

IHC Fall Addresses

Chair: Tom Maccarone, Lloyd 228, x1320/x6964

Secretary: Laura Brady, Lloyd 128 x1615

House President	Room	Phone Number
Alison Slep	Blacker 18	x1003
Bill Castillo	Dabney 22	x1146
Brian Katon	Fleming 70	x1202
Nestor Ocampo	Lloyd 205	x1313
Mike Vogel	Page 223	x1407
Art Clarke	Ricketts 32	x1560
Adil Karim	Ruddock 201	x1607

Any new student who has questions or concerns about Rotation should talk to a member of the IHC.

SURF Announces New Publication

by Chou Hung

SURFSAC (the SURF Student Advisory Council) is requesting submissions for the Caltech Undergraduate Research Journal. CURJ will be an annual publication giving account of the research and other projects undertaken by undergraduates at Caltech (including non-Caltech undergraduates) as well as Caltech undergraduates conducting research at other universities. About twenty articles will be published. The submission deadline will be October 23, the final submission day for SURF final reports. The SURF final report and the CURJ submission may be made jointly, provided it is clearly stated on the front cover that the manuscript should be considered for the CURJ as well as for the final report. The sub-

missions will undergo several stages of review, with the first stage conducted by members of the CURJ subcommittee of SURFSAC with the intent of weeding out poorly written articles. The second stage will include graduate students and more members of SURFSAC, distributed by option (with slightly more emphasis on biology and chemistry, as these are the options which tend to have larger turn outs). The second stage of reviewers will screen for well-written articles which will attract the general public and/or be scientifically interesting. They will also make suggestions and corrections. The corrected papers will be given to a third stage of re-

SEE CURJ, PAGE 2

Senior Class President Election Rescheduled

by David Cuthbert
Chairman, ASCIT Excomm

Due to an unfortunate and inadvertent error that affected the fairness of the original election, the ASCIT Executive Committee has decided to reschedule the election for the position of Senior Class President.

This is a completely new election; all eligible and interested persons are invited to be nominated. Candidates from the previous election should reapply; they will not be automatically reconsidered.

The timetable for this election is as follows:

Nominations open Wednesday, September 27. Sign up at Winnett. Nominations close Tuesday, October 3. Candidates' statements are due to The Tech by Wednesday, October 4. Statements will be printed in The Tech on Friday, October 6. The Senior Class President election will occur Monday, October 9.

From the Registrar:

The Registrar's office will be open during lunch this year. Now you can come by for one more hour each day (12:00 - 1:00 p.m.) to turn in your yellow cards, get transcripts, pick up a catalog, or just hang out.



PHOTO BY SAM FOSTER

Some pictures just don't need a caption...

Welcome to Caltech!

by Suzette Cummings, Dean's
Office

The Dean of Students Office wants to welcome you back for the 1995-96 academic year. Staff in the office are Rod Kiewiet, Dean of Students, Barbara Green, Associate Dean, Suzette Cummings, Assistant to the Dean and Sandra Estes, Senior Administrative Secretary. We are available to assist you in a variety of ways and we encourage you to stop by to talk with one of the Deans if you have any academic or personal concerns. Here are a few reminders that may help make first term a successful one for you.

If you are finding the material in a course difficult, contact our office for a free tutor. We hire upperclass students to tutor others, especially in the core courses. Tutoring is free to the student and the Deans Office pays the tutor. Of course, attending class regularly, talking with your teaching assistants and professors, attempting all your

homework sets, and collaborating with other students when appropriate can make a big difference in your success.

Students who become ill may want to be in touch with the Deans for assistance in excuses for late assignments and tests. If you are too ill to complete a course or can't take the final exam because of illness, only the Deans are authorized to give the grade of I, medical incomplete. Contact us if you have a medical problem that seems to be interfering with your academics.

Remember, the deadlines for dropping and adding courses. Add Day this year is October 13 and Drop Day is November 15.

See us anytime for assistance with petitions you plan to submit to UASH.

If we invite you to come in to talk with us about your progress, please respond. We usually have useful suggestions to offer.

Best wishes for a productive and enjoyable first term.

Palomar Survey Reveals Peak in Quasar Formation

by Jay Aller

PASADENA—Astronomers have discovered direct evidence that most quasars came into existence when the universe was still in its infancy. This discovery will help scientists use quasars, the most luminous objects in the sky, as tools for studying the universe back to a time when it was less than a billion years old.

"This survey allows scientists to investigate for the first time the era of quasar formation," said Maarten Schmidt, a Caltech astronomer and a co-author of the study.

Using data from the recently completed quasar search known as the Palomar Transit Grism Survey, Schmidt, Donald P. Schneider of Penn State, and James Gunn of Princeton University published their discovery in the July 1995 issue of the *Astronomical Journal*. (A grism,

from the combination of grating and prism, is a transmission grating mounted on a clear, wedge-shaped piece of glass.)

The survey shows that the space density of quasars—the number of quasars in a given volume of space—reaches a maximum for those with red shifts between 1.7 and 2.7, and declines steeply for quasars with higher red shifts.

"This maximum means there was a peak in the rate of quasar formation between 1.9 and 3.0 billion years after the Big Bang," Gunn said, "and a much lower rate earlier in the history of the universe."

A typical quasar emits 100 times more energy than our home galaxy, the Milky Way. This makes them the most luminous and also some of the most distant known objects in the universe. Because light from quasars takes billions of years to reach the

earth, scientists see them as they were billions of years ago. Therefore quasars are important to astronomers as one of the best probes available for studying the conditions present in the early universe.

Astronomers first identified quasars in 1960 as starlike counterparts to strong sources of radio waves, but were initially unable to determine the nature of the objects. In February 1963, Maarten Schmidt made a breakthrough.

"I recognized that the pattern of spectral lines in one particularly bright quasar was due to hydrogen, but that the location of the lines was red shifted," Schmidt said. "This indicated that the object was moving away from the earth at a very high velocity."

Red shifting is an effect seen in rapidly receding sources of light,

SEE QUASAR, PAGE 8

In This Issue

EDITOR'S CORNER	2
EDITORIAL	3
QUESTION	4
FOXTROT	4
DILBERT®	5
MORE DILBERT®	9
KREATIVE KORNER	10
CALENDAR	11
ANNOUNCEMENTS	12

Features

STUDENT
LOAN CUTS
CONDEMNED
2

TACIT PLAYS
3

PA COURSE
DESCRIPTIONS
6

TECH A
"BEST BUY"
10

National Student Groups Condemn Student Loan Cuts in Budget Resolution

by Kevin Boyer

Washington, DC — The United States Student Association (USSA), the National Association of Graduate-Professional Students (NAGPS), the American Medical Student Association (AMSA), and the United States Public Interest Research Groups (USPIRG), non-partisan national associations representing millions of undergraduate, graduate, and professional degree-seeking students, issued a joint statement condemning last week's proposal by the House and Senate Budget Committees to slash \$10 billion dollars in funding from the federal student loan program. In order to pay for tax cuts for wealthy Americans, the Budget Committee Conference Agreement specifically targets graduate and professional degree students for student loan cuts.

A \$10 billion funding cut could require the elimination of important government subsidies from the student loan program, including the in-school student loan interest subsidy. One of the nation's largest student aid programs, the subsidy pays the interest on student loans while students are still in school. The program is projected to provide \$12.5 billion in financial aid to the nation's post secondary students over the next five years. The \$10 billion cut was part of the House-Senate Budget Conference Agreement which would reduce federal spending by \$960 billion over the next 7 years and taxes by \$245 billion. The Conference Agreement also freezes spending over the next seven years for Pell Grants, which currently help provide access to post secondary education for 4 million low-income students. In

comparison, the alternative budget recently offered by President Clinton not only balances the budget, but also increases the federal investment in education over current levels by \$40 billion over the next seven years.

