



Gravity Lens Found

Caltech News Bureau

Using a systematic astronomical surveying technique, that combines radio and optical telescopes, scientists have found a faint and distant new gravitational lens system. A triple radio source known as 2016+112, this new system is only the fourth "lens" ever found and the first found by systematic search using the techniques of radio astronomy. The triple source consists of a double image of a distant quasar, and a much closer galaxy, whose gravitational field splits the single quasar image into two. The study of this and other gravitational lenses is expected to provide important clues for solving a number of cosmological mysteries, including the size and age of the universe.

The discovery (and the procedure used to make it) was the product of a collaboration of astrophysicists from three institutions. The scientists involved are Charles R. Lawrence, Donald P. Schneider, and Maarten Schmidt of Caltech; Charles L. Bennett, Jacqueline N. Hewitt and Bernard F. Burke of MIT; and Edwin L. Turner and James E. Gunn of Princeton University. Their work is reported in the January 6, 1984 issue of *Science* magazine.

In the universe, scientists have found that light from a distant source, such as a quasar, is bent by the gravitational field of an intervening galaxy. This lensing effect results in several images of the quasar reaching the observer and also causes the apparent brightness of the quasar to be magnified. (Einstein's theory of general relativity predicts that light will be bent by the gravitational field of a massive object. This effect has been observed during an eclipse for starlight passing near the sun during the eclipse.)

The newly discovered lensed object shows up as two com-

ponents of the triple source 2016+112. It is the most distant of the four lensed objects that have been discovered to date. It is also the faintest quasar ever observed spectroscopically and would probably have been impossible to observe optically without the magnification that accompanies lensing. Its redshift was found to be 3.27. This indicates that the light we observe left when the expanding universe was 4.27 times smaller than it is now.

The third component of 2016+112 appears to be a massive galaxy, at a redshift of about 0.8, that apparently is providing the lens for the distant quasar.

The new object is much like a normal quasar, except for the narrowness of the spectral lines, which may mean that it represents a previously unknown class of astronomical objects. "Distinctions between quasars, Seyfert galaxies, radio galaxies, and other active galactic nuclei are often blurred; even so, the lensed object does not fit neatly into any category," the scientists reported in *Science*.

Gravitational lens systems are extremely rare; 2016+112 is only the fourth lens system discovered. The Princeton astrophysicists estimate that from two to five of every 1,000 quasars will be lensed.

The procedure that enabled the scientists to find the new lens system begins with the MIT-Green Bank survey, which uses a 300-foot telescope at the National Radio Astronomy Observatory, at Green Bank, West Virginia, to discover and to catalog thousands of sources in the sky. High-resolution maps are then obtained from the NRAO's 27-antenna Very Large Array near Socorro, New Mexico. The original radio maps are made at six-centimeter wavelengths; once some good candidates are identified the scientists go back to

the VLA and look at these candidates at a different wavelength. This procedure eliminates another three-fourths of the sources. The scientists then examine photographs of these to determine if the radio sources have optical counterparts. This narrows the field further. The spectrum of each surviving candidate is then taken to establish whether the light is coming from the same source (quasar). This final analysis is done using Caltech's 200-inch Hale Telescope at Palomar Observatory and the Prime Focus Universal Extragalactic Instrument (PFUEI), developed jointly by Caltech and Princeton. The combination is the most powerful optical instrument in existence for the study of faint or distant objects.

Since the objects that are lensed are usually quasars, scientists may be able to determine whether the large redshifts they exhibit reflect their distances as is usually assumed. Lensing may also provide a powerful tool for investigating the distribution of mass in galaxies and clusters of galaxies because it depends on gravitational fields and not on radiation emitted by the intervening object. This could allow scientists to study the "dark material" in the universe, which is believed to be a large component of its mass. By studying the gravitational effects of this matter, scientists hope to gain more insight into its nature. Other interesting questions that may be answered in addition to the size and age of the universe include whether it is open or closed and the value of the cosmological constant, a factor that influences the large-scale motions of the universe.

The scientists expect progress on these questions to be significantly aided by study of a variety of gravitational lens systems. Scientists involved in the search for 2016+112 are confident that their new survey technique will find many more of the elusive objects that may open new windows on the universe.

Beethoven, Beautiful

By Chris Meisl

Joanne Kong and Paul Hanson gave a beautiful, albeit long, piano recital to a packed Dabney lounge last Sunday. Around two hundred concertgoers listened to the performance, with a string of latecomers standing at the back.

During the first half of the all Beethoven recital, Kong played the 38 Variations on a Waltz by Anton Diabelli. This work is Beethoven's response to Diabelli's idea that all the top Austrian composers write a variation on his theme. Impressed not only by the quantity, but also by the quality, Diabelli later wrote that the work rivalled Bach's numerous

variations on the Royal theme. Although little can match the genius of Bach's six-part fugue, Beethoven's "brilliant variations" come close, and surely require as much technical skill to execute.

