

Write for the  
Tech or we'll  
give you a boot  
to the head.

# The California **TECH**

Don't take  
your finals,  
Frosh! Write  
for the Tech.

Volume XCVII, Number 10

Pasadena, California

Friday, December 1, 1995

## Ball and Drain and the Battlefield of Honor

by Maria Huang

Each year, Professor Erik Antonsson leads a group of ambitious ME seniors to design and build from scratch, a fabricated machine. This year was no exception. Given a "bag of junk", a joystick, and 30 seconds of electricity, 32 graduating seniors challenged themselves to building 2-cubic-foot sized cars that trespass their opponent's territory and deliver a load of ping pong balls into the opponent's field. The 11th annual Caltech ME72 Engineering Design Contest took place in Beckman Auditorium on Thursday November 30th, 1995, and attracted massive audience around the Pasadena community.

At the beginning of the term, the participants were each given a bag full of springs, pulleys, washers, rubber bands, and various parts that were supposedly all they could use on their designs. Having taken ME71, which introduces students to basic machinery techniques and which builds up confidence, the seniors were thrown a timeline that guides the seniors toward finishing their project on time. As expected, the participants this year took 3 weeks putting together their ideas and design on the ball car, another 4 weeks on fabrication and then the rest of the term testing the machine and correcting errors.

The class seemed quite mellow at the beginning, but as the term went on, the pressure built up exponentially, "One begins to ask 'When is this gonna be over?'" said one senior, Jeffrey Mach.

As a general consensus, students found the contest a little "unfair," for each ma-

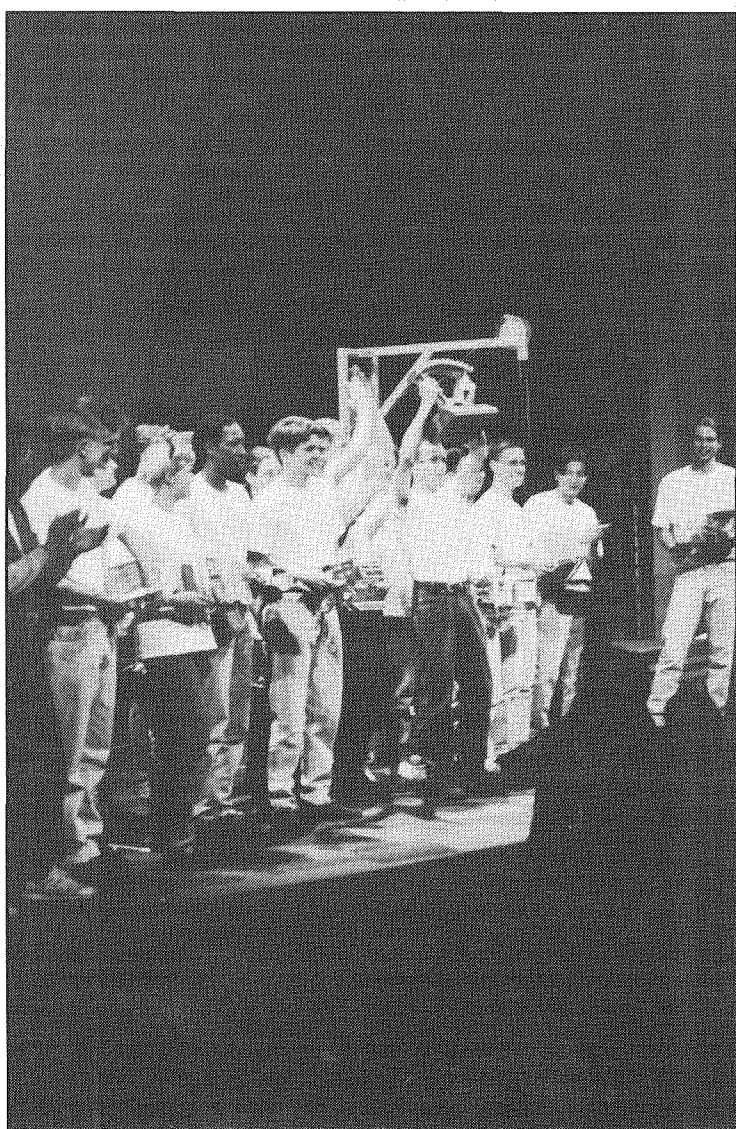


PHOTO BY SHAY CHINN

*Today I am a man.*

*32 graduating seniors built 2-cubic-foot sized cars that trespassed the opponent's territory and delivered a load of ping pong balls into the opponent's field.*

chine has its own strength and weakness, and one never know whom he will be competing with on the stage. "If you get unlucky, you could have the third best design and still get eliminated in

the first two round, simply because you were competing with the two guys who have the best and second best designs," replied senior Chris Marsh as he checked the rubber band on the wheels.

With the technical and emotional support from the friendly Manager John Ven Deusen and machinist Rodney Rojas, the participants feel more confident and innovative when building their machine. After all, "the shop

SEE ME72 ON PAGE 2

## Astronomers Announce Discovery of Brown Dwarf

by Jay Aller

PASADENA — Astronomers at the California Institute of Technology and the Johns Hopkins University today announce the discovery of what they believe is a brown dwarf, and release the first image and spectrum ever taken of this elusive type of object.

The brown dwarf, called GL 229B, lies in the southern-hemisphere constellation Lepus, near Orion, where it orbits a small, dim star called GL 229. This is the first detection of such a cool object outside the solar system.

The scientists will discuss their results on Wednesday, November 29, at noon EST during a Space Astronomy Update at NASA Headquarters in Washington, D.C. The results will also appear in the November 30 issue of the journal *Nature* and the December 1 issue of the journal *Science*. The discovery was discussed at a Caltech colloquium and in October at the Florence Cool Stars meeting in Florence, Italy, but this marks the first publication of the results and the first release of the brown dwarf's image and spectrum.

Brown dwarfs are objects that astronomers have long theorized must exist, but for which proof has been indirect and never 100 percent convincing. They are formed from the same gaseous material as stars, but are much less massive. Current stellar models agree that the upper limit to the mass of brown dwarfs is about one-twelfth the mass of the sun.

When objects are more massive than this limit, the energy

released by the contracting gas generates enough heat to ignite and sustain nuclear fusion. Fusion combines hydrogen atoms to form helium and releases tremendous amounts of energy as light, heat, and other types of radiation. Objects powered by fusion are called stars.

But when objects are less massive than about one-twelfth the mass of the sun, their cores never get hot enough to sustain fusion. These objects are called brown dwarfs. While young brown dwarfs can obtain enough energy from gravitational contraction to be quite bright, this source of energy isn't nearly as long lasting or as powerful as fusion. So brown dwarfs fade rapidly as they radiate away their gravitational energy. Later they radiate by means of their meager internal heat, and are much cooler, dimmer, and harder to see than stars.

While scientists concur that brown dwarfs and stars are made of the same stuff, it is not clear that they're made in the same way. Stars form by direct condensation of interstellar gas, while planets are thought to form by condensation of material within proto-planetary disks that form around stars. Brown dwarfs are intermediate in size between small stars and large planets, and could theoretically form in either manner.

Astronomers want to find brown dwarfs for two reasons. First, they want to determine the smallest-mass object that can form by condensation of interstellar gas clouds, in the manner of stars, and whether enough of

SEE DISCOVERY ON PAGE 4

## In This Issue

YNEWS	3
FOX TROT	5
IHC MINUTES	6
BASKETBALL PICTURES	7
ASCIT MINUTES	8
SPORTS	10

# ME72: The Battle Continues

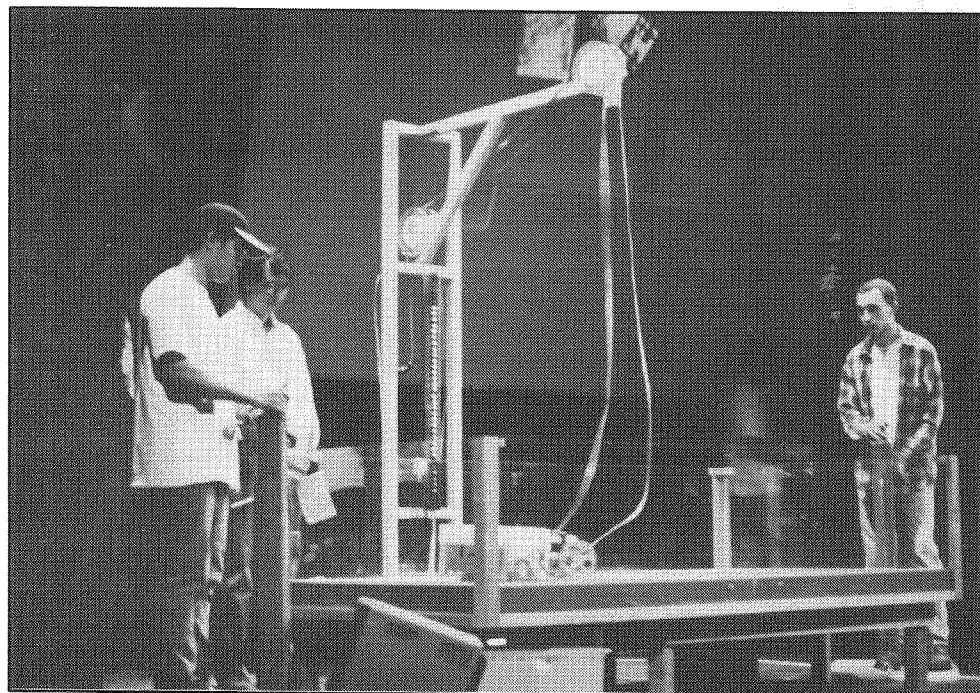
CONTINUED FROM PAGE 1

gets quite lonely during second term, since students don't come here as much anymore," claimed Rojas with slight disappointment.

Being the "only event at Caltech that has a dead-line," the ME72 Contest had a great turn out. This year's trophy goes to Scott DeWinter, whose car focuses both on defense and active attack. Right after his machine blocks the way of the oppo-

nent, it drifts toward the opponent's drain and dumps all the balls into the hole.

Doctor Antonsson was once again impressed with the intelligent approach his students have taken and the amount of effort they willingly put into this project. "Solving open-ended real world problems" has always been an interest to Professor Antonsson, and he would gladly lead his future students exploring ways to make magic out of a "bag of junk."



"Hee, hee, hee"

## Interview With a Victoriously-Challenged Competitor

Tech editor Mason Porter interviewed ME72 contest participant Nestor Ocampo on Wednesday night to discuss the contest.

MAP: What are the best and worst aspects of working on this project?

NO: The whole class is geared towards hands-on learning more than any other class or lab I've ever been in. Since a vague, term-long goal is given, I've had a lot of freedom to play with different design ideas and learn by breaking my machine. I think this is a lot more interesting and rewarding than trying to learn from a book or a more structured lab. Unfortunately, since the true test is not until the day of competition, it can become easy to put tasks off and fall behind if you're not careful. A few milestones during the term keep us in check to some extent.

MAP: Can you describe the "goal" for this year's entries? How does your machine work?

NO: The goal for this year's contest is to get a number of ping pong balls from inside your machine to a funneled hole on the opposite end of the contest arena. The person who delivers more ping-pong balls

win. Some people are doing this by driving their machine to their drain. My machine shoots ping-pong balls kind of like a baseball or tennis ball pitching machine would.

Two spinning disks project the balls and a venetian blind from our bag of junk serves as a track to direct the balls in the right direction. Since some machines can hold 250 or so balls, and the contest is only 30 seconds long, balls have to be shot pretty quickly.

*I've had a lot of freedom to play with different design ideas and learn by breaking my machine.*

MAP: Is this type of class part of the reason you came to Caltech?

NO: I'd heard of something similar to this class at MIT when I was in high school, but I didn't know we had it here until I came. It was a nice benefit of being an E&AS major, so I wanted to take the class soon after I learned we had it.

MAP: What have been goals for these contests in past years?

NO: Last year, people had to grab as many golf balls from a trough as they could. The year before that, people worked in groups to build a rolling chair contraption. A few years ago, machines had to Sumo wrestle with each other.

