouraging to many would-be ASCIT Van users, but one can get around them with a little extra effort. Students wishing to take the van on a trip (skiing, to the beach, etc.) may get the sponsorship of their houses' social teams, making the event a house trip. The

MOSH and Deans have proved willing to give authorization for things like getting to a job interview, moving belongings from one residence to another, etc. If you have any other questions or concerns, feel free to come talk to me or any other of your friendly neighborhood ASCIT BOD members.

Thus beginning this year, van use is more restricted. Students representing ASCIT subcommittees, ASCIT-sponsored clubs, sports teams, or student house events will still be able to use the van. Personal use will only be authorized with written permission from the Deans or the MOSH.

letters

Dear O-Wonderful Editors:

Although I was rather impressed by the Watson Lecture given by James Blinn on the notion of using computer graphics to teach physics and manners, I left the lecture a bit disturbed because of the behavior of selected members of the audience. While I welcome the members of the Pasadena community to broaden their horizons by attending these lectures, I feel that Public Events should begin to require that children without Caltech I.D. be accompanied by their parents.

I have nothing against high school students coming on campus to learn a bit more about science to supplement their education. However, I wish that they would not use the Watson lectures as an excuse to spend a Wednesday evening away from their parents. Granted that the Caltech campus was voted the best place to meet a date by the *Pasadena Reader*, but there are better places in Pasadena to socialize with friends and loved ones, without disturbing people who are truly interesting in finding out what a lecturer has to say.

Not only did I have to endure hearing a presentation on Special Relativity and Magnetism at Blinn's lecture, but I also had to endure flashlight wars, gossip about boyfriends and girlfriends, and George Michael being played a walkman with the volume set to 11. While I didn't mind the physics, the George Michael was quite annoying. So please, if your not interested in seeing a Watson lecture other than getting meaningless extra credit in your science class, please hangout elsewhere in Pasadena with your friends.

-Andrew Hsu

To the Editors:

I say "Hear, hear!" to the statement about need for more and higher quality classrooms. I have struggled with this problem for a long time and the situation only seems to get worse instead of better.

Gentlemen and Ladies, I can't find space for you to hold class if the available rooms are removed for other purposes. Please don't get upset if you can't teach in your building, or, God forbid, you should be scheduled into a basement room. I can't help it.

-Joan Cable
Registrar's Office

opinion

An Ex-Editor's Rant at Everything

This is a general rant. It covers lots of topics because there's so much to scream in public about. First, the editorship.

I am erroid for only this week. I want to graduate this year, so I am not considering doing this full time. This was a tough decision; this was largely because printing a quality *Tech* is a very rewarding experience.

For those who have time or can delegate to others, being an editor can be safe and worthwhile. Not only can an editor learn to distinguish between responsible and irresponsible journalism, if she chooses the responsible route, she can stave off the ever-present threat of fascism any college administration wilds. (He can also make people stop to consider feminist language.)

The presence of authoritarian administration in fact reared its ugly head twice in last week's issue. The first instance appeared in "White paper" article: "The structure and tone of undergraduate life would be, to some extent, taken out of the hands of the student lead-

ers in the houses and would become the responsibility of the faculty." You, the undergraduate poulace, should be worried about this.

The second surfacing of oppression happened in the "Coffeehouse scandal" article. This piece asserted that Steve Lodge broke Coffeehaus rules by working when he wasn't a student and that student employees paid him to do this. True enough.

Nancy Matthews, the non-student administrator of the Coffeehouse, thought this was a problem; hence, the "scandal." I propose that this was actually a solution to a situation Ms. Matthews failed to recognize. Mr. Lodge was working only because students were not willing to.

I encountered him two or three times this summer while he was working in the Coffeehaus. He made it abundantly clear that he was working because no one else would. He expressed that he was working because it would be sad to see the Coffeehouse close.

It is obvious that Lodge and others broke rules, but I believe the rules need to be changed or, perhaps ignored in this exceptional situation. These regulations were designed to offer employment opportunities to undergrads. This is fine, but it seems that during the period rules were broken, no undergrads wanted to fill the empty positions. That makes upholding the rules a pointless and unproductive pursuit.

One case of open positions available to undergrads that are being denied to them also needs to be addressed; this is the TACIT recruitment strategy. Here, dozens of students want to participate in theatre productions (fools though they may be, given the high correlation between second term flame-outs and musical participants).

Many people recognized for their talent who want these roles and are willing to work endless hours perfecting their performance are being passed up in favor of trained professionals. TACIT coordinators seem to feel the students are recompensed by being given bit

parts, though this is clearly not so.

TACIT stood for Theatre Arts of the California Institute of Technology, not TA of a-friend-of-a-friend-of-someone-at-JPL-who-is-taking-a-break-between-films. These productions are supposed to be recreation for Caltech students (both kinds), faculty, staff, and JPL people and as a showcase of their talents. If there are enough of these people talented enough to produce an adequate show they should do it without outside interference.

Participation and enjoyment are as important as the performance here, Shirley "I don't care if they have mid-terms, we have a show to put on" Marnaeus may disagree.

By the way, none of you readers are writing to the *Tech* enough. I know most of you have strong opinions on a wide variety of subjects like the ones I discussed here, but none of them are being printed here where they should be.

A message to you who posted those notes to concerned undergrads - become a reporter. The points you made valuable and relevant. They deserve a wider readership and a by-line.