Joint Statement "We are appalled that Congress would so severely target students and families in its efforts to reduce federal spending and provide tax benefits for the wealthiest sectors of Americans. Student loans currently make higher education possible for 4.5 million individuals, are supported by huge margins of Americans, and are a crucial part of our nation's investment in its future.

By eliminating the needbased interest subsidy, Congress would increase the cost of student loans by 20-50 percent, depending on the amount borrowed. The American Council on Education reports that for someone taking out the maximum possible amount in student loans, losing the subsidy would result in a \$41-a-month increase for undergraduates, and nearly \$400-a-month for graduate and professional-degree students. As a result, access to higher education will be seriously threatened as fewer Americans will be able to afford the education mortgages required to obtain a post secondary degree.

Congress is out of step with the nation on this issue. According to a recent poll of registered voters conducted by KRC Re-

search and Consulting, 89% of Americans (87% of Republicans) believe that the government should maintain student aid funding at its current level. Moreover, 86% believe that tax dollars spent on student aid programs is money well-spent. Ninety-two percent of those polled believe that federal government spending on student financial aid was a good investment in America's future. Sixty-eight percent said federal funding of student aid should be maintained even if the defense budget had to be cut.

We are also stunned that Congress would propose to cut graduate and professional student loans without regard or comment to the investment loss this represents. For years, studies have shown that US economic productivity is directly benefited by federal government spending on student aid and higher education. While proposals to eliminate waste and duplication are welcome, eliminating the interest subsidy takes money directly from students and their families and is irresponsible in light of our nation's need to remain competitive.

We sincerely hope that Members of Congress will vote against the Budget Resolution because of the drastic cuts to student aid and student loans. We believe that Members of Congress were elected to ensure a bright and productive future for our nation, not a future where economic productivity and individual opportunity are sacrificed to achieve unsupported and misguided objectives.

Editor's Corner

We at the *The California Tech* would like to welcome the Frosh and welcome back all returning students to Caltech. We hope you all enjoyed your respective summers. As you know, this is the first issue of this academic year. There will be twenty-nine more before we get to enjoy another summer. We currently are looking for people to help in all facets of our publication, including writing, editing, and delivery. We meet weekly to discuss the previous issue and improvements for future ones. The first such meeting will be Friday, September 29th, in the Coffeehouse in the SAC at 12:15 p.m. Everybody is encouraged to drop to see what our meetings are like and to eat some free food. People who are interested in working for *The Tech* can receive three units of PA 15 credit. Those who are interested in adding this class should therefore bring the yellow scheduling card. All suggestions are welcome. Additionally, anybody who is interested can also drop by our office located in room fourty in the SAC. We hope that this will be an enjoyable and productive year for everybody. We look forward to working with many of you.

-The Editors

Deadlines for Submission to *The Tech*

- Letters to the Editor - 5 P.M. Monday
- Events and Notices - 5 P.M. Tuesday
- Unsolicited Articles - 5 P.M. Tuesday
- Regular/Semi-Regular Columns - 5 P.M. Wednesday
- Articles, News Submissions - 5 P.M. Wednesday
- Art/Photo Submissions - 5 P.M. Thursday

Work for *The Tech*

3 units PA 15 credit and free food all in one.



 Allen Robert Gross
Conductor

AUDITIONS
THURSDAY
Sept. 28, 4-6 P.M. and
7-10 P.M.

Sign up on the Student Activities Center Bulletin Board, or call Rob Knop, manager at 795-4152 or Allen Gross, conductor at 818/796-8966.

First concert includes Brahms First Symphony!

CURJ

FROM PAGE 1

suggestions and corrections. We hope to distribute 5000 copies to the Caltech community as well as to the Alumni Association Life Members. The projected distribution time is April 1996.

SURFSAC hopes that the journal will promote undergraduate research at Caltech as well as foster and strengthen ties between Caltech undergraduates, faculty, and alumni. Contributors should submit one copy of the manuscript with a professor's endorsement, and an abstract (less than 100 words). All copy, including indented matter, footnotes, and references should be double-spaced and justified to the left margin only. The author and the advisor should be identified with address and phone number/e-mail on the title page. CURJ prefers manuscripts of 4-6 pages including graphics and reserves the right to return those of excessive

length. Typeface size should be no smaller than 10 point. Again, CURJ is seeking well thought-out, clear papers which will appeal to the general public and/or be of scientific interest. Interesting papers with few results will also be considered. Inquiries and submissions should be directed to Carol Casey, CURJ, SURF Office 139-74, Caltech, Pasadena, CA 91125. (818) 395-2885 E-mail: caseyc@starbase1.caltech.edu

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Editorial:

There are serious flaws in Caltech's current rotation rules. Students must mask their opinions during rotation week in order to avoid 'rotation violations' and the consequences they entail. Though the intended purpose of preventing prejudice transfer is certainly good, several problems arise with its current implementation.

The primary problem is that many freshmen end up in a house which is completely different from the impression they received during Rotation. In almost all such cases, the environment is considerably worse than this freshman envisioned. Fortunately, there are means to move to other houses or off-campus as an

upperclassmen which can shorten the duration of such problems. However, the fact remains that there are several freshmen each year who must deal with this. Some grow to like their house, while others wish to live somewhere else as soon as possible.

I believe that this problem arises because of a lack of information. Freshmen are entitled to hear each of the stereotypes of each of the houses. Since most of these stereotypes are based on small kernels of truth, freshmen who desire more information can seek to get it. This is especially important if the freshman's perception of the house is so contradictory to the stereotype as to seem inherently incongruent. Students

Rotation Rules Require Alteration

should not be presenting this information, however, on an individual basis. Instead, there should be some sort of presentation at the beginning of the year where all of this information is presented in a complete and organized fashion. There should be exactly one representative from each house, along with some of the institute officers present. Moreover, each student should describe the stereotype of his/her own house (the freshman need not be told which student belongs to which house), and then anybody else who wants to add a stereotype not mentioned should be allowed to do so. Freshmen would therefore possess information they deserve to possess before they decide

which houses they prefer.

There is also a second, though related, problem of lesser magnitude. During Rotation week, one often hears upperclassmen stating, "They are all fine houses," who do not believe that all houses are indeed 'fine.' (I'll grant that there are also many who probably do believe it.) People who do not believe it should not be saying so! I feel it is hypocritical for lying to be condoned in the name of rotation. If a freshman asks an upperclassman a question which could warrant such a comment, a simple statement of the institutes prohibitions of comments that present biases would be sufficient.

I reiterate that I agree with the

purpose of these rules. One does not want freshmen to be unfairly biased for or against any of the houses. I assert, on the other hand, that one does not want people to be unfairly trapped in a situation which takes at minimum a few months to rectify. The current rules allow for the latter far too often. Therefore, changes not necessarily limited to what I previously stated need to be made.

Mason A. Porter

Mason A. Porter

TACIT Ready for New Year

by Mark Adler

Aliens, Sluts and Murderers wanted.

Do you sometimes feel like an alien? Have your friends questioned your promiscuity? Did you ever desire to do in your significant other? Now is your chance! Citizens of Crestview from the Fourth World in the Goolagong System and eccentrics from a small Welsh seaside village are needed for TACIT's productions of *Revenge of the Space Pandas* and *Under Milk Wood* this November. Auditions are being held soon.