CALTECH  
public events

## EXPECT THE UNEXPECTED

### BOYS OF THE LOUGH A CELTIC CHRISTMAS

SATURDAY, DECEMBER 2, 1995 / 8 PM  
Beckman Auditorium

Regular Prices: \$28.00 - 25.00 - 22.00

COLEMAN CHAMBER MUSIC CONCERT

### JUILLIARD STRING QUARTET

Beethoven, Hindemith, Dvorák

SUNDAY, DECEMBER 3, 1995 / 3:30 PM  
Beckman Auditorium

Regular Prices: \$22.50 - 19.00 - 15.50 - 12.00\*

the  
WAVERLY  
CONSORT

The  
CHRISTMAS  
STORY

FRIDAY, DECEMBER 8, 1995 / 8 PM  
Beckman Auditorium

Regular Prices: \$31.00 - 28.00 - 25.00

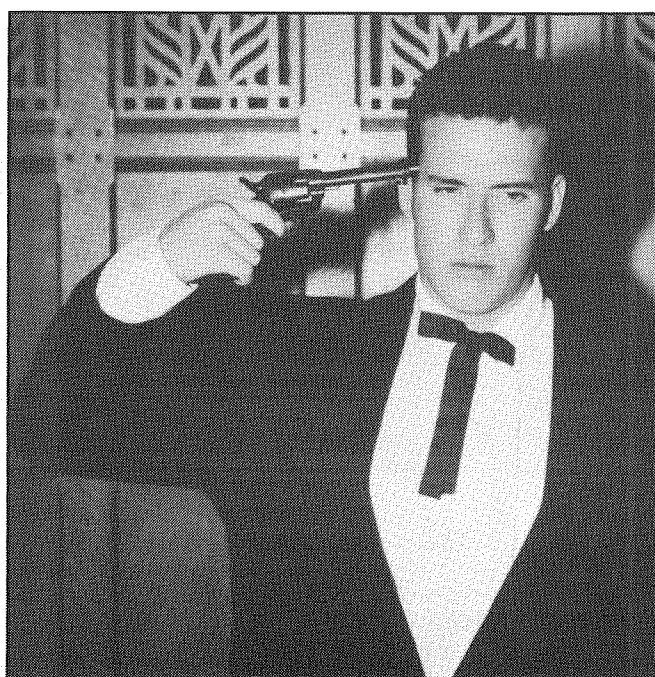
CALTECH  
DISCOUNTS

**CIT STUDENTS:**  
Half price for all events  
\$5.00 RUSH tickets day of show  
(subject to availability)

\*50 FREE tickets available for  
Juilliard String Quartet

**CIT STAFF / FACULTY:**  
\$2.00 off for all events  
Half price TECHTIX available day of show (subject to availability)

Call the Caltech Ticket Office at x4652



## WRITE FOR THE TECH... OR ELSE

Well, okay; we've actually had a great term as far as submissions go. Thanks to all the writers and contributors! We hope to have an even better one next term; please sign up for PA15! (We can't let one term go by without running a gratuitous 'Write for the Tech' advertisement.)

## The California TECH

Caltech 40-58 SAC, Pasadena, CA 91125  
phone: (818) 395-6153  
e-mail: editors@tech.caltech.edu  
ISSN 0008-1582

VOLUME XCVII, NUMBER 10  
DECEMBER 1, 1995

<b>COPY EDITOR</b> Shay Chinn	<b>PHOTOGRAPHER</b> Maria Huang
<b>LAYOUT EDITORS</b> Autumn Looijen Samantha Gizerian	<b>STAFF WRITERS</b> Stephen Van Hooser Mason Porter Myfanwy Callahan Maria Huang Tasselhoff Burrfoot
<b>MISCELLANEOUS EDITORS</b> Mason Porter Stephen Van Hooser	<b>FEATURE WRITERS</b> Adam Villani Terry Moran Joe Trela
<b>EVENTS AND NOTICES</b> Terry Moran	<b>CONTRIBUTORS</b> Laura Brady David Relyea Donna Ebenstein
<b>BUSINESS MANAGER</b> Francisco Gutiérrez	<b>ADVISOR</b> Hall Daily
<b>CIRCULATION</b> Sander Granat	
<b>GAMES AND TRIVIALITIES</b> Wei-Hwa Huang	

Published weekly except during vacation and examination periods by the Associated Students of the California Institute of Technology, Inc. The opinions expressed herein are strictly those of the authors.

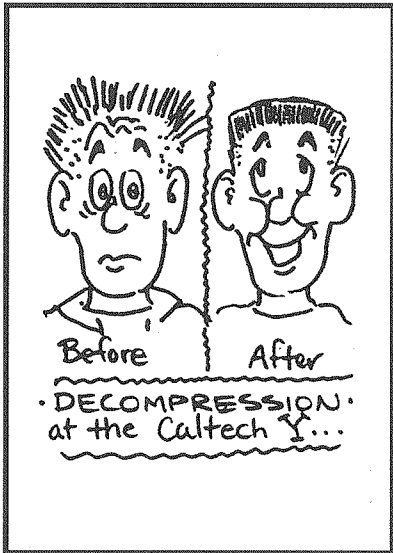
Letters and announcements are welcome. All contributions should include the author's name and phone number and the intended date of publication. Submit copy (preferably on Macintosh 3.5" disk) to the Tech mailbox outside SAC room 40, or e-mail to editors@tech.caltech.edu. The editors reserve the right to edit and abridge all submissions for literacy, expediency, etc. All articles are the property of the authors. Authors and columnists retain all intellectual property rights.

The California Tech is distributed free. Issues will be mailed off-campus upon receipt of \$11 per year to cover third-class postage and preparation costs. Printed by News-Type Service, Glendale.

# YNEWS

by Donna Ebenstein

Feeling bummed about finals?? We have the cure for you! Come to **DE-COMPRESSION**, brought to you by the Caltech Y! It's two nights of free dinner (hamburgers, hot dogs, chili, bagels...), entertainment, and relaxation. This term's agenda is as follows:



**Saturday, December 2:**  
Group Twister competition—with prizes!  
Holiday Movies

**Sunday, December 3:**  
Guitar Duo  
More Movies

So stop by Winnett Center for a few minutes or a few hours this weekend. Food and entertainment begin at 7:30 p.m. Hope to see you there!

More entertainment is on its way later this month. For any of you who won't be going home this vacation, the Caltech Y is once again hosting the **STRANDED STUDENTS PARTY** on *December 15th*. There will be movies, a tree to decorate, and lots of great home cooked food to eat! The party starts at 5:30 p.m., and in the Y Lounge (above Winnett Center). Call Chris at x6163 for more information. Have a great vacation!

## THE BOSTON CONSULTING GROUP

*BCG is a premier management consulting firm specializing in strategy consulting*

*All graduating seniors interested in our Associate Program should submit a cover letter, resume, transcript and SAT/GRE scores by January 12, 1996:*

**Karen Chow**

**Recruiting Coordinator**  
**The Boston Consulting Group**  
**333 South Grand Avenue**  
**Los Angeles, CA 90071**

**Information Evening: December 4, 1995**  
**Case Interview Workshop: January 11, 1996**  
**Resume Deadline: January 12, 1996**  
**First Round Interviews: January 25, 1996**  
**Second Round Interviews: February 14, 1996**  
**Final Interviews: March 1996**

**THE BOSTON CONSULTING GROUP, INC.**  
*The Worldwide Leader in Corporate Strategy*

AMSTERDAM	BRUSSELS	FRANKFURT	KUALA LUMPUR	MELBOURNE	NEW YORK	SINGAPORE	ZÜRICH
ATLANTA	BUENOS AIRES	HAMBURG	LISBON	MILAN	PARIS	STOCKHOLM	
AUCKLAND	CHICAGO	HELSINKI	LONDON	MONTERREY	SAN FRANCISCO	SYDNEY	
BANGKOK	DALLAS	HONG KONG	LOS ANGELES	MOSCOW	SEOUL	TORONTO	
BOSTON	DÜSSELDORF	JAKARTA	MADRID	MUNICH	SHANGHAI	TOKYO	

### ACADEMY BARBER SHOP

27 N Catalina Ave., Pasadena  
Open Tues.-Sat., 7:30A.M. -4:00 P.M.  
(818) 449-1681

### BEAR'S RESEARCH, WRITING & EDITING SERVICE

Since 1985  
Assistance with Research Papers, Theses, Dissertations, Books & Vitae/Resumes  
Tutoring Services  
International Students Welcome  
Sharon L. Bear, Ph.D. (310) 470-6662

### FRIDAY NIGHT ASCIT MOVIE

Children 3 and under get in FREE  
Children 10 and under only \$1.50



Baxter Lecture Hall Times: 7:30 & 10:00  
\$1.50 ASCIT members \$2.00 All others

## LAEMMLE THEATRES

### ESQUIRE

2670 E. Colorado Blvd.  
(818) 793-6149

Emma Thompson

### CARRINGTON

Daily 6:35, 9:15 p.m.  
Sat-Sun Bargain Matinee 1:15 p.m.  
Sat-Sun Regular Matinee 3:55 p.m.

### COLORADO

2588 E. Colorado Blvd.  
(818) 796-9704

Jane Austen's

### PERSUASION

Daily 4:30, 7:00, 9:30 p.m.  
Sat-Sun Bargain Matinee 1:45 p.m.

## Caltech Glee Clubs Annual Holiday Concert



*Britten Ceremony of Carols* Rutter *Dancing Day*  
Traditional Carols

Friday, December 1, 1995  
Saturday, December 2, 1995

Reception

8:00 pm Dabney Lounge, Caltech

Free Admission

Further Information Call (818) 395-4652

# DISCOVERY: Astronomers Locate Ancient Star

CONTINUED FROM PAGE 1

these hard-to-detect objects exist to comprise a dominant component mass in our galaxy. That is, could brown dwarfs solve a difficult cosmological puzzle by accounting for a significant portion of the missing "dark matter?" Second, astronomers want to study the atmospheres of brown dwarfs and learn how they are related to the atmospheres of planets. Such understanding is important to the search for other planetary systems.

Because of the importance of brown dwarfs both to cosmology and to finding other planets, astronomers have made a considerable effort to find the objects, especially young brown dwarfs because they are still hot, relatively bright, and more easily seen. Young brown dwarfs are most likely to appear in star clusters, the "nurseries" where stars form.

The Caltech/Johns Hopkins team has tried a different approach to finding brown dwarfs over the past few years. Caltech astronomers Shri Kulkarni, Tadashi Nakajima, Keith Matthews, and Ben Oppenheimer have been collaborating in the search with Johns Hopkins scientists Sam Durrance and David Golimowski. Instead of scouring stellar nurseries for young brown dwarfs, they looked for older, cooler brown dwarfs as companions to stars within our local

neighborhood, within 45 light-years, or about 265 trillion miles, of the sun. These are not young stars, but have ages as large as 10 billion years, with an average age of 5 billion years.

There are two advantages to searching for these older, nearer brown dwarfs instead of young ones. First, scientists know the distances to nearby stars with good accuracy, so when they identify a brown dwarf candidate, they can immediately calculate its total luminosity. The lowest luminosity of any normal, hydrogen-fusing star is one ten-thousandth that of the sun. But brown dwarfs, especially those more than one billion years old, can have much lower luminosities. Searching for an object with a luminosity less than this limit is a very simple method of unambiguously detecting brown dwarfs.

Second, the minimum temperature of a star is about 1800 K, while old brown dwarfs can have much lower temperatures. This makes old brown dwarfs interesting to planetary scientists, since their cool atmospheres are similar to those of the giant gaseous planets in the solar system. For instance, it is well known that prominent absorption features are seen in the spectrum of Jupiter that are never seen in the spectrum of any star. Takashi Tsuji of the University of Tokyo in Japan has found that below 1000 K, carbon prefers to attach

to hydrogen and form methane, CH<sub>4</sub>, not the more usual carbon monoxide, CO, seen in cool stars. So methane absorption lines in a spectrum is a sure sign of low temperature.

Last year the Caltech/Hopkins team started the "Byr survey," a survey of stars with ages of near a billion years. As the first step, the astronomers made an image of each of the stars they wanted to study with a "coronagraph," a camera with the ability to see faint objects in the glare of bright stars. The coronagraph blocks light from the star so that dimmer nearby objects become visible, much like a solar coronagraph blocks out the sun to allow astronomers to see the relatively faint flares and explosions on the sun's surface.

This coronagraph, used at optical wavelengths, was made by the Johns Hopkins team and has been used extensively at the 60-inch telescope at Caltech's Palomar Observatory. A similar device built by Matthews, but which detects infrared wavelengths, (1 to 2.5 microns), has been commissioned recently at the 200-inch Hale Telescope at Palomar.