I hear a voice from the past. It is a voice reeking of slack, a voice that warns us against becoming dupes of the conspiracy. It says dorky, dorky, dorky.

- Josh Kurutz
an ex-erroid by the
time you read this

Lack of Trust and Respect

From the Caltech Catalog, 1988-1989:

The primary purpose of the undergraduate school of the California Institute of Technology, as stated by the original trustees, is "to train the creative type of scientist or engineer so urgently needed in our educational, governmental, and industrial development." It is believed that this purpose is attained at the Institute for both undergraduate and graduate students because of contacts between a relatively small group of students...and the members of a relatively large research staff.

If you have heard or read the White Paper, this statement from the Catalog seems to fall short of the ideals it represents, but is this anything we didn't already know? The problems of student life that I have witnessed, I suspect predate my three years of attendance here.

There seems to be a lack of respect between the students and the faculty. Because the concern of our new president, however, this problem is finally being openly discussed and solutions finally examined.

How was the current state of affairs reached? Somewhere over the years it was forgotten that this mighty Institute was once a meager vocational education school and that great dreams and efforts were realized to convert it into a school where the bright young minds of the world could come and study. Sure, much outstanding research is done here today, but the faculty have become so emersed into their projects that the students are regarded as less important than the research.

It is this attitude that is the root of the problems of faculty/student relations and quality of student life. No efforts have been made to change this relationship because it has not been deemed important before now. The very problem feeds off itself!

As a consequence Caltech is realizing that it could lose its place among the top colleges in the United States because the best high school seniors are being lured to other campuses.

Is the solution to totally restructure undergraduate life? One of the brightest spots about Caltech life is that the students really get to govern themselves. It is a system that the students feel passionately about because we take pride in the fact that we are treated maturely because we are allowed to govern ourselves.

I know that we, the students, are most angered when decisions are made about our lifestyle without our consultation. There are still hard feelings among students regarding such issues as the Renovation of the South Houses and there is a general uneasy feeling towards the potential power that the administration holds over us. I suspect there is a feeling among the faculty and administration that the students are only transients for four years and ungrateful for what they do for us. These feelings cannot help to solve any of the perceived problems, we must work together in a spirit of trust and respect.

- Mike McDonald

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January 13, 1989

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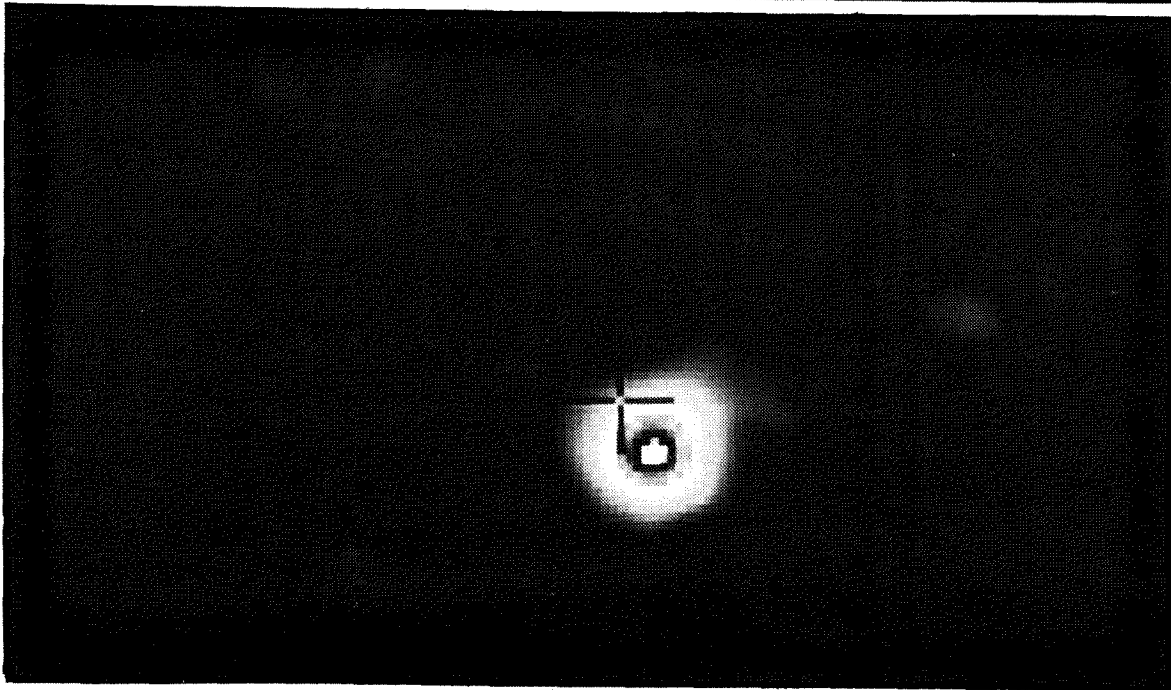
Letters and announcements are welcome. All contributions should include the author's name and phone number and the intended date of publication. The editors reserve the right to abridge and edit letters for literacy, expediency, or else.

Turn in copy (preferably in WordStar format on an IBM-compatible floppy disk) to the *Tech* mailbox outside SAC room 40. The deadline for copy is Wednesday at noon; for announcements, Tuesday at 5 P.M. Subscription requests should be directed to the office manager. Rates are \$3.50 per term, \$9 for one year, \$17 for two years, \$24 for three years, \$30 for four years, \$125 for life (many years).