Such technical skill is exactly what Kong demonstrated. Even though the audience was somewhat tired after 45 minutes of uninterrupted, Kong received a long and well-deserved applause.

After a relatively brief intermission, Hanson came out and played the "Hammerklavier." This is Beethoven's longest sonata, composed in what he called "distressful circumstances." Listening to Hanson's fantastic

performance, however, Beethoven must have been in top form. Of special note is the unusually rapid Largo (solemn movement) which includes excellent examples of free improvisation. The entire sonata lacks the formality of Beethoven's earlier works, although the most general design is the same.

Again the end was marked by an extensive applause, after which the tired audience ventured home. The program was very long, but the excellence of the performance made the concert too short.

The third event in this season's Dabney Chamber Concert Music series will be held on Sunday, February 5, at 3:30 pm, when guitarist Darryl Denning plays classical, flamenco, and Renaissance works.

Theft in the Houses

Two Criminals Caught in Ruddock

By Dave Fun

During finals week last term, a stranger was observed in a room in Ruddock House. He was detained and turned over to campus security for questioning.

His responses led security to a parked car on San Pasqual Street, which was filled with stereos, cameras, keys and other expensive items. The fact that these objects matched the description of items that had been reported stolen on campus gave security probable cause to search the car.

Some of the items found were positively identified later as having been stolen from Caltech undergraduates. The stranger and a companion found in the car were subsequently arrested on the basis of this evidence.

It was later found that these two men have had a documented history dating back to February, 1982 of trespassing on Caltech grounds. They are presently in police custody awaiting trial.

Survey Finds It Costly but Avoidable

By Deb Kremer

The table on page 2 shows the results of a theft questionnaire that undergraduates were invited to answer recently. The purpose of the questionnaire was to gather information about the occurrence and objects of theft in undergraduates' lives here on campus. The houses are invited to treat their results individually. For purposes of this article the totals at the far right will be used to draw observations.

The total number of Caltech years represented by the questionnaire participants is 661, an overestimate since freshmen were credited with one year, etc. Hence, the average participant has been at Tech for 2.1 years. These data yield a lower bound for the theft probability of 0.23 thefts/person-year. This number may be larger or smaller for you depending on which house you live in.

Some clarifications that should be pointed out are:

continued on page 2

Implications of Defense Work to Be Discussed

Caltech Philosopher Brian Barry and two physicists will discuss the moral implications of careers in defense work at a program in Baxter Lecture Hall next Wednesday, Jan. 18 at 7 pm.

The program will be moderated by Caltech President Marvin Goldberger. Joining him and Professor Barry on the panel will be Dr. C. I. van Hudson, a physicist and defense consultant; and Dr. Charles Schwartz, a professor

of physics at U.C. Berkeley and an outspoken critic of university involvement in weapons research.

The panel discussion, co-sponsored by The Caltech Y, is part of a free public education series entitled "The Fate of the Earth: Human Values in the Nuclear Age."

The series is being produced by Karen Litfin for L.A.'s Immaculate Heart College Center; by the Alliance for Survival; and by the California Council for the Humanities.

Right Brain Lab is Back

The Right Brain Laboratory, a popular Friday afternoon diversion sponsored by The Caltech Y last term for undergrads and graduates, returns this term for another round.

Cynthia Corngold, who presides over the loosely-structured expression of artistic signals from the right hemisphere, says that participants will be brought up to creative speed at the beginning of each lab by a series of exercises.

"These exercises," she says, "are designed to free the powers of imagination. That done, we'll proceed to evoke the creative potential that lies

curled up on the artistic side of the brain, the right side."

Techers do fine on the left side, Ms. Corngold notes approvingly, but points out: "For full human functioning, both the left and right hemispheres are necessary."

Participants in the RBL should come prepared to play and relax, Ms. Corngold says.

"You need not know how to draw, and there are no grades or assignments. It's all relaxing self-expression—good therapy after a long hard week of classwork."

The lab is scheduled from 3 to 5:30 each Friday in the workroom of The Caltech Y.

90% of Room Thefts Through Open Doors

	Ruddock	Lloyd	Page	Fleming	Dabney	Blacker	Ricketts	Annex	Totals
Number of People Responding	82	36	70	37	21	27	38	6	317
Reporting Multiple Thefts	9	0	3	2	3	1	3	0	21
Reporting No Thefts	44	29	50	23	5	14	18	5	188
Total Number of Thefts	51	7	24	16	15	14	23	1	151
Property Stolen									
Bicycles	17	2	5	6	7	4	4	0	40
Wallet	15	2	7	4	5	3	4	1	39
Portable Radio	2	0	1	0	1	2	2	1	8
Camera	2	0	0	2	0	0	1	2	7
Watch	5	0	1	1	0	0	1	0	8
Other	14	3	10	4	5	9	18	0	59
Number of Thefts									
In Rooms	24	2	11	3	8	7	8	1	64
In House but not in Room	19	3	7	6	3	5	11	0	54
Outside House	8	2	6	7	4	2	4	0	33
Reported to Security	47%	29%	46%	38%	53%	34%	52%	100%	46%
Percentage of Room Thefts									
With Unlocked or Open Doors	96%	100%	91%	100%	100%	93%	100%	100%	97%
Number of Assaults or Other Threats									
	3	4	1	4	3	0	1	0	16

locked and shut room doors. Unfortunately, locked and shut room doors may not be an obtainable reality for 100% of the campus. Making the houses' hallways and enclosed courtyards secure from intruders, however, would eliminate an even greater number of thefts without necessitating that room doors be locked shut. The chart indicates that about as many thefts occur in the houses outside of rooms as do thefts in rooms.