In addition to the aliens in *Revenge of the Space Pandas*, other roles available include Binky Rudich and Vivian Mooster (students); Bob (a sheep); the Grand Pumpkin Smashing Executioner (a grand pumpkin smashing executioner) and many more.

Auditions will be held for a few remaining voices for Dylan Thomas' poetic play *Under Milk Wood*, directed by Caltech graduate student Maneesh Sahani. The piece is about sound...the sound of the sea, the night, the gossip, the pub. The production will be unstaged with the sounds of the actors and of the town around them enveloping the audience. A couple of the more than 50 character voices include:

Rose Mae Cottage, who lies in the clover with the nannygoats, painting circles of lipstick around her nipples, waiting for someone, anyone, to help her "sin till she blows up."

Mr. Pugh, the school master, who reads the "Lives of the Great Poisoners" at supper and concocts in his imagination devilish potions to do away with Mrs. Pugh.

Actors will play multiple characters, a variety of accents and voices is desired.

There are plenty of backstage positions open for those who would like to participate in either or both productions, but are panic stricken at the idea of being in front of an audience. Set construction (create a unique civilization!), special effects, alien makeup and design, a Pumpkin Smashing Concentration Booth, sound effects, musicians, stage man-

agers, and much, much more are needed.

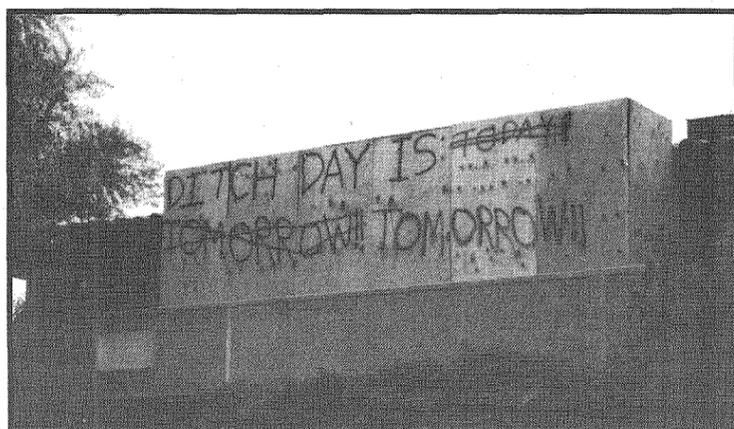
Auditions for both shows are on Friday, September 22 from 6 pm - 9 pm and on Saturday, September 23 from 1 pm to 3 pm in Winnett Club Room 1. You may audition for, and if cast, be in either or both shows! If you have any questions or would like further information, please contact Maneesh Sahani at (818) 793-2879 or e-mail maneesh@vis.caltech.edu.

From Shakespeare to Space Pandas, TACIT does it all...

Some of you who are new to campus may be now asking yourself, "What is TACIT?" T.A.C.I.T. is the catchy acronym for Theater Arts at the California Institute of Technology. For those of you who thought that Caltech was all science and no play, have we got news for you!

Last year TACIT produced shows from musicals to Shakespeare. This year there are no fewer than four productions lined up! Starting off the season will be Pulitzer Prize winning playwright David Mamet's wacky sci-fi comedy, *Revenge of the Space Pandas*. Soon after will be the lyrical "Under Milk Wood" by Dylan Thomas. To give Southern Californians a chill in winter will be the gripping "K2." Ending this terrific season will be the classic "Inherit the Wind."

If you would like to get involved in the theater program, just e-mail: tacit@cco.caltech.edu. Actors, musicians, designers, technicians, stage hands and audience members are always welcome!



Ditch Day is tomorrow, Fresh!

Poster Design Contest

A \$50 scholarship is the first prize in a poster design contest sponsored by TACIT (Theater Arts at the California Institute of Technology). Student artists are encouraged to submit artwork for the fall theater season.

All entries must be the student's original artwork, be 8 1/2 x 11 in size, be black and white (no color), include both TACIT show titles and authors:

Revenge of the Space Pandas
(or *Binky Rudich and the Two-Speed Clock*)

by David Mamet

Under Milk Wood

by Dylan Thomas.

They also must be submitted on or before Monday, October 9th, be accompanied by a page with your name, address, phone number, e-mail address, and a statement verifying that you are a Caltech student and are permitting your original work to be used by TACIT.

Entries should be sent to Diana St. James at 127-72. For more information, please contact Maneesh Sahani at (818) 793-2879 or e-mail maneesh@vis.caltech.edu. Whimsical designs that reflect the nature of both shows will be given preference!

CLUE in to the Web

from Kanna Shimizu

The CLUE's web page is ready. It can be accessed through "http://www.cco.caltech.edu/~clue/clue_95/index.html".

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*Sat-Sun Bargain Matinee

THE POSTMAN
Daily 7:00 p.m.
Sat-Sun Regular Matinee 2:45 p.m.

Question of the Month: Visible Stars

Answered by:
S. George Djorgovski, Associate Professor of Astronomy

Question: How many stars can a person see at night with the naked eye?

Answer: Under ideal conditions, about 3,000 stars should be visible at night with the unaided eye, but many factors can reduce this number.

In the best of circumstances, about 6,000 stars are bright enough to be visible to the naked eye. But of course, only half of these are visible at any one time; no one can see the stars below the horizon.

A full moon reduces the number of stars that are visible. The sunlight reflected from the moon's surface brightens the entire sky and obscures the fainter stars. A similar problem is created by the artificial lights of towns and cities. That's why the telescopes on Mount Wilson near Los Angeles aren't able to see as well as they might; city lights brighten the sky and mask the faintest stars.

Certain atmospheric conditions can also make stars more difficult to see. Smoke from fires, dust kicked up by wind, and high humidity all make stars harder to see. And of course clouds block them out altogether.

So for the best viewing, go out on a dry, clear, calm, moonless night far from the city, and you should be able to see nearly all the 3,000 visible stars.

This is a monthly feature produced by the Media Relations Office at the California Institute of Technology, in collaboration with Caltech's faculty, to answer commonly asked or particularly intriguing questions about science and the natural world.

FOXTROT

by Bill Amend

STUDENTS, BEFORE I PASS OUT YOUR EXAMS, I SHOULD REMIND YOU THAT THIS TEST WILL CONSTITUTE A QUARTER OF YOUR FINAL GRADE, SO GOOD LUCK.

HERE YOU GO, MR. FOX...

HEE HEE... HEE HEE HEE... WAAA HA HA HA HA HA HA HA HA HA HA...

I'M SORRY, I WAS JUST STRUCK BY THE IRONY OF THE LETTER CLIFFS NOTES "A" ON YOUR CAR. UM SIR? DIDN'T MENTION THIS CHARACTER.

WELL, STEVE, IT TOOK AN ALL-NIGHTER, BUT I DID IT.

I MEMORIZED EVERY PAGE OF THIS PHYSICS TEXTBOOK. EVERY FORMULA... EVERY LAW... EVERY THEORY... COULD TODAY'S TEST WILL BE A WALK IN THE PARK.

SERIOUSLY, I MEMORIZED EVERYTHING. EXCEPT MAYBE THE EXAM SCHEDULE.

AAA! TODAY'S THE HISTORY FINAL?!! PHYSICS IS ON FRIDAY.

I WILL NOT BE PSYCHED OUT BY MY MATH FINAL...