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Photo Courtesy Caltech



This image, made by the Caltech gamma-ray imaging telescope, shows the region of the galactic center. The galactic nucleus is located at the center of the cross, and the bright gamma-ray source, tentatively identified with 1E1740.7-2942, is centered at the dot in the image and is at least 340 light years away.

More Gamma-rays! from front page

precise subtraction of the large gamma-ray background. The result of this "coded aperture mask" system is a camera that can divide up the field of view into 350 separate parts, or pixels. Most previous gamma-ray detectors were only able to identify a general direction for gamma radiation. Such gamma-ray detectors first discovered the emission coming from the region of the galactic center. The camera must be sent aloft on a large high-altitude balloon since Earth's atmosphere absorbs most gamma rays. But since the camera hangs freely beneath the balloon, it requires an elaborate pointing system to keep it trained on a single object. The pointing system uses Earth's magnetic field, detected by an internal magnetometer, as its guide. In addition, two CCD (charge-coupled device) cameras view the sun in the day and the stars and planets at night to measure the telescope's pointing direction accurately. The data is recorded digitally on a series of eight commercial videotape record-

ers and is also radioed to the ground.

The observations were made last April from a balloon launched from Alice Springs, Australia. The galactic center is readily observed only from the southern hemisphere. Seven hours of the 30-hour flight were devoted to the galactic center area.

The team plans to continue its gamma-ray observations, with another camera launch set for March or April, 1989. "There's a very exciting story developing about positron-annihilation emission starting and stopping and starting again in the region of the galactic center," said Prince. "We want to find out whether it's 1E1740.7-2942 or the galactic nucleus that's responsible for this positron-annihilation emission."

Positron-annihilation emission is thought to be produced when large amounts of material fall onto a neutron star or a black hole. Such an event produces large numbers of gamma rays, which in turn can produce large numbers of positrons. When such a positron meets up with an electron, they annihilate each other and produce two other gamma rays, each with an energy of precisely 511 keV. Positron-annihilation emission was

first observed coming from the region of the galactic center in the 1970s, but then, between 1979 and 1980, the emission was observed to switch off mysteriously. The Caltech team observed no positron-annihilation emission coming from the newly imaged object during the April 1988 flight.

However, Crawford MacCallum of Sandia National Laboratories was expected to report this week that his group's observations from May and October, 1988, show that positron-annihilation emission from the region of the galactic center may be starting up again. One possible explanation for this is that a new batch of material is falling into a black hole and producing positron-annihilation emissions in the process. The Caltech group is eager to learn whether the positron-annihilation emissions are coming from their newly imaged object or directly from the galactic nucleus, which may harbor a black hole far more massive than the one that may be responsible for objects like Cygnus X-1 and possibly 1E1740.7-2942.

NASA supported the Caltech team's research. Development of the gamma-ray cameras was funded by NASA, Caltech, and the Ralph B. Lloyd Foundation.

BEAT CRIME

From the files of Hal Ginder

- THEFTS:**
 between 12-18 and 1-6: Camera from a Steele lab
 bet. 12-23 and 12-27: Tools from 153 N. Mudd
 bet. 1-3 and 1-6: Color plotter from Guggenheim
 1-6: Bike from Fleming alley 5
 1-6: Tools from a cart by Arms
 1-9: \$10 in quarters from N. Mudd
 1-10: Workout bag with arm weights from Chandler parking lot

- Sundry CRIMES**
 1-6: Attempted car theft at IPAC on S. Wilson
 1-9: Attempted car theft (damaged locks and ignition) on Wilson N. of San Pasqual

Tip for the law abiding public from Hal Ginder: "Do not prop open doors that are supposed to be locked."

Understand

from front page

"not real promising." MATHEMATICS! will be \$800,000 short of its proposed budget for each of the next five years. Blinn is hoping to be saved by donations and other contributions.

Any student who has gone through *The Mechanical Universe* program (or those who did not—and are still confused) can understand the contribution Dr. James Blinn has made to the teaching of Physics. Indeed, the computer animation "creator" has met the topic of his lecture—by making science understandable.