A more humorous observation that can be made from the questionnaire results is that any particular intruder could live on Caltech booty. Think of it... food, clothing, money, music, transportation, warm places to sleep, and many fenceable items.

Lastly, it is evident that less than 50% of all thefts get reported to campus security. This has a bearing on patrolling routines of the officers, the recoverability of your stolen property, and the ability of campus security to know what to look for on a suspect.

I would like to thank everyone who participated in and helped conduct the questionnaire and encourage further discussion on this subject. The scope of this questionnaire was limited to on-campus undergraduates.

from page 1

1. bicycle thefts occurred almost exclusively outside of students' rooms, and thieves took locked and unlocked bicycles equally; 2. most threats and assaults to Techers occurred off-campus on walks to and from grocery shopping and night strolls through nearby neighborhoods; 3. the "other" category consists of property such as backpacks, food, laundry, bicycle parts,

keys, car covers, and personal items easily picked up in a student's room.

A few conclusions may be drawn. First, if the average value of bicycles can be placed at \$200 each, then we can see that the average undergrad loses \$12 per year due to bike thefts alone. Campus-wide the bike theft problem alone is a hidden cost to the students of approximately \$3800 per year.

Second, over 90% of room thefts could be avoided by

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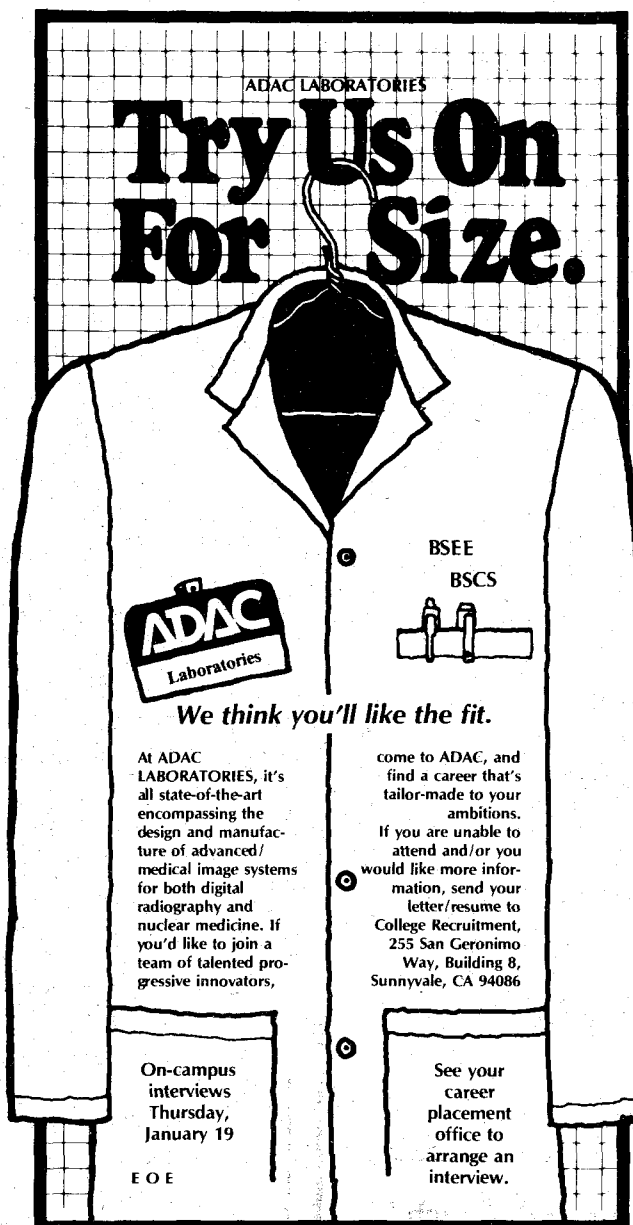
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On-campus interviews Thursday, January 19

E O E

See your career placement office to arrange an interview.

THE CALIFORNIA TECH

Volume 85 Number 13
Friday, January 13, 1984

Published weekly except during examination and vacation periods by the Associated Students of the California Institute of Technology, Inc. The opinions expressed herein are strictly those of the authors and do not necessarily reflect those of the editors.

Letters and announcements are welcome. Included with all contributions should be the author's name and phone number and the intended date of publication. The editor reserves the right to abridge letters, so please keep them concise.