I WILL NOT BE PSYCHED OUT BY MY MATH FINAL...

DON'T START THE TEST UNTIL I'VE PASSED THEM ALL OUT.

I WILL NOT BE PSYCHED OUT BY MY MATH TEACHER, EITHER.

HEE HEE HEE...

MISS O'MALLEY? OH? I THINK THIS TEST HAS A MISTAKE IN IT.

QUESTION 2(a) ASKS FOR THE DECIMAL EQUIVALENT OF 1/10. THIS IS WAY TOO EASY.

SURELY YOU MEANT TO ASK FOR THE DECIMAL EQUIVALENT OF SOMETHING CHALLENGING LIKE 1/5.

I STILL DON'T UNDERSTAND WHY SHE WOULD SEND YOU HOME EARLY. WELL, IT WAS RIGHT ABOUT THEN THAT THE PENCILS STARTED FLYING.

IT'S SUMMER VACATION!

94 DAYS WITHOUT A SINGLE HOMEWORK ASSIGNMENT OR TEST!

94 DAYS! THAT'S 2,256 HOURS! 135,360 MINUTES! 8,121,600 SECONDS!

OF COURSE, MY MATH BRAIN WAITS UNTIL NOW TO SHOW UP.

AAAA! I'M DEAD! PAIGE, WHAT'S WRONG?

I HAVE TO GIVE A THREE-MINUTE SPEECH FOR MY SOCIAL STUDIES CLASS ON FRIDAY! THAT'S ONLY A FEW DAYS AWAY!

WHAT WILL I DO? I'M SURE YOU'LL THINK OF SOMETHING TO SAY.

SAY SCHMAY! I'LL TELL YOU HOW TO GET MY CUTE NEW SKIRT DRY CLEANED! PAIGE, THE PHRASE "STYLE OVER SUBSTANCE" WASN'T MEANT TO BE A CREDO!

NICOLE, I CAN'T BELIEVE I HAVE TO GIVE A THREE-MINUTE SPEECH FOR SOCIAL STUDIES CLASS!

MY TEACHER'S GONE INSANE! WHAT IS SHE THINKING?!

HOW CAN I POSSIBLY TALK ABOUT ANYTHING FOR THREE MINUTES STRAIGHT?!

SAYS THE GIRL WHO'S BEEN ON THE PHONE FOR TWO HOURS.

AND LET ME TELL YOU HOW SYMPATHETIC MY MOTHER IS BEING...

WHAT ARE YOU WATCHING? C-SPAN.

I HAVE TO GIVE A SPEECH IN MY SOCIAL STUDIES CLASS ON FRIDAY.

I THOUGHT WATCHING ALL THESE POLITICIANS GIVING TALKS IN NEW HAMPSHIRE MIGHT GIVE ME SOME POINTERS.

GOING THE BROWN-NOSE ROUTE, I TAKE IT.

WELL, I DON'T HAVE TIME TO REALLY PREPARE ANYTHING TOO INSIGHTFUL.

HEH HEH HEH... HEE HEE HEE...

WAA HA HA HA HA HA (COUGH) HA HA HA!

(SNIFF) OH, MAN...

WHY THE ANGRY FACE? I THINK YOUR SPEECH'S OPENING JOKE IS REALLY FUNNY.

THERE IS NO OPENING JOKE!

OK, PAIGE, IT'S JUST A THREE-MINUTE SPEECH. DON'T BE NERVOUS.

DO WHAT DAD SAID: IMAGINE EVERYONE IS IN THEIR UNDERWEAR.

YOWZA! IT'S LIKE A CHIPPENDALES SHOW!

I'VE REALLY GOT TO STOP LISTENING TO DAD.

MISS FOX CAN WE GET THIS STARTED SOMETIME TODAY?

I SURVIVED MY SPEECH! I SURVIVED MY SPEECH!

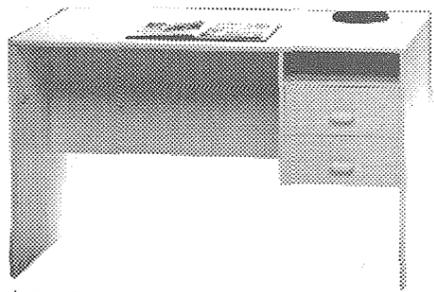
I DIDN'T FAINT... I DIDN'T THROW UP... I ONLY GARBLED THREE OR FOUR WORDS...

MY SPEECH IS OVER! WEEEEEEEEEE!

MISS FOX, IT'S CUSTOMARY TO DO THAT AWAY FROM THE PODIUM.

HEH HEH... SORRY.

When It Comes To Value, No One Even Comes Close.



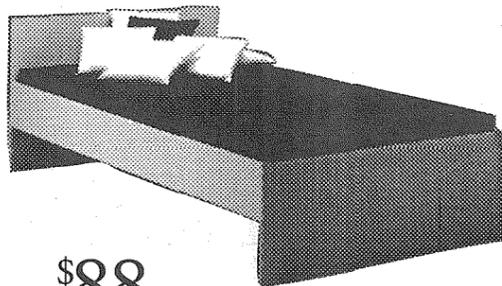
\$79 Danish Desk. Functional and affordable. This Danish desk is just the right size for an apartment. 47.5" w x 27" x 28"h. In all-white, black or white with beech trim, only \$79.



\$29 Low Bookcase. An exceptional value. These quality Danish bookcases are great for storing everything. Low bookcase 27" w x 10" x 33.5" h \$29. High bookcase 27" w x 10" x 68.5" h \$39.



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by Scott Adams



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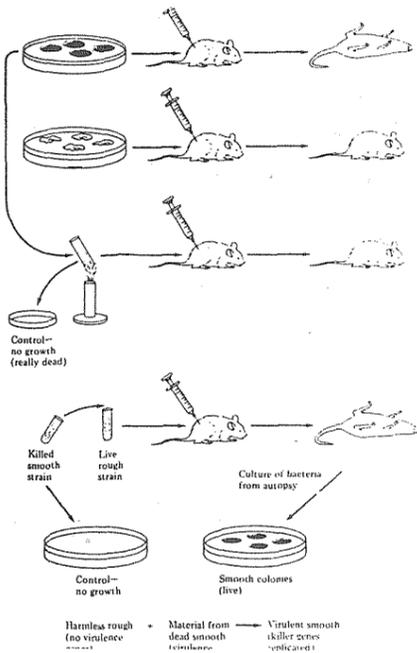
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PA 30 abc. Women's Glee Club. 3 units (0-3-0); first, second, third terms. Prerequisite for PA 30 c: PA 30 a or PA 30 b.. Study and performance of the choral repertoire for women's voices encompassing all styles, all periods. Includes both group and individual instruction; campus and off-campus performances. Instructor: Hubbard.

PA 31 abc. Chamber Music. 3 units (0-3-0); first, second, third terms. Study and performance of music for ensembles of three to seven members. Literature ranges from the Baroque to contemporary eras. Open to students who play string, woodwind, or brass instruments, or piano. Instructor: D. Bing.

PA 32 abc. Symphony Orchestra. 3 units (0-3-0); first, second, third terms. Study and performance of music written for full symphony orchestra and chamber orchestra. The orchestra performs both the standard symphonic repertoire and contemporary music. Two and a half hours of rehearsal per week. Instructor: Gross.

PA 33 abc. Concert Band. 3 units (0-3-0); first, second, third terms. Study and performance of music written for the classical wind ensemble. Emphasis is placed on the traditional literature, but the study of contemporary music is an important part of the curriculum. Instructor: W. Bing.

