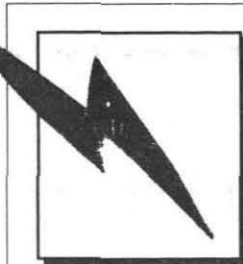


Student/Faculty centerfold

see page 5



"Cells really aren't the chicken" - Bill



Media Guy strikes again.

see page 3

# THE CALIFORNIA TECH

VOLUME XCVIII, NUMBER 23

PASADENA, CALIFORNIA

FRIDAY, APRIL 11, 1997

## The prefrosh are coming! The prefrosh are coming!

BY ERIK STREED

Prefrosh weekend starts next Thursday, April 17th when a fresh infusion of prospective members of the Class of 2001 from around the country. At least 165 tender young high school seniors will be testing the institutional waters of Caltech for four days. On Sunday, the 20th these prefrosh will return from whence they came, many returning again in September as fully fledged frosh.

The Admissions Office has a host of official activities planned to introduce the prefrosh to life at Caltech. Unlike last year, the Noble Laureate dog and pony show will not return and more traditional fair will dominate the weekend. Lab tours, informational sessions, and a few frosh classes will fill the day on Friday. ASCIT has a party planned for 10:00p.m. Saturday in Dabney Hall. Most houses

have social events planned for the weekend in addition to the usual flicking and other random happenings which occur.

During their visit, each prefrosh will stay with an undergraduate host. More than just occupants of 12 sq. ft of floor

space, prefrosh need their hosts to answer basic questions about Caltech and find representatives for more detailed questions. Hosts are also expected to show their prefrosh the campus and in general make sure their stay is pleasant. This is

especially important in the South Hovses, whose architecture is confused at best.

Requests can range from locating a nearby Tech editor for a prefrosh interested in journalism or finding a friendly, flashlight bearing, Tech editor for a prefrosh interested in getting subterranean. Write for the Tech, prefrosh. Write for the Tech.

For most frosh this event marks the beginning of the end to their froshliness. Prefrosh weekend is the first event where most frosh got a first taste of things to come. Now the Class of 2000 stands on the other side of the looking glass for the first time.

The Tech would like to remind the undergraduates that Rotation Rules are in effect. Don't unfairly bias the prefrosh. Basically, don't rip on other houses or talk about upcoming social events. However, previous social events are fair game.



Jim Pierce leading his flock of prospective students

## Student/Faculty Conference to occur on Tuesday

A message from the Academics and Research Committee on the Student-Faculty Conference

The Academics Research Committee is sponsoring the third Caltech Student Faculty Conference on April 15th, starting at 9:30am in Baxter Lecture Hall. ASCIT holds this conference every three years in order to facilitate communication between the faculty and the students. The goal of the conference is to determine which problems with student life here at Caltech most need to be addressed, and to engender possible solutions through discussion and input from both the faculty and students. Thus the professors have been encouraged to either cover non-essential material during the conference times,

or to discontinue class during that time. Student body members and faculty who come to listen or to voice their opinions are entirely welcome.

The topics covered change each conference to address the ideas that have a great deal of immediate relevance. This year, three committees were instituted for the purpose of examining the issues of the Purpose of Undergraduate Life, the Honor System, and Student Life. They have been meeting now for several months, and each committee has formulated ideas that bring some of the difficulties of student life into focus. The Undergraduate Purpose committee studied what the undergraduate education here at Caltech prepares students for in the real world, and the quality of that

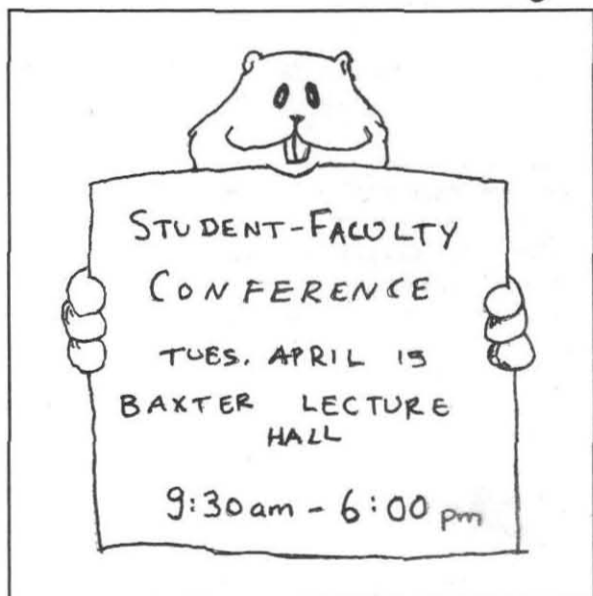
education. The Student Life Committee wanted to improve the communication between the faculty and the students. They studied different approaches to open communication pathways and discussed problematic areas like the current Advising system for undergraduates. The main focus of this group is to facilitate communication during the conference, so they would like people to come and voice their thoughts and opinions about the problems facing undergraduates here, the places where miscommunication between the students and the faculty occurs repeatedly, and the ability of the administration to resolve the issues that the student population brings to the forefront. The Honor System Committee discussed possible improvements to the BOC (Board of Control) and possible ways of educating the faculty about the purpose of the Honor System and how the BOC operates. These committees will be presenting the ideas they have generated and encouraging the audience to both think and speak about undergraduate life here at Caltech.

The individual committee presentations/discussion can be attended separately. If there are questions about the committees, the House ARC representatives can be consulted or the committee heads. The committee heads are Seth Blumberg as the Undergraduate Purpose chair, Ellis

Meng as the Student Life chair, and Geoff Smith as the Honor System chair. House Arc reps will be making announcements about the conference. Also, the Caltech weekly calendar has the schedule information. The aim of this conference is to give the students a forum to express their ideas about aspects of life at Caltech, and how they can be improved. Audience participation is necessary for the conference to fully benefit the Caltech community. Students and faculty are definitely encouraged to voice their concerns and well-thought out opinions. All of these committees have met to

formulate ideas about specific issues, but the main focus of the conference is to be a vehicle for the expression of student and faculty views about the quality of life, learning, and living here at Caltech. Express your views now, because it will be another three years before the next forum of this kind!

Devi Thota, ARC Secretary



### The schedule of the Conference is as follows:

9:00-9:30	Continental Breakfast
9:30-9:45	Opening Remarks
9:45-12:00	Undergraduate Purpose Committee
12:00-1:00	Lunch, everyone's on their own
1:00- 3:15	Student Life Committee
3:15-3:45	Snack
3:30-5:45	Honor System Committee
5:45-6:00	Closing Remarks
6:00	Dinner on the Olive Walk

### IN THIS ISSUE

#### THE USUAL STUFF

Announcements.....	12
ASCIT Minutes.....	4
Dean's Corner.....	10
DILBERT®.....	11
The Outside World.....	3
Y News.....	4

#### THIS WEEK'S FEATURES

ASCIT Movies presents.....	4
ASCIT Excomm Minute.....	4
Media Guy.....	3
Student/Faculty Conference.....	5

(excerpts from)

**Research Strategy: Teach***(American Scientist v.84, #1, pp.20-22)*BY ROALD HOFFMANN, CHEMISTRY  
PROFESSOR AT CORNELL

Condensed by Robert Rossi

Roald Hoffmann wrote a lengthy article proposing a symbiotic relationship exists between cutting-edge, "big" research (like that carried out at Caltech and Cornell) and undergraduate education. Some of his arguments are condensed here.

Hoffmann began by emphasizing the similarities between presenting new research results and presenting new ideas to students. He went on to suggest that the techniques one uses in teaching others are equally applied by researchers in attempting to enlighten themselves with regard to unsolved mysteries in science.

Hoffmann then presented what he views as some of the key symbiotic interactions between research work and teaching efforts. Here's an excerpt:

...undergraduates take in not only the subject matter of their courses; they are also extraordinarily sensitive to the person of the professor outside the classroom. Do you realize what an effect it has on an undergraduate to go into the library to study on Saturday afternoon, everyone else at the football game, and see there his organic chemistry professor sit for two hours looking through, and taking notes on, the new journals that have come in that week? Or in the course of a summer job to sit in on research group meetings, hear the family-like banter, feel what it is like to learn that you've been scooped, sense the single-minded concentration on the new?

*The usual advantages of the active research scientist as teacher, often cited, are authoritativeness, proximity to the sources, and a sensitivity to what is and is not important in the current state of the science. I think the intangibles, a selection of which was given above, are equally important.*

In what I think is his most interesting argument, Hoffmann discusses what he titles "POSITIVE TENSION":

Given all this, we must face up to the stress and tension that do characterize the life of active university research scientists. Part of that stress comes from the balancing act we must perform between our teaching and research functions, perceived as distinct. I have argued above that we should not see them as such, for

every activity is mixed-mode. Nevertheless, being human, we do characterize them as such. And they compete for slogs in the 24-hour day.

My argument, not likely to be popular, is that a measure of tension is one of the wellsprings of creativity. First consider stress in the individual. We are unique products of genetics, basic psychological drives, childhood traumas, the coping with the irrationality and pain (and pleasure) of life. This we have learned from Aeschylus and Freud. What creative individuals bring to this world is often derived from the tension within them, the dissatisfied, ever-reaching psyche.

In a complex dance of desires and constraints American academics balance their various responsibilities and come out with marvelous new molecules, or mechanistic detail of a chemical reaction probed on a femtosecond time scale. That dance is not a courtly pavane; probably it's been choreographed by Twyla Tharp. Its driving force is tension, the creative tension of desire and doing.

This is not a rationalization for the inhumane level of stress that sometimes characterizes the workplace of the academic or the taxi dispatcher. We see some of our best students choosing industrial careers over academic ones because they expect lower stress levels in industry. This, incidentally, is just about as realistic as the romantic notion that teaching in a small liberal-arts college is devoid of tension.

I believe that human beings are inherently creative. But more than that—they rise to the occasion. They produce their best work, work that perhaps they themselves felt incapable of achieving, when their psyche, other individuals (friends, competitors), society pushes them on, by incentive and obligations to do that work.

It seems an imperfect system, this concentration of research, scholarly, and teaching functions at one place, the research university. It is also an idea that inherently generates stress for the individuals who make it go, with minimal financial encouragement. But what a place! The exciting, tense, productive research setting in which professors do their balancing act, the university, is correctly seen by most students as what it is, the world of mind and hands learning, teaching. Both. I wouldn't want to be anywhere else.

**Research Emphasis vs. Teaching Quality: a rebuttal***(Journal of College Science Teaching v.26, #2, p.91. Reprinted with permission.)*

Roald Hoffmann's essay "Research Strategy: Teach" (see accompanying article) contains very bad advice for assistant professors at research universities. It is not "a damaging misconception... that research dominates and diminishes teaching." This is the damaging reality. Research university faculty who are excellent teachers but unproductive researchers rarely get tenure, but productive researchers who are poor teachers almost always get tenure.

The overemphasis on research has cost the U.S. education system dearly in many ways. Not only are many of the best teachers lost from the large public universities but professors know that their teaching performance is not very important and allocate their efforts between teaching and research accordingly. Also, too much teaching is done by inexperienced graduate teaching assistants who are hired by the university because of their research ability or potential. Research projects and facilities take precedence over teaching facilities and budgets. As a result, state research university teaching facilities and equipment are often put to shame by those at public teaching universities or even community colleges.

To provide cheap labor to do research, universities overproduce science Ph.D's, who end up as lower paid postdocs rather than assistant professors. Many of these postdocs eventually end up as teachers at small colleges where they find their research experience has left them poorly prepared for teaching.

University libraries spend huge amounts on an ever-growing host of obscure, often exorbitantly expensive, for-profit research journals. Such journals often serve as a dumping ground for redundant, flawed, or trivial research articles. Even a part of the nation's science illiteracy is due to research-university faculty who take little interest in precollege science teaching.

The overemphasis on research has a chilling effect on scholarly publications in science teaching. While there are many thousands of science research journals, the number of science teaching journals is only a few dozen at best. At research universities, publishing articles in science teaching journals generally is of little or no benefit in tenure and promotion and may even count against you.

Hoffmann's definition of teaching is so broad that he even includes casual conversations with graduate students and postdocs. University teaching and research are judged by very different standards, so it is usually easy to differentiate them. Teachers are judged primarily by subjective student evaluations. This effectively rules out graduate student and postdoc supervision from the teaching category because graduate students and postdocs do not formally evaluate their major professors.