The astronomers looked at each star twice, at an interval of one year. All stars move relatively quickly across the sky, so true companion stars will move the same distance and remain together after a year. But unrelated objects that line up by chance and only seem to be companions will have different motions and will drift apart over a year. The

astronomers identified brown dwarf candidates on the 60-inch telescope and examined them more closely with the 200-inch Hale Telescope.

This method paid off when the scientists found a faint companion to the star GL 229, an M1-type star at a distance of 17 light-years, or about 100 trillion miles. They found that the companion had moved the same amount as GL 229 in a year, and concluded that the two must be in orbit around each other. Using the known distance to GL 229, they calculated the luminosity of the companion to be only 7 millionths that of the sun, almost 10 times less than the faintest known star. The presence of water, seen in the absorption lines of the spectrum, shows that the surface temperature is very cool, less than 1000 K, or 800 K lower than the coolest known star. They also detected methane absorption lines in its spectrum, confirming Tsuji's prediction that methane is found only in cold objects.

This discovery, the first of a cool brown dwarf, is an important first step in the search for planetary systems beyond the solar system. The strange colors of the object, extremely red in the optical wavelengths and blue in the near-infrared, and the presence of methane suggest new strategies to search for brown dwarfs and massive Jupiter-like planets. The spectra of faint objects could be screened for these unusual characteristics, allowing astronomers to concen-

trate on the most likely brown dwarf candidates.

The brown dwarf is 44 astronomical units, or about 4 billion miles, from the main star and has a mass roughly 20 times that of Jupiter. It is unclear whether it was formed like a star, by direct condensation of interstellar gas, or like a planet, by condensation of material within a protoplanetary disk that formed around the star. As brown dwarfs get less massive, it is increasingly difficult to explain how they could form like stars, since that process requires smaller and smaller condensations caused by ever larger pressures.

But explaining the formation of larger, Jupiter-type planets is also difficult. Thus there is a new threshold between small brown dwarfs and large gaseous planets, where one method of formation stops and the other takes over.

The theories of the Caltech/Johns Hopkins team are rudimentary at this point, but the proximity of the companion to the parent star suggests that it was formed in a planetary disk rather than directly from the interstellar medium. They are continuing to observe this system and have obtained images and spectra of GL 229B using the 200-inch Hale Telescope at the Palomar Observatory, the 10-meter telescope at the Keck Observatory atop Mauna Kea, Hawaii, and the Hubble Space Telescope.

For more information contact Jay Aller at [aller@caltech.edu](mailto:aller@caltech.edu).



## BAGEL BAKERY

20 KINDS OF BAGELS  
BAKED CONTINUOUSLY  
ON PREMISES

### ARCADIA

412 N. Santa Anita Ave.  
(next to In-N-Out Burger)

447-2457

### PASADENA

86 W. Colorado Blvd.  
(next to UA Market Place Theatre)

792-2435

Gourmet Cream Cheeses • Lox  
Pastrami • Hebrew National Salami • Bialys  
Bagel Dogs • Kosher Pickles • Pizza Bagels

**BUY 3 BAGELS  
GET 3 FREE**

Must Be Equal or Lesser Value • Not Valid at Drive-Thru  
Coupon Required • One Coupon Per Customer  
Expires 12-22-95

**1/2 OFF ANY  
SANDWICH**

Not Valid at Drive-Thru • Wraps Not Included  
Coupon Required • Not Valid With Any Other Offer  
Expires 12-22-95

## Hastings Laundry

The cleanest, and safest coin laundry in LA  
Just minutes from campus...

- Attendant Always on Duty
- Large Machines
- Dry Cleaning and Shirt laundering
- Premium fluff and fold service

3815 Sierra Madre Blvd. Pasadena, (818) 351-1241  
In the Albertson Shopping Center

**FREE DRY FOR STUDENTS!  
(TUES, WED, THURS)  
WITH THIS AD**

open 7 days 6am-10pm  
(Last wash 9pm)



## OPTOMETRISTS

PLAZA PASADENA  
Dr. Alan Siegel  
An Optometric Corp.  
Dr. Svetlana Fisher

(818) 577-7205

Your Own Doctor's Prescription Filled—  
ONE HOUR SERVICE

LAB ON PREMISES • ONE HOUR SERVICE IN MOST CASES  
OPEN 7 DAYS A WEEK

Coupon

**\$89**

DAILY WEAR  
SOFT  
CONTACT LENSES

Includes: Exam, Fitting,  
and Follow Up

Reg. \$130  
Selected Brands Only

With Coupon Only. Not Valid with  
other offers.



We feature the  
ReNu® regimen by  
Bausch & Lomb—  
The easiest way to  
take care of contacts.

Coupon

**\$99**

EXAM, FRAME,  
& LENSES

Reg. \$159

Single Vision

Choose From Our Special  
Selection of Frames

With Coupon Only. Not Valid with  
Other Offers.



## World Vista Travel

150 S. Los Robles  
Pasadena, CA 91101

(818) 577-1220

Corporate, Leisure, Cruise,  
Groups and Tours

Special Discounts for Cal.  
Tech Students and Faculty

Guaranteed Lowest Fares



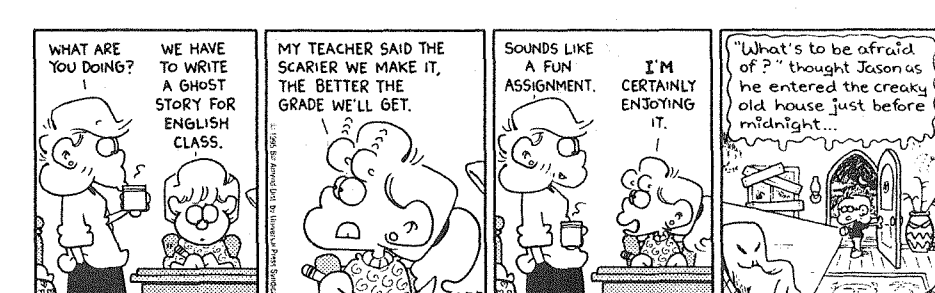
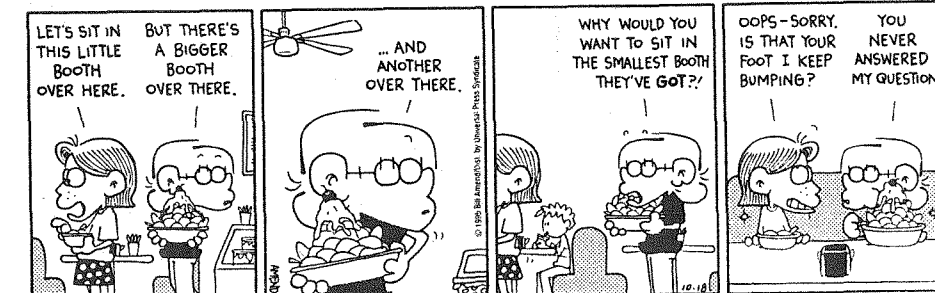
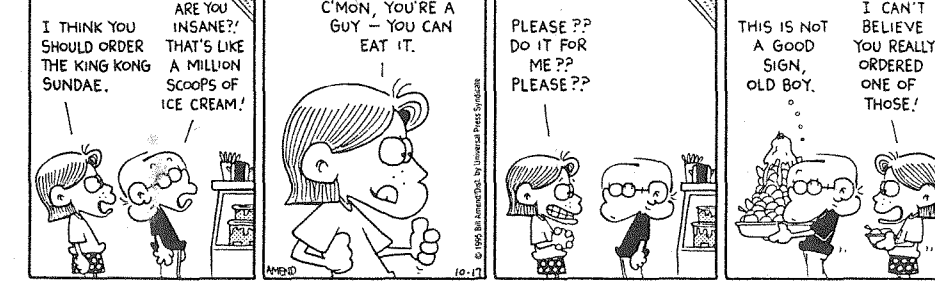
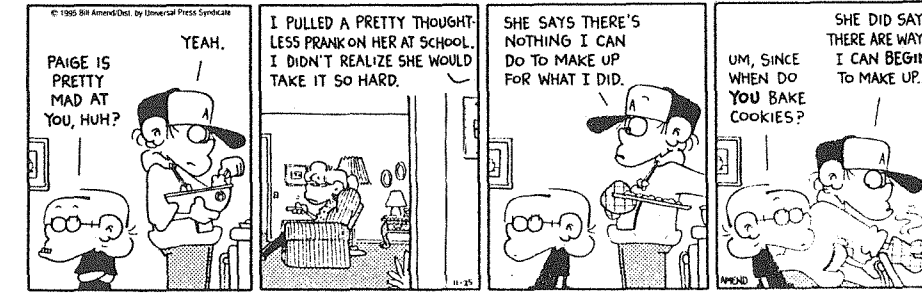
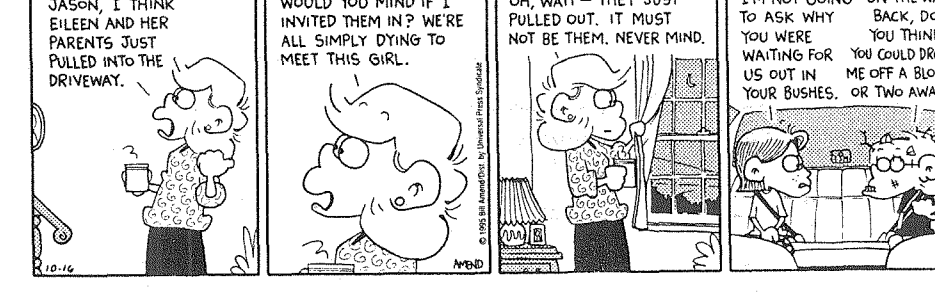
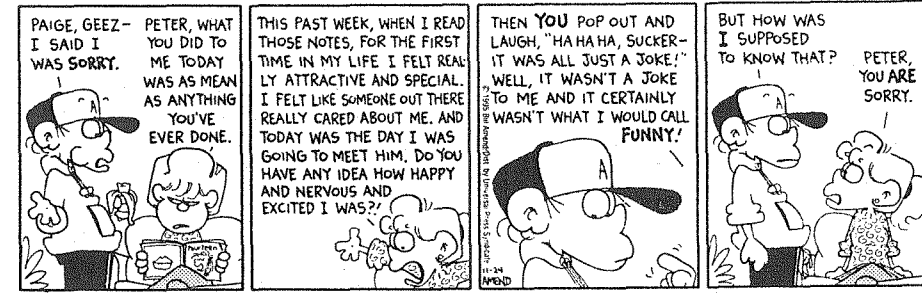
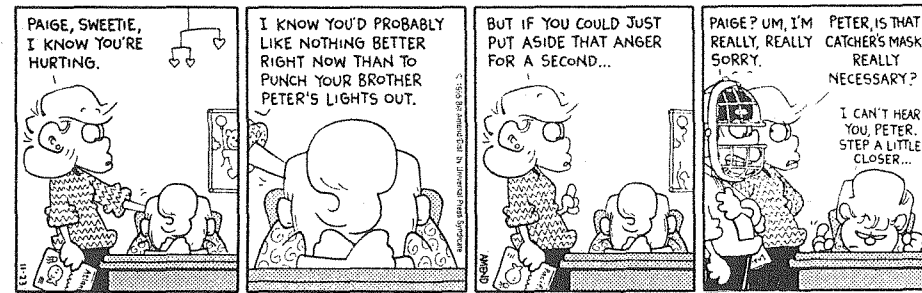
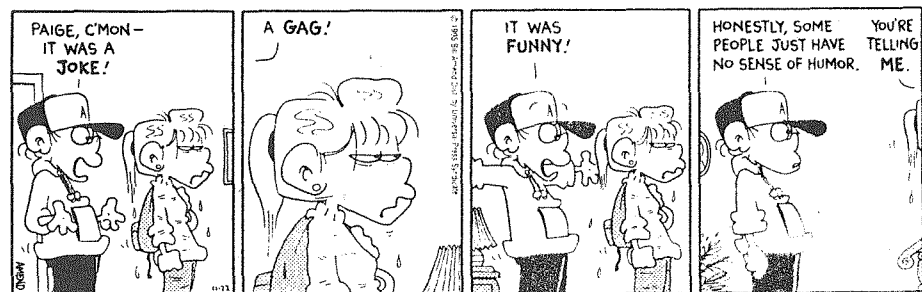
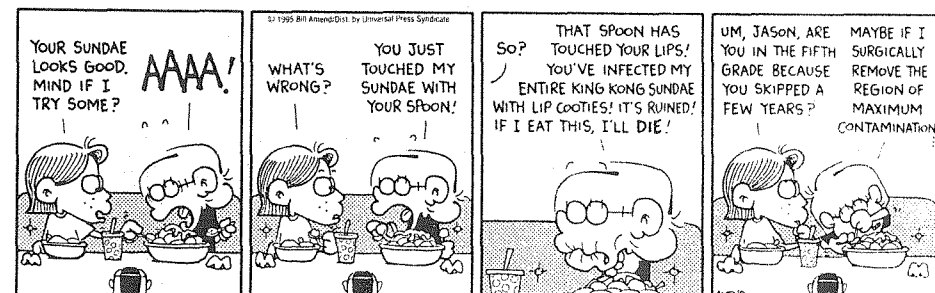
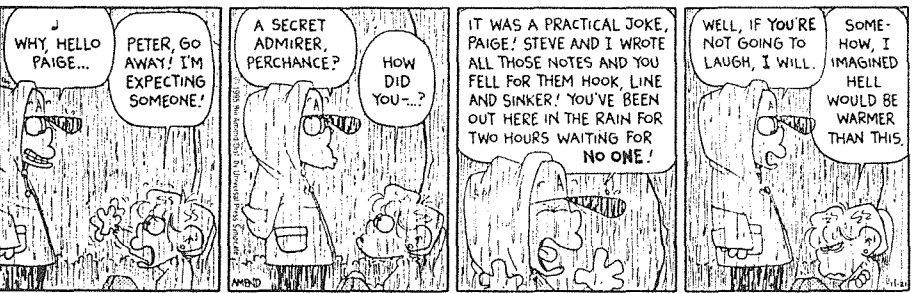
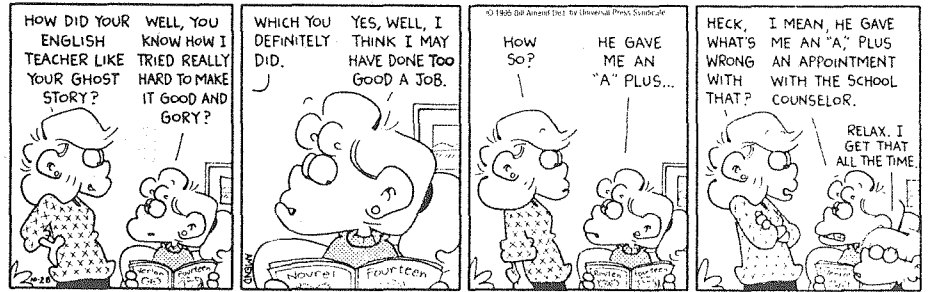
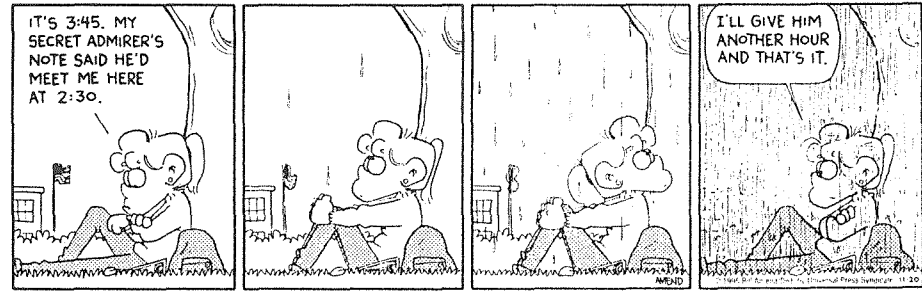
## World Wide Air - Ocean Shipping Services