Turn in copy to the Tech office mailbox, room 107 Winnett. The deadline for copy is Wednesday evening at 8:00 pm. Late copy may not be printed unless previous arrangements have been made with the editor.

Editor in Chief Ken Whang
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The offices of the California Tech are located in Winnett Center on the Caltech campus.

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Business Manager: Room 107 356-6154
Production: Room 115 356-6153

The California Tech, 107-51 Caltech, Pasadena, CA 91125
Printed by News-Type Service, Glendale, California.

Subscriptions should be directed to the attention of the circulation manager.
\$6.00 per year (three terms)
\$100.00 per life ISSN 0008-1582

The Body Shop

Keep Drinking

Maintenance of water balance in the body is essential, especially in warm, dry climates and when viruses are circulating.

As a nutrient, water is the second most essential, oxygen being the first. 70 percent of the human body contains water and it can only last for four days without it, in contrast to most other nutrients where effects of deprivation may only occur after weeks or months.

Its functions are all vital. Water is an important regulator of body temperature, allowing heat to escape when perspiration occurs. It also contributes as the major component of the transport systems of the body, blood being 80 percent water. Blood and lymph fluids carry other essential nutrients including products of digestion and oxygen to where they are required by the body. Fluids also protect and lubricate, especially in the oral and nasal cavities and at joints to prevent friction. Fluid provides a cushion for the intestines and other body tissues.

Water is equally important

in the excretion of waste products and can prevent severe toxic states from forming due to inadequate removal of wastes from the body.

The average adult can maintain water balance (that is equal ingestion and excretion) with approximately ten cups of fluid a day. Water can, of course, be substituted for other liquids such as juices, lemonade, tea and broth. However, even drinking six cups will be sufficient as food and the products of digestion will usually provide the remainder.

Thirst is not always an accurate indication of the body's needs. For example, with exercise the body needs 2 percent more fluid than your thirst tells you.

A good rule would be to ingest three more cups of liquid a day than our thirst tells us. Leading busy, rushed, strenuous and athletic lives we may be less susceptible to ill health through as simple a measure as drinking more water.

—Miki Goodwin, R.N.
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- A creative thinker.
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P.S. If you know someone who might be interested in this job and who could fit these qualifications, please tell them about this opportunity.

The Inside World

Blacker: This week, the president of Aird House received the following letter:

Mr. President,
If u evr want to c Naome agin, bern all yor telephon buks and leve \$1000 in penuts and Tiki Punch in yor malbox by Satrday,
Well let me tell you, mister Head Gopher, the members of Aird House do not succumb to blackmail! (Yea!) And that goes for kidnapping too! (Yea!) You gophers have gone too far this time, and we will *not tolerate it!!!* Prepare yourselves, for Friday night we storm your stronghold to liberate our beloved Naomi!!!!!! — *Sigmund B. Fernmeister*

Dabney: No entry.

Fleming: Welcome back. The Poly-Party was a great success (thank you Jordis!). Final Score at the Stephens-Zanelli/Myers-Fenderbender Purity Challenge: 0 to 0. House meeting was appropriately capped by X-mas tree burning.

Second term Social Calendar includes Super Bowl Sunday, Ski Trip, Road Trip to Vegas (?), and 3-house party against Page and Ruddock.

Congratulations to new members Robin Whitt, Andy Tikofsky (from Page), Mike Rhodehamel (from Ruddock), and Mark Wiczorek (from Page). Current Scoreboard:

FLEMING	PAGE	RUDDOCK
4	-2	-1

any others?

Janice and Sarah: 1 month late for Interhouse Swimming. Try again next year.
Elections in 3 weeks. Egg for President.

— *Al Fansome*

Page: No entry.

Lloyd: No entry.

Ricketts: Hello, and welcome to Ricketts House, land of Jigsaw Puzzles, Jacks (Do you remember how to play jacks?), Towing services, and bogus Ph2 quizzes. Since your faithful reporter has taken an extended Xmas vacation there is much to go over. First, last term ended with a period for settling old accounts when the juniors finally finished showering Dave in the record time of 2 years, 63 days, and 1 hour, also the Frosh finally got the guts to shower me. Now on to the present, this term first jacks and jigsaw puzzle joined the traditional bridge game as lounge time-sinks (Anyone knowing the whereabouts of 1 totally black puzzle piece please report to the lounge and give it back). For any sophomores still worried about the Ph2 quizzes that weren't due this Monday, don't. The Ricketts Towing Co. satisfactorily completed its first job by moving a Volkswagen with four flat tires so that it would not get ticketed by the PPD for parking in the yard of 360 S. Holliston; note: from now on parking is officially forbidden in the gym. Finally, just in case anybody *survived* missed it, yesterday was meet Clea day.

— *Bob Bolender*

Ruddock: The social event of the week was the Courtyard (oops!) Picnic held on Saturday. Attendance was high; even the laziest of Rudds showed up for the free grub.