Researchers are judged more objectively, usually by simply counting the number of grant dollars obtained and research articles published. Teachers are limited in the number of courses they can teach. However, researchers who are good fundraisers can get credit for the re-

search produced by as many graduate research assistants and postdocs as they can afford to hire. What a tremendous advantage to the researcher! All the teachers that helped train the graduate students and postdocs so they are qualified to do research get gypped out of any credit.

The bottom line is that if you want to become a tenured professor at a research university, the best strategy is to emphasize your research for the first 10 to 15 years until you get promoted to full professor. After that you can concentrate more on teaching, if you are still interested.

David R. Hershey  
Adjunct Professor  
Biology/Horticulture  
Department  
Prince George's Community  
College  
Largo, MD 20772-2199  
E-mail address:  
[dh321@pgstumail.pg.cc.md.us](mailto:dh321@pgstumail.pg.cc.md.us)

## THE CALIFORNIA TECH

Caltech 40-58, Pasadena, CA 91125  
phone: (818) 395-6153  
advertising: (818) 395-6154  
e-mail: [editors@tech.caltech.edu](mailto:editors@tech.caltech.edu)  
advertising: [adv@tech.caltech.edu](mailto:adv@tech.caltech.edu)  
ISSN 0008-1582

VOLUME XCVIII, NUMBER 23  
APRIL 11, 1997

EDITORS Ryan Cox Autumn Looijen Erik Streed	EVENTS & NOTICES Ryan Cox
COORDINATING EDITOR Wren Montgomery	STAFF ILLUSTRATOR Kjerstin Easton
COPY EDITORS Jacques Frechet Ben Brantley	BIRTHDAY BOY Terry Moran
NEWS EDITOR Erik Streed	BUSINESS MANAGER Heidi Eldenburg
OPINIONS EDITOR John Hatfield	STAFF WRITERS Myfanwy Callahan Mason Porter Neil Stevens Samson Timoner
FEATURES EDITOR Kanwar Kahlon	FEATURE WRITERS Ron Dulleit Daisy James
SPORTS EDITOR Amanda Schaffer	CONTRIBUTORS Bradley Honsinger Baldeep Sadhal
LAYOUT EDITOR Chris Brooks	ADVISER Hall Daily
LAYOUT Andrew Childs	

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](mailto: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. Articles received in BINHEX format will not be accepted.

Annual subscriptions to *The California Tech* for domestic delivery are \$28 for First Class Mail, \$12 for Standard Mail.

Printed by News-Type Service, Glendale. This issue brought to you by the letter A, the number 1, and Rob Rossi.

**Student-Faculty Conference**

Tuesday April 15th

9:30 am - 6:00 pm

**Schedule:**

9:00am - 9:30 am	Continental Breakfast
9:30 - 9:45	Opening Remarks
9:45 - 12:00 pm	Undergraduate Purpose Committee
12:00 - 1:00	Lunch
1:00 - 3:15	Student Life Committee
3:15 - 5:45	Honor System Committee
5:45 - 6:00	Closing Remarks

Dinner on the Olive Walk at 6:00 pm

Professors have been encouraged to either suspend class or cover non-essential material

**Come, express your views!**

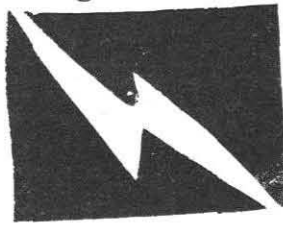
## LAEMMLE THEATRES

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

2 Academy Nominations

**Sling Blade**Daily 5:00, 8:00 p.m.  
Sat-Sun Bargain Matinee 2:00 p.m.**COLORADO**2588 E. Colorado Blvd.  
(818) 796-9704**ANNA  
KARENINA**Daily 4:30, 7:10, 9:45 p.m.  
Sat-Sun Bargain Matinee 1:30 p.m.

ASTOUNDING ADVENTURES featuring  
**ADAM VILLANI:  
 MEDIA GUY**



by Adam Villani

**The Saint**

This spy adventure movie rises above the crowd of action movies not due to anything particularly inventive in the script or exceptional directorial flair, but from the sheer fun of seeing Val Kilmer as a master of disguise wielding a vast array of fake accents and personalities. That's not to say it's bad in other respects; the recent film *The Saint* compares to best is last Summer's *Mission: Impossible*, with a more straightforward plot and without the annoying source-material-defying betrayals, but also not quite reaching the same exciting heights of the earlier film's elaborate set-pieces. From a thematic viewpoint, *The Saint* is more likable, with its title character a thief who reconsiders his mercenary ways when hired to steal a cold fusion formula (!) for some Russian meanies from a woman he falls in love with (Elisabeth Shue). As the scientist, Shue isn't particularly convincing, and as the love interest, she doesn't generate much heat. The problem is that she tries to be down-to-earth, while Kilmer wisely approaches his role with over-the-top glee. As a bonus, Orbital's new version of the theme song is pretty keen.

**Crash**

Many of you will hate this movie. I liked it a lot. James Spader (*White Castle, sex, lies, and videotape*) and Holly Hunter (*The Piano, Raising Arizona*) play car crash victims who get involved in a seamy underground group led by a mysterious character played by Elias Koteas (*Exotica, Teenage Mutant Ninja Turtles*) that finds sexual pleasure in auto accidents. Our protagonists, as it were, react to the cold, unfeeling world they live in by embarking on an ever-intensifying path of single-minded self-destruction, making literal the ever-implicit link between sex, cars, and death. Indeed, while not "hardcore" from

beginning to end, there's more sex in this NC-17 film than any theatrical release in recent memory. Be warned that, like much of *Lost Highway*, the film moves quite slowly, and that the characters are not supposed to be realistic—they're surrealistic, living on the fringes of a hyper-modern world. Director David Cronenberg's (*The Fly, Naked Lunch*) adaptation of J.G. Ballard's novel is daring, shocking, and mesmerizing.

**A Single Girl  
 (La Fille Seule)**

This tantalizing French film has just been released in Southern California, and is the best movie about realistic people to make it out here from France in quite some time (*The City of Lost Children* was a fantasy and *Microcosmos* didn't have any humans). The film takes place nearly in real time, following the first day of work at a fancy hotel of a young woman (Virginie Ledoyen, the daughter in *La Ceremonie*) who has just discovered she is pregnant. The magic of this film and the beautiful Ledoyen's performance is that, since it transpires in real time, a lot of time is spent walking down halls or waiting for elevators, and yet that time is not wasted. Instead, Ledoyen's body and facial expressions become windows to the inner struggle over her feelings for her boyfriend, mother, co-workers, and the hotel guests. The editing and pacing of the script is tight, moving things along briskly even through the day's monotonous work. This excellent picture is showing exclusively at Laemmle's Music Hall theatre in Beverly Hills and Edwards Town Center in Costa Mesa.

**Liar, Liar**

I'm part of the vocal minority that considers *The Cable Guy* to be Jim Carrey's best work, but I'm also part of the large segment of the American population that found the more lighthearted *Liar, Liar* to be pretty damn funny, too. Presum-

SEE MEDIA GUY ON PAGE 9

**The Outside World**

by Myfanwy Callahan

**ALGIERS, ALGERIA** – Attackers from a militant Islamic faction killed about 90 people in less than two days last weekend near the capital of Algeria. Security forces have been fighting the militants since their insurgency five years ago.

Reports say that a hundred refugees die every day from starvation and disease, as they flee further into Zaire.

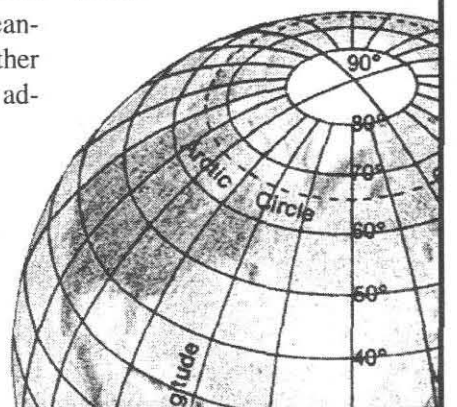
**HEBRON, WEST BANK** – A street battle begun on Wednesday led to three killings and 100 wounded. This is the worst outbreak of violence since Israel began work on a Jewish neighborhood three weeks ago in Arab East Jerusalem.

**PYONGYANG, NORTH KOREA** – Congressman Hall called for humanitarian aid to be sent to North Korea after he returned from a visit there this week. Floods during the last two years have brought eight million Koreans to the brink of starvation.

**KINSHASA, ZAIRE** – President Mobutu Sese Seko declared a state of emergency banning political activity and removing the civilian Prime Minister from office. Meanwhile, rebels have won another major city in Zaire and are advancing on the capital.

**BISMARCK, NORTH DAKOTA** – A blizzard thwarted the efforts of sandbaggers to contain the rivers at the headwaters of the Mississippi after water rose dramatically from snow melt. Dikes failed in Minnesota flooding the streets of some towns with three feet of icy water.

**KISANGANI, ZAIRE** – A mass evacuation of refugees is planned for next week to return them to their homeland, Rwanda, which they fled in 1994.



**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

**ACADEMY BARBER SHOP**

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



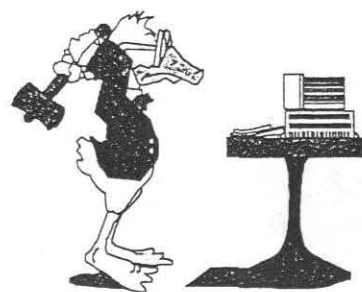
★★ Award Winner ★★

Mandarin Cuisine & Seafood  
 Cocktail Lounge

Lunch Specials \$4<sup>75</sup> 11:30-3 p.m.  
 Early Bird Specials \$6<sup>50</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



**HOW ABOUT  
 DINNER WITH THE  
 MOSH?**

Now is your time to come to dinner with other students, faculty and staff at Steele House.

If you would like to sign up please see Sue Chiarchiaro in the Residence Life office.

# A.S.C.I.T. Minutes

APRIL 7, 1997

Meeting called to order 10:35 p.m.

BoD Members present: Adrienne Bourque, Maria Satterwhite, Lori Hsu, Kiran Shekar, Baldeep Sadhal, Kohl Gill, John Lin. Guests present: Gabriel Au, Keoni Pua'a, Melissa Saenz, Valerie Anderson, Rebecca Jones, Wesley Tanaka, Niniane Wang, Jon McDunn.

Keoni Pua'a and Gabriel Au present petition for ASCIT recognition of the **Hawaii Club**. Motion passed unanimously.

Mike Westover enters.

**Semana Latina** requests \$1000 from ASCIT. Melissa Saenz presents proposed budget. It is decided that the issue will be settled at the Third Term Budget Meeting on Saturday the 12th.

Devi Thota enters.

The four *little t* editors (Valerie Anderson, Rebecca Jones, Wesley Tanaka and Niniane Wang) are currently scheduled to be paid \$500 total for what they estimate was over 150 hours of work per editor. Last year's *little t* editors were paid \$750 each.. The four edi-

tors are requesting \$500 each.

The **ASCIT Movies Team** is present to discuss the specifics of their movie calendar.

Baldeep Sadhal presents a petition for ASCIT Recognition for the **Caltech Electric Vehicle Club**. The motion is passed unanimously.

Kiran Shekar had a meeting with a bunch of people about the **van**. Rules need to be drafted regarding appropriate van usage and reasonable checkout procedures need to be established. The costs associated with operating the van also need to be determined.

John reports that there does exist a surplus of funds in the ASCIT coffers. Maria states that in her best judgement this money ought to be converted to crack cocaine and used to fill hot tubs for her personal pleasure.

Adrienne reports that the deposit has been placed on the room and the band for the **ASCIT formal** (May 23rd). The prefrash party will be April 19th at 10pm in Dabney Gardens.

Mike tells us that the **Student Faculty conference** is next Tuesday. Three committees will be presenting: Student Life, Honor System, and Purpose of Undergraduate Education. The format will be a sort of "talk show" format, with presentations and getting questions from

the audience. A mass memo will be delivered to all with the schedule for that day. Professors have been asked to make accommodations for students attending the conference.

There will be an open **ARC meeting** on April 10th at 7:30 in the Sherman-Fairchild Library.

In the IHC meeting last Thursday, Judy Green was elected **IHC Secretary**. See the IHC minutes for the full details of the meeting.