Household goods - Cars  
Commercial shipments  
Door to Door Logistics  
Consolidated cargo or  
straight loads

Offices in LA & SFO  
Call 800-383-3157

# FoxTrot

by Bill Amend



# I.H.C. Minutes

**Minutes of the IHC:** Tuesday, November 14, 1995

Present: Art (Ri), Mike(Pa), Alison(BI), Bill(Da), Brian(FI), Nestor(LI), Adil(Ru), me(Chair)

• The first issue addressed was the Johns Hopkins Center for Talented Youth program, and whether we should house them at Caltech in exchange for the significant sums of money being offered to us by Caltech. All the presidents except Nestor said their houses thought the program was a good idea. There was some support for the notion of hosting the program on campus

for the first year, and in Avery every year after that. Dabney could not offer any spaces, since it is being renovated this summer, Fleming is willing to give about 30 spaces, Blacker isn't too sure, but Alison said, "We'll probably give 'em Hell." Ricketts isn't willing to make any commitment at this time, but isn't ruling out the possibility of giving up space. Page is willing to give up the bottom floor of their house. Ruddock is willing to give up taking doubles as singles, but not willing to kick people off campus during the summer. The total commitment is about 120 spaces if Lloyd and Ricketts give none.

We should be able to give Tom Mannion a fairly definite answer about whether we can easily meet their request for 175 spaces by next week.

• Interhouse: All the houses seem interested in getting the restriction on multiple parties at the same time lifted, but no one seems enthusiastic about the financial or work-time burdens of putting on an Interhouse party in the near future.

• We talk briefly about locks on the arcade in the SAC. Some people have requested locks be put there to prevent damage to the machines. Many member of the IHC think the damage is mostly due Caltech students, but that it doesn't do any harm to give it a try. Brian asks that the key lock on the arcade be removed if a combo lock is put in place.

• Maintenance: The day after the discussion at the President's dinner for student leaders about Physical Plant charging students for excessive maintenance in the student houses without warning the students to give them a chance to fix the damage themselves, PPlant replaced 28 ceiling tiles in Lloyd out of a 6 to 8 that were damaged. They also failed to replace

some tiles that were damaged. The charge of \$1500 was absorbed before it got to Lloyd, but there is a recurring problem illustrated by this incident. The chair will talk to Bill Irwin and ask him to put a policy of giving one week's notice on non-emergency maintenance in the student houses into effect.

• We talk about Interhouse sports a little bit. We agree to ask the next IHC to consider the women's 50 yd backstroke as a possible swimming event for next year, although it's too late to do it this year. Brian asks what happened to the Discobolus changes we thought they passed last year — adding about 6 minors, and making a rule that no valid challenge could include more than 1 racket sport. Alison said she'd check with the old minutes.

• Discobolus: Blacker challenges Page this week. Dabney challenges the winner next week.

• Also, the issue of students whose names appear on multiple ath lists is brought up. By consensus, two additions to the rules are made: (1) A student may play for only one house in any term. (2) If a person appears on multiple ath lists in any term, they may determine on which ath list they belong by merely playing for the house for which they wish to play the rest of the term. However, it is strongly discouraged

for a house to place names on its ath list of people who they know will not play for them.

• Brian likes the new furniture in the IHC-AS-CIT office.

• The bike purge has started, so you're probably out of luck if you didn't remove the note from your bike.

• Adil mentions that PPlant did a fine job of re-attaching the Ruddock toilet seats, and mentions that Page should be expecting a bill for that soon. He also asks Mike to have Page clean up after their pranks better.

• Nestor mentions the Star Trek convention. Someone put a sign up saying that there would be a reception with refreshment for all convention goers at Lloyd House after the convention. Nestor tried to convince the Trekkies who showed up that there was no reception and that it was a joke, but Nestor doesn't speak Klingon, so he had a hard time explaining. Luckily, his phaser was set on kill, and he diffused the crisis before any major incident happened.

• Brian mentioned a strange thief who took his coffee grinder and left a hacksaw.

Meeting ended around 9:45 p.m.

Tune in next time - same IHC time, same IHC channel,

Tom

## QUALITY LEGAL SERVICES

### BUSINESS WRITING & PARALEGAL SERVICES

Research Papers; Theses; Dissertations; Resume's Reports; Essays; Articles

Proficient Writer; Proofreading Experience

20yrs. Secretarial Experience  
UCLA Paralegal Certificated  
English Degree

**GENEVA M. BROUSSARD**  
(818) 795-6478

Pick Up & Delivery Available

## Rag Time on Green

RESALE CLOTHING  
for  
WOMEN

1136 E. Green St. • Pasadena  
(818) 796-9924

Wed 10-6 • Mon-Tue-Thu-Fri 10-5 • Sat 10-3

**Paris**  
**\$190\***

London	\$229*
Mexico City	\$115*
New York	\$159*
Boston	\$178*
Wash. D.C.	\$178*

\*Fares each way from Los Angeles based on a roundtrip purchase. Restrictions apply and taxes not included. Call for other worldwide destinations.

Open Saturdays 10 am - 2 pm

**Council Travel**

10904 Lindbrook Drive  
Los Angeles, CA 90024

**818-905-5777**

EURAILPASSES  
ISSUED ON-THE-SPOT!

## Tip Top Cleaners

**15% Discount**

for Caltech Students, Faculty and staff  
with Caltech ID

- Complete drycleaning and laundry service
- Alterations and reweaving

We accept American Express, Visa, and Mastercard

565 S. Lake Avenue

Next to Alexandria Bookstore

(818) 796-6777

**THIS FRIDAY'S  
TECH MEETING  
HAS BEEN RE-  
SCHEDULED TO  
JANUARY 5.  
SO GO AWAY.**

# Women's Basketball

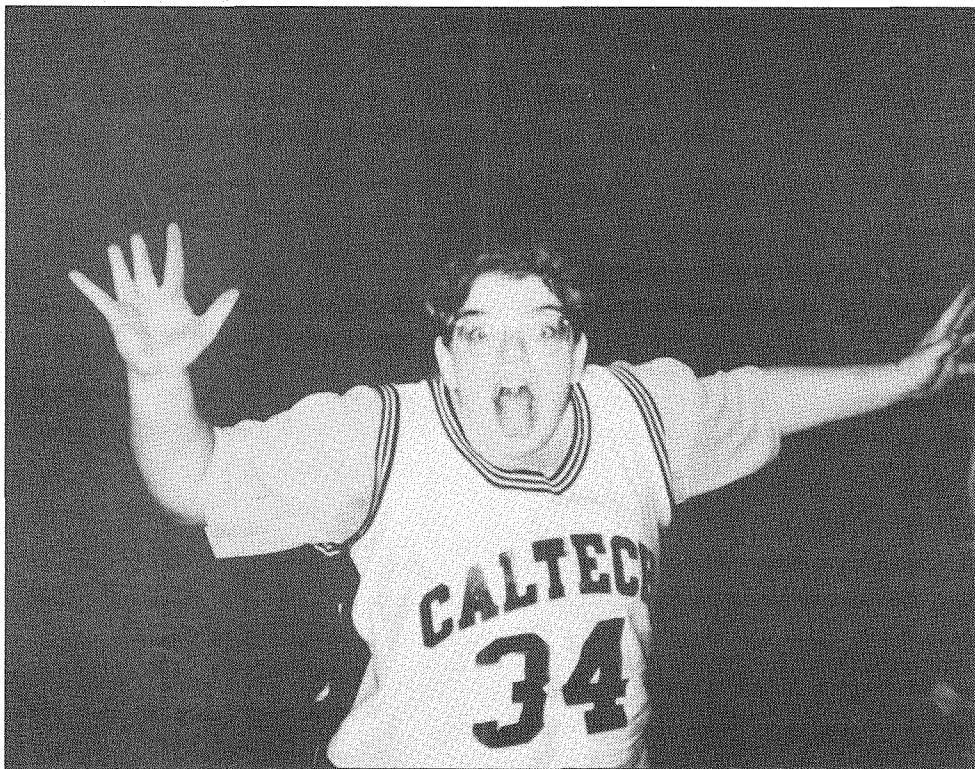
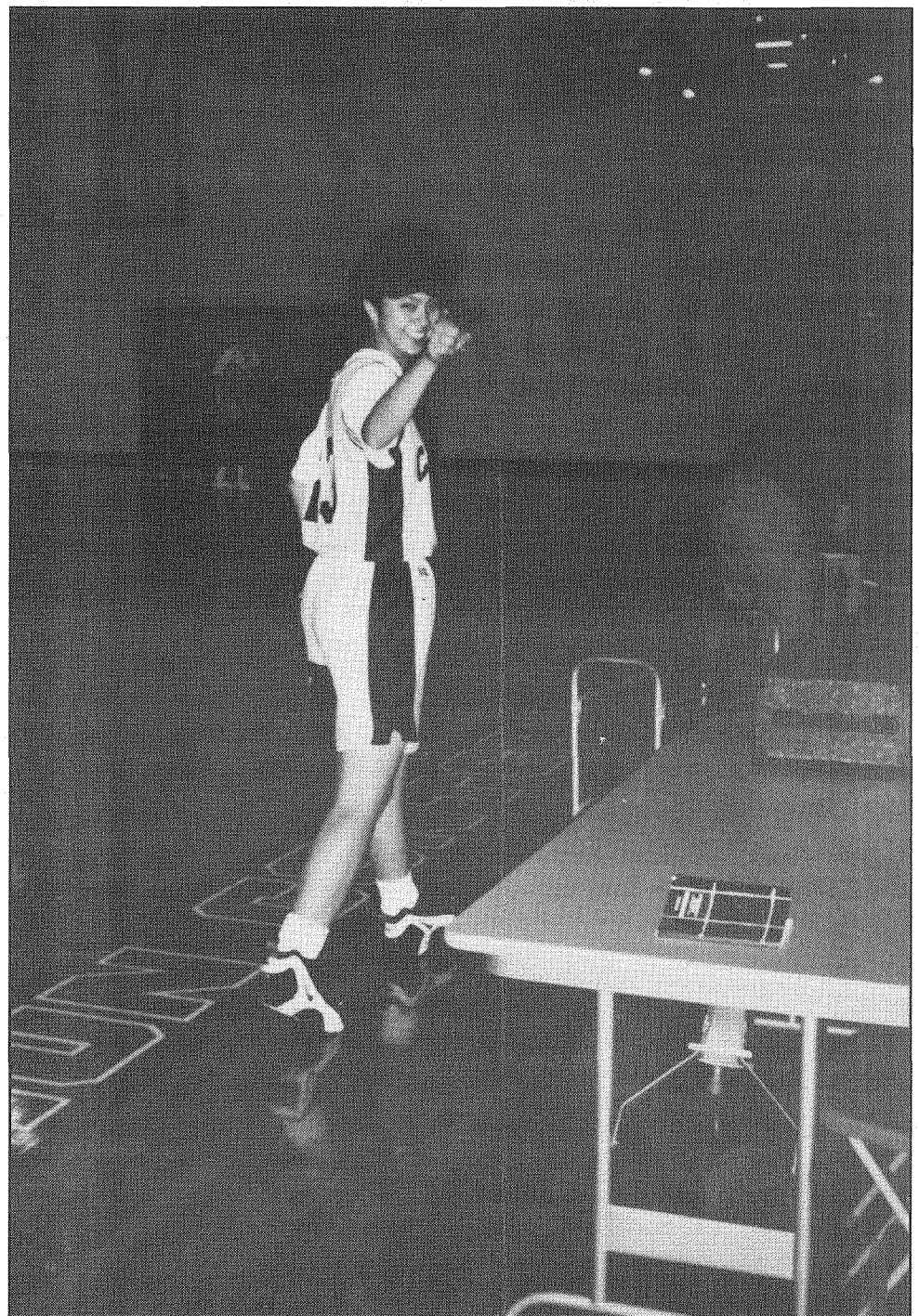