PA 34 abc. Jazz Band. 3 units (0-3-0); first, second, third terms. Study and performance of all styles of jazz music, from Duke Ellington to Pat Metheny. Jazz improvisation is also stressed. Instructor: W. Bing.

PA 35 abc. Guitar. 3 units (0-3-0); first, second, third terms. Offered on three levels: beginning, intermediate and advanced. Instruction in a strong classical technique, followed by exploration of various styles of guitar—classical, flamenco, folk, and popular. Instructor: Denning.

PA 36 abc. Men's Glee Club. 3 units (0-3-0); first, second, third terms. Classical repertoire from Renaissance to the present day for both men's and mixed voices, often with orchestra. Includes both group and individual instruction. Three hours of rehearsal per week. No prerequisite. Instructor: Caldwell.

PA 37 abc. Chamber Singers. 3 units (0-3-0); first, second, third terms. A sixteen-voice SATB auditioned student ensemble, the Chamber Singers provide costumed entertainments for the Athenaeum in December and perform annually on the All-Mozart Concerts in the spring. One and a half hours of rehearsal per week. Instructor: Caldwell.

PA 61 abc. Silkscreen and Airbrush. 3 units (0-3-0); first, second, third terms. Instruction in silkscreen and airbrush techniques, using a variety of media including T-shirts. Instructor: Barry.

PA 62 abc. Drawing and Painting. 3 units (0-3-0); first, second, third terms. Instruction in techniques of drawing and painting, utilizing models, architecture, and still-life as subjects. Instructor: Barry.

PA 63 abc. Ceramics. 3 units (0-3-0); first, second, third terms. Instruction in the techniques of creating ceramics, including slab roller and potter's wheel, and glazing methods. Instructor: Freed.

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Delores Bing (chamber music) dbing@cco, (213)684-8964
or consult our web page
<http://www.cco.caltech.edu/~musicpgm/instrumental.html>

*Pianists auditioning for chamber music
must be Caltech students

Caltech Cross Country Teams Stalk SCIAC

by Brian Barris

The Caltech Men's and Women's Cross Country Teams returned to campus eager to build on their intense summer training programs. Then 'two-a-days' started, yet they still persevered, and have competed in two meets already in this young season. The first meet was the Whittier Invitational on September 9. Caltech did quite well at this large, early season meet, despite being without top runner Dan Kleinman, who injured himself over the summer and claims to have a friend who stress-fractured his femur. Seniors Tom

Dmukauskus and Tom Meyer placed 1-2 for the Beavers, at 22:29 and 22:33, respectively, for the 6K course. Sophomore Brian Barris was third with a time of 23:18. The Men's A team finished a respectable 11th place out of 17 teams. On the women's side, Cailin Henderson demonstrated her usual dominance and was joined by Gretchen Larson and frosh Phyliss Chen.

Following this success, the two teams traveled to Santa Barbara for the Westmont Invitational on September 16. The motor-pool caravan departed at 6:00 AM, arriving in plenty of time for the men's race to

start at 8:30. The only problem was that the men were scheduled to begin at 9:45. After the wait, during which an ignition key was somehow broken off in the door of one of the cars (Think, Kleinman.), the race finally began. On this day Barris proved to be the fleetest Beaver, with Meyer, sophomore KELROF sensation Brad Nakatani, Dmukauskus, and frosh Conrad "Goose" Ziesler

rounding out the top five. Caltech finished in 3rd place among the 6 competing teams. For the women, Henderson ran a refreshingly free-form course and dominated the field.

Next for the Beavers is the home meet in the Arroyo this Saturday, September 23. It looks to be a banner year for cross-country at Caltech, with Kleinman expected back soon, strong returning runners, and prom-

ising freshmen. Joining Ziesler are Tom "Pepe" Collier and Jeff "Rondell" Mendez. There is also talk of a blazingly fast frosh named Haile Gebreselassie who is expected to join the team soon. So come out to the lone meet of the year within jogging distance of campus, and watch us dedicate the final 200 meters of the course to the memory of Schuyler Cullen.

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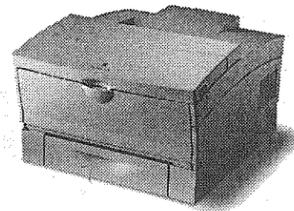
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QUASAR

FROM PAGE 1

where the spectral lines of such sources move toward longer wavelengths, or toward the red end of the visible spectrum. The larger the red shift, the more the light is shifted toward red, and the greater the distance to the source.

The small size of quasars is as astonishing as their luminosity. Studies of the variability of quasars have shown that their brightness can change on time scales of days, or sometimes just a few hours, which

implies that their physical size is not much larger than our solar system. Because of quasars' extraordinary brightness and small size, astronomers suspect that they are probably powered by matter spiraling into a supermassive black hole. But just how quasars form and whether black holes really power them remain a puzzle, one which studies such as the one reported here will help scientists solve.

The Palomar Transit Grism Survey was undertaken with the goal of finding a large number of high-red shift quasars so that scientists could study the evolution of these objects back to a time when the universe was

less than a billion years old. The survey began in 1985 using a special electronic camera designed by James Gunn that was mounted on the 200-inch Hale Telescope at Palomar Observatory.

Finding a large number of quasars was like looking for needles in a haystack and required special software to separate the quasars from superficially similar foreground objects. "For every high-red shift quasar that we found, we recorded and sorted through thousands of nearby objects," Schneider said.

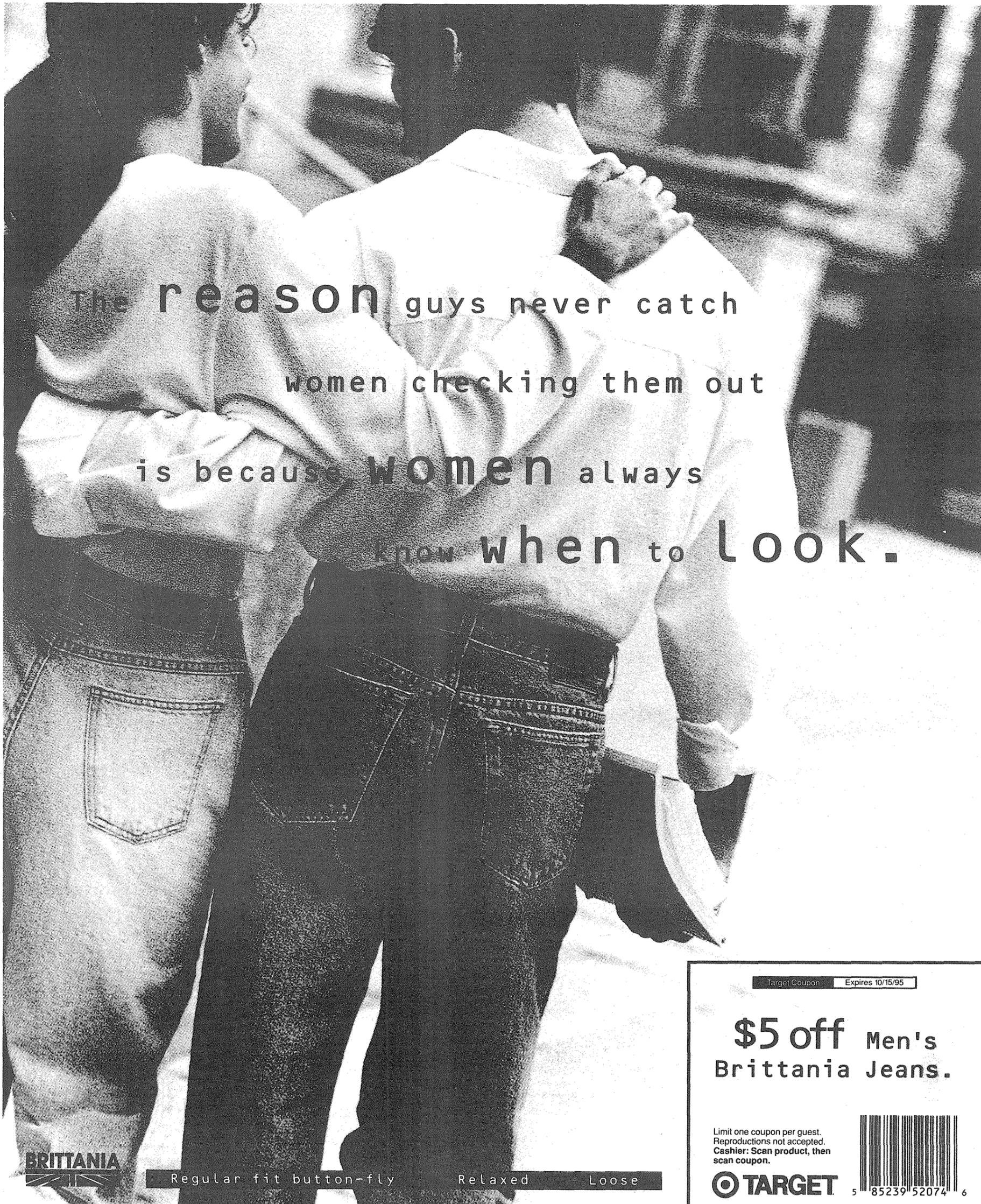
The Palomar Transit Grism Survey succeeded in identifying 90