John has prepared some materials for the budget meetings for better control of the flow of money to various salaries. John proposes that the signups for the various appointed offices stay up for an extra week so that more people may be given the opportunity to sign up.. The general BoD consensus is that this should be done.

Maria reports nothing, because if she did she'd have to kill the BoD.

Kohl requests that we schedule a meeting time. Meetings will be held on Mondays at 10:30.

The Meeting becomes closed. The Meeting becomes open again and is adjourned at 12:05a.m.



Baldeep Sadhal  
Acting Secretary

# Y news

by Bradey Honsinger

The Caltech Y is both presenting and sponsoring a number of programs this term. If you'd like to help us, or if you have any ideas for programs you'd like to see on campus, show up at one of our meetings. The Y Excomm meets each Monday at noon in the Y Lounge.

We're putting on a Y Noon concert today; if you'd like to hear the cool sounds of Caltech's own Jazz Combo, head for the Winnett Quad at noon.

This Saturday, April 12, we'll be sending volunteers to the Adopt-A-Canyon trail main-

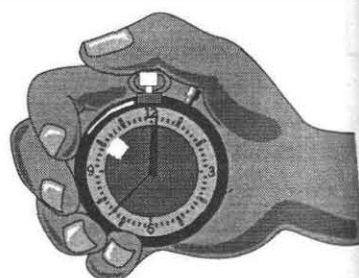
tenance program. If you're interested in getting out and playing in the dirt for a few hours, stop by the Y today before 5 to sign up.

We're also helping to present International Day, which will occur next Friday, April 18. If you've been before, you'll recall the great food and interesting displays; if you haven't, try it!

Finally, we're looking for volunteers for the annual Christmas in April event; volunteers will travel to low-income neighborhoods and help paint or repair the homes of the sick and elderly. This year, Christmas in April will be on Saturday, April 26 and Sunday, April 27. Remember, if you're a work-study student you can be paid for volunteering!

If you'd like more information on these or any other of our Y programs, stop by the Y, call x6163, or email Chris Sundberg at [sundbergc@starbase1.caltech.edu](mailto:sundbergc@starbase1.caltech.edu).

# ASCIT ExComm Minute



APRIL 7, 1997

Present: Jeanne Wilson (Chair), Brandon VandeBrake, Joe Carroll, Myfanwy Callahan, Steve Van Hooser

Meeting starts, 8:14 p.m. Baldeep Sadhal named interim ASCIT Secretary; he performs duties but can't vote. Meeting ends, 8:15 p.m.

— Respectfully submitted,  
Steve Van Hooser

# Inktomi is coming to Caltech!



**WHO:** Inktomi Corporation, one of the hottest new Internet technology firms in the Bay Area.  
**WHAT:** Information Session  
**WHERE:** The Student Activity Room 35  
**WHEN:** April 15 from 4-6p.m.

\*Food and drinks served. For questions and RSVP, call (510)883-7300.

## ASCIT Movies presents...

# Shaft



BY JOE CARROLL

*Shaft* is the quintessential "blaxploitation" movie from the 70's. Richard Roundtree stars as John Shaft, "the black private dick who's a sex machine to all the chicks." The suave Shaft is hired by black gang boss Bumpy Jonas (Moses Gunn) to find his kidnapped daughter Marcy (Sherri Brewer). Shaft spends his time kickin' ass and gettin' laid, and winds up tangled up with the Mafia.

The funky soundtrack, written by blues legend Isaac Hayes, is a major part of the entertainment. It went to number one on the charts in 1971 and won both a Grammy and an Oscar.

*Shaft* will be shown this Friday, April 11, in Baxter Lecture Hall. Showtimes are 7:30 and 10:00 p.m. Admission is \$2.00 for ASCIT members and \$2.50 for others. Come watch — if you can dig it.

## Spring Garden Chinese Restaurant

### Mandarin & Szechwan Cuisine-Best in Town!



Party Tray to Go - \$5.00 per person (Min. 25 People)

Orange Chicken      Vegetable Noodles  
Pork Fried Rice      Kung Pao Beef

Great for meetings, parties, etc.

5% discount with Caltech ID  
CATERING & FOOD TO GO  
Beer•Wine•Banquets

Lunch Special  
Monday Sunday 11:30-3:00 pm

(818) 796-2531  
187 N. Sierra Madre Blvd.      Pasadena, CA 91107

# 1997 Faculty/Student Conference

## Student/Faculty Conference Schedule

Tuesday, April 15th  
9:30 a.m. — 6:00 p.m.

9:00 a.m. — 9:30 a.m.	Continental Breakfast
9:30 a.m. — 9:45 a.m.	Opening Remarks
9:45 a.m. — 12:00 noon	Undergraduate Education Committee
12:00 noon — 1:00 p.m.	Lunch
1:00 p.m. — 3:15 p.m.	Student Life Committee
3:15 p.m. — 5:45 p.m.	Honor System Committee
5:45 p.m. — 6:00 p.m.	Closing remarks
6:00 p.m.	Dinner on the Olive Walk

Professors have been encouraged to either suspend class or cover non-essential material, so show up and talk.

## ...from the Committee on the Purpose of Undergraduate Education

BY SETH BLUMBERG AND ROBERT ROSSI

The "Purpose of Undergraduate Education" Committee is one of three making a presentation at the April 15 Student/Faculty Conference. Our goal is to investigate Caltech's undergraduate education system. Faculty, graduates, and undergraduates are all represented on our committee. In order to fairly gauge the range of opinions within the Caltech community, the committee has had discussions with a variety of faculty, administrators, and students. We have also looked at previous conference and committee reports, in an attempt to understand the evolution of policy in recent years and the challenges associated with the implementation of new ideas.

We hope to generate a thoughtful discussion concerning undergraduate education. At the conference, we plan to raise questions about undergraduate education at Caltech and suggest possible means for improvement. We hope to supplement the Student/Faculty Conference with a number of smaller discussions in the houses and the commu-

nity at large. In addition, we are including several articles in this issue of *The Tech*. Towards the end of the academic year a report of our findings will be compiled and we will work to implement our suggestions.

We have ambitious goals and need all the help we can get. If you would like to help our committee or have input to offer, please e-mail [blumberg@cco.caltech.edu](mailto:blumberg@cco.caltech.edu).

Below, we outline some issues we hope to address at the Conference on April 15.

*How well does a top grade correspond to a solid, intuitive understanding of the material?*

### Educational Philosophy

#### What is the purpose of undergraduate education?

*Issue:* In a broad sense, Caltech is a place for undergraduates to obtain a solid foundation in the basic sciences and to develop sharp analytical skills. However, students entertain a variety of different options once they graduate. Among these are research/academia, technical work in industry, and business development.

SEE EDUCATION ON NEXT PAGE

## ...from the Committee on Student Life

BY ELLIS MENG

Concerned about student life? Well then, be sure to show up for the Student Life Committee presentation for the Student/Faculty Conference on April 15th. We will mainly be addressing problems with the advising system and the decline of Tech traditions, however, your suggestions and concerns about anything having to do with student life are welcome. This conference is a great opportunity for you to voice your opinions and as Kohl said last week, the only way this conference can be successful is with your help. We are here to help you but we can't do anything about problems we don't know about so SPEAK UP! Below is a sample of the issues we have identified and will be discussing at the conference. Note that many of the concerns brought up four years ago at the last conference are

still true even today. Should you have any questions, comments or additions, please e-mail Ellis Meng (chair) at [fanchuin@cco](mailto:fanchuin@cco) or Christy Edwards (secretary) at [cmee@cco](mailto:cmee@cco).

*Pranks and many Caltech traditions are either extinct or on the endangered list.*

*Issue:* The advising system is one of the most valuable resources for both undergraduate and graduate students here. However, it does not live up to everyone's expectations as there are many flaws which need to be addressed.

#### Concerns:

- Some departments have no known ways of dealing with advisor/advisee conflicts and most students have no knowledge of how to change advisors if necessary. In particular, most undergraduates are unaware that they can change advisors at any time and as many times as

SEE LIFE ON NEXT PAGE

## ...from the Committee on the Honor Code

BY GEOFF SMITH

The Honor System Committee was convened to discuss the current state of the Honor Code and suggest remedies for perceived imperfections. We decided quickly that Caltech seems to have a well-functioning Honor System. In appreciation of this, the committee has decided to offer refinements that we think will improve trust and communication within the existing system rather than trying to reinvent the wheel.

Much of our discussion time was spent trying to reduce the complaints that have arisen with respect to the honor code into a few easily manageable categories. The problems we spent the most time discussing fell into two major groups:

### 1. Education Issues

The members of the committee all agreed that there is not enough awareness among many members of the community about the Honor System and how it is enforced. This leads to reduced trust between different groups and feelings of powerlessness among members who don't know where to turn when they feel victimized.

The undergraduate community, because of the much

more structured nature of undergraduate life, is generally familiar with the Honor System and its enforcement apparatus. The committee was in agreement that more needed to be done to educate other groups in the community.

### 2. Procedural Issues

#### 2a. Trust of Community

The current system of dealing with Honor System violations, although admirably set up to remove advantage while still protecting the offender to the

greatest degree possible, doesn't address the problem of nullifying the lack of trust engendered by the very fact that a somebody accused somebody else (justly or not) of an infraction in the first place.

#### 2b. Consistency

One of the major fears produced by bodies of such considerable secrecy as the BoC and GRB is that they may produce inconsistent verdicts over time.

Of course, the committee also has a list of proposed solutions to these problems, but in order to emphasize the importance of the input of the community at large, it is not included in this article. Attend the Conference and take a hand in shaping them yourself.

*Caltech seems to have a well-functioning Honor System.*

## Student/Faculty Interactions

Photos from the Tech archives



# 1997 Student/Faculty Conference

## EDUCATION: Learning without thinking?

CONTINUED FROM PREVIOUS PAGE

### Questions:

- What specific features of undergraduate education address the skills required for these positions?
- Should Caltech make an effort to prepare students for all the various career options, or should it focus on the needs of a specific group?
- What type of students should Caltech admit?
- What does Caltech gain from being a technical school, as opposed to a liberal arts school?

### Is there strong correlation between the goals of faculty, staff, and students concerning undergraduate education?

*Issue:* In order for education to be effective, a general consensus of educational objectives should be reached between students and faculty. Unfortunately, any precise list of goals is unlikely to meet with the approval of all, because normative opinions concerning education seem to vary widely, even within a given demographics group.

### Questions:

- Should we develop a statement of purpose for undergraduate education at Caltech?
- How does the admissions office portray Caltech to prospective students? Does it provide an

accurate depiction?

- Do the faculty and staff understand the challenges facing undergraduate students? How about the reverse? If not, what can be done to increase communication between students, faculty, and staff?

### Educational Infrastructure

#### What are the effects of Caltech's research emphasis and outstanding reputation?

*Issue:* Professors receive greater professional encouragement to do research than they do to teach. Ideally, the incredible resources associated with Caltech's research program could be used to enhance the quality of undergraduate education at Caltech; does teaching suffer because of the lack of incentive?

### Questions:

- Should a system be set up which provides greater encouragement for good teaching?
- Can the faculty's research interests be benevolently incorporated into teaching?

#### What are the benefits and problems associated with the high expectations Caltech has for its students?

*Issue:* The students who enter Caltech are among the most talented in the country. Caltech's faculty recognize this and get excited about developing the potential of individual students. They aim to challenge all students, in order to help them reach their potentials. The natural medium for pushing students is through standard coursework. However, one needs to be cautious about having expectations which are too high. If pushed too hard, students are forced to play a game of survival in which they aim to "just get through."

### Questions:

- Are the graduation and coursework requirements reasonable? Do students have time to explore individual interests?
- Is there too much emphasis on homework in classes? Should more attention be given to open-ended problems which encourage an increased degree of creativity?
- What can be done to help lessen the effect of the "I'm no longer the best / big fish, bigger pond" syndrome?