PHOTO BY ANGIE BEALKO



"Foul?? What foul??"

"I'm too sexy for my team..."

THE BOSTON CONSULTING GROUP

## CASE INTERVIEW WORKSHOP

Are you a graduating senior interested in learning how a "case interview" works? If so, please join us for an *informal* session given by The Boston Consulting Group on the "case interview" experience.

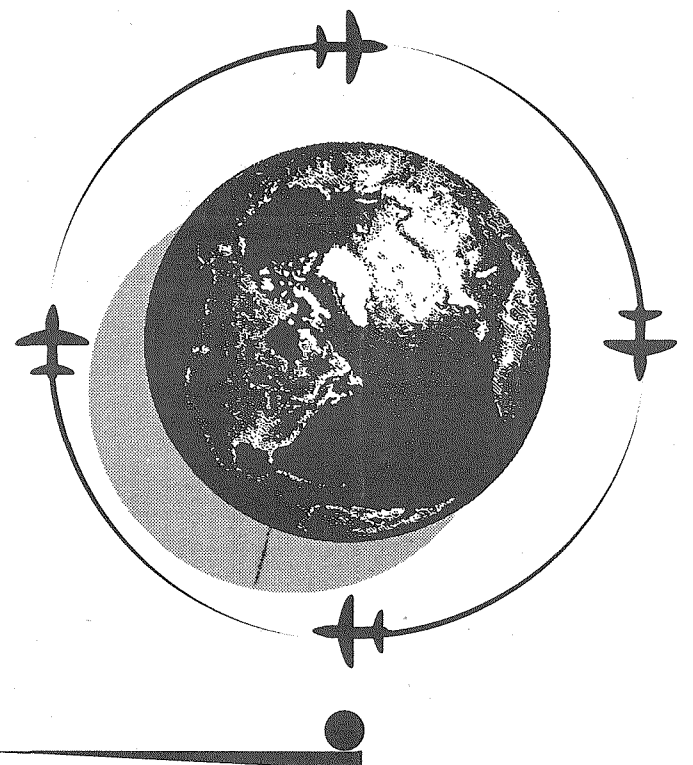
**Thursday, January 11**

**4:00pm**

**Student Activities Center Rm#13**

**Hosted by**

**Dan Jansen (BCG LA)**



- |           |              |           |              |           |               |           |         |
|-----------|--------------|-----------|--------------|-----------|---------------|-----------|---------|
| AMSTERDAM | BRUSSELS     | FRANKFURT | KUALA LUMPUR | MELBOURNE | MUNICH        | SEOUL     | SYDNEY  |
| ATLANTA   | BUENOS AIRES | HAMBURG   | LISBON       | MILAN     | NEW YORK      | SHANGHAI  | TOKYO   |
| AUCKLAND  | CHICAGO      | HELSINKI  | LONDON       | MONTERREY | PARIS         | SINGAPORE | TORONTO |
| BANGKOK   | DALLAS       | HONG KONG | LOS ANGELES  | MOSCOW    | SAN FRANCISCO | STOCKHOLM | ZÜRICH  |
| BOSTON    | DÜSSELDORF   | JAKARTA   | MADRID       |           |               |           |         |

# A.S.C.I.T.

## Minutes

NOVEMBER 20, 1995

Present: The ENTIRE BOD minus James and Ken for 27th and Kanna for 20th.

This meeting (the second) was most likely Jon's last official meeting as ASCIT President. Jon is graduating and will become the resident "person who graduated who knows how everything works" for a term or two.

Meetings begin at 10:05 and 10:08. Unless you're really anal, don't ask. Dave is wearing a suit in one meeting.

- CAPISU asks for funding for the Here & Now after it had gone and went. The BOD does not retroactively fund events, so we couldn't fund them.

- Greg mentioned that quite a few people read the minutes (aren't you special) and liked the idea of an ASCIT Social Hour. Greg estimates the cost of such an hour to be approximately \$1000/year. Greg would like to put the first ASCIT Social Hour on the third Friday of every month. Dave proposes ASCIT Tea and Scones on the second Monday of every month, but

nobody listens. Greg would also like to remind seniors to note the location of companies you apply to work for. If the company is nearby, you don't get to be flown out (unless you're a total stud).

- Tom says the IHC agreed to putting locks on the arcade door and some other doors. Cream cheese and fish on doors, however, was right out.

The CTY program (seventh graders who did well on the SATs) will be at Caltech over the summer.

- By Robert's Rules of Order, everyone on the BOD is a screw-up, and the meeting ends. Next week. Same time. Same place.

- The HKSA requests money for events, MANY OF WHICH ARE OPEN TO THE WHOLE CAMPUS HINT HINT HINT, that will occur second term. The BOD agrees to give them \$70 for a few parties and some food. Special food. You eat it with soup. We're suckers, aren't we?

- THE ASCIT BOD DISCUSSES BY-LAW CHANGES AND RESOLUTION CHANGES: Dave's election bylaw (insertion of the word HALF in BIG letters) is

passed for election sometime next term 6-0-0.

- Jon agrees to rewrite a few bylaws. A few bylaws are struck down and beaten into the ground with blunt objects. Sticks.

I really didn't take decent notes on the merits of these bylaws and why we accepted/rejected them, so here goes:

- The BOD agreed to HIGHLY SUGGEST putting away about 5% of its total funds away every year.

- There's a new footer on the minutes. Read it. Heed its words. Join us.

Jon agrees to rewrite a bylaw requiring ASCIT to meet with various members of the Administration once per term. Jon also agrees to rewrite the Bylaw that separates the offices of BOC Chair and Vice President and gives the VP duties akin to an "overseer" over ASCIT funded groups such as the publications, Movies (generally make the day to day running of student government as smooth as possible). Jon finally agrees to rewrite the amendment to prevent one form of strategic voting from occurring on the BOD. If you have any questions about possible Bylaw amendments, don't hesitate to contact Jon McDunn (keep in mind he's trying to graduate), Tom Maccarone (ditto), or any other BOD member (we're mostly bloody throats, but what did you expect?).

- We vote against a bylaw reclarifying the President's duties because it seems redundant. We also voted against a bylaw removing the BOC Chair and the IHC Chair from the BOD. We we we we we we. We propose that next year's BOD meet at least twice per term instead of

at least once per week (we don't need to meet this frequently). We vote against a bylaw which would make the Tech Editors appointed instead of elected AS THIS COULD LEAD to the Tech Editors all being from one house year after year after year after year after year. Not that this ever happens with any ASCIT affiliations. Never. We vote against the Uber Council proposal which would separate the IHC Chair and BOD Chair from the BOD and then create an Uber council consisting of them plus the ASCIT president to deal with issues of jurisdiction.

- We vote to move the Bylaw suggesting a dues increase from \$20 to \$25/term to general election. Dues haven't been increased in about 10 years (literally) and the BOD can't continue to fund clubs and Movies and houses if dues stay at their present rate. What's \$15/year out of \$24000/year? Seriously.

Meeting ends at 12:28 AM. We leave.

Try to laugh at yourself once in while. Everybody else does.

**Dave Relyea**

ASCIT Secretary

A standing invitation to all open ASCIT meetings is extended to ASCIT managers, ASCIT-appointed officers, faculty-student committee members, and members of the IHC and the BOC. Additionally, any member of the Caltech community is welcome to attend. HINT HINT.

# OWN.

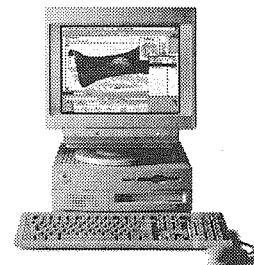
Yours and yours alone.

# MAC.

The awesome computer with all the bells and whistles.

# ASAP.

We mean like yesterday.




**Power Macintosh<sup>®</sup> 7100/80 w/CD**  
8MB RAM/700MB hard drive,  
PowerPC<sup>™</sup> 601 processor, CD-ROM drive,  
15" color monitor, keyboard and mouse.



**Power Macintosh<sup>®</sup> 7200/75 w/CD**  
8MB RAM/500MB hard drive,  
PowerPC<sup>™</sup> processor, quad-speed CD-ROM drive,  
15" color monitor, keyboard and mouse.