quasars with red shifts between 2.75 and 4.75, with a typical luminosity more than a trillion times that of our sun. Analysis of the survey data has revealed that between red shifts of 2.7 and 4.7, the space density of luminous quasars declines by a factor of seven. That is, for quasars with red shifts greater than 2.7, the higher the red shift, the fewer quasars there are in a given volume of space.

Previous studies by other groups have shown that the space density of quasars increases dramatically — by a factor of 100 or more — in the range of red shifts between 0 and 2.0. These results, combined with other

studies of quasars with intermediate red shifts, show that the space density of quasars exhibits a sharp peak at a red shift between 1.7 and 2.7, indicating that the bulk of quasar formation must have occurred around 2.5 billion years after the Big Bang. This result will help astronomers refine their theories by placing important constraints both on models of galaxy and quasar formation, and on ideas about the mechanism that supplies quasars with their tremendous energy.

This is a joint release by Caltech and the Pennsylvania State University.



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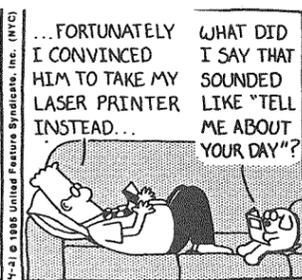
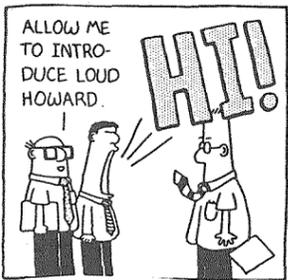
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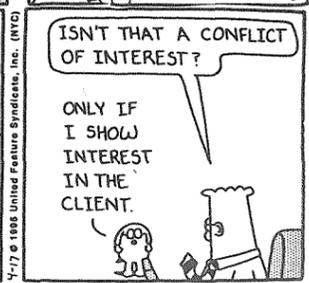
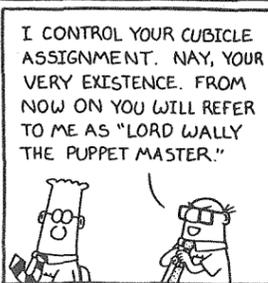


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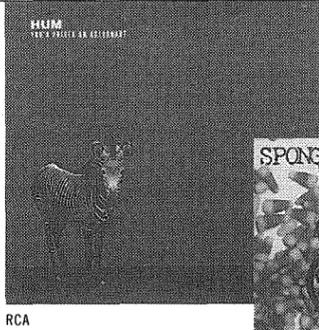
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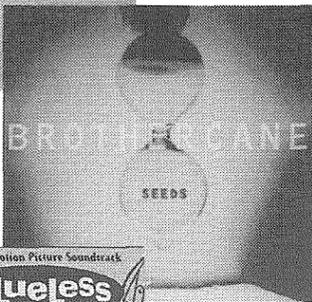
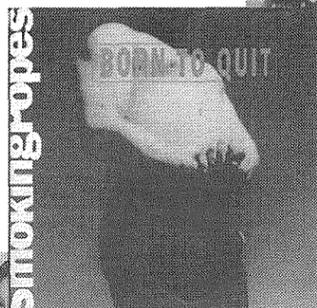
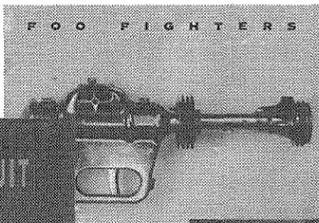


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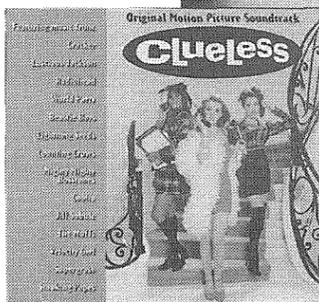
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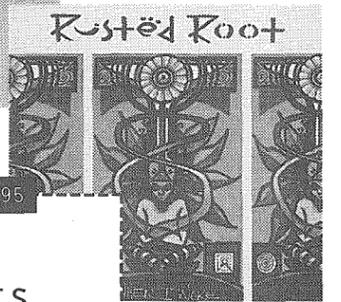
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Caltech #1 in U.S. News & World Report

by Steven Van Hooser

For the second consecutive year, *U.S. News and World Report*

has ranked Caltech first in its "Discount Tuition" category in its "College Best Buys" issue. *U.S. News*, noted for its

yearly list of "America's Best Colleges", ranked schools by considering several factors: the ratio of quality (e.g., the *U.S.*

News rank) to average discounted cost (e.g., cost after need-based grants); the percentage of undergrads receiving need-based grants; the percentage of undergrads receiving merit or other non-need-based grants; and the percentage that a school's total cost has been discounted for the average recipient of need-based grants.

\$3,913.

Rounding out the top five in the "Discount Tuition" category for national universities were Rice University, the University of Rochester, MIT, and Stanford. Among liberal arts schools, Grinnell College topped the list followed by Wabash, Mount Holyoke, Pomona, and Macalester.

U.S. News also included a "Sticker Prices" division in which only the ratio of quality to total cost (including tuition, room, and board) was considered. Brigham Young took the Sticker crown for national universities, and Washington and Lee University took top honor for liberal arts colleges.