#### Is the grading system representative of understanding?

*Issue:* Grades are used as an indicator for the level of understanding one achieves in a particu-

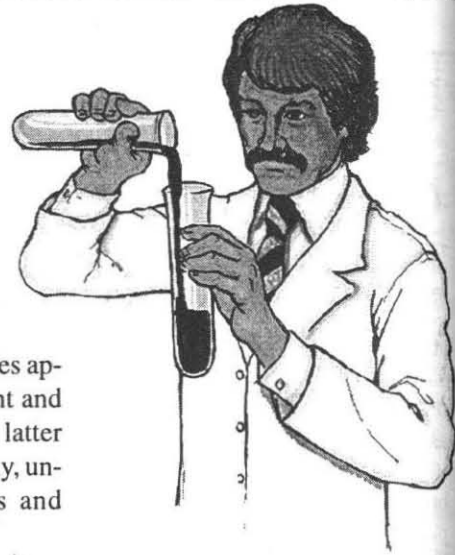
lar class. Ideally, they serve as a source of motivation for students to learn. However, in a competitive environment, this ideal purpose can be overshadowed by the effect grades appear to have on employment and graduate admissions. The latter concern can lead to unhealthy, unnecessary levels of stress and pressure.

### Questions:

- Does the 4.0 grading system work? How well does a top grade correspond to a solid, intuitive understanding of the material?
- Does a good grade often require a lot of extraneous effort which is unrelated to furthering one's understanding?
- Do students understand the relative importance (or unimportance) of grades? Do they impose too much pressure on themselves for a good grade?
- Do students avoid certain classes because of the grades they fear they might get?

#### Can interaction among students, faculty and staff be improved in ways which benefit undergraduate education?

*Issue:* Since Caltech is small, the opportunity for undergraduates to interact with faculty, graduates, and staff is significant. However,



just because the opportunity exists, there is no guarantee that such interaction will spontaneously occur. One hopes that current policies encourage mutually beneficial ties between students and faculty. However, no system is perfect, and it is likely that steps could be taken to improve communication and understanding between the various groups at Caltech.

### Questions:

- Should there be more emphasis on small-group, "seminar-type" discussions with faculty members?
- How well does the advising system work? Do most students get more out of the relationship than a bunch of signatures?
- Is Caltech's administrative system effective in evaluating educational needs and leveraging support for appropriate programs and policies?

## LIFE: The Student Life Committee has some questions for you

CONTINUED FROM PREVIOUS PAGE

they want.

- Certain departments are experiencing a shortage of faculty and thus advisors. The result is that many students have advisors from outside of their option.
- Many new advisors are unfamiliar with Caltech and are unable to offer advice on general requirements or deal with certain problems when they arise. As a result, many students rely on other students.
- In many cases, student-advisor relationships have degenerated into card signing.
- Beyond academics, there is little interaction between students and advisors even though the Deans Office is willing to provide financial support for social activities.

*Issue:* There is little interaction between faculty, undergraduates, and graduate students even though Caltech is such a small school.

### Concerns:

- Undergraduates are predominantly bound to a single house or are alienated by the lack of house identity. Graduate students' social circles are far removed from the undergraduate community. Faculty-undergraduate relations have deteriorated to the point where there is negligible interaction at a social level and academic interaction, for most students, is limited to card-signing. There is no central place for interactions to take place (1991)
- Undergraduate activities center

around the individual houses, and most faculty members, graduate students, and even undergraduates from other houses don't feel comfortable visiting houses without special circumstances.

- Most faculty and graduate student events occur in department meeting areas, which discourages members of other departments from feeling welcome, as well as undergraduates, who are often not well associated with any department. (1991)

• Avery House is meant to be a place where the entire Caltech community can come together and interact informally. However, little interaction exists between the various groups and many professors are unaware of the opportunity to dine there. Also, many undergraduates are unhappy with the disparity in the amount of attention from the administration that Avery receives as opposed to the Student Houses.

*Issue:* Many of the elements which make Caltech a unique experience are in jeopardy. Much of the freedom students in the past had to be innovative outside of satisfying academic requirements is gone. Pranks and many Caltech traditions are either extinct or on the endangered list. These are an integral part of what makes Caltech unique and should be preserved.

#### From the 1991 Student/Faculty Conference:

- Information transfer is poor. Few people know where to go to get information about events happening in a department which are organized independently

of each other. Events are not advertised all in one place and some hardly advertised at all.

- There has been a gradual decrease in faculty participation in student affairs. Much of the traditional faculty involvement in students' interests has been taken on by administrative personnel. This has removed some of the important channels for student involvement with the faculty.

• There is no social or official route for an undergraduate to become involved in a research group.

- There is no social or official route for a graduate student or a faculty member to become involved with an undergraduate house, other than the few professors in the NRFA program [and the graduate students in the RA program].



# 1997 Faculty/Student Conference

## Finding a path to the top of the mountain

### Educational Science and Science Education

BY ROBERT ROSSI

In reality, what follows is probably too imprecise and untested to deserve the moniker "educational science;" if you prefer, think of it as analytic educational philosophy. It is certainly my own speculative brand thereof, and I encourage opposing opinions. I thank Arnel Fajardo for helpful and critical discussions leading to the development of some of the ideas expressed herein, particularly that of "slope."

#### Evaluating Learning

Concrete evaluation of learning, what we attempt to do with "grades," is a messy business. Despite it being a passionate issue for most students, (for reasons both pragmatically sound and psychologically dubious,) the definition of what a grade should represent is rather vague. Should one's grade in a calculus course reflect "ability" in that area of calculus, or the extent to which that "ability" has been developed as a result of one's efforts related to the course? Does one deserve an "A+" for knowing everything covered in a course before it even starts, despite never attending a lecture, asking a question, doing the homework, or engaging in any thought or study related to the course whatsoever save for that expended in writing the final exam with such aplomb that it must clearly be seen as the work of a master? It may seem unreasonable for a professor to require that a calculus student actually learn calculus **from his or her own course**, and yet assigning course grades based in part on such "tedium" as homework to some extent does just that. Those who are actively learning from a course, working hard to master material with which they are presently unfamiliar, generally wish to have their homework be the primary indicator of their grade—after all, they pour a lot of effort into it. On the other hand, those who already know all or most of the material covered in a course would prefer to do away with the homework altogether, cut to the chase, and just take the final.

In most nations outside the U.S., performance on (bi)annual standardized cumulative exams is the singular measure of success—one's effort on homework and so forth means nothing in and of itself. We as a nation have conspicuously, and conscientiously, I think, rejected this approach, but we rarely reflect on this fact. We certainly value the *ability to learn*, and we do attempt to incorporate an assessment thereof into our grading system. But there seems to be little agreement on how large a role it should play, and how it is best assessed.

Whatever the genesis properties of one's "ability," assessment of "ability" is a very difficult issue in and of itself. The single-variable, numeric-equivalent grading system, used almost universally at the college level, certainly doesn't do justice to the true complexity of measuring one's "ability" in a given field. It is understandable, however, that parsimony has pushed the edu-

cational community to adopt such an approach. Even so, I think it worthwhile to attempt to break down "ability" into more fundamental "aptitudes." I see four primary colors, as it were, that combine to produce the glow of "ability" in a given field of study. Some of these are barely assessed in modern education, while others are given disproportionate weight.

#### 1. Solving Ability

This aspect of ability generally gets more than its fair share of attention, being what a typical test is all about. Given a question, can you find the "correct" answer, in numerical or normative terms? This is the easiest aspect of ability to assess and quantify, and I'm sure that plays a significant role in making it the central yardstick by which grades are doled out at the college level.

#### 2. Understanding

Quite separate from the issue of whether someone is able to solve a problem, one might ask whether they understand a concept. The ability to crank through a prescribed set of formulas, or regurgitate a given definition, is no indication of true understanding of an issue; nor does such an understanding guarantee that one will arrive at the "correct" answer to a given quantitative question. It is possible to probe the depth of one's understanding through "new" questions, and those annoying essay-type inquiries,

*On the surface, Caltech's core doesn't look too unusual. Why, then, do undergrads often describe their Caltech experience as "drinking from a firehose?"*

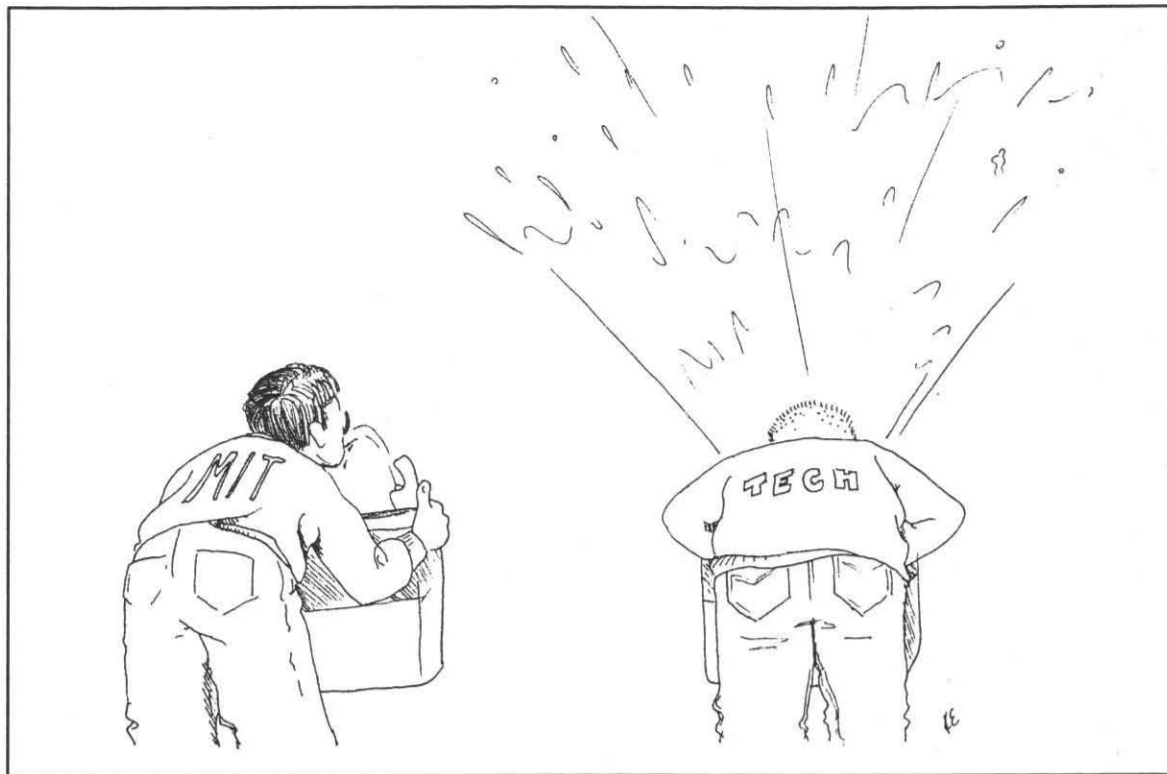
among many other methods.

#### 3. Explanation

This aspect of ability is often called upon, but rarely quantified explicitly. Whatever their level of understanding, students vary widely in their aptitude for **explaining** what they *do* understand to others. Such an aptitude may have a slight impact on one's score in a tolerably time-critical "show your work" exam, and a significant effect where a presentation or report is required. However, this aptitude is most vividly revealed in one's efforts to interactively educate another, say in a tutoring or correspondence situation, and it is hardly ever assessed in this manner.

#### 4. Extension

Although tied to understanding, I feel this is a separate issue. Some understand a concept quite well, but fail to appreciate its applicability beyond the specific situations presented to them as examples. Others see applications everywhere, failing to appreciate



where an analogy fails, or where a variable or descriptor must be carefully reinterpreted in order to extend a known concept. More than at many schools, this ability is tested to some extent at Caltech, albeit almost exclusively as a time-critical skill.

Maybe someday I'll satisfy my dream of becoming a career teacher. Of course, then I'll be stuck with the ugly job of handing out grades, and ranking people against one another. If I had my druthers, I'd evaluate the four aptitudes described above independently, insofar as that is possible, and then only by necessity coalesce these four measures of ability into a single number, using a consciously chosen weighting. Whereas "solving ability" and "extension" are particularly important aptitudes for engineers, teachers are best served by strong "explanation" and "understanding" aptitudes. Of course we'd each like to be blessed with all four attributes in endless measure, but life is rarely so kind. It is important to realize that an ill-prepared engineer might make a superbly prepared teacher, and vice-versa. (I think this to some extent underlies the common engineering pejorative "those who can't do, teach." I would reply that "those who **can** do, can't [always] teach.")