**RIGHT NOW AT YOUR CAMPUS RESELLER.**

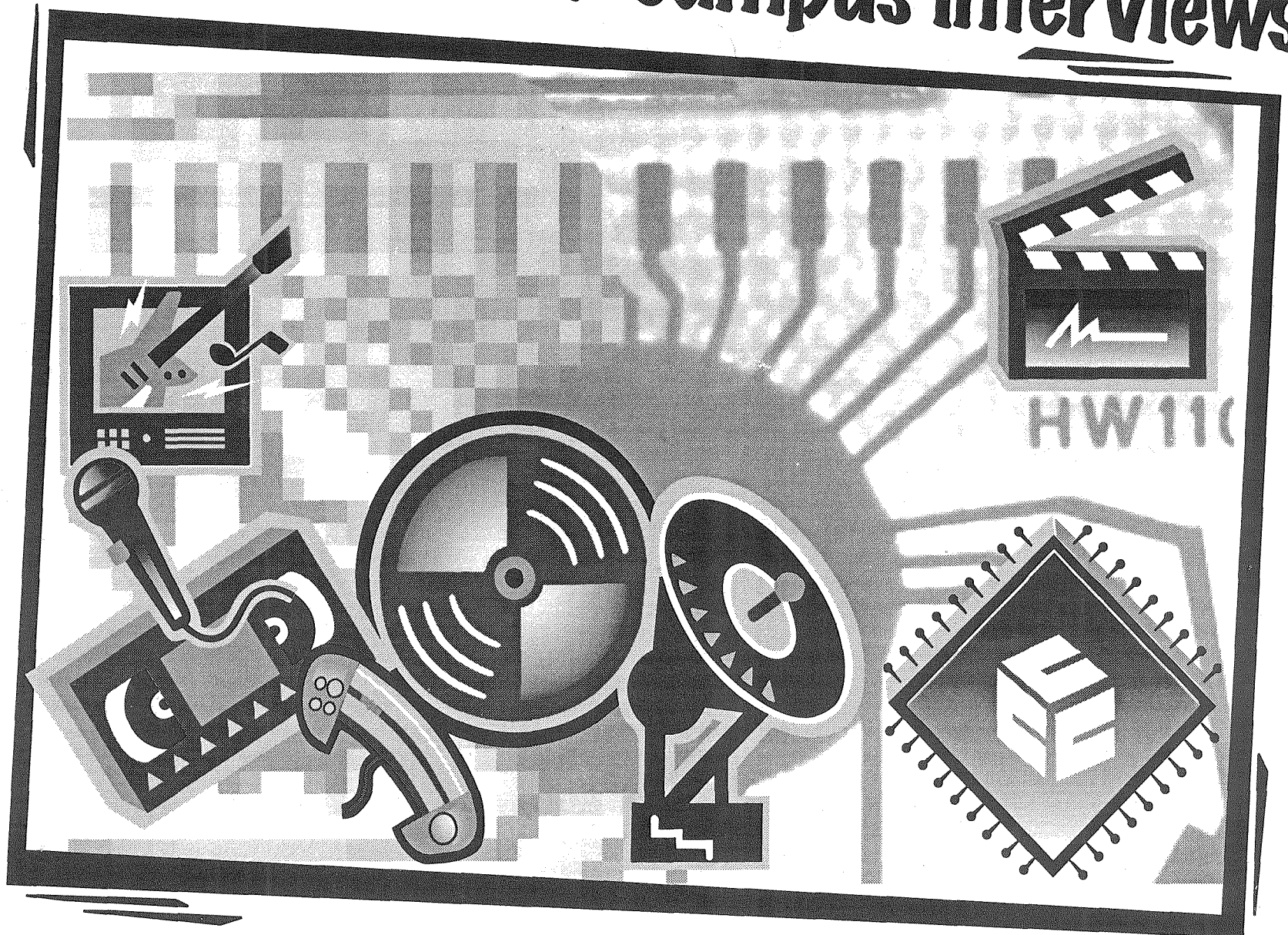
Being a student is hard. So we've made buying a Macintosh<sup>®</sup> easy. So easy, in fact, that the prices on Macintosh personal computers are now even lower than their already low student prices.

Unfortunately, they won't stay this low forever. So you need to forget about how hard your life is for a minute and start thinking about how easy it will be with a Macintosh. The computer that gives you the power any student can use. The power to be your best. 

For further information visit the  
Campus Computing Organization  
Jorgensen Building 158-79  
(818) 395-4612



## Off-campus interviews



# Capture imagination

Encoders, decoders, and codecs. Full-motion video and true-color images for multimedia computers, CD-based consumer electronics, and digital television. Anything that's being done in this fast-moving field is being done with technology from C-Cube Microsystems, Inc.

An early leader in the field, we've not only captured the imagination of the world, we also won an Emmy last September for our "Outstanding Achievement in Engineering Development for the television industry." Imagine how much you could do, in one of these areas at C-Cube.

All positions require a BS/MS in EE/CS, and the following skills:

### Design Engineers

VLSI Design, Verilog behavior and gate modeling, logic design and synthesis, circuit design and SPICE simulation, layout and post-layout verification.

### Algorithm Software Engineer

Prototyping in C under UNIX, porting and performance tuning to video DSPs, real-time multitasking, error analysis.

### Architecture

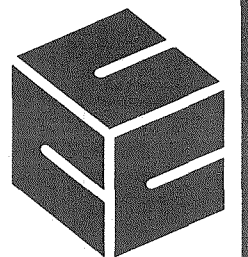
Register transfer level (RTL) behavioral modeling, memory hierarchy tradeoffs, validation suites, programming in C.

### System Software/Hardware

Device drivers, Windows user interfaces, programming tool construction: assembler, linkers, compilers, debuggers.

**C-Cube will be conducting off-campus interviews in your area, the week of December 11th. We will be pre-screening candidates, so if you are interested, please FAX your resume to C-Cube at: (408)944-8167.**

C-Cube is headquartered in the heart of the Silicon Valley, California. We're minutes from San Jose. Less than an hour from San Francisco. And just a little farther from the Santa Cruz mountains and beaches. And in addition to growth, technology and scenery, C-Cube offers an excellent compensation plan, including stock options, flexible spending accounts, and comprehensive insurance benefits. For more information about our College Recruitment program, please call (408) 944-6321. We are an Equal Opportunity Employer.



**C-Cube  
Microsystems**

# Caltech Sports

## Men's & Women's Swimming & Diving



On Saturday, the men's diving trio of Phil Rodriguez, Ben Taskar, and Mike Fisher traveled to Claremont to compete in the CMS Winter Diving Invite. All the divers had their moments as Ben nailed his first four dives and Mike hit his last four dives in the eleven dive format. However, it was Phil's steady performance and clean entires that placed him second out of seven men divers. Final placement was Rodriguez with 265 points, Fisher with 209 for fourth, and Taskar with 197 points for fifth place.

quite a few players coming off the bench to play tough and help out the starters. Matt Hetterman came in off the bench scoring 9 points. Coach Victor stated, "We have a ways to go, but we feel we will continue to improve."

Over the Thanksgiving vacation, CIT hosted the Sixth Annual Hi-Tech Tournament. Competing in the tournament were: Caltech, LaSierra, California Christian, and California Maritime. The Beavers took on the Keelhaulers of Cal. Maritime in their first game on Friday, Nov. 24th. The Beavers jumped out on top and kept the lead throughout the entire game, winning 64-48. All 15 players that suited up for the game saw some playing time. Leading the scoring for CIT was senior Matt Goff with 23 points. Other high scorers in the first game were Moats with 13 and Steve Tsai with 12. This first win allowed them to play LaSierra in the finals on Saturday. The Beavers battled hard but lost a close to them by a score of 66-69. It was tight right up to the wire with the CIT players showing character and mental toughness. Tsai had a scoring high of 24 points and Turk had 16 points and 12 rebounds. The Beavers travel to St. Louis, MO this weekend to compete in the Lopata Tournament hosted by Washington University.

Christian Knights. Although the Techers got off to a slow start, they scored 13 points in the first half. After adjusting their defense and taking a rest at half, the Lady Beavers slowed down the opponents, containing them to 17 points in the second half, while scoring 17 of their own points. Caltech made a strong showing in their first game despite the 30-57 loss. Senior Angie Bealko, team captain, scored an amazing high of 18 points. Ellis Meng, team co-captain and center, made 5 points, while Michaeleen Callahan totaled 4 points. Playing tough at guard, Irene Wong brought in 2 points and Frances Siu scored 1. Swift-footed Lori Hsu brought the ball down the court most of the night, never acceding to the Knight's press. Unfortunately, guard Nasim Afsarmanesh was taken down by the Pacific Christian defense, injuring her knee.

banner day! Emma Goldberg and Mihoko Kato won 11 and lost only 1 each. Adrienne Bourque, who is nursing an injury, won 7 and lost 5. As she becomes healthier, her record should improve drastically for she has plenty of talent. The sole CIT lady epeeist, Emily Jennings, also won 11 with only 1 loss.

The men's saber team was once again undefeated, but Austin Collins' perfect record was blemished by one loss in the match against UCSB, and another unfortunate loss against a USC fencer. Despite these losses, Austin should still win the individual title barring an unexpected catastrophe. Xavier Fan, in his very first college tournament, won his first three matches against USC. The Sabermen are solidly in first place in the conference and should be able to stay there with continued hard work.

The epee men had a good showing. Wes Salzillo won 7 and lost 2. John Langford won 5 and lost 4. Freshman Aaron Higgins, with only a limited amount of practices, had one win against 8 losses. He should continue to improve and will do much better before long.

Men's foil had the toughest time because of very stiff competition. Dan Hennessy and Devon McClain are both improving, and with more practice and experience will do better. The good news about men's foil is the two new freshmen. They look very promising, and if all work together, the team may do well in the second half of the season.

Men Overall: 1-0

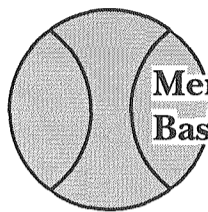
SCIAC: 0-0

Women Overall: 0-1

SCIAC: 0-0

The swim team had a match against the Whittier P week. The men and womer enjoyed early leads thanks callingan, Phil Rodriguez, Mike Fisher, and James Honaker. The men extended their lead with wins from captain Mike Green in the backstroke events and a quick 22.44 in the 50m freestyle. Adding to the speed was Jim Pierce in the distance events and Wes Tanaka in the butterfly.

The women had some great efforts from first year swimmers Mina Leung, Heather Dean, and Samantha Howarth. The Lady Techers were pleased as the returners gave some mid-season performances very early in the season, as Christie Armentrout had a personal best leading off the 200 yard freestyle relay (28.13), Jennifer Holland broke three minutes in the 200 freestyle (2:56:10), and Keri Ryan swam to a 2:51.4 in the 200 I.M. The final score for the men: Caltech 149, Whittier 44; and for the women: Caltech 70, Whittier 135.

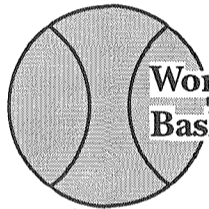


## Men's Basketball

Overall: 1-2 SCIAC: 0-0

On November 16th, the Caltech Men's Basketball team had an exhibition game with the Australian Junior National Team. It was a very exciting game filled with fun and camaraderie. The Aussies were big and strong, but the Beavers gave them some exciting competition. It was a good experience for the CIT plers, despite an unofficial loss to them.

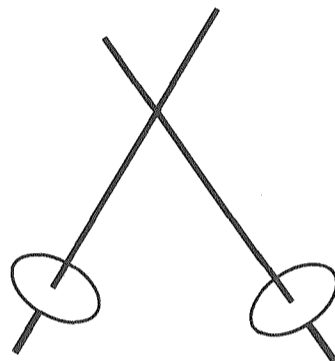
The Beavers opened their official season on November 18th against L.I.F.E. Bible College at home. It was a close game for the entire 40 minutes, with the lead going back and forth. Josh Moats had a high score of 17 points with Ben Turk close behind with twelve points as well as 10 rebounds. Behind Turk in scoring was Arun Duraraj with 9 points. Caltech worked hard with



## Women's Basketball

Overall: 0-1

On November 20th, the Lady Beavers went up against the Pacific



## Fencing

The fencing team traveled to the University of California at Santa Barbara on November 18th to compete against UCLA, USC, and UCSB. The lady foilists had a

## THE BOSTON CONSULTING GROUP

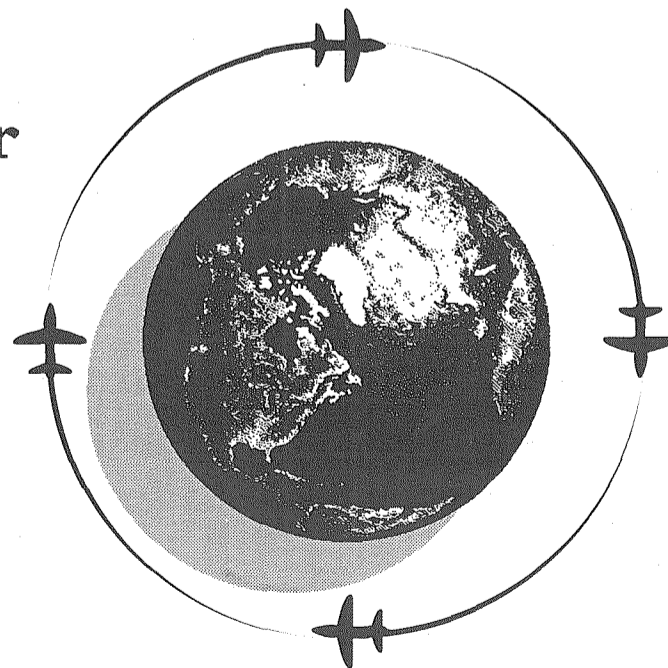
**Graduating Seniors** interested in Management Consulting: Please join us for an *informal* reception and briefing to learn more about our Associate Program

**Monday, December 4**

**4:00 pm**

**The Athenaeum Room**

**Dinner and Refreshments will be Served**



- |           |              |              |             |               |           |
|-----------|--------------|--------------|-------------|---------------|-----------|
| AMSTERDAM | BUENOS AIRES | HAMBURG      | Los Angeles | MUNICH        | Singapore |
| ATLANTA   | CHICAGO      | Helsinki     | MADRID      | NEW YORK      | STOCKHOLM |
| AUCKLAND  | DÜSSELDORF   | HONG KONG    | MELBOURNE   | PARIS         | SYDNEY    |
| Bankok    | DALLAS       | Jakarta      | MILAN       | SAN FRANCISCO | TOKYO     |
| BOSTON    | Dusseldorf   | KUALA LUMPUR | MONTERREY   | SEOUL         | TORONTO   |
| BRUSSELS  | FRANKFURT    | LONDON       | MOSCOW      | Shanghai      | ZÜRICH    |

# Women Hoopsters to Take Court Tonight

by Angie Bealko

It's a Friday night. You're hanging out with your friends wondering what the heck you're going to do tonight. So you ask yourself: "What's free? Where will all my other friends be? Can I win cool prizes? Do I get to scream and yell? Where can I get all of this for just one low price of nothing???" Fear not my friends, your worries are over... *Come to the Women's basketball game at 7:30 p.m. tonight (Friday) at Braun gymnasium!!!*

The Ladies have yet to capture a win after their first two showings, but they're hungry for one. Both of their first games were against Pacific Christian College. The first match up drew a huge crowd of nearly a hundred spectators. Despite lacking a set offense (due to limited practice time prior to the first game), the lady hoopsters made a decent showing for their first time out on the court.