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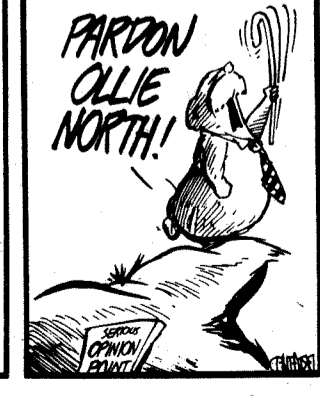
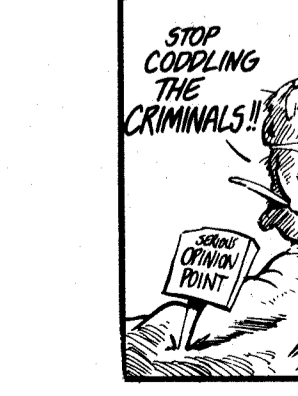
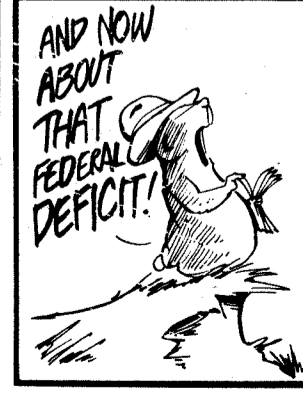
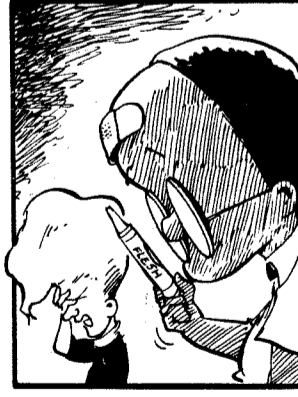
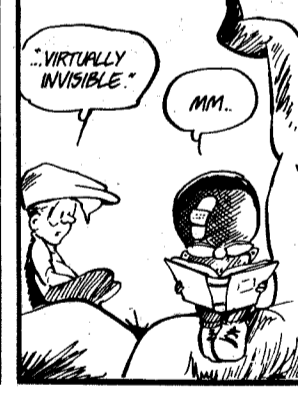
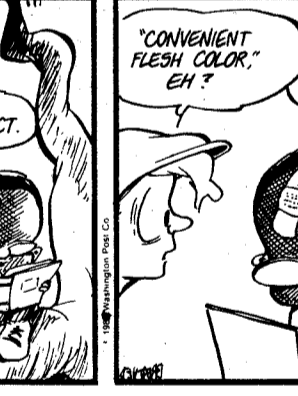
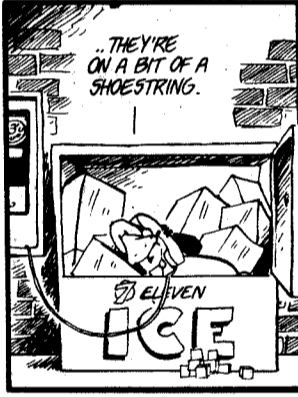
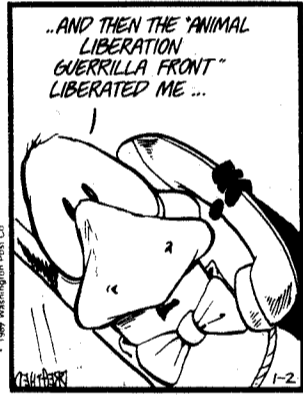
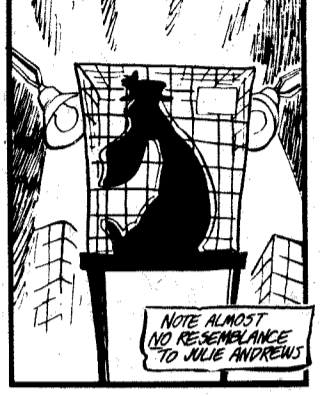
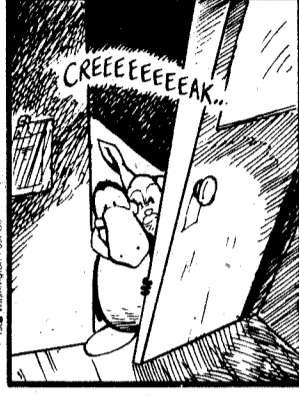
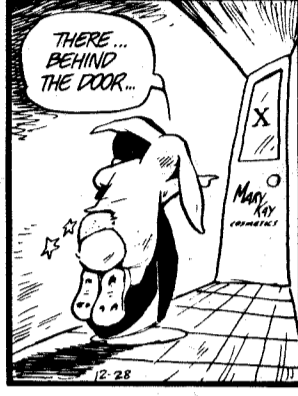
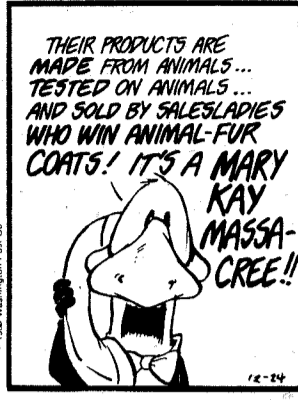
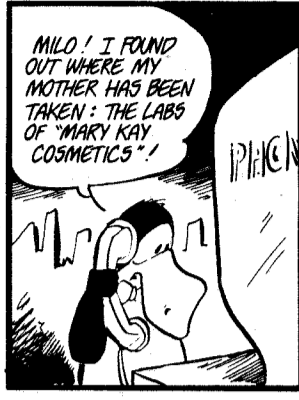
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entertainment

Back from the dead...

Gannett Entertainment II

by Susan Spillman

GANNETT NEWS SERVICE

The follow-up formula went belly up in 1988, when more sequels failed than succeeded at the box office. Hollywood isn't giving up on sequels, though—more than a dozen are planned for 1989.

In 1988 only 'Crocodile' Dundee II and Nightmare on Elm Street IV lived up to expectations. Everything from Arthur 2 on the Rocks to Cocoon: The Return, failed to lure moviegoers.

The sequels of '89 begin with The Fly on Feb. 10, starring Eric Stolz as the scientist gone buggy. Other attempts to repeat past successes:

—Fletch Lives brings back Chevy Chase as a Los Angeles newspaper reporter, this time paired with Julianne Phillips. Their sleuthing takes them to the plantations of Louisiana. March 17.

—Indiana Jones and the Last Crusade co-stars Sean Connery as Indiana's dad. Connery's brawn helps take the heat off Indiana, according to Harrison Ford, who says the latest installment was less physically grueling than the previous two. Due in May.

—Back to the Future II reunites original director Robert Zemeckis (Who Framed Roger Rabbit) and stars Michael J. Fox, Christopher Lloyd and Leah Thompson. Summer.

—Star Trek V, directed by William Shatner, will mark the Starship Enterprise's last trip to the movie theaters, according to Paramount Pictures. Summer.