#### Evaluating Teaching

I've argued there is more to "ability" than a single parameter can fully describe. Assessing the "quality" of a course or educational regimen can be equally intricate. Just as a given blend of aptitudes might match well with certain occupations but not others, the traits of a given course might make it a good match to some students, a poor match for others. To elucidate this suggestion, let me introduce the following analogy. Imagine the learning process as an effort to climb to higher elevations, up a mountain, at the top of which one emerges tired, perhaps, but with a better view of the world. An instructor's job is to prepare and lead his or her class along a wisely-chosen path to the summit. He or she will not often have direct con-

trol over all aspects of this climb: frequently he or she will be told what peak is to be ascended and to what altitude. But these decisions are generally within the control of the educational institution as a whole, and should ultimately be considered malleable.

#### 1. Slope and Pace

One of the most important decisions an instructor can make is how steep a "slope" their instruction will have, and at what "pace" they will expect their students to proceed. Sharp slopes minimize explanations, skip details, and often lose a substantial portion of the class—they are like a trail that skips the switchbacks and goes straight up the mountain. A rapid pace means lots of homework, flying through topics at great speed, and not stopping to pick up stragglers.

Slope and pace are related to each other, in that many combinations thereof can be used to attain the same change in elevation over a fixed period of time; a shallow slope will require a breakneck pace to attain the same results as a steep slope taken at a slow pace; but a gradual ascent up a very steep slope should hardly be considered leisurely; it's more like a rock-climbing expedition. Some students are well-suited to rock-climbing; indeed, a few sickos even delight in it. Others, however, find a steep slope daunting at best, intractable at worst, and would prefer a shallower slope taken at a faster pace.

#### 2. Path Quality

Whatever the slope and pace of a course, the path along which an instructor leads his or her students can vary in quality. A bumpy trail covered with loose gravel, tree roots, jutting rocks, and snakes makes for difficult climbing at almost any pace. Instructors pose such obstacles through poor board technique, starting and ending class late, having disorganized lectures (getting lost), giving "obstacle-like" homework, etc. On the other hand, a well-planned, well-organized course in which the professor warns students of common stumbling points, delivers information clearly, provides helpful analogies, and gives educational homework, more resembles a well-maintained park service trail.

Whereas scientists breaking new ground must hack their way through dense growth, find their way around unexpected obstacles, and frequently double back when they make mistakes, the role of an instructor is generally seen to be that of a guide, leading students so they can avoid such adversity and can climb far faster than the scientists who first conquered any given mountain. Some would argue that such hand-holding produces students with no ability to make their way on their own through uncharted territory, training them to cry wolf at the first sign of confusion. It can be countered that survival training and trail-blazing are best treated as separate subjects, learned through undergraduate and graduate research, where the "instructor" becomes a "research advisor" and plays a very different role.

#### 3. Utility

Another measure of the quality of a course and what it teaches is its ultimate utility to the student. Does the course enhance aptitudes important for the student's future career? Is what the student learns from the course useful in everyday life? Often this aspect of quality is a reflection not so much of the nature of the subject material itself, but rather the context and manner in which it is presented. I would argue that lots of fundamental science is of great utility in day-to-day life, but I've certainly taken science courses that led me to re-examine this belief.

#### 4. Motivation

Students are people too, strangely enough, and they need motivation. Sure, to a certain extent motivation derives from the promise of the fruits of academic success, or just plain interest in a subject, but lots of people who make it up a mountain at Caltech do so only to find themselves so unfulfilled by the experience that they never want to climb like that again. This seems a particularly prevalent problem with Caltech's core sequence, but it is a general problem in college science education. To quote a telling line from the book *They're Not Dumb, They're Different*, by Sheila Tobias, "I was not given the belief that I

CONTINUED ON NEXT PAGE

# 1997 Student/Faculty Conference

## Alternate futures: the CITadel, Techcidental, or a middle ground?

BY ROBERT ROSSI,  
WITH SUGGESTIONS FROM ARNEL  
FAJARDO AND WILL ROYEA

I sincerely hope that Caltech never develops into either of the anti-utopian worlds presented in the following scenarios. Thankfully, that isn't likely. They are intended to present extremes in direction, and thus highlight some of the factors I think deserve consideration when pondering what Caltech's educational paradigm is and possibly should be.

### Scenario #1: The CITadel

Excerpts from an interview with Drill Professor Stewart Corbin (USMC):

"These kids come in here thinking they know everything. First we have to break them, show them how stupid they really are. Then we can start to build them back up again. Learning is pain.

"The CITadel is not for everyone. We take in only the strongest candidates, and even some of them can't cut it. We don't stop to pick up stragglers. We are here to serve the interests of the strong, to make real men out of the best boys we can find. This is more than old school, kid, this is war. We fight it to win it.

"Look, I know what's good for these kids, I've been there. I see my job as educating them, making them intellectual juggernauts. That takes concentration. Part of my job is to focus them on their education, to stamp out distractions of any kind, so they can really dig their teeth into what I'm challenging them with...and challenge them I do. The real world ain't no line-dance, boy. You gotta be tough to make it, an' you gotta be like steel to make it

big. We sure as hell expect steel. "We focus on what's important. It's like Dr. Jones said in *The Last Crusade*: we engage in a '...search for fact. Not truth. If it's truth you're interested in, [the]

*"The CITadel is not for everyone.... We don't stop to pick up stragglers."*

philosophy class is right down the hall.' Except, of course, that we don't really have any philosophy classes. Ha ha, be real! If you wanted to lose your manhood, you could go pick that crap up from those Birkenstock-wearing freaks over at Techcidental, but I

*"We want them to become one with the quantum mechanical reality of our transcendental existence."*

sure as hell wouldn't recommend it."

### Scenario #2: Techcidental

An interview with Professor Tranquility Johnsyn-Lambert-Halupek:

"When new members join our family, we are worried about their self-esteem, about all the nasty grading and competition to which they were exposed elsewhere. We want to heal them from these experiences, to help them appreciate their special, individual identities. We help them learn to love each other, and their subject matter. We want them to become one with the quantum mechanical reality of our tran-

scendental existence on the planet we are so lucky to share with so many other living things.

"We don't use grades here. We don't rank students against each other at all, in fact, because we know everyone is different and special. Learning is, as it should be, a community effort. 'It takes an entire village to raise a single child,' you know.

"Sometimes one of us will become lost, will not keep pace with the discussion we are having. We wait when this happens, we help them understand, so that we do not lose or alienate them. This is so very important. We do not want anyone to feel left out of the special circle of understanding that we work together to develop. We succeed only in so far as the entire community moves with joy toward enlightenment. We try to help everyone discover the adventure of discovery.

"I feel so sad for those happiness- and youth-challenged men in the CITadel. They seem so unhappy, and so confused. Brother Stewart seems to have completely missed the point of *Indiana Jones and the Last Crusade*, and that of OPI."

### Conclusion

It seems that somewhere between these two extremes lies a reasonable balance—perhaps at many points in between. But clearly CITadel recruits wouldn't appreciate a trip to Techcidental, and vice-versa. It seems Caltech is not so focused as it once was, that there is now a wide range of both professorial and student opinions spanning the CITadel to Techcidental spectrum. Is this a healthy development, or would it be better for all involved to regain the focus of the past?

### Frosh courses at the CITadel

Physics 1a - Quantum Mechanics in One Dimension  
Computer Science 1a - Quantum Calculations on Serial Systems  
Math 1a - Green's Theorem, Multivariable Calculus, and Differential Equations  
Hum 101 - The Job Interview

Physics 1b - Quantum Mechanics in  $n$  Dimensions  
Computer Science 1b - Massively Parallel Quantum Calculations 2  
Math 1b - Nonlinear Differential Equations  
Hum 102 - How to Win Arguments (even when you are wrong)

Physics 1c - Multiparticle Quantum: "Chemistry and Biology"  
Computer Science 1c - How to Make It Spit Out the Answer You Want  
Math 1c - Topological Bifurcation Theory of Coxeter Groups in Nonlinear Quantum Manifolds (known externally as "Math Stuff You Can Confuse Anybody With")  
Hum 103 - Research Grants and Salary Negotiations

(Summer Retreat)

Endurance 1 - Winning the Ironman Triathlon

### Freshmyn courses at Techcidental

Emotions 1a - Love and Understanding  
Femyn Studies 1a - How to Put the Toilet Seat Down or Forgive Those Who Leave It Up  
Sociology/Anthropology 1a - Appreciating Differences  
Philosophy 1 - Science and Our Existence

Emotions 1b - Anger and Pain: How to Cope  
History 1/Femyn Studies 2 - The History of Oppression  
Science 1a - Exploration and Discovery  
Philosophy 3a - Why Are We Here?

Emotions 1c - Sharing, Listening, and Caring  
History 3a - Nice People You Never Read About in Science  
Science 1b - Reconciling Logic, Experience, and Intuition  
Philosophy 3b - Epistemology, Knowledge, and Science

(Summer Retreat)

Philosophy 103 - Quantum Mechanics

## Should Caltech have a policy of educational Darwinism?

CONTINUED FROM PREVIOUS PAGE

could give something to science and that it could give something back to me." When that feeling takes root in anyone, however bright or capable, they will not strive for a future in a given science discipline.

Whatever the "quality" of a course, it is possible for its objectives to be unreasonably lofty. Whether the instructor chooses to attempt such an ascent using a steep slope or a rapid pace, many students will not make it to the summit. Sure, some will just give up, they won't work as hard as they can. But every mortal has physical and mental limits beyond which they simply can not go, and my time at Caltech has forced me to accept that these limits do indeed vary from individual to individual. As such, it is possible for a slope to be too steep for some students, and/or a pace too rapid. In such situations an instructor is put in an extremely awkward situation: a steep slope at a slow pace will allow one group of students to succeed; a different group of students will benefit from

a shallower slope taken at a more rapid pace. Approaching either extreme, and at all points in between, some subset of the students will not be able to keep up. Others will succeed regardless, but may resent hav-

*Should Caltech let people sink or swim, or should it go to great lengths to protect weaker fish in the "shark tank?"*

ing to do "tedious" homework relating to things they already know. Indeed, these students could probably have climbed ever higher over the course of a term, and will feel 'held back' by the 'sluggish' pace of presentation of new material.

On the surface, Caltech's core doesn't look too unusual. Perhaps a bit more physics and a bit less of the humanities than is typical, but nonetheless the load looks reason-

able. Why, then, do undergrads often describe their Caltech experience as "drinking from a firehose?" The "elevation change" expected in a single Caltech course is, on average, much larger than that expected elsewhere. Although Caltech tends to admit students already at reasonably high elevations, it is very difficult to tell how well any student will be able to keep up, to climb at the incredible rate Caltech expects. This is particularly important in light of the highly variable path quality found here at CIT. Consider the fate of Tom Worthen, as described in *They're Not Dumb, They're Different* by Sheila Tobias:

*Tom Worthen might have become a scientist had he not "hit the wall," as he put it, 30 years earlier as a Caltech freshman. Coming to that western "shark tank" from a less competitive high school environment in Utah, Worthen's successful background in high school science and mathematics turned out to be inadequate to the Caltech challenge. He left Caltech after one year, and returned, defeated, to*

Utah. After a break, his mathematical interests were redirected to ancient languages. In time he received a Ph.D. in Greek and Latin and became a professor of classical languages and history at the University of Arizona.

It's easy to say Tom just wasn't Caltech material. (Hey, we all know that real scientists don't like languages, right? See Anne Roe's *The Making of a Scientist*.) On the other hand, it does take a wee bit of brain power to master Latin and Greek...and history. Ok, so slowing down the pace of learning at Caltech would have been a disservice to some of the "sharks" in Tom's class, those who easily clambered up the mountains Tom fell off of. But that raises the question of whether admitting Tom to Caltech was a cruel thing to do, something not in his best interest. He may well have gone on to a happy career in science, had he started at a "lesser" institution.

This all bears relevance to the issue of undergraduate education at Caltech. Should Caltech's trademark be courses demanding huge elevation changes? Does that sort

of teaching really stick with people, is it effective in the long run? Should Caltech let people sink or swim, or should it go to great lengths to protect weaker fish in the "shark tank?" Or is the shark tank no place for fish at all—perhaps a more demanding selection process on the part of the admissions office is called for?

Although Caltech may be one of the last places to feel its effects, I think that a paradigm shift in college science education, away from "weeder" courses and toward out-of-field science literacy, is long overdue and is beginning to take place. Professor Goodstein comments eloquently on this issue at <http://www.caltech.edu/~goodstein/elites.html>, as does Sheila Tobias in *They're Not Dumb, They're Different*.

The switch from scientific Darwinism to inclusivity will require increased motivational content, shallower slopes, and greater utility in the science curriculum. Path quality will continue to be important, but it will be even harder to maintain with all-new instructional trails being blazed.