Five teachers lit up the scoreboard with Angie Bealko leading both teams with 18 points. Ellis

Meng threw in a few and managed to play an aggressive game, tallying up four fouls. Excellent hustling was seen at the guard positions by Lori Hsu, Irene Wong and Michaelen Callahan. Rachel Steinberger did a great job playing intense defense, while Joanna Dodd found a few offensive boards, putting some strong pressure on the other team's defense. Katie

Stofer, Kara Swedlow, Melissa Hampton, and Frances Siu all saw some minutes and filled in at forward, giving some more depth and much needed fresh bodies. Nasim Afsarmanesh did an outstanding job hustling at guard, but unfortunately suffered a knee injury that will plague her throughout out the rest of the season.

The team had better offenses

set for the second match up but still fell to Pacific Christian. Hsu and Wong kept the game alive for Tech by controlling the floor and running at a phenomenally fast pace for the entire game. All of the players saw a lot of playing time as the lady hoopsters had only nine players on the roster.

They've lost their first two games but that doesn't mean

they're out of the running yet. Tonight the ladies meet College of Notre Dame. This fierce match-up against a Division Two team will be quite a challenge for the team, but it'll still be an exciting game none the less. So come out to Braun gym at 7:30 p.m. and cheer on the women as they battle for rebounds, knock some unsuspecting opponents over, and score a few threes!!!

## Intelligent choice

Since 1988

### Multimedia Classic

#### 486 Audio Notebook Best Buy! Notebook

- > 4MB Ram, up to 32MB
- > BUILT-IN REMOVABLE 340MB FAST IDE HARD DISK
- > 9.5" Dual Scan Color Screen
- > VESA LB SVGA Card w/1MB Ram
- > BUILT-IN IBM LIKE TRACK-POINT MOUSE
- > BUILT-IN 16BIT SOUND CARD & MICROPHONE & SPEAKERS
- > BUILT-IN REMOVABLE 1.44MB FLOPPY DRIVE
- > Built-in one PCMCIA III and two PCMCIA II
- > Direct Connection for CD-ROM
- > NiHM Battery (2 Hours Charging time)
- > Carrying Case
- > 1-Year Limited Parts & Labor Warranty

**486DX4-100 \$1750**

GE additional 3-Year on-site service \$169.95

#### 486/586 PCI Office PC

- > 8MB RAM, 256K Cache, 1.44MB Floppy Drive
- > 540MB FAST IDE HARD DISK
- > PCI Enhanced FD/HD Controller
- > PCI LB SVGA CARD W/1MB RAM EXP. TO 2MB
- > 14" 1024 .28 NI "POWER SAVING" SVGA MONITOR
- > 101 Keyboard, 3 Button Mouse

**486DX2- 66 \$ 969**

**486DX4-100 \$ 999**

**Pentium- 75 \$1199**

**Pentium- 90 \$1299**

GE additional 3-Year on-site service from \$139.95

#### Pentium Best Buy!

- > INTEL PENTIUM CPU, 256K CACHE
- > 8MB RAM, 1.44MB Floppy Drive
- > 850MB FAST EIDE HARD DISK
- > 2 High Speed Serial, 1 Parallel Ports
- > PCI LB SVGA CARD W/1MB RAM EXP. TO 2MB
- > 15" 1280X1024 .28 NI SVGA MONITOR "POWER SAVING"
- > 4X CD-ROM, CREATIVE LAB 16BIT SOUND CARD & SPEAKERS
- > 101 Keyboard, 3 button Mouse

**Pentium- 75 \$1498**

**Pentium- 90 \$1598**

**Pentium-100 \$1650**

**Pentium-120 \$1830**

GE additional 3-Year on-site service \$169.95

1 year parts & labor warranty with above computer systems.

**MS DOS & Windows \$85 / Windows 95 \$135**

All prices reflect a 3% discount for purchases made with cash. There are no discounts for sales made with credit cards. 90 days same as cash financing available!

- > 8MB RAM, up to 32MB
- > BUILT-IN REMOVABLE 540MB FAST IDE HARD DISK
- > 11.3" BIG DUAL SCAN COLOR SCREEN
- > VESA LB SVGA Card w/1MB Ram
- > BUILT-IN IBM LIKE TRACK-POINT MOUSE
- > BUILT-IN REMOVABLE 2X MULTISECTION CD-ROM
- > BUILT-IN 16BIT SOUND CARD & MICROPHONE & SPEAKERS
- > BUILT-IN REMOVABLE 1.44MB FLOPPY DRIVE
- > Built-in one PCMCIA III and one PCMCIA II
- > NiHM Battery (2 Hours Charging time)
- > Carrying Case
- > 1-Year Limited Parts & Labor Warranty

**486DX4-100 \$2475**

**Pentium- 75 \$2860**

**Pentium- 90 \$2950**

**Pentium-100 \$2990**

GE additional 3-Year on-site service \$199.95

#### 486 PCI Family PC

- > 8MB RAM, 256K Cache, 1.44MB Floppy Drive
- > 540MB FAST IDE HARD DISK
- > PCI Enhanced FD/HD Controller
- > PCI LB SVGA CARD W/1MB RAM EXP. TO 2MB
- > 14" 1024 .28 NI "POWER SAVING" SVGA MONITOR
- > 2X MULTISECTION CD-ROM
- > CREATIVE LAB 16BIT SOUND CARD
- > PAIR OF SPEAKERS
- > 101 Keyboard, 3 Button Mouse

**486DX2- 66 \$1065**

**486DX4-100 \$1095**

GE additional 3-Year on-site service \$139.95

#### Smart Win 95 Station

- > INTEL PENTIUM CPU, 256K CACHE
- > 16MB RAM, 1.44MB Floppy Drive
- > 1000MB FAST EIDE HARD DISK
- > 2 High Speed Serial, 1 Parallel Ports
- > DIAMOND STEALTH 64 PCI LB SVGA CARD W/2MB
- > 15" 1280X1024 .28 NI SVGA MONITOR "POWER SAVING"
- > 4X CD-ROM, CREATIVE LAB 16BIT SOUND CARD & SPEAKERS
- > 101 Keyboard, 3 button Mouse

**Pentium- 90 \$1938**

**Pentium-100 \$1988**

**Pentium-120 \$2168**

**Pentium-133 \$2388**

GE additional 3-Year on-site service \$169.95

School PO's are welcome!

There are no discounts for sales made with credit cards.

## PASADENA COMPUTER CENTER

1756 E. COLORADO BL., PASADENA CA 91106

Tel:(818)568-1088

Fax:(818)568-9132

PM5/Catech10/25/95

### CLASSIFIED ADS

#### EMPLOYMENT SERVICES-

**JOB SEARCH NEWSLETTER**  
for technical Jobs, plus Job Search Guide. Use analytical methods in your search for a job or a better job. Details: John Huntley, e-mail: ao388@lafn.org

#### FOR RENT-

**2 BD, 2 BR CONDO.** \$800, view, security building, pool, jacuzzi, rec room, carport, washer/dryer hook-ups, dishwasher, stove & refrigerator, central air/heating, balcony, N/S. Call Robby (818) 577-9348 or robbay@bombay.gps.caltech.edu

#### FUNDRAISING-

**RAISE \$\$\$** The Citibank fundraiser is here to help you! Fast, easy, no risk or financial obligation-Greeks, groups, clubs, motivated individuals, call now. Raise \$500 in only one week. (800) 862-1982 ext. 33

#### HELP WANTED-

**STUDENT WITH KNOWLEDGE** of frame relay setup and html programming for collaboration on WWW page. Please call Sean (213) 261-2018.

**\$1750 WEEKLY** possible mailing our circulars. No experience required! Begin now! For info call (301) 306-1207.

#### OPPORTUNITIES-

**REGISTER YOUR TALENT** to get tutoring business. Ask for an application form. Subjects: math, physics, chemistry, computer science, business. Sigma Tutorial Agent, PO Box 794, Duarte CA 91009-0794.

#### SERVICES-

**AIKIDO: JAPANESE MARTIAL ART.** Adult classes evenings & Saturday AM at 1305 E. Colorado Blvd., behind Holliston Church. Southland Aikido offers USAF certified instruction. Kids' class forming. Call (213) 255-9641.

**LET MY LETTERPERFECT SERVICE** come to your assistance. Computerized to your specification and satisfaction. Papers, theses, transcription, mailing lists/labels, using FAX and/or modem. Call Andree (818) 683-9328.

**FOREIGN STUDENTS - VISITORS**  
DV-1 Greencard Program available. Tel: (800) 660-7167 & (818) 772-7168. 20231 Stagg St., Canoga Park CA 91306.

**RATES** . . . . . \$4.00 for first 30 words;  
. . . . . 10¢ 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.

Events

▶ **The Boys of the Lough** will be presenting their Christmas performance tomorrow, December 2nd, at 8pm in the Beckman Auditorium. The Boys will be performing traditional holiday music of Ireland, Scotland, Shetland, and Northumberland on a variety of ancestral instruments, including the flute, penny whistle, concertina, fiddle, mandoline, Uilleann pipes, guitar, cittern, and button accordion. Tickets begin at \$22 for general admission, with student rush-tickets on sale one half hour before show at \$8.

▶ **The Julliard String Quartet** will be holding a Coleman Chamber Concert on Sunday, December 3rd at 3:30pm in the Beckman Auditorium. The program will include a performance of Beethoven's Quartet in B-flat Major, Op. 18, No. 6; Hindemith's Quartet No. 5; and Dvorak's Quartet in A-flat Major, Op. 105. Admission starts at \$12 with a \$4 student discount.

▶ **The Affirmative Action League** of Pasadena City College invites all students to join their rally in support of Affirmative Action on December 7th at 12 noon at the PCC quad, followed by a debate on Affirmative Action at 7pm, December 7th, in the Lounge of the Cross Cultural Center at PCC. For further information, please call 791-1978.

▶ **The Waverly Consort** will perform Medieval, Renaissance, and baroque storysongs of the Nativity with pageantry and ancient music in their *Christmas Story* on Friday, December 8th at 8pm in the Beckman Auditorium. Admission begins at \$25 with a \$2 student discount and rush \$8 tickets going on sale to students one half hour before the performance.

The **Caltech Glee Clubs Annual Holiday Concert** will be held Today and tomorrow, December 1st and 2nd, at 8 pm in the Dabney Lounge. Included on the program is a performance of Britten's Ceremony of Carols and Rutter's Dancing Day, as well as many other traditional carols. Admission is free.