Meanwhile, in the Ruddock Dining Hall, the Alley 5-Sun God Alley Challenge was held. In the extremely physical & emotional game of penny hockey, the awesome studs of Alley 5 clobbered the stumbling wimps of Sun Clod, 6-1.

Later that day, Trojan Alley challenged Grand Central in yet another test of strength and agility, poker dice. Despite gallant efforts by RA's Rick & Deb, the Trojan Alley prevailed, 50-40. (After all, it's really their type of game...) By the way, the place was left a mess afterwards... come on guys, dump them beer bottles!!!

— *Bubba-Loo*

Caltech Presents

"Mysteries of the Leaping Fish," "A Modern Musketeer" and "The Iron Mask" will screen in Ramo Auditorium, Thursday, January 19 at 8 pm.

This is the fifth in a series of six evenings devoted to the films of Douglas Fairbanks. It is a comedic look at the drug scene of the period.

"A Modern Musketeer" was thought to be lost at one time. It features Fairbanks in many stunts and special effects.

"The Iron Mask" is the sequel to Fairbanks' "The Three Musketeers." Fairbanks plays D'Artagnan who, together with the Three Musketeers, saves France from the domination of a nobleman who seeks to substitute a cruel twin brother for the rightful king.

Robert Israel will accompany the films on the theater organ. Caltech student ticket price is \$2.50 with a Caltech student I.D. They are available at the Caltech Ticket Office, just north of the Beckman Auditorium parking lot. For information, call campus extension 4652.

The Bayanihan Philippine Dance Company will appear Saturday, January 14 at 8 pm in Beckman Auditorium.

Reflecting the islands' Arabic, Malayan, Chinese, and Spanish influences, as well as the customs of the indigenous tribes, the company presents a variety of theatrical portraits and dances. Twenty-eight dancers and twelve musicians make up the company.

Bayanihan as an art form was renewed as a result of a revival of interest in Philippine folklore. In 1957 the Bayanihan Folk Arts Center was established to research and present the dances and culture of the Philippine islands.

Caltech students prices to this events are \$7.00-\$6.50-\$6.00. They are available at the Caltech Ticket Office, just north of the Beckman Auditorium parking lot. Students must show their Caltech I.D. to take advantage of the discount prices. For further information, call campus extension 4652.

Robin Lee Graham will personally narrate a presentation about his adventures in the Northern wilderness and at sea, tonight at 8 pm in Beckman Auditorium.

Graham's talk will be highlighted with color slides and National Geographic illustration. His adventures in the Northern Wilderness are featured in his most recent book, "Home is the Sailor."

At the age of 16, Graham began his round-the-world voyage from Honolulu. He spent five years in the 24-foot sloop "Dove." His adventure has been chronicled in three articles in National Geographic, in the book entitled "Dove" and in a Paramount movie by the same name.

Tickets for this event are priced at \$6.50-\$5.50. They are available at the Caltech Ticket Office, just north of the Beckman Auditorium parking lot. For further information, call campus extension 4652.

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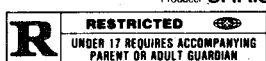
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Proposed ASCIT Amendments Explained

Following are ASCIT's descriptions of eight proposed amendments in the ASCIT bylaws to be voted on this Monday. The exact text of the changes should be available in the student houses.

AMENDMENT 1: Changes in the Elections Procedures

Many of you can remember the string of run-off elections which usually accompany ASCIT elections. With each run-off election fewer and fewer voters show up to the ballots making the results of the last run-off, the crucial one, almost a joke. Therefore, we (the ExComm and the BOD) have proposed the elections changes contained in Amendment 1. While it appears to be much more complicated than the present system it will mitigate many problems created by the present system, will eventually make things easier for voters, the elections chairman, and the candidates by eliminating the numerous run-offs, and offers the following major features:

1. Stricter nominations procedure will prevent nominations without the nominee's knowledge. (Article VIII, Sect. 1)

2. An absolute majority of valid, non-no votes is required for victory in the first election. (Note that if 'No' gets a plurality, the office is vacant—this is the purpose of the 'No' vote. Only if 'No' loses are those votes then separated out, since the focus then is finding a majority of the votes cast for candidates.)

3. No more than two elections needed. (Article VIII Sects. 2, 6, 7)

4. No more than three candidates in second election, and only if third candidate not too far back. (Article VIII Sect. 5)

5. System used in final election:
a) Voters circle (or write in) preferred candidate, and/or cross out least preferred. (More flexible than now, whether two or three candidates.) b) If a majority prefers a candidate, that candidate wins. c) If not, the one most [preferred minus disliked] wins. (Article VIII Sect. 6)

6. Have one frosh and one upperclass Director at Large, instead of the current confusing and essentially equivalent scheme. (Article V Sect. 1)

7. If an exact tie in final election, go back to first results. (Article VIII Sect. 7)

AMENDMENT 2: Removing References to Gender in the By-Laws

When the ASCIT by-laws were written the student body was all-male. This is clear by the use of only masculine gender when referring to officers and students. When women were admitted to Caltech no attempt was made to remedy this situation. This year, however, 4 of the 9 members of the BOD and almost 20% of the student body are female. Last year the BOD responded to this by removing references to gender from the Honor System booklet. This year the BOD proposes to do the same with the By-laws through the simple changes proposed in Amendment 2. Without these changes the By-laws are presently old-fashioned and inaccurate.