The magazine reported that the average need-based grant for Caltech students was \$12,435, with 67% of all students receiving grants. The percentage of students receiving non-need-based accolades was 25%, with the average recipient's awards totaling

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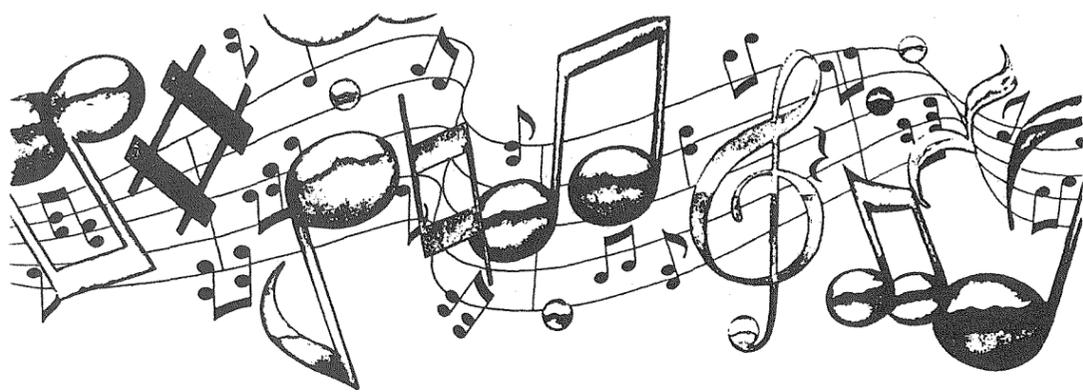
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Further info: x6197, dgc@cco; www.cco.caltech.edu/~musicpgm/dgc/mgc.html



WOMEN'S GLEE CLUB SIGN ~ Ups

Sunday, Sept. 24, 1-4PM
Monday, Sept. 25, 2-5PM
Student Activities Center, Room 1

Undergrads, Grads, Faculty and Staff invited!
Great Music! Great Friends!

For further information contact Director, Monica Hubbard (395-6260 or mhubbard@cco.caltech.edu); President, Jennifer Miller (577-4637 or jam@ugcs); or Graduate Liaison, Kitty Erkkila (X6379 or kitty@cco.caltech.edu) Check out our WWW page at <http://www.cco.caltech.edu/~musicpgm/mhubbard/glee.html>

Kreative Korner

A Life in the Day of Humanity

by Mason A. Porter

The green slime crawled onto the surface;
it foraged and chewed and digested its food.
And the green slime slithered upon the surface;
it beat up its cohorts and enjoyed itself immensely.

And the green slime crawled onto the surface;
it conjugated, masticulated, differentiated, and integrated.

And the green slime slithered upon the surface;
it payed for the privelege of being tortured in hope of future reciprocity.

And the green slime crawled onto the surface;
it ate other dogs, polluted its eyes and its ears, and spread its other wonderfully noxious slime.
And the green slime slithered upon the surface;
it harassed all the red slime, yellow slime, black slime, polka-dot slime, plaid slime, and pollen.

And the green slime crawled onto the surface;
it faded and cracked but still did not receive any Social Security benefits.

And the green slime slithered upon the surface;
it crackled and popped and lost its will and found another and wrote a script for its funeral.

And the green slime tentatively slithered across the surface;
it spoiled its derivatives with preservatives and chronically harkened back to earlier times and body.
And the green slime gradually slid off the surface, only to be replaced by a new and better one;
it ranted and retched, sputtered and inhaled, but did not exhale as it imploded, silent for the rest of eternity.

Kreative Korner Submissions

We at *The Tech* encourage everybody to submit poems, artwork, scripts, etc. for this column. However, we reserve the right not to print any submissions for any reason. Please try to submit as early in the week as possible. All creative writing printed in Kreative Korner will be in turn submitted to *The Totem*. Thank you very much.

-The Editors

Calendar

by Terry Moran

The Calendar section will hopefully be a weekly part of the Tech, hopefully bringing easy access to a diversity of activities and spots throughout the Southern basin that even a local might not know about.

Nails concert that is to be held in Los Angeles at the Forum on October 28th. From the gibe that has been coming from performances that were held in

the East last week, NIN fans shouldn't expect to hear much from Reznor, who still is recovering from his last tour. In the performances already held, the unlikely couple performed a set of duos, followed by Bowie performing songs from his recently released album.

Theater

Andrew Lloyd Webber's seven Tony winner *Cats* returns to the southland for 8 performances only at the Pasadena Civic Center between October 3rd and 8th. Nightly performances will be at 8 p.m., with two matinees on Saturday and Sunday at 2pm. Tickets are limited and are priced from \$39.00 a piece.

Outdoors

The Autumn 1995 edition of the *Outdoors in the Santa Monica Mountains National Recreation Area*, a calendar/guide made available seasonally by the National Park Association which lists hikes, walks, talks and special events for this October through December, is currently available free to all those interested. To get your own edition, either call 597-1036 or write to Outdoors, SMMNRA, 30401 Agoura Road, Suite 100, Agoura Hills, CA, 91301.

Restaurants

The grand opening of Los Angeles owned **Planet Hollywood** was held in all possible pomp last week, leaving in its wake an opportunity for all those hungering for both edible and oracular satisfaction at what is being hailed as the closest L.A. will ever have to a movie museum. Featured in this the twenty-eighth Planet Hollywood are Charles Chaplin's coat from *The Great Dictator*, an ape from the film version of Crichton's *Congo*, *Forrest Gump's* box of chocolates, and much, much more. Often overwhelming, but always enjoyable, the newest Planet Hollywood has been set up in the midst of Beverly Hills—so, if the wait is too long to get a seat at P.H. this weekend, there's always the Hard Rock Cafe right down the street.

Concerts

Tickets go on sale this Sunday for the much-talked-about **Bowie/Nine Inch**

WRITE FOR THE TECH

We're looking for a few good writers. Actually, we're looking for a lot of good writers. Come to think of it, we're looking for a lot of writers, period. No, make that we're looking for anyone that can handle anything from writing to assigning articles to newsmongers to idea makers. So please come to our meeting in the Caltech Coffeehouse on 12:15 on Friday, September 29 and we'll get you working. Truly.

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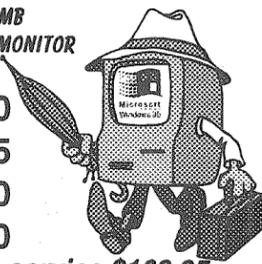
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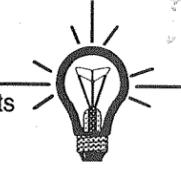
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Announcements

All Announcements are new.

Class Additions & Changes

*CIT **Guitar Classes** for the Fall quarter will meet on Tuesdays starting October 3rd in Room 1 of the Student Activities Center (SAC) as follows: beginning classes will be held from 4:30 to 5:30 pm, 3:00 to 4:00pm for intermediate students, and from 5:30 to 6:30pm for advanced students. Classical and Flamenco repertoires are explored but techniques transfer to other styles of guitar. The Beginning Class includes a jazz/folk chord system. Classes are free to Caltech students and other members of the Caltech community (space permitting). Undergraduates can receive 3 units of credit if they choose. Private instruction on any level can also be arranged. The instructor, Classical Guitarist Darryl Denning has an international background in performance, teaching and recording and can be reached by phone at (213) 465-0881 or by email at: ddenning@cco.caltech.edu

*Three **H&SS** courses have been added to this fall's class offerings. While Ec 161 has been moved to third term, Professor Caroline Fohlin will be teaching Ec 162, Monetary Theory this fall. An organizational meeting will be held on Tuesday at 1:00pm. Professor Martin Ridge is offering H 146, American Biography Tuesday evenings at 7:30pm. H 161, Culture and Society in the English Speaking World, 1660-1830, will be taught Thursday evenings at 7:30 by Professor John Styles, a visiting professor of history from Victoria and Albert Museum in London. This course will consider the cultural dimension of the rags-to-riches transformation in English fortunes between 1660, when England was a minor European country, to 1830, when it had become the dominant European nation and the center of the world economy. A full schedule of courses

to be taught in the Humanities & Social Sciences Department in the 1995-1996 year are available in 228 Baxter.

