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 machine has its own strength and weakness, and one never knows 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 Marsh, the competing 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.

Today I am a man.

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 Lupus, 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 Astronomy Update at NASA Headquarters.

Astronomers have long theorized that brown dwarfs exist, but this marks the first public 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-neth of 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-neth 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 mariner 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 clouds, while planets are thought to form by condensation of material within protoplanetary 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 these objects exist to support the brown dwarf hypothesis.
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 opponent, 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.”

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 fanned hole on the opposite end of the context arena. The person who delivers more ping pong balls wins. 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 vending machine blind fold 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.

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 toSams wrestle with each other.

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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.)
Feeling bummed about finals?? We have the cure for you! Come to DECOMPRESSION, 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.

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DISCOVERY: Astronomers Locate Ancient Star

CONTINUED FROM PAGE 1

these hard-to-spot 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. The 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 dwarf companions to stars within our local neighborhood, within 45 light-years, or about 265 million 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-burning star is one 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. A high-temperature brown dwarf is 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, rather than 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 the 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 Palomar Observatory. The astronomers looked at each star twice, at an interval of one year. The brown dwarf is 44 astronomical units from the main star and has 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 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

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The California Tech
Minutes of the IHC: Tuesday, November 14, 1995

Present: Art (Ri), Mike(Pa), Alison(BI), Bill(Da), Brian(Fl), 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 having 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, PPPlant 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 PPPlant did a fine job of retouching the Rudder 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.

Tun
Women's Basketball

"Foul?? What foul??"  

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

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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)
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.
• CAPSU 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 fund events, many of which are open to the ASCIT community is welcome to attend. 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 (insert of the word HALF in big letters) is passed for election sometime next term.
• Jon agrees to rewrite a bylaw pertaining to 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.

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 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. 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 consisting of them plus 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 $2400/year? Seriously.
Meeting ends at 12:28 AM. We leave. Try to laugh at yourself once in while. Everybody else does.

Dave Pelayo
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.

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

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**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 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.
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 eleventh dive format. However, it was Phil's steady performance and clean entries that placed him second out of seven men divers. Final placement was Rodriguez with 263 points, Fisher with 209 for fourth, and Taskar with 197 points for fifth place.

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 players, despite an unfortunate 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 quite a few players coming off the bench to play tough and help out the starters. Matt Herteman came in on 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 26th. 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 Angie Bealko, team captain, scoring an amazing high of 18 points. Ellis Meng, team co-captain and center, made 5 points, while Michaela Callahan totaled 4 points. Playing tough at guard, Irene Wong brought in 2 points and Frances Sio scored 1. Swift-footed Lori Hsu brought the ball down the court most of the night, never according to the Knight's press. Unfortunately, guard Nasim Afsarmandeh was taken down by the Pacific Christian defense, injuring her knee.

On November 20th, the Lady Beavers went up against the Pacific 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 30-37 loss. Senior Angie Bealko, team captain, scored an amazing high of 18 points. Ellis Meng, team co-captain and center, made 5 points, while Michaela Callahan totaled 4 points. Playing tough at guard, Irene Wong brought in 2 points and Frances Sio scored 1. Swift-footed Lori Hsu brought the ball down the court most of the night, never according to the Knight's press. Unfortunately, guard Nasim Afsarmandeh was taken down by the Pacific Christian defense, injuring her knee.

The fencing team traveled to St. Louis, MO this weekend to compete in the Lopata Tournament hosted by Washington University. Xavier Fan, in his very first college tournament, won his first three matches against USC. The Sabermen are sadly in first place in the conference and should be able to stay there with continued hard work.

The men's foil team was once again undefeated, but Austin Collins' perfect record was diminished 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 sadly in first place in the conference and should be able to stay there with continued hard work.

The mespo men had a good showing. Wes Salizzo won 7 and lost 2. John Langford won 5 and lost 4. Freshman Aaron Higgins, with only a limited amount of practice, 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新鲜men. They look very promising, and if all work together, the team may do well in the second half of the season.
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 friends go? Can I win cool prizes? Do I get to scream and yell?” Fear not my friends, your worries are over. Come to The Women’s basketball game at 7:30 p.m. tonight (Friday) at Brown 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 hoopers made a decent showing for their first time out on the court. Five techers 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 Michaela Callahan; Rachel Steinberger did a great job playing intense defense, while Joanna Afsarmanesh found a few offensive boards, putting some pressure on the other team’s defense. Katie Stofer, Kara Swellow, Melissa Hampton, and Frances Sin all saw some minutes and fit in at forward, giving the team some needed fresh bodies. Nasim Afsarmanesh did an outstanding job hustling at guard, but unfortunately suffered a knee injury that will plague her throughout 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 compelling 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 hoopers 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 Brown 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!!