AMENDMENT 3: Dues Non-refundable After Add Day

It is very difficult, when planning quarterly expenditures, to be faced with requests for ASCIT dues refunds which arrive late in the term. Therefore, the BOD proposes that ASCIT dues be nonrefundable after add day. This will make it easier to prepare a quarterly budget and will also put ASCIT dues on the same pay schedule as tuition which is also 100% nonrefundable after add day. *ASCIT dues, however, will be fully refundable before add day.*

AMENDMENT 4: Delineation of Fiscal Year

The ASCIT year begins on March 1, but this amendment delineates more clearly when the fiscal year ends, especially in leap years.

AMENDMENT 5: Preservation of the Undergraduate Research Opportunities Handbook

This amendment is designed to insure the future publication of the Undergraduate Research Opportunities Handbook by making it an official ASCIT publication and by delegating the responsibility of publishing the book to the Directors at Large.

AMENDMENT 6: Change in Voter Qualification

This amendment makes it possible for any registered undergraduate to vote for the offices of BOC Chairman, BOC Secretary, and IHC Chairman.

AMENDMENT 7: Update of The California Tech Commissions

In 1968, The Tech's national advertising representative (who arranges the large, high-revenue ads from national companies) raised its commission from 32% to 37%. Because the bylaws at that time specified only a 35% commission, they were modified to allow a maximum 40% commission from which the 37% could be deducted. Since that time, the rep's commission has been raised to 47%, which means that technically the net commission is -7%! (The Tech has little choice but to accept these increases: national ads account for 30-40% of the Tech's ad revenue, but the Tech is one of the rep's smaller clients.)

This amendment is intended to permanently correct this problem regarding commissions on national ads. The net commission before the later increases had been 3% of the gross cost of the ad (approximately 5% of the net). Since the Tech receives a check for the net amount, not the gross, calculating the commission is easier if based on the net.

This amendment also affects how commission is computed for ads not

placed by national advertising representatives. Advertising agencies deduct 15% from the gross cost of the ad for their commission. The net commission in this case is 20% of the gross (-23.5% of the net). Ads received directly from advertisers have no external commission, so the net commission is 35% of the gross (-35% of the net). Setting the commission to be 30% of the net amount, whether direct or through an agency, will simplify the computation process: both ads are done the same way, and on the check amount. Since there is usually more direct ad revenue than ad revenue, the decreased direct commission (-5%) will offset the greater increase (+6.5%) in the agency ad commission. The total net commission may be reduced, but so has the work required to compute it.

AMENDMENT 8: Change in Tech Commission Distribution

This amendment changes the split between the business manager and the editor of the total commission. In 1967, when the split originated, the editor's salary was \$300 and the split occurred at \$600. In 1973, the editor's salary was raised to \$600 (+100%) but the split only to \$800 (+33%). In 1977, the editor's salary was raised again to \$900 (+50%) but the split was untouched.

Since the editor's salary was tripled since 1967, and commissions are about three times the amount they were then, the \$800 is seen as an aberration and the new split is proposed for \$1800 (three times the original \$600).

The final sentence adds to the bylaws a policy the Tech has used in recent years: when the person in either office changes during the fiscal year, the split is adjusted accordingly. For example, if a business manager earned \$1000 in commissions by the end of third term and then quit, he would not receive all of the \$1000, but only a portion of it; the remainder would go to the editor(s) who served during that same period.

The business manager's guaranteed commission should read "\$1200," not "\$1800." As it is, the amendment would give the business manager double the editor's salary. Please vote against it.
— The California Tech

VOTE NO ON AMENDMENT 8

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Time: 4:00-6:00 P.M.

Place: Winnett Lounge

(refreshments will be served)

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Weekly Sports Calendar

Sat.	1-14	10:00 am	Swimming (M)	U.C. Riverside	Caltech
Sat.	1-14	10:00 am	Wrestling	Caltech Invitational	Caltech
Sat.	1-14	6:00 pm	Basketball (JV)	Occidental	Occidental
Sat.	1-14	8:00 pm	Basketball (Varsity)	Occidental	Occidental
Wed.	1-18	4:00 pm	Wrestling	Univ. of La Verne	Caltech
Wed.	1-18	6:00 pm	Basketball (JV)	Whittier	Caltech
Wed.	1-18	8:00 pm	Basketball (Varsity)	Whittier	Caltech
Wed.	1-18	9:45 pm	Hockey Club	UC Irvine '82	UCI '82
Sat.	1-21	10:00 am	Swimming	Whittier & C.M.S.	Caltech (M/W)
Sat.	1-21	10:00 am	Wrestling	SCIAC Dual Meet	U. of La Verne
Sat.	1-21	6:00 pm	Basketball (JV)	Claremont-Mudd	Clare-Mudd
Sat.	1-21	8:00 pm	Basketball (Varsity)	Claremont-Mudd	Clare-Mudd

Tech Greater Than LIFE

by Ath Man at Large

The Caltech basketball team increased its record to 6-2 with a 63-55 victory over LIFE College last Friday before falling to Pomona-Pitzer, 96-48, in the league opener on Wednesday.