# MEDIA GUY: Find out what you should see at the movies

CONTINUED FROM PAGE 3

ably as a reaction to the criticism of *Cable Guy*, this movie puts on some necessary "heartwarming" touches, but that doesn't stop some very inspired scenes of hilarity. As made public in one of the outtakes over the closing credits, it's missing the point to criticize Carrey as an overactor, as his talent lies in being able to overact farther and better than any other big name in Hollywood right now. If you like Carrey, though, you may want to check out Jeffrey Combs in *The Frighteners* or the Italian Roberto Benigni in movies like *The Monster* and *Night on Earth*. It's also worth noting that while it's still largely all Carrey's show, his supporting cast, including Jennifer Tilly and Cary Elwes, does get to shine a bit more than usual in this film.

## City of Industry

This movie is kind of like a Tarantino movie, only without the interesting characters, snappy dialogue, or tight direction. Characters act without motivation, the story meanders along a flat arc, and the action is alternately confusing and simplistic. The worst 4 seconds of film for the year occur when Harvey Keitel, on the run from some crooks, walks into his motel room and the camera, for no other reason, pans over to

the left to reveal... a propane tank! I won't hand out any prizes to readers who figure out what happens to the propane tank. About all that can be said for this movie is that considering the material they have to work with the actors do a decent, if workmanlike, job, and it uses the local scenery well (probably more due to being forced into suitably scuzzy locations by the budget rather than any effort on the part of the filmmaker). By the way, I did actually see this movie at a theatre in the City of Industry.

## Waiting for Guffman

Directed by and starring Christopher Guest, guitarist Nigel Tufnel of *Spinal Tap*, *Waiting for Guffman* is a charming and funny look at a small-town America. Guest portrays Corky St. Clair, the effete high school drama teacher of Blaine, Missouri (Stool Capital of the World) striving to put together a sesquicentennial pageant honoring the town. *Waiting for Guffman* never acquires a condescending tone, instead remaining good-natured and saluting the spirit of those willing to perform. The pseudo-documentary style begs for comparisons to Rob Reiner's seminal *This is Spinal Tap*, and while *Guffman* invariably comes up short in comparison, it's well worth watching in its own right.

Eugene Levy, Parker Posey, Fred Willard, and Catherine O'Hara co-star.

## Return of the Jedi: Special Edition

Easily the least of the three *Star Wars* films to begin with, *Jedi* also receives the brunt of the *Special Edition* "improvements," the embarrassingly bad "Jedi Rocks" musical number at Jabba's palace. Watching the third installment of the trilogy also gives a rather stale sense of deja vu throughout, with the return of familiar locations, the story's insistence on neatly wrapping up loose plotlines, and the generally phoned-in performances all around.

All that being said, it's a remarkable testament to the strength of the series that *Return of the Jedi* is still a pretty good movie. Jabba the Hutt and the Emperor are excellent villains by any metric, the fight scene at Jabba's sail barge and Endor speeder bike chase are thrilling, and the sheer spectacle of seeing the series conclude are more than enough to recommend the movie. Enjoy the *Special Editions* as opportunities to see the trilogy in a theatre again, and hope that filmmakers realize that at this point in time characters generated by computers rarely look realistic.

## The Godfather and Donnie Brasco

Perhaps lost in all the hoopla of the *Star Wars* trilogy's return, Paramount has rereleased Francis Ford Coppola's *The Godfather* to a limited number of theatres (in L.A., Mann's Chinese). This isn't anything like a "director's cut," just a new print with cleaned-up visuals and sound. But if you've never seen it, or have only seen it on video, you owe it to yourself to see one of the few truly great movies on the big screen. This exceptional tragedy traces the moral collapse of Michael Corleone (Al Pacino) as he rises in the ranks of the Sicilian-American Mafia, but perhaps its greatest strength is that there are a vast number of characters in this film, portrayed by the likes of Robert Duvall, James Caan, Diane Keaton, and, of course, Marlon Brando in supporting roles that are more fully realized than the one or two lead roles of ordinary or even most good movies.

As good of a movie as it is, I can understand the criticism of *The Godfather* as spreading the impression that all Italians are gangsters and glamorizing the mob, being part Sicilian myself. The recent release *Donnie Brasco* is anything but a glamorization of the mob. Lefty Ruggiero (Pacino again), the guy who takes Johnny Depp as Donnie Brasco into the

mob, talks big but is in reality a "spoke on a wheel," relegated to busting apart parking meters to pay the higher-ups in his organization while he worries about whether his buddies who passed him up will kill him. *Donnie Brasco* is a personal film, making us feel pity and sadness for its characters. This is the best mob movie since 1990's *Goodfellas*.

## Private Parts

Howard Stern's autobio *Private Parts* is a well-crafted work, accomplishing the impossible task of turning Howard Stern into a sympathetic character who loves his wife and is tormented by snivelling, humorless radio executives. It's also a very funny movie, smoothly scripted by Len Blum and Michael Kalesniko and recreating some of his best-known radio segments. The problem with the whole Stern phenomenon is that, the movie aside, his show just isn't very funny. I've tried on several occasions to listen to his show to see what the fuss was about, and each time it just sounded like one guy talking about how great he is surrounded by sycophants who laugh at his every word. Some of his fans say that to appreciate him you have to listen on a regular basis, but it was pain enough to force myself to listen to his show for half an hour.



## MAXTECH YESBOOK

We Took The "NO" out of Notebook

- ✓ Intel Pentium processor, 256KB PB cache
- ✓ Max. 40 MB RAM (Use standard DIMM)
- ✓ 8X CD-ROM Drive (6X for Dual Scan)
- ✓ 1.44 MB floppy drive
- ✓ PCMCIA Type 4 slot
- ✓ Removable HD (Up to 2 GB)
- ✓ 16-bit sound card, 2 speakers & mic
- ✓ PCI accelerator w/2 MB video RAM
- ✓ 11.3" DS or Active 800X600 display
- ✓ Touch pad & Infra-red port
- ✓ Windows 95 keyboard
- ✓ Rechargeable NiMH battery
- ✓ 7 lbs. with battery
- ✓ Composite TV video output
- ✓ Universal AC adapter & deluxe carrying bag

"If you're looking for a bargain-priced high-end machine, consider MaxTech's YesBook Model X753...The YesBook performed well on most of our benchmark tests." PC Magazine, 8/96

16MB, 1.3GB	Dual Scan 11.3" 800X600	Active TFT 11.3" 800X600	Active TFT 11.8" 800X600	Active TFT 12.1" 800X600
P-120 MHz	\$1629	\$2029	\$2099	\$2299
P-133 MHz	\$1669	\$2069	\$2139	\$2339
P-150 MHz	\$1699	\$2099	\$2169	\$2369

## PCI MULTIMEDIA PRO

- \* INTEL Pentium processor w/ fan
- \* 256K Pipelined Brust Cache, Triton chipset
- \* 32 MB Synchronous Dynamic RAM (50% faster than EDO RAM)
- \* TEAC 1.44 MB floppy drive
- \* 2.5 GB EIDE hard drive
- \* Matrox MGA Millennium w/2 MB WRAM
- \* Viewsonic 17GS 17" monitor .27 dp
- \* Flat screen, Low-radiation (3 yr parts & labor)
- \* 2 high speed serial, parallel, & game ports
- \* Enhanced 104 key keyboard
- \* Medium tower case w/230 Watt
- \* Microsoft mouse
- \* Sound Blaster 32 Wavetable sound card
- \* Super fast 16X CD-ROM drive
- \* 240 Watt Hi-Fi speakers & Microphone
- \* MaxTech 33.6 Kbps Voice/Fax/Modem (Full duplex speakerphone system)

Best Selling

P-200 w/MMX	\$2279
P-166 w/MMX	\$2079
P-200 MHz	\$2179
P-166 MHz	\$1979
P-150 MHz	\$1849

## PCI MULTIMEDIA PLUS

- \* INTEL Pentium processor w/cooling fan
- \* 256K Pipelined Brust Cache, Triton chipset
- \* 16 MB EDO RAM expandable to 128 MB
- \* TEAC 1.44 MB floppy drive
- \* 1.7 GB EIDE hard drive
- \* PCI Enhanced IDE HD controller
- \* Stealth 3D w/2 MB EDO DRAM
- \* 17" 1280 X 1024 monitor .28 dp
- \* Flat screen, Digital control, Low-radiation
- \* 2 high speed serial, parallel, & game ports
- \* Enhanced 104 key keyboard
- \* Medium tower case w/230 Watt
- \* High resolution mouse
- \* Sound Blaster 16 PnP
- \* Super fast 12X CD-ROM drive
- \* 140 Watt Hi-Fi speakers

Best Buy

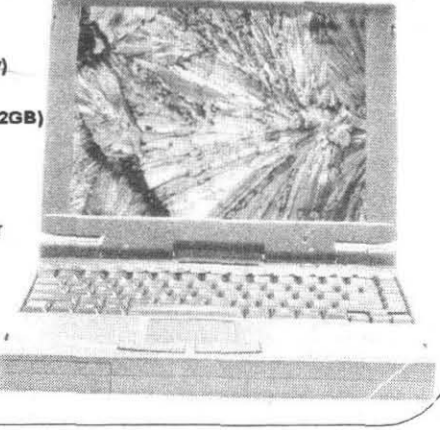
P-200 w/MMX	\$1799
P-166 w/MMX	\$1599
P-200 MHz	\$1699
P-166 MHz	\$1499
P-150 MHz	\$1369
P-133 MHz	\$1319

## SCEPTRE Soundx 4000 SERIES

Featuring 128-bit accelerator & Li-Ion battery

- \* Intel Mobile Pentium processor (2.9V)
- \* Intel Mobile Triton chipset for better performance
- \* 64-bit 256 KB cache memory
- \* EDO memory upgradable to 40 MB
- \* Removable 6X CD-ROM (for FD or 2nd Li-Ion battery)
- \* Removable 1.44 MB floppy drive
- \* PCMCIA Type III slot
- \* PCI Enhanced IDE & Removable Hard drive (Up to 2GB)
- \* 16-bit sound card, 2 speakers & mic
- \* PCI 128-bit graphic accelerator
- \* 12.1" TFT 800X600 display
- \* Touch Pad & Infra-red port
- \* High speed serial, EPP/ECP parallel ports
- \* Smart Lithium-ion battery w/ built-in indicator
- \* Only 6.8 lbs. w/ battery
- \* Universal AC adapter & Deluxe carrying bag

P-133 MHz, 16MB, 1.08 GB HD  
12.1" ACTIVE COLOR  
6X CD-ROM DRIVE  
WINDOWS 95 CD  
Only \$2749



## PCI MULTIMEDIA

- \* INTEL Pentium processor w/ fan
- \* 256K Pipelined Brust Cache, Triton chipset
- \* 16 MB EDO RAM expandable to 128 MB
- \* TEAC 1.44 MB floppy drive
- \* 1.3 GB EIDE hard drive
- \* PCI Enhanced IDE HD controller
- \* 64-bit MPEG Accelerator w/1 MB DRAM
- \* 15" 1024 X 768 NI monitor .28 dp
- \* Flat screen, Digital control, Low-radiation
- \* 2 high speed serial, parallel, & game ports
- \* Enhanced 104 key keyboard
- \* Medium tower case w/230 Watt
- \* High resolution mouse
- \* 16 bit sound card
- \* Super fast 8X CD-ROM drive
- \* 140 Watt Hi-Fi speakers

Special

P-200 MHz	\$1359
P-166 MHz	\$1159
P-150 MHz	\$1029
P-133 MHz	\$ 979
P-120 MHz	\$ 959

## PENTIUM PRO SUPREME

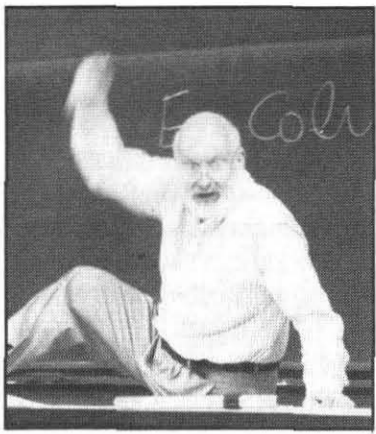
- \* INTEL Pentium Pro processor w/ fan
- \* INTEL VENUS Motherboard
- \* 32 MB EDO RAM expandable to 128 MB
- \* TEAC 1.44 MB floppy drive
- \* WD 4.0 GB EIDE hard drive
- \* Matrox MGA Millennium w/2 MB WRAM
- \* Viewsonic 17GS 17" monitor, .27 dp
- \* Flat screen, Low-radiation (3 yr parts & labor)
- \* 2 high speed serial, parallel, & game ports
- \* Enhanced 104 key keyboard
- \* Medium tower case w/230 Watt
- \* Microsoft mouse
- \* Sound Blaster 32 Wavetable sound card
- \* Super fast 16X CD-ROM drive
- \* 240 Watt Hi-Fi speakers & Microphone
- \* MaxTech 56 Kbps Voice/Fax/Modem (Full duplex speakerphone system)

Special

200 MHz	\$2799
180 MHz	\$2649
150 MHz	\$2269

**TGG** (818) 795-6112  
Fax: (818) 795-6320  
M-F 9:30-6  
SAT 10-5  
1154 E. Colorado Blvd.  
Pasadena, CA 91106 (between Lake & Hill Ave.)