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### For Rental

- 2 BD, 2 BR CONDO $800, view, security, hardwood floors, washer/dryer, carpet, refrigerator, central air/heat, balcony, m/f. Call Hobby (818) 577-3342 or robby@hobby.com @caltech.edu

### Fundraising

**RAISE $$$** The Citibank fundraiser is here to help you! Fast, easy, no risk of financial obligations—groups, clubs, motivated individuals, call now. Raise $500 in only 1 week. (800) 163-1830 ext. 30

**HELP WANTED**

- **STUDENT WITH KNOWLEDGE of frame relay setup and html programming for collaboration on WNN page. Please call Sean (213) 551-2018.**
- **$175/ WEEky possible mailing our circu­lars. No experience required! Be a part of it! (323) 368-3200**

### Opportunities

- **REGISTER YOUR TALENT to get tutoring business. Ask for an application form. Subject: math, physics, chemistry, computer science, business. Sigma Tutorial Agent, PO Box 794, Duarte CA 91010-0794.**

### Services

- **AKIKO: JAPANESE MARTIAL ART. Adult classes evening & Saturday AM at 190 E. Colorado Blvd., behind Holstien Coffee. Beginners welcome, all others USA certified instruction. Kid's class toiling. Call (213) 255-9641.**

### LIST OF SPECIAL EFFECT SERVICE come to your assistance. Computerized to your specification and satisfaction. Papers, transcripts, transparencies, microfiche, data processing using FAX and/or modem. Call Andree (818) 360-1029.

### Foreign Students - Visitors

01-1 Greencard Program available. Tel: (818) 718-7107 & (818) 772-7118. 20231 Stagg St., Canoga Park CA 91306.

### Rates

- $4.00 for first 30 words.
- $.10 for each additional word

**Fees**

- $150.00 per page. Please call Keesha (818) 734-3325.

**Deadlines**

- Each issue is 6 p.m., Monday before issue. No charge for on-campus text & found.

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**Sports December 1, 1995**

### Women Hoopers to Take Court Tonight

### Classified Ads

**Employment Services**

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**Announcements**

**From the Counseling Center**

- **G421, Lesbian & Bisexual Support Group**
  - Monday, Tuesday, and Thursday from 7:00 to 9:00 in the Health Center Lounge. This confidential meeting is open to all community members looking for a supportive community. **No dues, no rules, no questions about sexual orientation; including being out, coming out, self-labeling, and coming with families.** We begin with a focus on **support** to whatever is feeling most relevant to the group that night. **Refreshments are served.** For information, please call 8553.

**Fellowships and Scholarships**

- **From the Office of International Programs, MSC 634, ext. 6380**
  - One-year cultural exchange programs in technical fields are now available to students through the Congress-Bonn Exchange Program for Young Professionals and Researchers. The program targets American participants the chance to learn more about German culture, language, and the practice and study of their respective fields. The American prestige will be submitted to a board of judges. The deadline for applications is December 15th at 5:00 pm. For more information, please contact Dr. Michael Walker, ext. 8552.

- **Bagnoud Fellowship.** The award will provide six students with $5,000 for study in an applied science or engineering field. Fellowship awards provide evidence of financial need and are available to full-time student members of the American Institute of Aeronautics and Astronautics who are applying. Applicants must be U.S. citizens, permanent residents, or nationals of the United States or legal permanent residents of the United States. Applications must be submitted to the Finance Office, the deadline for applications is Wednesday, January 24th. Applications can be obtained by phone or mail at DOD International, Inc., 1500 Avenue of the Americas, New York, New York 10036-5012, (212) 790-1400. The application deadline for the 1996-97 program is December 15, 1995.

- **From the Admissions and Advising Office, ext. 2130, e-mail lauren_stolper@slarbase1.whtf;oh.edu**
  - Internship sessions interested in pursuing a Masters of Science degree in aeronautical, astronautical, and related fields at the Caltech Athenaeum. The deadline for applications is January 31st. The internships are available to full-time students at Caltech, and the internships will be awarded on a first-come, first-served basis. The deadline for applications is January 31, 1996.

- **From the Department of Environmental Science and Engineering, ext. 2130, e-mail lauren_stolper@slarbase1.whtf;oh.edu**
  - The Harry S. Truman Scholarship Foundation is an independent, non-profit organization that seeks to equip American citizens with the skills and knowledge to become leaders in public service. The foundation awards scholarships to outstanding students who are U.S. citizens or permanent residents of the United States who have completed at least one year of graduate or professional study in the United States. Applications must be submitted to the Finance Office, the deadline for applications is January 15th, 1996.

- **From the Department of Environmental Science and Engineering, ext. 2130, e-mail lauren_stolper@slarbase1.whtf;oh.edu**
  - The American Concrete Institute (ACI) is a professional society that promotes the development, dissemination, and application of international codes and standards related to the design and construction of structures for the benefit of society. Applications must be submitted to the Finance Office, the deadline for applications is January 15th, 1996.

- **From the Department of Environmental Science and Engineering, ext. 2130, e-mail lauren_stolper@slarbase1.whtf;oh.edu**
  - The American Chemical Society is a professional society that promotes the development, dissemination, and application of international codes and standards related to the design and construction of structures for the benefit of society. Applications must be submitted to the Finance Office, the deadline for applications is January 15th, 1996.

- **From the Department of Environmental Science and Engineering, ext. 2130, e-mail lauren_stolper@slarbase1.whtf;oh.edu**
  - The American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. is a professional society that promotes the development, dissemination, and application of international codes and standards related to the design and construction of structures for the benefit of society. Applications must be submitted to the Finance Office, the deadline for applications is January 15th, 1996.

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