—Ghostbusters II brings back all the original crew from the 1986 smash and is currently finishing production in Los Angeles. Summer

—Lethal Weapon II, again directed by Richard Donner (Scrooged), and again starring Mel Gibson and Danny Glover. Currently in production. Fall.

And what year would be complete without another Police Academy (6) and Nightmare on Elm

Street (5)?

And in production for possible 1989 release: RoboCop II, Rocky V, Dirty Dancing II, Rambo IV, and the third go-round for Jim Varney's Ernest.

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Okay guys it's here...

That Lieber Book

by Nick Smith

The Knight and Knave of Swords
by Fritz Lieber
Arbor House, \$17.95

For the last 50 years, Fritz Lieber has been delighting fantasy readers with a wonderful array of tales, some of the best ones being the series about Fafhrd and the Gray Mouser, two rather philosophical rogues who tend to outwit their more Conan-esque rivals as much as outfight them.

For the last few years, apparently due to personal health and related problems, Lieber had turned out few of the stories, but there was a long-standing rumor that there would be one more novel forthcoming. Well, this one is it, and the book was well worth the wait.

This volume contains three inter-related short works, and a full novel. My favorite of the short pieces concerns the most interesting curse I've ever seen: the curse of thinking like you're nearing the end of your life and of missing all the things you don't have and don't know. The result is to turn Fafhrd into a man obsessed with the cosmos, and the Mouser into a connoisseur of the little things in life. Needless to say, the curse does not

achieve its original purpose, which is the whimpering defeat of the duo.

The novel contained in the volume is an even more unusual sword-and-sorcery fantasy, one that deals with the side-effects of a life of adventuring. For example, in the typical Conan-style story, the hero rides off into the sunset, with loot under one arm and a wench under the other. Nothing more is ever said about any surviving enemies plotting revenge, the final destinations of the loot, or even the more pragmatic problem of pregnant wenches and Barbarian Juniors.

Well, for Fafhrd and the Mouser, their pasts come back to haunt them, almost literally, as Death himself ends up tweaking the noses of the duo in a grand jest. And, almost unheard of in the genre, the heroes spend almost the entire story as passive participants in the plot, not in control of their own destinies. A humbling thing indeed, for the "Two Best Thieves in Lankhmar".

Anyway, I realize that the price is steep, being a hardbound book, but if you can afford it, or if you want to get a nice gift for someone, it's got a beautiful cover illo. Also, there will be a paperback someday, so be ready for it.



Tech Musical Arts

by Andrew Hsu

Although Caltech is not exactly a school known for cutting edge music facilities, the month of January will feature a wide selection of musical groups showcasing their talents on campus.

Today, the Y noon concert series will resume with the band Rain on Fire performing in the Winnett quad. The band also performs tonight at the Pasadena club, the Cage (next to the Icehouse), in case you can't make the lunch date. Other noon concerts this terms will include the Bedshredders, Sam I am, and Caltech Jazz bands. Be on the look out for flyers!

Besides noon concerts, classic rock can be heard in Beckman this Saturday as the Golden Groups of the 50's and 60's perform. The concert will feature such famous groups as the Coasters, Chuck Rio and the Champs, and the New Chordettes. Discount tickets for the Caltech community are available through the Caltech ticket office.

The Caltech wind ensemble will perform in Ramo auditorium

next Saturday at 8:00 p.m. The ensemble, led by Bill Bing and featuring Jim Blinn on principle trombone, will perform works by Sousa, Grainger, Gershwin, and Mozart. Mary Rowe, Tom Skelton, and Dawn Sumner will also perform as flute soloists. Not only is this concert free, but so is the food at the reception following.

Finally, if chamber music is your inclination, the Viklarbo Chamber Music Ensemble will give a free concert on Tuesday, the 24th. The program has yet to be announce but the fine technical skill of the quartet is definitely worth seeing. In addition, various student chamber music groups coached by Delores Bing will be featured in a series of concerts at the end of the month be on the lookout for more details.

While I exposed many on-campus opportunities to see movies in my article last week, I hope that this week's article will help the vast California Tech audience discover that the arts do exist somewhere on campus.

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PLACE: Winnett Lounge

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Attention: Ed Lambert

sports

WEEKLY SPORTS CALENDAR

Day	Date	Time	Sport	Opponent	Location
Sat.	1-14	11:00 am	Swimming (M-W)	Pomona-Pitzer & Oxy	Caltech
Tue.	1-17	7:30 pm	Basketball	Occidental J.V.	Occidental
Fri.	1-20	7:30 pm	Basketball	La Verne J.V.	Caltech
Sat.	1-21	11:00 am	Swimming (M-W)	Redlands	Redlands

Marathon!

Heavy-duty sports schools take note: Caltech's faculty and staff are trying for their third straight athletic championship...in the marathon!

For the third consecutive year, Caltech and JPL are planning to enter the United States Corporate Athletics Association marathon championships. This winter's race is scheduled for Sunday, January 15 in Houston, Texas.

According to Elliott Andrews, division administrator in Engineering and Applied Science at Caltech, the team hopes to attract as many as a dozen marathoners from the campus and lab ranks to compete in the men's and women's open competition and various age categories. Staff employees at JPL and Caltech—as well as representatives of the faculty and graduate student body—are expected to participate in the upcoming marathon.

In 1987, Caltech/JPL finished seventh overall in the corporate marathon. Last year, the team ended up eleventh in a field of 31 teams—besting corporate giants including Texaco, Continental

Airlines, Dow Chemical, and IBM. In both years, the team finished first in Division II (small employers).