The Beavers played exceptionally well in some stretches of Friday's game, gaining large leads in each half. LIFE came back both times, however, and pulled to within 58-55 with

just minutes to play. The Beavers prevailed, however, as fine play by Bill Gustafson and free throws by Stewart Peebles and Dave Wertz clinched the victory.

Peebles finished with 17 points and 10 rebounds, a performance which, when combined with his effort against Christ College, was enough to get him named as the NAIA District III Player of the Week. Ed Zanelli and Jim Helgren, numbers one and two in District III scoring, netted 15 points each, and the large crowd of Beaver rooters went home happy again.

Caltech was outclassed against the big, deep Pomona squad, but the Beavers worked hard and did not make as many of the stupid mistakes that have plagued them in league games in previous years. Bill Gustafson rebounded well, Chris Kyriakakis shot effectively from outside, and Ed Zanelli handled the ball well against Pomona's pressure defense.

Cricket Win

By Cricket Reporter

In their last game of 1983, The Caltech Cricket Club beat PCC in a close encounter. In reply to Caltech's 40 runs, PCC was bowled out for 38.

Caltech was playing without a number of regular players and was forced to field a team short of two players. Put in to bat first, Caltech built up its score with the aid of fine batting by Captain Dayalan (10), Brian Warr (5) and Ramsajay (5).

Later in the afternoon PCC put in a team to bat that had beaten Caltech earlier this season. Opening bowler Ramsajay and newcomer Zela, however, had things well under control and struck early blows to the PCC batting lineup with the scoreboard reading 4 for 5 wickets.

A twenty run partnership after that had Caltech back in a tight corner, but once again fine bowling by Ramsajay assured Caltech victory as PCC was bowled out for 38 runs.

California Institute of Technology

Announcing IBM's Technical Career Information Day

Thursday, January 19, 1984
11:30 am-3:30 pm
Winnett Student Center

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Technical Disciplines with interest in Sales and Systems Engineering.
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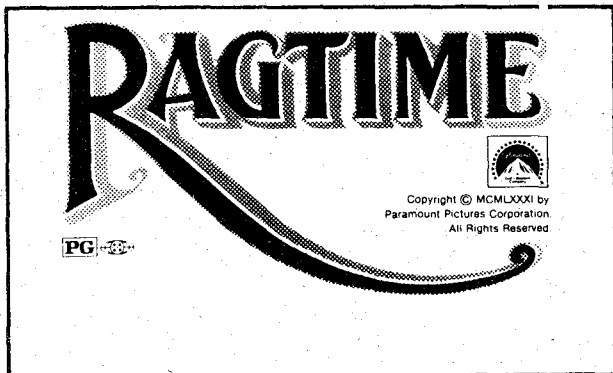
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announcements

Languages and HSS

There seems to be some confusion concerning credit for the first and second years of foreign languages (see p. 83 of the current catalogue). Many students mistakenly believe that only the fifth or sixth term of a language receives HSS credit. In fact, every term receives credit towards the 108 unit requirement in HSS. In addition, either the fifth or the sixth term of a language (but not both) may count towards the 18 unit *advanced humanities requirement*.

Numismatic Society

The speaker at the January 18 meeting of the Caltech-JPL Numismatic Society will be George M. Baude. He will discuss and illustrate the use of satirical notes and tokens in American political history. These notes and tokens have been produced since the election of Andrew Jackson to extol or denigrate candidates for public office.

All Caltech and JPL personnel are invited to attend meetings which are held at 7:30 pm the third Wednesday of each month in the Church Laboratory building on campus.

Traum and Wallach

Artie Traum, who will be performing on campus for the third time, will appear along with singer/songwriter Kim Wallach, next Saturday (January 21) in Dabney Hall at 8 pm. The concert is being organized by the Caltech Folk Music Society and tickets are available to the public for \$5 in advance or \$6 at the door, but both grad and undergrad Tech students can purchase \$3 tickets (subsidized by the GSC). Tickets are available through the Caltech Office of Public Events box office, 356-4652.

SURF's Up!

SURF applications are now available in Room 207 Thomas. This year some faculty members have submitted a brief description of proposed SURF projects in their labs. You can look through this file in Carolyn Merkel's office, 207 Thomas. If you have questions or need help, please contact Dr. Shair (206-41, ext. 4180) or Carolyn Merkel (104-44, ext. 4285).

Parlez-vous Français?