Notices

*Auditions for the **Caltech Jazz bands, Concert band and Chamber Music Group** will be held in Room 12 of the SAC from 4:30-6:30, 8:00-10:00 on Sunday, September 24th, and 4:00-6:00, 8:00-10:00 Monday, September 25th. All members of the Caltech community are welcome to audition, regardless of previous experience. Please call or write Bill Bing at (213) 684-8964 or wbing@cco for more information.

*The **Caltech Men's and Women's Glee Clubs** and the **Chamber Singers** would like to invite all interested students and staff to join in an exciting year of singing! The Men's glee club and the Chamber Singers, under the supervision of Dr. Donald Caldwell, will meet Mondays, between 7:30 and 9:30; Wednesdays, between 5:00 and 6:00; and Tuesdays between 5:00 and 6:30. Sign-ups will be held in SAC 3 on this Sunday between 2:00 and 5:00 and Monday between 1:00 and 4:00; all members of the Caltech community are invited to join independent of their experience level.

The Caltech Women's Glee Club is now welcoming new members for their 1995-96 Concert Season as well. Sign-ups and an informal audition will take place on Sunday, Sept. 24th between 1:00 and 4:00pm and Monday, Sept. 25 between 2:00 and 5:00pm in Room 1 of the SAC. Regular rehearsals are held on Monday evenings from 7:30 to 9:30 p.m. and Wednesday afternoons from 5:00 to 6:00p.m. in 1 SAC. For further information contact the Director, Monica Hubbard (x6260 or mhubbard@cco.caltech.edu); President, Jennifer Miller (577-4637 or jam@uges); or Graduate Liaison, Kitty Erkkila (x6379 or kitty@cco.caltech.edu).

From the Counseling Center

*The Counseling Center is offering a **Women's Therapy Group For Graduate Students** to begin in the fall term. The group is designed as an expansion of the women's group offered last year which provided an opportunity for women to examine a range of personal and professional issues in a confidential setting. Through the group discussion, women will be able to examine their patterns relating to others, their family and intimate relationships, and challenges they experience in achieving success. If you would like more information or would like to schedule a pre-group interview, please contact the counseling center at ext. 8331 by October 13th. The group will be held on Tuesdays beginning October.

*The Counseling Center's **Gay, Lesbian, & Bisexual Support Group** will meet the first and third Thursdays of every month at 7:30pm in the Health Center Lounge. This confidential meeting is open to all Caltech community members looking for a supportive context in which to address questions and concerns about sexual orientation-including coming out, being out, self-discovery, coping with families... The group begins with a focus topic but moves to whatever is feeling most relevant to the group that night. refreshments are served. For more information, please call x8331.

*The Women's Center and the Counseling Center are co-sponsoring a confidential **Assertion Training Group** for both graduate and undergraduate women. The group will focus on developing assertion skills to be used in professional settings. Goals of the group will include: developing a conceptual understanding of aggressive, non-assertive, and assertive behavior; practicing specific behavioral skills (eye contact, voice projection, body language); strengthening cognitive skills including gaining an understanding of rights and appropriate behavior; and problem solving specific difficult situations. Jan Aura,

Ph.D. and an intern from the Counseling Center will co-facilitate the group which will be held for eight weeks at the Women's Center on Mondays from 12:00-1:00 pm starting October 2nd. If you would like more information or you would like to sign up for the group, please contact the Counseling Center at (818) 395-8331.

Competitions

*Disc Makers is giving a chance in a lifetime for unsigned bands to get signed! The **Disc Makers' 1995 Los Angeles Unsigned Band World Series** is open to all unsigned Southern Californian bands. The six finalist of this competition will be given the chance to perform for music industry's leaders at the Troubadour on November 30th, while the top band will be given the chance to record their album to be mastered, manufacturing, and promoted as a major-label-quality CD (a prize valued at \$10,000). The contest is open to all Southern California bands that submit either a demo or CD by November 9th, along with a \$15.00 cover charge to: Disc Makers' 1995 Los Angeles Unsigned Band World Series, 213 W. Alameda, Suite 101, Burbank, Ca 91502.

Fellowships and Scholarships

The Financial Aid Office has applications and/or information on the following and additional undergraduate scholarships. All qualified students are encouraged to apply. Our office is located at 515 S. Wilson, second floor.

*The **National Hispanic Scholarship Fund** is offering awards ranging from \$500 - \$1,000 to full-time undergraduates who are of Hispanic parentage and who are U.S. citizens or permanent residents. Applicants must have completed at least 1 term of study and, to be competitive, should have a GPA of 3.0 or higher. Applications are due **no later than October 1, 1995**.

*The **California Park and Recreation Society Aging Services and Activities Section** announces its scholarship competition. Undergraduates and graduates may apply for the \$250 awards. Applicants need to be full-time students in the areas of recreation, leisure studies, or in an aging-related field. Applicants also must have GPAs of 3.0 or above and must have financial need. The deadline to submit applications is **November 30, 1995**.

*The **American Concrete Institute (ACI)** is offering several awards. The Peter D. Courtois Concrete Construction Scholarships are two \$1000 awards for undergraduate study in

concrete construction for the 1996-97 academic year. Eligible students must be enrolled at least half-time and must be seniors in 1996-97. The application, available at the Financial Aid Office, with all required supporting documents is due **January 15, 1996**. The **ACI James Instruments Student Award** in the amount of \$800, for original student research on non-destructive testing of concrete. Applicants must submit a technical paper describing the research. The award is open to undergraduates or graduates, and the research work must have been completed within two years of the submission date. Completed technical papers must be received by ACI Committee no later than **November 30, 1995** at the following address: c/o Dr. Allen Davis, Madsen, Kneppers and Associates, 9 East Exchange Place, Suite 900, Salt Lake City, UT 84111, (Telephone (801) 533-2888). **ACI** is also sponsoring three different competitions: the Concrete Cube Competition, the Concrete Egg Protection Device Competition, and the Concrete Projects Competition. For complete rules, call the ACI Education Department, at (313) 532-2600.

*Applications are available in the Deans' Office, 102 Parsons-Gates for the **Churchill Scholarship Program**. The one-year graduate study award is available to graduating seniors and graduate students. It includes full tuition, \$6,000 living allowance for a full-year program, and a \$500 travel allowance. At current exchange rates, the value of a Churchill Scholarship is approximately \$20,000. Churchill College is a predominately engineering and science-oriented college at Cambridge University. Applicants must be U.S. citizens between the ages of 19 and 26. The deadline to submit a complete application to the Deans' Office is November 13, 1995. Caltech can nominate two candidates to the Churchill Foundation.

*The **Harry S. Truman Scholarship Foundation** awards scholarships to juniors who have outstanding leadership potential and intend to pursue careers in public service. If interested, please stop by the Deans' Office, 102 Parsons-Gates for more information.

*Looking for outside scholarships to assist with the cost of your Caltech education? Check out the **Fund Finder** in the Caltech Career Center. There are more than 3,000 listings for both undergraduate and graduate study opportunities. The Career Center is located in Room 8 of Parsons Gates and is open from 8-12 noon and 1-5pm, Monday - Friday. The Fund Finder is a free service provided by the Caltech Financial Aid Office and Career Center Office.



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