One year parts & labor warranty  
30 Days Money Back Guarantee  
15% restocking fee on non-defective parts  
On-site Service, Delivery & Setup, Training  
Extended Warranty Available  
Limited rights reserved. This ad is not an offer  
Prices & specifications subject to change without notice.  
Not responsible for typographical errors.



# Dean's Corner

## Hail Hale . . .

by Jean-Paul Revel

. . . and hail Bopp . . . the two guys who discovered the comet that has made the news in the last month. I have been blasé about comets myself, until very recently. After all I have seen lots of pictures of comets; I have read about them, and as a boy, in my Walter Mitty stage, I dreamed of finding one. Actually I still dream but I'm a grown-up now and must contain my youthful enthusiasms.

I got very excited at the time of Halley's comet, even though it was a bust, in spite of the expectations. But while the view from earth was not what it was predicted to be, the close up views taken by the European space probes were so exciting!

I had imagined a comet to be a ball, spherical, but instead it was, in the poetic words used,

"potato shaped." Leave it to Idaho to leave its mark in the sky!

The other amazing thing was that its surface had a very low albedo, i.e. reflected very little light! What a strange thing for a supposedly bright object! All the brightness came from little spots on its surface, jets of gases, but the rest was covered in dark stuff, maybe a kind of a tarry skin . . . To me, that was especially interesting, because as a biologist I am always intrigued when I come across suggestions of the presence of hydrocarbons in the universe.

Maybe the surface is covered with hydrocarbons, which after all were detected as part of the gases in the tail. They might not evaporate as readily as the ice and so remain at the surface as the ice sublimates away. With evidence for complex organic

mo-  
lecules in space, perhaps there is real hope for some sort of life in all the potential "solar systems" that are being found in the universe, not just a statistical probability.

Now, even though there is a good or even excellent probability that something is going to happen, it does not logically follow that it will happen. In science nothing is "absolutely sure." Even absolute zero is a figment of our imaginations: we can get closer and closer, but will never get there, although we may get close enough to do experiments and observe the behavior of atoms as if caught in molasses. "Absolutely sure" does not exist, and one single contradictory observation, made under properly controlled conditions, can ruin a whole system of probability.

That's the crux of Karl Popper's idea: for a theory to be scientific it has to be falsifiable. One must be able to do experiments which have the capability

to prove it wrong. Until and unless proved wrong things are possible, but never certain. That's why scientist so often hem and haw, and are never sure . . .

But back to Hale and Bopp and their comet. I did see it in the end, by accident, and it was tremendous, exciting, a sight to fill one with reverence. My thoughts about the dull mundanity of comets were falsified right then and there.

I was driving NNW on a very dark stretch of Route 2 between the 134 and the 210 and all of a sudden, high in the sky, just on the left of my windshield my eye was caught by this large soft light, not a star, but something much more diffuse, a disc, with a broad tail, incredible! My heart leaped as I recognized the comet!

I pulled off to the right across the traffic and stopped to look. It was sensational. It did not seem to twinkle, probably because the twinkle was lost in the diffuse disc of light of the comet, and the tail was complex. It was huge compared to a star or a planet. It was awesome, truly affecting. Silent, distant, but my mind involuntarily wanted it to be telling me something. There could just not be anything as unusual, serene, foreboding and magnificent, without it meaning something. The comet's tail gives it a feeling of speed, of rapid movement, yet there it hangs, immobile in the sky (unless we do something specific to detect its movement against the stars), while seemingly rushing somewhere. These two incongruous observations add to the mystery and charm.

And so suddenly I had the feeling that I understood something I had never appreciated before. I had always thought that all the stories of the ancients trying to interpret comets as portentous signs were amusing stories of a quaint past. How naive they had been.

How naive I have been! How patronizing to think that there was no basis for their awe. Which does not mean that I am not puzzled by the fact that even today, presumably rational, educated people could delude themselves into believing there was a space ship out there, hiding next to the comet, and that the path to the ship and to a higher state, lay in killing oneself.

While the comet is awe-inspiring, it seems to me that suicide is the sure way to insure that we will not be able to see more of the wonders of our universe. All of us will die some day. That is the only thing certain about life. Of course as scientists we might look at ways to falsify this belief. But the way to approach the truth is certainly not to carry out prematurely what will inevitably happen to us after three score and ten, according to tradition.

The poor people on the way to the hypothetical space ship believed their leader's assertions. They believed in him because he provided a family, a caring environment, or at least an attentive one.

I cannot prove that there was no such ship. The hypothesis is alive but very unlikely. So unlikely that I would certainly not want to plunge into the void in the hope to encounter it. A fairy tale, a story, a parable are not reality. Would not a deity or a more advanced civilization outwait our human time, let us live out the years we have to live, till our bodies wear out and may be our minds too?

So Hale the comets and the scientists and all those who Bopp their heads against the unknown and try to understand the world and thus admire its marvels. Hail to those who have the courage to live.

A bientôt . . .

*J.P. Revel*

EXCLUSIVELY for FACULTY and STAFF

PAIN.

PAIN KILLER.

For fast relief from the nagging ache of taxes, we recommend TIAA-CREF SRAs. SRAs are tax-deferred annuities designed to help build additional assets—money that can help make the difference between living and living well after your working years are over.

Contributions to your SRAs are deducted from your salary on a pretax basis, so you pay less in taxes now. And since earnings on your SRAs are also tax deferred until you receive them

as retirement income, the money you don't send to Washington can work even harder for you.

What else do SRAs offer? A full range of investment choices and the financial expertise of TIAA-CREF—America's largest retirement organization.

To find out more, stop by your benefits office or give us a call at 1 800 842-2888. We'll show you how SRAs can lower your taxes.

Do it today—it couldn't hurt.

Visit us on the Internet at [www.tiaa-cref.org](http://www.tiaa-cref.org)



Ensuring the future for those who shape it.™

\*Based on assets under management.

CREF certificates are distributed by TIAA-CREF Individual and Institutional Services, Inc. For more complete information, including charges and expenses, call 1 800 842-2733, ext. 5609, for a current CREF prospectus. Read the prospectus carefully before you invest or send money. Date of first use: 2/97.



SOME COMPANIES OFFER YOU THE SUN, THE MOON AND THE STARS.

WE'RE A LITTLE MORE DOWN TO EARTH.

As a new graduate, you will hear career promises from varied companies. Many will offer the opportunity to be entrepreneurial, innovative and creative. But take a good look. Do they have competitive products? Market demand? The resources and stability for the long run?

PairGain Technologies does. We are a world leader in the design, manufacture and marketing of High-bit-rate Digital Subscriber Line (HDSL) products and systems. We have been listed 9th by *Fortune* and 3rd by *Inc.* in their ranking of the country's fastest growing public companies. With annual revenues in excess of \$200 million and a 70% market share, our promise of a stellar future is a down-to-earth proposition. Put your engineering degree to work in one of the following areas:

- Analog and Digital Circuit Design Engineers
- Communications Systems Engineers
- Firmware Engineers
- Software Engineers
- VLSI Design Engineers

Find out more about our company by joining us at our On-Campus Information Session on Tuesday, April 15, 4:00 - 6:00pm at the Student Activity Center. We'll also be conducting On-Campus Interviews on Wednesday, April 16. Please sign up at the Career Center to schedule an appointment. Or if you're unable to meet with us, please forward a resume to: **PairGain Technologies, Inc., Human Resources Dept.-DP/CT, 14402 Franklin Avenue, Tustin, CA 92780; fax: (714) 730-3199; e-mail: [hr@pairgain.com](mailto:hr@pairgain.com).** Equal Opportunity Employer.

**PAIRGAIN**  
THE COPPEROPTICS COMPANY  
<http://www.pairgain.com>

IT'S NOON. LET'S GRAB A SANDWICH AT THE CAFETERIA.

OKAY, BUT MAKE SURE THAT'S ALL YOU GRAB. I'D LIKE TO KEEP THIS ON A PROFESSIONAL BASIS.

AND I'LL NEED TO BORROW FIVE DOLLARS.

HE'S LIKE A BEAUTIFUL, UNTAMED BEAST.

SIGH

YOU ARE GUILTY OF BEING A TECHNICAL WRITER WITH AN UNNATURAL ATTRACTION TO AN ENGINEER.

IT'S NOT A MAJOR SIN, SO YOU ONLY GO TO HECK. I'M PHIL, THE PRINCE OF INSUFFICIENT LIGHT.

HECK

SIT DOWN AND TYPE. "I PROACTIVELY LEVERAGE MY SYNERGIES," A HUNDRED TIMES.

NO-O-O!!!

I ALWAYS FALL FOR THE WRONG GUYS. I'M A JERK MAGNET.

TINA, THE TURKEY IN YOUR SANDWICH IS ALREADY DECEASED. YOU DON'T HAVE TO TALK IT TO DEATH.

I MUST DISGUISE MY AROUSAL.

HEY, LOOK! WE'RE EATING EXACTLY THE SAME QUANTITIES FOR LUNCH!

IT'S CALLED A "SMART CARD," AND WE SHOULD BUILD OUR NEXT PRODUCT TO HANDLE THIS SORT OF PAYMENT TECHNOLOGY.

AAAGH!!

Foop

I'VE NEVER SEEN THAT HAPPEN.

HIS BODY REJECTED THE "SMART CARD."

ALICE, I THINK I'M DEVELOPING A CRUSH ON DILBERT.

IS THAT SO WRONG?

APPARENTLY IT IS.

I HAVE A REPORT OF A TECH WRITER DESIRING AN ENGINEER.

I'VE INVENTED A QUANTUM COMPUTER, CAPABLE OF INTERACTING WITH MATTER FROM OTHER UNIVERSES TO SOLVE COMPLEX EQUATIONS.

ACCORDING TO CHAOS THEORY, YOUR TINY CHANGE TO ANOTHER UNIVERSE WILL SHIFT ITS DESTINY, POSSIBLY KILLING EVERY INHABITANT.

SHIFT HAPPENS.

FIRE IT UP.

**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

---

**what film?**  
 I THOUGHT I HAD MONO FOR AN ENTIRE YEAR. IT TURNED OUT I WAS JUST REALLY BORED  
 Find out at council

paris \$449  
 tokyo \$589  
 costa rica \$498  
 rio \$689

Student fares, may require an International Student ID card. Taxes are not included and may range from \$6-\$33. Fares are subject to change. CST#1008080-50

**Council Travel**  
 10904 Lindbrook Drive, Los Angeles, CA Tel: 310-208-3551 / 213-463-0655  
 Open Sat. 11am - 3pm, beginning 4/1.

**travel: real life flicks!**

**CLASSIFIED ADS**

**SERVICES**

**PREGNANT?** - We are a professional, married couple, a pilot and a nurse hoping to start a family through adoption. We have a lovely home and will teach good values and provide all emotional, physical, spiritual and material wants in life to your healthy baby. We are willing to pay all medical expenses allowed by law. Please help us by calling toll free: 1-888-921-BABY.

**AUTO REPAIR** - Complete Service. Smog Checks, Tune-Ups, Oil Change, Brakes, Electrical, Engine Repairs, etc... Hrant Auto Service, 1477 E. Washington Blvd., Pasadena, (818) 798-4064 (818) 791-1993. Call for Appointment. Discount for students and staff.