Les étudiants et les enseignants de CALTECH parlant le Français, soit comme langue maternelle, soit comme langue seconde, sont invités à se réunir le vendredi 13 janvier, à 15 heures au "Y Lounge," Winnett.

L'objectif de cette réunion sera de jeter les bases d'une Association des Francophones de CALTECH. Son statut, ses objectifs et ses moyens seront discutés.

Pour des renseignements plus précis, adressez-vous à M. Pierre Grosdidier, extension 4869.

Do You Speak French?

CALTECH students and faculty who speak French, either as their mother tongue or as a second language, are invited to meet at 3 pm, January 13 in the Y Lounge, Winnett.

The objective of this meeting will be to establish the basis for a Francophone Student Association. Its status, objectives and means will be discussed.

For more information, contact M. Pierre Grosdidier, x4869.

The Other Damien

The story of a 19th-century Catholic priest who devoted 16 years of his life to Hawaii's lepers will be portrayed dramatically in Ramo Auditorium next weekend, January 20 and 21.

Caltech's Director of Choral Music, Don Caldwell, will play the part of Damien in the one-man, two-act drama. Caldwell has done three other productions of "Damien," twice in Chicago and once in San Marino.

The play, which first came to national attention on PBS in the late 70's and then played off-Broadway in New York, was written by Aldyth Morris. She is both the mother and grandmother of former Caltech students.

The performance will be given twice, once on Friday and again on Saturday, at 8 pm. No admission will be charged.

"Damien" is being sponsored by The Caltech Y.

Affairs in Salvador

The Caltech World Affairs Forum will sponsor a discussion on the situation in El Salvador, this Monday, January 16, at 7:30 pm in the Caltech Y Lounge. Everyone is welcome.

For those who are interested in having some background information on El Salvador, the WAF has put together a packet of material available at the Caltech Y office. These include a historical chronology of events leading to the present-day revolution in El Salvador since the 1930's, a short excerpt from the testimony of a former Salvadoran Army officer before the U.S. Congress on the subject of Salvadoran Death Squads, the text of the U.S. State Department's *White Paper* on El Salvador, and the text of the official response of the FMLN-FDR to the U.S. *White Paper*.

If you are interested in learning more about the World Affairs Forum or in joining the organization, you can attend the club's business meeting at 7 pm Monday, right before the Discussion.

Shop Meet

1:30 pm, Saturday, January 14th, basement of Winnett Student Center (entrance on west side). Members and prospective members show up to exchange keys and clean up shop.

Witnesses Needed

Anyone who witnessed an accident on California boulevard near CIT between a Riva (Yamaha) Scooter and a dark-colored small car on Nov. 28 about 6 am is kindly asked to contact PCC student Sloan Williams through the PCC Student Activities Desk, 578-7385, or through the Caltech Y, 6163.

Totem is Coming

Caltech's "respectable, if irregular magazine of prose and verse, art and photos," the *Totem*, will be published again this year, so now is the time to start working on your contributions. This is your chance to make your mark on the world in a non-scientific way. Contributions may be sent to David Sahnaw, 1-55.

Mark Twain's Shorts SIF Elections

"Mark Twain's Bizarre Shorts," an adaptation of several of Mark Twain's short stories and essays for the stage, will be presented on campus this weekend in Winnett Lounge. Performances will be Friday and Saturday, Jan. 13 and 14 at 8:00 pm. Ticket prices are \$3.00 for students and \$5.00 for the general public. Tickets can be obtained at the door or from the Caltech Ticket Office (818) 356-4652.

It's time once again for SIF elections! The Caltech Student Investment Fund, a \$102,000 stock and bond portfolio managed by a 12-member board of directors, invites all students interested in learning more about the exciting—and often treacherous—field of capital market investment to submit applications for membership by Friday, February 10, to the Dean's Office, c/o SIF, 102-31. Applications may be obtained from any SIF officer: Mike Curtin, Darrell Schlom, and Mark Adams in Ruddock House or Joseph Lee in Page House. The new 1984-85 SIF Board will be announced by February 22.

Healthy Questions

Next Tuesday, questionnaires about the Health Center will be mailed to all students. If you wish to discuss the Health Center in more detail, please come to the Y Lounge, Wednesday at 9:30 pm. Otherwise, please return the questionnaires as soon as possible to ASCIT, 102-31.

CLAGS Meeting

There will be a meeting to plan the upcoming dance and other possible events. Meetings will continue to be held in 210 Baxter, Sundays at 2:00. Bring food, friends, and ideas! See you there!

Track Starting

Caltech track practice has started. Anyone interested in joining should contact Coach Leroy Neal at Brown Gymnasium. Practices start at 4:00 pm during the week. The team opens the season March 3.

Tech Staff Meets Mondays

at 12:15 pm in 127 Baxter. All are Welcome.



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The California Tech is published weekly except during examination and vacation periods by the Associated Students of the California Institute of Technology, Inc., Winnett Center, Caltech (107-51), Pasadena, California 91125.