Beaver B-Ball Battles

by The Disciples of Aram

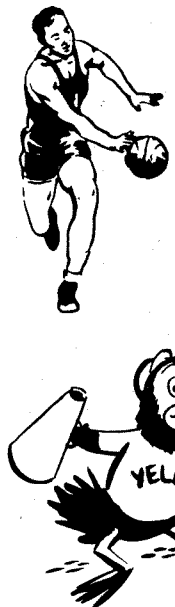
It's been a tough week for the Beaver basketball fan. After a long winter break the Battling Beavers have suffered three straight losses as they struggle to regain their pre-break form. The Beavers fell to the Pacific Christian College Eagles 60-45 and twice to the Loma Linda University Golden Eagles by scores of 64-57 and 69-56.

Despite these three losses, all is not bleak for Beaver basketball. George Papa has emerged as the team's offensive leader, averaging 22 points over the three games. George followed a season high of 28 points against Loma Linda at home with an equally impressive output of 26 points against Loma Linda on Wednesday night. After Wednesday's game, George remarked "It's hard to be happy with 26 points if the team loses and you don't even score with the babes." Whereas George scored 26 points and 0 babes, it is rumored that forward Aram Kaloustian scored 0 points and 26 babes.

The stellar efforts of George Papa and Aram Kaloustian was backed by the consistently strong performances of Jason Karceski who led key plays on both offense and defense. Sean Hillyard, Scott Bradley, Randy Ralph, and Larry Ahle also turned in solid if at times spotty play. Bill Swanson, whose excellent post play helped stabilize

the Beavers in the early season, played erratically early in the week, but in Wednesday's game showed encouraging signs of reestablishing himself as a dominant post player. He also managed to keep his eyes and his goggles attached to the rest of his face ending a streak of 7 games in which he lost both goggles and temper.

The Beaver's exciting basketball season continues next week with a road game against Occidental on Tuesday and a home game against LaVerne on Friday. Come catch the Beaver fever!



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LA Film Critics' Best Picture
Charles Dickens' *Little Dorrit*

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Bruce Kahl, M.D., Director

what goes on the back page

Submit announcements for *What Goes On The Back Page* on forms available outside the *Tech* office (SAC room 40A) and in the copy/mail room (SAC room 37), or use a plain piece of paper. Send announcements to 40-58, or put them in the IN box outside the *Tech* office. Indicate the date(s) the announcement must run. Announcements for the current issue must be received by 5 pm Tuesday and should be shorter than 75 words. Announcements will be published as space becomes available and will be chosen according to size and interest to the Caltech community. Announcements for commercial events unrelated to Caltech will not be published.

Folkdancing

The Caltech Folkdancers will have a beginner's night on January 17. Everyone welcome, with teaching 7:40-9:30 pm. Easy dances to follow in open dancing until 11:55 pm in Dabney Hall Lounge. No partner needed. For more info call Chris at x3697 or Nancy at 797-5157.

Noontime Briefing

The Caltech Management Association presents a Noontime Briefing by George Alexander, Manager of JPL Public Affairs Office, discussing "When They Say All Systems 'Go', How Many Do They Mean?" The informal talk will be on Thursday, January 19 at noon in 167 Conference Room, JPL. All employees are welcome.

Need A Job?

The Coffeehouse is now hiring waiters. Rate of pay is \$5.50/hour plus tips. Please see head manager, Barry Lind, if you're interested (Fleming #8.5)

Expose Your Art!

Caltech artist needed for poster/flyer design. Will pay! Please contact Bill Bing at (213) 684-8964, or send a note to Bill Bing, mail code 12-58.

Work In Japan?

A Caltech alum is offering two jobs in his Japanese factory for the summer. Travel, room and salary are provided. Students will be doing basic factory work. Preference will be given to ME and/or students with machining experience. A presentation will be made by last year's participants in the Rm. 13 SAC at 7:15 pm on Monday, January 16th. All interested undergrads welcome. Refreshments will be served.

The deadline for submitting a brief letter of interest is Monday, January 30th. If more information is required, contact the Deans' Office, 102 Parsons-Gates.

Journalism Class For CREDIT

Caltech undergraduates interested in enrolling in a "Reporting and Newswriting" class can receive Institute credit for successful completion of Journalism 4A at Pasadena City College. PCC Registration for its spring semester will be Jan. 26-Feb. 3. The class meets on the PCC campus; it is offered either MW 11 am to 12:30 pm or Th 7-10 pm. If you are interested, contact Hall Daily in the Caltech Alumni House, or at x6256.

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RATES: \$3.00 for first 25 words; 10c for each additional word. Send written ad with payment to 40-58. Deadline is 6 p.m., Monday before issue. No charge for on-campus lost & found.

Seven Samurai, Cheap!

This Saturday, January 14th at 2 and 7 pm (NOTE: NO 10 pm showing). Cinematech presents *Seven Samurai*, which is the samurai movie to see, if you can only see one. The basic plot, of a small 16th century Japanese village hiring a small band of samurai to protect them from bandit attacks, has been remade into a host of other films, the two most remarkable being *The Magnificent Seven* and *Battle Beyond the Stars*, a western and an SF movie! See it! See it! See it! See it!

Special second feature: the 9-minute short subject, "Gravity," the ultimate spoof on the low-budget educational films: Mary Jane asks the burning question, "What makes the sun set?" and discovers that we are on the brink of a serious gravity shortage. \$1.50. Baxter Lecture Hall.