**JOBS**

**INTERNET INTERNSHIPS IN WASHINGTON** - Marketing, journalism, web design, PR, research! Call Ben: 202-408-0008 or interns@interactivehq.org

get a major

get a degree

get a job!

You've got a long road ahead of you. Get comfortable.

**BIRKENSTOCK®**

BRING IN THIS COUPON AND GET

**\$10 OFF YOUR NEXT PAIR** OF REGULAR PRICED BIRKENSTOCK SHOES! REGISTER TO WIN A FREE PAIR!

**BIRKENSTOCK OF PASADENA**  
 696 E. COLORADO, #11, PASADENA 818-796-5028

**LUCHA COMFORT FOOTWEAR**  
 921 FAIR OAKS AVENUE, S. PASADENA 818-799-6891

**WALK THIS WAY**  
 2253 HONOLULU AVENUE, MONTROSE 818-248-7206

NOT VALID WITH OTHER OFFERS. COUPON EXPIRES MAY 15, 1997.

## Events

⊗ This week's ASCIT Movie is *Shaft*. Can you dig it? It will be shown at 7:30pm and 10pm in Baxter Lecture Hall. Admission for ASCIT members is \$2.00 and \$2.50 for non-members.

⊗ Are you a swinger? Can you dig it? Then come to a *Swingin' Thing* from 8pm-12am this Saturday, April 12th, at Avery House. Live swing music, hors d'oeuvres, and drinks will make for a rip-roarin' time for all. Swing lessons may be provided during the event.

⊗ **Terry Moran**, ex-Tech editor, turned 21 yesterday. Congratulate him — now he has as many years behind him as hair colors. Blacker's excellent president, **Jon "Marty" Allen** also turned 21 yesterday, it's never too late to shower him.

⊗ The first movie to screen in the German Film Series for Spring term is **Der König und sein Narr** (1981). It will be shown in Baxter Lecture Hall on Wednesday, April 16th, 1997 at 7:30pm. The film features English subtitles; there will be an introduction and discussion afterwards. Admission is free. For more information call x3610.

The **Prefrosh** are coming! Prefrosh Weekend will be held from Thursday, April 17th until Sunday, April 20th. Any organizations, groups, or departments wishing to hold Prefrosh Weekend activities are encouraged to contact the Prefrosh Weekend Planning Committee to organize scheduling, etc. Also, any comments or suggestions about Prefrosh Weekend will be welcomed. Send email to [dina@admissions.caltech.edu](mailto:dina@admissions.caltech.edu) or call the Admissions Office at x6341. If you want to get your own personal prefrosh, turn form in to the Admissions Office today.

The Caltech Division of the Humanities and Social Sciences will be presenting the following seminars for the Spring Quarter 1997:

**Science, Ethics, and Public Policy** in conjunction with William Bennett Munro Memorial Seminars Thursday, April 17th, 1997, 4:00pm, in the Judy Library, Baxter Building "Sexuality in France: The Irony of Legal Tolerance Since the French Revolution" Dr. Robert Nye Thomas Hart and Mary Jones Horning Professor of Humanities and Professor of History Oregon State University.

**William and Myrtle Harris Distinguished Lectureships in Science and Civilization** Friday, April 18th, 1997, 3:30pm, in the Beckman Institute Auditorium "Debate in the Republic of Science: Michael Polanyi and P.M.S. Blackett on Science and Its Social Ends" Dr. Mary Jo Nye Horning Professor of the Humanities and Professor of History Oregon State University.

*Seminars are on the Caltech campus and are open to the community. If you have further questions, contact Christine Silva at [silva@hss.caltech.edu](mailto:silva@hss.caltech.edu) or x4087.*

⊗ "Reading Rocks," a lecture in the **Astronomy/Geology 0.1 seminar series** will be presented by Edward Stolper, William E. Leonhard Professor of Geology, in Baxter Lecture Hall April 11th, 1997 4:00pm.

⊗ Leon Silver, W.M Keck Foundation Professor for Resource Geology, and Professor Emeritus Brian Wernicke will present "**The Assembly and Evolution of the Continents**" April 18th, 1997 in Ramo Auditorium at 4:00pm as part of the Astronomy/Geology 0.1 seminar series.

*The Astronomy/Geology 0.1 lectures, presented by Caltech faculty, are designed as an interconnected series introducing some of the central problems and techniques in earth and planetary science and in astronomy. All will be directed at a nonspecialist scientific audience. No prior knowledge of geology, astronomy or planetary science will be necessary to understand them. For further information, please contact the Office of the Provost at x6320.*

## Notices

⊗ The **Women's Center** of Caltech will be holding a **Open House** on Monday, April 14th. A light lunch and refreshments will be served. Please bring your questions, concerns, interests for programs, etc. to the Center (Winnett Student Center 205).

⊗ **Hell Civil Engineering Society** would like to announce **Classical Music Appreciation Night**, featuring the newly com-

## Mints

⊗ denotes a new announcement.

posed "Concerto for Sledgehammer and Reciprocating Saw" by Ryan Cox and Nathan Schara. Residents of the South Hoves may experience some noise and mental health hazards. Remember, upperclassmen, Hell Ride is **Tonight**.

New Course: **SES/H/PL 169 Contemporary Issues in History and Philosophy of Chemistry**.

Philosophers have recently begun to take an interest in chemistry because in posing the question of the reduction of the sciences, one cannot ignore the question of whether chemistry reduces to physics. If reduction even fails at the first hurdle, then there would seem little hope of achieving a more ambitious reduction like that of biology to physics.

This course seeks to explore some recent issues in history and philosophy of chemistry, including the impact of discoveries made in atomic physics on chemistry. A survey will be made with reference to the history of modern chemistry, of questions such as whether chemistry is reduced to quantum mechanics, the role of atomic orbitals in chemistry, the history and theoretical status of the periodic table, the nature of explanations in chemistry and the debate regarding the relative virtue of prediction and accommodation by chemical theory. Instructor: Diana Barkan and Eric Scerri W 7pm to 10pm For further details contact Eric Scerri, x4030, or [scerri@hss](mailto:scerri@hss).

**Johns Hopkins University** will be running a summer program for 7th and 8th grade students at Caltech this year. There are several openings for TAs, RAs, instructors, and office help. JHU will pay for room and board for the duration of classes and pay a stipend as well. The program will run from June 23th to August 9th. If you are interested in applying for these jobs, please contact Keith Counsell at [keithc@cco](mailto:keithc@cco), at x3320, or in the Housing Annex between the hours of 8:00am and 5:00pm.

## From the Counseling Center

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

## Stress Management for Students

For help in learning how to relax and manage stress, Jon Pedersen, Ph.D., and Fern Klapper, M.A., of the Caltech Counseling Center, will be offering a four-week workshop beginning February 11th. On each of four consecutive Tuesdays, from 12:00 - 12:50pm, a variety of practical, simple, and effective techniques will be taught, ranging from progressive relaxation to basic meditation techniques to the principles of healthy living. The sessions will be primarily experiential and will build on material from the previous week. This workshop is open to any student and if you are interested, please contact Dr. Pedersen at x8331.

The Caltech Counseling Center is sponsoring a program entitled "Stress Management in the First Two Years of Graduate School." This program will consist of a discussion and presentation by a panel of graduate students (Selena Forman, Weng Ki Ching, and Ivett Leyva) and Counseling Center staff Aimee Ellicott, Ph.D. and Deborah Southerland, M.A. We will focus on the specific kinds of stress grads encounter as first and second year students, such as adjusting to graduate school, qualifying exams and relationships with advisors. The program is open to all graduate students and will be held on Thursday, February 13th, from 6:00-7:30pm in Winnett

Clubroom One. Light refreshments will be provided.

If you have any questions about these programs or want to discuss your individual questions or concerns regarding coping with stress, please contact the Counseling Center at x8331

## Fellowships and Scholarships

**Fellowships and Scholarships for graduate study and travel:** Juniors & Sophomores interested in learning about the Rhodes, Fulbright, Marshall, Churchill, Watson and Luce Fellowships are invited to a workshop on Wednesday, April 16th from noon until 1pm in Winnett, Club Room One. Since a pizza lunch will be served, email the following information to us at [fellowships@starbase1.caltech.edu](mailto:fellowships@starbase1.caltech.edu) by Monday, April 14th, if you plan to attend the workshop. We need to know your name, major and favorite toppings or special dietary needs.

From the *Fellowships Advising and Resources Office*, x2150, e-mail [lauren\\_stolper@starbase1.caltech.edu](mailto:lauren_stolper@starbase1.caltech.edu):

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

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

The **Asian/Pacific American Association for Advancement, Inc.** (4A) is accepting applications for their 4A San Francisco Bay Area Scholarship Program. 4A will be selecting three scholarship recipients who will each receive a \$1,000 scholarship. Eligible students must be Asian/Pacific, U.S. Citizens or permanent residents, and must be enrolled full-time as undergraduate or graduate students. Applicants will be evaluated based on their scholastic discipline, personal achievement, and community involvement. AT&T, Lucent Technologies, and NCR employees and their children are ineligible to apply. Applications are due **April 15th**, 1997.

The **Sunkyong Group of Korea and LeaderShape Inc.** are sponsoring the "Global Leaders of Tomorrow" essay contest. Entrants must be undergraduate or graduate students at the time their entries are submitted. Essays may be written from one of four perspectives: Business, Government/Law, Science, or Media/Communications. Three winners will be selected in each of these four categories. First prize (one winner in each category) is \$2,500 plus a one week trip to Korea. Second prize (one winner per category) is \$500 plus one week at a LeaderShape training program. Third prize (one winner per category) is \$500. The Financial Aid Office has more information. The deadline for entries is **April 15th**, 1997.

## THE CALIFORNIA TECH

Caltech 40-58  
Pasadena, California 91125

The **ACIL (formerly the American Council of Independent Laboratories) Scholarship Alliance** is offering scholarships for students majoring in the physical sciences: physics, chemistry, engineering, geology, biology, or environmental science. Awards are based on academic performance, career goals, leadership, and financial need, and are typically \$1,000-\$2,000. To apply you must be a junior or senior in undergraduate study, or a graduate student. Applications and all supporting documents are due **April 15th**, 1997.

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

The **Jewish Vocational Service** is accepting applications for scholarships from the Jewish Community Scholarship Fund. The scholarships are designed to provide financial assistance to Jewish students who are legal residents of Los Angeles County, attending college on a full-time basis. Applicants must have a 2.5 minimum G.P.A., must be a sophomore or higher by September 1997, and must be able to document significant financial need. The deadline for submission of completed applications is **April 15th**, 1997.

The **American Electroplaters and Surface Finishers Society** is offering scholarships to undergraduate juniors and seniors and graduate students who are interested in careers in the electroplating and surface finishing industry. Undergraduates must be full-time and must be majoring in metallurgy, metallurgical engineering, materials science or engineering, chemistry, chemical engineering, or environmental engineering. Applications must be submitted by **April 15th**, 1997.

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

The **Jewish Family and Children's Services** is pleased to announce the continued availability of financial support for Jewish individuals and their families. JFCS provides hundreds of students loans, grants, and scholarships to Jewish students. Individuals may apply for up to \$5,000. Special scholarships are available for study in Israel. To be eligible, students must have financial need, have at least a 3.0 GPA, and be residents of San Francisco, the Peninsula, Marin or Sonoma counties, or the Bay Area. There are no deadlines—applications are accepted throughout the year and are available in the Financial Aid Office.

The **Coalition of Higher Education Assistance Organizations (COHEAO)** is pleased to present an opportunity for students to apply for three \$1,000 scholarships and three \$200 runner-up awards. Applications and supporting documents are due **May 15th**, 1997.

NORTHWESTERN UNIVERSITY  
SUMMER SESSION '97

- Over 300 courses in 44 departments
- Earn a full year's credit in biology, chemistry, physics, or one of eight languages
- Smaller class sizes
- Weekly outdoor movie nights
- Tuition discounts for teaching professionals
- Courses in everything from the Beatles to biochemistry
- Five ways to study abroad this summer
- Campus musical and theatrical productions

## SUMMER BETTER THAN OTHERS

- Earn two, three, or four credits and conduct field research in
  - archaeology
  - environmental studies
  - ethnography
  - social policy
  - urbanology



FOR YOUR FREE SUMMER CATALOG  
Phone: 1-800-FINDS NU or 847-491-5250  
Web: <http://www.nwu.edu/summernu/>  
E-mail: [summer@nwu.edu](mailto:summer@nwu.edu)