The **Friends of Caltech Libraries (FOCAL) Annual Dinner** on Thursday, December 7th, will feature Jack Miles, author of the recently-published book, *God: A Biography*. The event will be held at the Caltech Athenaeum starting at 6:00 pm with a no-host social hour and book autographing, dinner at 7:00 pm,

# Announcements

means you should read it.

followed by Dr. Miles' talk "Writing the Life of God." Admission is \$58 (\$48 for FOCAL members); reservations and payment are due by Monday, December 4th. Contact Barbara Huff-Duff at x4048 or by email at [huffduff@cco.caltech.edu](mailto:huffduff@cco.caltech.edu).

## From the Counseling Center

**Gay, Lesbian & Bisexual Support Group** meets the first and third Tuesdays at 7:30pm in the Health Center Lounge. This confidential meeting is open to all Caltech community members looking for a supportive context in which to address questions and concerns about sexual orientation - including coming out, being out, self-discovery, coping with families...We begin with a focus topic but move to whatever is feeling most relevant to the group that night. Refreshments are served. For information, please call x8331.

## Fellowships and Scholarships

From the Office of International Programs, MSC 0-54, extension 6330:

One-year cultural exchange programs in technical fields are now available to students through the **Congress-Bundestag Youth Exchange Program for Young Professionals and Agriculturists**. This program offers American participants the chance to learn about Germany first-hand through a combination of intensive language study, professional or technical schooling, and practical work experience. Applications can be requested directly from the CDS International by phone or mail at DCS International, Inc., 330 Seventh Avenue, New York, NY, 10001-5010, (212) 760-1400. The application deadline for the 1996-97 program is **December 15, 1995**.

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

▶ Attention seniors interested in pursuing a Masters of Science degree in aeronautical, astronautical, or aerospace engineering: Student members of the American Institute of Aeronautics and Astronautics who are planning to attend graduate school next fall can apply for a one time **Francois-Xavier Bagnoud Fellowship**. The award will provide six students with full tuition up to \$20,000 plus an \$18,000 stipend for one year. The Fellowships Advising Office has applications; the deadline for this application is **February 1st, 1996**.

▶ The **Computational Science Graduate Fellowship Program** supports full time doctoral study in an applied science or engineering discipline with applications in high performance computing. Applicants must be in their first year of graduate study and be either U.S. citizens or permanent residents. The postmark deadline for completed applications is Wednesday, January 24th. Applications are available in the Fellowships Advising Office.

▶ Graduating seniors with a program concentrated in biomedical engineering and graduate students who have completed one year of grad study in biomedical engineering may apply now for the **Whitaker Foundation Graduate Fellowships in Biomedical Engineering**. Applicants must be U.S. citizens or permanent residents. Students must be planning or be enrolled in full-time Ph.D. study in engineering. Applicants do not have to plan a concentration in biomedical engineering, but must be involved in a program that will lead to the development of expertise in the biomedical engineering field. The application deadline date is **December 11th**. Applications are available in the Fellowships Advising Office.

Attention seniors and first year graduate students. Applications for the **National Defense Science and Engineering Graduate Study Program (NDSEG)** are available in the Fellowships Advising and Resources Office. Applications are also available via the web at <http://www.battelle.org/ndseg/ndseg.html>. At this point the application is not live-it can only be printed from the web. A live application is still under development. Although, it was hoped that it would be available this year, this will probably not be the case. The NDSEG supports work in almost all fields of science and engineering. If your field of study does not appear on the list (e.g. astronomy), then list the field closest to it as your main field of study and your actual field under subdiscipline. (In the case of astronomy, a person would probably list either physics or math with astronomy as the subdiscipline.) If you have any other questions, please contact Lauren Stolper at the Fellowships Office. The NDSEG provides three years of support for graduate level study. Applicants must be U.S. citizens or nationals and be graduating seniors, recent alumni who have not yet begun graduate school, or 1st year graduate students. No military service or sponsorship of the Department of Defense is required of applicants. All NDSEG materials including transcripts and references must be received by, not postmarked by, **January 17th**.

The **1996 U.S. Department of Energy Integrated Manufacturing Predoctoral Fellowships program** is now open: applications and information are available on the Internet. This program awards 12 fellowships for 3 years of full-time study toward the PhD in an area related to integrated systems of manufacturing. Fellowship awards provide an annual stipend of \$20,000 and a cost-of-education allowance of up to \$15,000. Applicants must be US Citizens. The application deadline is **Today, December 1st**. For further information, please access <http://www.nas.edu/jfo/index.html>.

The Department of Energy Computational Science Graduate Fellowship supports full-time Ph.D. level study in areas where the computer is used as a tool to solve problems in a scientific or engineering discipline. Examples of projects in this area might be computer based predictions of environmental changes, plasma dynamics for fusion energy, semiconductor design, or the study of fluid flow through geologic structures, etc. Therefore, students from a wide range of fields may find themselves eligible to apply for this

fellowship. The application deadline is **January 24th**. A small number of applications are available in the Fellowships Advising and Resources Office.

▶ The **Rotary Scholarship meeting** for Juniors, Seniors and Graduate students will be held **Today, December 1st** at 12 noon in Winnett Lounge. The Rotary has several programs: a 1 year fellowship for study in any Rotary country, a multi-year program for those who wish to earn a degree abroad, and a short-term 3 or six month fellowship to support language study. Juniors should plan to attend this meeting in particular as the application process takes place in the winter with finalists announced in the spring/summer. Winners of this year's competition would not leave to study abroad until *fall of 1997*! Therefore juniors should apply this year and not wait until senior year unless they want a one year gap after graduating. Seniors should not be discouraged from applying as there are productive ways to use this interim year. Grad students can go while grad students or to do a project after receiving their Ph.D. A pizza lunch will be served at the meeting. To help us in planning numbers, send an email with the subject line titled **Rotary Pizza Lunch** and let us know your name, year of study, and your favorite toppings and if you usually eat more than 2 large slices of pizza! Please send this communication to [lauren\\_stolper@starbase1.caltech.edu](mailto:lauren_stolper@starbase1.caltech.edu) by **Tuesday, November 28th**.

The **National Security Education Programs** seeks to equip American citizens with an understanding of the less commonly taught languages and cultures to allow them to become more integrally involved in global issues in their field as professionals. Through the NSEP Undergraduate Scholarships for Study Abroad, students can study in any country except the following: U.S., Canada, New Zealand, Australia, and Western Europe. Freshmen, sophomores, juniors, and seniors may apply. Freshmen and sophomores can apply for summer, semester, or full year programs. Juniors and seniors are only eligible for semester or full year programs. Seniors may only apply for the program provided they will not graduate from the program before or during their term of study. Students interested in applying for the program should request an application from Lauren Stolper, Fellowships Advisor, by November 13th to allow sufficient time to complete the application and devise a plan of study. Completed applications are due by **November 30**, turned in to Lauren Stolper.

From the Deans' Office, 102 Parsons-Gates:

▶ The **Morris K. Udall Scholarship and Excellence in National Environmental Policy Foundation** has created a scholarship program to attract students into careers in environmental public policy, health care, or tribal public policy. Scholarships are awarded on the basis of merit to students who are sophomores or juniors during the 1995-96 academic year and who have excellent academic records and demonstrated interest in and potential for careers in environmental public policy or are Native Americans or Alaska Natives who have excellent academic records and demonstrated interest in and potential for careers in health care or tribal public policy. The scholarship covers eligible expenses for tuition, fees, books, and room and board to a maximum of \$5,000 for one academic year.

The **Harry S. Truman Scholarship Foundation** awards scholarships to juniors who have outstanding leadership potential and intend to pursue careers in public service. If interested, please stop by the Deans' Office. The deadline for receipt of nominations for this scholarship is **Today, December 1st, 1995**.

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

The **American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc.** is offering nonrenewable scholarships in the amount of \$2,500 to full-time engineering students in the final two years of undergraduate study. Students must have a GPA of 3.25 or above and must be involved in the fields of heating, ventilation, air conditioning, or refrigeration, or in related areas including indoor air quality, energy conservation, human comfort, or HVAC system design, operation, or maintenance. Applications are available at the Financial Aid Office, and are due **December 15, 1995**.

The **Elie Wiesel Foundation for Humanity** is sponsoring its annual essay contest for full-time undergraduate juniors and seniors. Students are challenged to examine and analyze urgent ethical issues in essays of 3,000 - 4,000 words. First prize is \$5,000, second prize is \$2,500, and third prize is \$1,500. Essays must be **postmarked by January 12, 1996**. For essay guidelines and additional information, visit the Financial Aid Office.

The **American Concrete Institute (ACI)** is offering several awards. The Peter D. Courtois Concrete Construction Scholarships are two \$1000 awards for undergraduate study in concrete construction for the 1996-97 academic year. Eligible students must be enrolled at least half-time and must be seniors in 1996-97. The application, available at the Financial Aid Office, with all required supporting documents is due **January 15, 1996**.

**GLAMOUR Magazine** announces its **1996 Top Ten College Women Competition**. Women who are currently full-time juniors are invited to submit applications to receive one of ten awards consisting of a cash prize of \$1,000, the opportunity to meet with top professionals in your field, and national recognition in **GLAMOUR's** October 1996 issue. Applications are available in the Financial Aid Office and must be completed and **postmarked no later than January 31, 1996**.

▶ The **American Mensa Education & Research Foundation** announces its 1995-96 Scholarship Essay Contest. Applicants must submit an application/entry form and an essay of fewer than 550 words describing their academic or career goals. Applicants must be U.S. Citizens or permanent residents. Applications must be **postmarked on or before January 31, 1996**.

▶ The **American Chemical Society** is accepting applications for its **Minority Scholars Program**. Qualified applicants must be of African-American, Hispanic/Latino, American Indian, Alaskan Native, or Native Pacific Islander descent, and must be citizens or permanent residents of the United States. Applicants must also be majoring in chemistry, biochemistry, chemical engineering, or in a chemically-related science, and must be planning a career in a chemically-related field. Other qualifications include full-time attendance in 1996-97, demonstrated high achievement in chemistry or science, and evidence of financial need for scholarship aid according to FAFSA guidelines. Applications are due **February 15, 1996**.

The **Consulting Engineers and Land Surveyors of California (CELSOC)** are offering scholarships of up to \$5,000 to undergraduates and graduates working towards degrees in engineering or land surveying. Undergraduates must be juniors or seniors in 1996-97. Both undergraduate and graduate applicants must be enrolled full-time, have a minimum cumulative GPA of 3.2, and be U.S. Citizens. Applicants must also be interested in pursuing a career in the consulting engineering or land surveying fields. Completed applications and all supporting documents are due **February 16, 1996**.

▶ The **Zonta Club of the Santa Clarita Valley Area** is offering two \$1,000 undergraduate scholarships to female residents of the Santa Clarita Valley. Applicants must be full-time during the 1996-97 academic year, and must have legal addresses within the Santa Clarita Valley. Applications are due **March 1, 1996**.

**OCEAN CORAL**  
珊瑚 Restaurant

★★ Award Winner ★★

**Mandarin Cuisine & Seafood**  
Cocktail Lounge

Lunch Specials \$4<sup>50</sup> 11:30-3 p.m.  
Early Bird Specials \$6<sup>25</sup> 3-7 p.m.  
Classic Dinners 3-10 p.m.

**Food To Go Welcome**  
**OPEN 7 DAYS**  
**Tel: 449-8018**  
2475 E. Colorado • Pasadena  
between Sierra Madre Blvd. & Altadena Dr.  
Free Parking in Rear

 **GOLDEN GLOBE**  
**PARIAN TRAVEL**  
Caltech Officially Approved

Most professional, courteous, economical and efficient service for your **official** and **personal** travel needs.  
Free service to you. We deliver.

Airlines, Cruises, Tours, Hotels, Car Rentals.  
Individual, Commercial, Groups.  
**(818) 577-8200**  
468 S. Sierra Madre Blvd., Pasadena

## DUKE OF OIL

**10% OFF 14 Pt. FULL SERVICE OIL CHANGE**  
THRU DEC. 95  
W/ Student-faculty ID

**PLUS OTHER SERVICES**

- ✓ Automatic Transmission Service
- ✓ Fuel System Cleaning Service
- ✓ Radiator Service

**Free Refill Policy Offered**  
Open 7 Days a Week  
No Appointment Necessary

jiffylube

Pasadena

	210 FWY	
LAKE		HILL
	WALNUT	Jiffy Lube
A	COLORADO	

1420 E. Walnut St.  
**(818) 793-9896**

## The California **TECH**

Caltech 40-58 SAC  
Pasadena, California, 91125