MacValley Users Group

The MacValley Users Group is holding a meeting on Tuesday, January 17 at 7:30 pm in the cafeteria of Burbank High School, Burbank Blvd. and Third St. in Burbank. Springboard Software will present Springboard Publisher, an integrated desktop publishing program.

Airtalk: The Caltech Edition

On the third Wednesday of every month, KPCC FM (89.3) broadcasts *AIRTALK: The Caltech Edition*, a program devoted to Caltech-related speakers, topics and programs. This month, on January 18th from 6-7 pm, the program will feature Dr. Paul Jennings, Professor of Civil Engineering and Applied Mechanics and Chairman of the Division of Engineering and Applied Science, talking about earthquakes, why people die in them, and how buildings can be designed to keep them alive.

Professor Robert A. Rosenstone will discuss his class, "History on Film," a study of films as both an art form and a recorder of history.

Marketing Presentation

On Wednesday, January 18, William Barry, President of Barry and Company and an expert in the field of marketing will be speaking at the Athenaeum at 6 pm. This is the first in a series of lectures on entrepreneurship and business sponsored by the Caltech Y. All students are invited to attend the program at no charge. Dinner will be provided. Please contact the Caltech Y at extension 6163 to reserve your space. Regardless of what field you are in, knowledge about marketing is sure to be useful in your career; space is limited, so be sure to sign up early for what is sure to be an interesting and informative evening.

S.P.E.C.T.R.E. Meets the General

Hi, Hi, Hi There!!! S.P.E.C.T.R.E., the Caltech Science Fiction Club, will be holding another meeting on Wednesday, 18 January 1989 at 7:30 pm in Clubroom B (Rm. 15 SAC). Topics of the meeting will include the return of author David Brin (*Startide Rising*, *The Uplift War*, *The Postman*, etc.) to the campus for his third visit on 25 January. After the meeting we will watch Episode 6 of *The Prisoner*: "The General", and a special "mystery" feature presentation selected by our own beloved G.E. (General Eccentric). For further information BUG MARK LOOPER at 304-0006 (3 am-4 am is best) Be seeing you...

Right-Brain Drawing Class

An art class teaching students to draw by using the right side of their brains will be offered by the Natural History Museum of Los Angeles County on Saturday and Sunday, February 4 and 5, from 10 am to 4 pm. The system, designed to allow individuals to gain better access and control of visual modes of cognition largely attributed to the brain's right hemisphere, was designed by Dr. Betty Edwards, a nationally-known art teacher. Instructing the class will be Lynda Greenberg of Dr. Edwards' Center for the Educational Applications of Brain Hemisphere Research at Cal State Long Beach.

Students will practice their drawing skills by sketching the flora and fauna found in the museum's mammal halls. The cost of the class is \$50 for museum members and \$60 for non-members. The museum address is 900 Exposition Blvd., Los Angeles. For more information, call (213) 744-3342.

Gay/Lesbian Discussion Group

An ongoing discussion group on Gay/Lesbian topics is held on the 1st and 3rd Tuesday of every month from 7:30-9:30 pm at the Archibald Young Health Center. All members of the Caltech community are welcome. Refreshments are provided. For further information please contact Bruce Kahl, x8331.

Be In The Top Ten

Caltech juniors are invited to participate in *GLAMOUR* magazine's 1989 All New Top Ten College Women Competition. This, the 23rd annual competition, will select the winners on the basis of solid records of achievement in academic studies and/or extra-curricular activities on campus or in the community. The competition is broken down into the areas of: Creative Arts, Communications, Science and Technology, Health, Public Service, Government and Politics, International Relations, Business and Economics, Entrepreneurship, and Sports. One outstanding woman in each category will win the big prize of \$2,500 and an appearance in the October, 1989 issue of *GLAMOUR*.

David Brin Returns!

David Brin, award-winning science fiction author, will give a talk titled "Tropisms, Big Telescopes, and Pyramids, or How to Accumulate Nifty Things for the 21st Century." The talk will be at 8 pm on Wednesday, January 25th in 22 Gates. His talks in the past have been interesting and entertaining, and have, on occasion, dealt with the topic in the title. Sponsored by S.P.E.C.T.R.E., the Caltech Science Fiction Club.

Mensa Money

Mensa Educational and Research Foundation is offering opportunities for students to win scholarships ranging from \$200 to \$1,000 in the Annual Mensa Scholarship Essay Contest. Entries must be postmarked on or before February 1, 1989. Applications are available in the Financial Aid Office.

Chamber Concert

On Friday, January 20 at 8:00 pm, three Caltech freshmen will present a chamber music concert in Dabney Hall Lounge. The concert will feature the music of Mendelssohn (*Piano Trio #1*) and the *Ghost Trio* by Beethoven. Admission free.

German Film: Eisenhans

There will be a showing of *Eisenhans* (1982) on Wednesday, January 18 at 7:30 pm in Baxter Lecture Hall. There will be an introduction and discussion after the showing. The film is shown in conjunction with L 132. All are invited.

The film, whose title refers to the nickname of the main character (roughly, "Iron Jack"), is about the collapse of a troubled family and the breaking of the "iron" control of a self-styled strong man.

Yet Another Totem Poll for Art

Attention writers, poets, and artists! The second *Totem* in as many years will appear this spring and will contain a diverse, if not complete collection of Techer-expressed wisdom and imagination. Address submissions to 116-58. For information contact Sam Dinkin (1-59 or x3828), or Erik Russell (Annex #5, 1-59, x6188). Copies of previous issues of the *Totem* are available.

Folk Music In Dabney Hall

The Caltech Folk Music Society presents Martin and Jessica Simpson in concert on Saturday, Jan. 21 at 8:00 pm in Dabney Hall Lounge. Martin Simpson is a highly reputed folk guitarist, and Jessica Simpson joins him to perform a repertoire ranging from American blues to English ballads. Tickets are \$7 in advance, \$8 at the door, with \$3 off for Caltech students. Advance tickets available at the Caltech Ticket Office, 332 S. Michigan.

Wind Ensemble Goes Pop

The Caltech Wind Ensemble (Concert Band) will present a "Pops" concert on Saturday, January 21 at 8:00 pm in Ramo Auditorium. This FREE concert by the forty members of the Caltech ensemble will include music by Mozart, Grainger, Sousa and Gershwin. Also on the program is a composition that features the artistry of Caltech flutists Mary Rowe and Dawn Sumner. There will be a reception with food following the concert.

Career Development Tidbits

The City of New York is sponsoring the Mayor's Corps of Engineers, offering 75 outstanding engineering students who have completed their junior year of college the opportunity to work on some of the most exciting engineering projects currently underway in New York City. Deadline for applications is February 15, 1989.

IBM Latin America is seeking candidates to fill the positions of Marketing Representative and/or Systems Engineer to work in selected Latin American countries. (Openings are for citizens of Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela).

SPIE's OE/LASE '89 International Conference and Exhibition on Optics, Electro-Optics, and Laser Applications in Science and Engineering is looking for an Audio Visual Assistant for the dates of January 14-20.

Sandia National Laboratories sponsors the "One Year on Campus" Masters Degree Program. The program provides an opportunity for highly competitive minority bachelor-level individuals to continue their education for a masters degree. Candidates normally work at Sandia for several months to become familiar with the laboratories' environment before beginning the program.

Operation Crossroads is sponsoring a cross-cultural exchange project in Africa and the Caribbean.

Milliman & Robertson, Consulting Actuaries, has a need for part-time employees with general mathematical skills to work about 10-12 hours per week during the school year. They would like to employ someone in his or her sophomore year with the expectation of continued employment on a part-time basis through graduation. The company is located on South Lake Ave.

Stop by the Career Development Center, 08 Parsons-Gates, for more information.

Women's Trip To Scandinavia

San Jose State University is sponsoring a travel program to Scandinavia in June and July 1989, focusing on women's issues, including equality, government, representation, sports, the arts, academia, and the women's movement. There will also be seminars on international networking, women's organizations, and the history of women in each country visited, as well as a chance to meet local feminists. The tour, led by Dr. Margaret (Meg) Bowman, noted feminist author and a member of the sociology department at SJSU, departs the U.S. on 27 June, and will include Norway, Sweden, Denmark, and Holland, returning 15 July. An optional extension includes a week in London. For further information, write: Travel Programs, Office of Continuing Education, San Jose State University, San Jose, CA 95192-0135.

College Women's Club \$\$

The College Women's Club of Pasadena is offering \$2000 scholarships for 1989-90. Applicants must be in either their sophomore or junior year. Applications must be received in the Financial Aid Office by Jan. 31, 1989. For more information, contact Financial Aid at 515 S. Wilson.

Korean-American Scholarships

The Korean American Scholarship Foundation has 14 \$1,000 scholarships to aid full-time college students of Korean heritage, including graduates and undergraduates. The deadline for applications is January 31, 1989. For more information, contact the Financial Aid Office, 515 S. Wilson.

Summer Biomedical Program

The Jackson Laboratory of Bar Harbor, Maine, is offering a summer program of biomedical research. Each student conducts original, hands-on research as a contributing member of a sponsoring scientist's research team. Projects are tailored to the student's background and interests. Research areas focus on advancing the knowledge of molecular, developmental, genetic, biochemical, and immunological mechanisms related to normal growth and development and human disease. The Laboratory's extensive resource of mutant and inbred mice strengthens this basic research.

Stipend: \$1,000 plus travel allowance. Housing: Room and board is provided at Highseas, a Jackson Laboratory residence at the shores of Frenchman Bay, and is paid for by Jackson Laboratory scholarship funds.

Application receipt date: February 28, 1989. Selections will be made and applicants notified in late March.

Program dates: June 18 to August 15, 1989. For further information and application forms contact the Training and Education Office, The Jackson Laboratory, 600 Main St., Bar Harbor, Maine 04609.

Carnegie Summer Bio Program

The Department of Biological Sciences of Carnegie Mellon University is offering a summer undergraduate research program in '89. The program is designed for college students who are interested in research careers in the biological and biomedical sciences and who aspire to attain a Ph.D. Students who have completed their junior year and who have strong academic records in the sciences will be given preference. Prior research experience is helpful but not mandatory.

Students selected into the program will receive a stipend of \$2400 and will spend 10 weeks working with an outstanding faculty member in one of the Carnegie Mellon laboratories. Students will also participate in special seminars.

An application and a complete description of the program, including a list of the sponsored projects and participating faculty, can be obtained by writing to: Dr. Eric Grotzinger, Department of Biological Sciences, Carnegie Mellon University, 4400 Fifth Ave., Pittsburgh, PA 15213.



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