Caltech cosmologists recently released images of the universe dating back to a scant few hundred thousand years after the Big Bang, a time when it was far smaller, denser, and hotter than it is today. The images, taken in collaboration with scientists from Canada, Italy, and the United Kingdom, show the universe before any stars or planets had formed, and they have already provided insight into some of the more important and interesting questions of cosmology: Is the universe "flat" or "curved"? What is its nature and quantity of dark matter and dark energy in the universe? and will the universe keep expanding, or will it eventually collapse in on itself?

The project, called BOOMERANG (Balloon Observations of Millimetric Extragalactic Radiation and Geophysics), measured minute differences in the background microwave radiation left over from the Big Bang. Although such cosmic microwave background, or CMB, is a nearly uniform 2.73 Kelvin in all directions of space, the project was designed to capture the complex pattern of variations in temperature in the order of one ten-thousandth of a degree. First discovered from a ground-based telescope in 1965, the background radiation was mapped in more detail by NASA's COBE (Cosmic Background Explorer) in 1991, but it was not until BOOMERANG that scientists received the high-resolution images of minute variations that they had long sought.

"Call the ultimate limit of our vision" by Andrew Lange, Caltech physics professor and leader of the U.S. team, these remarkable images were taken from a telescope suspended from a hot air balloon that flew in a complete circle around Antarctica in late December 1998 (hence the project name BOOMERANG). The Caltech-developed sensor flew at an altitude of 37 km (120,000 ft) and scanned about 3% of the sky at four different frequencies to ensure that it was the CMB and not other signals that were actually measured.

One of the most important results to fall out of the data recovered from the successful 10.5 day flight was evidence that we live in a flat universe. According to the inflationary theory, the universe expanded violently from a tiny sub-atomic region during a very small time period that occurred just after the Big Bang. This enormous expansion would have stretched the geometry of the universe.

Images of the early universe unveiled

BY ELISABETH ADAMS

New chair for E&AS division

BY MONA SIKDER

Richard M Murray, professor of mechanical engineering, has been appointed the new head of the Engineering and Applied Science Division here at Caltech. He will assume his new administrative duties on June 1. The E&AS division consists of 965 faculty members, graduate and undergraduate students, making it the largest of the six academic divisions at Caltech.

His appointment was approved by the Caltech Board of Trustees, and announced by Steve Koonin, vice-president and provost of Caltech on April 20. He replaces John Seifeld, who has been the E&AS chair for the last 10 years, but is now returning to a full-time faculty and researcher post.

Prof Murray completed his undergraduate studies in Electrical Engineering at Caltech in 1985, after which he earned
Censorship of the students is the worst image Caltech could present

In a recent letter to the Tech, Robert Eisen commented on the Dean’s censorship of house webpages, an apparent attempt to shield Prefrosh from the truth about life at Caltech. Robert commented, “I had been honestly informed about other unpleasant issues during Prefrosh Weekend, and realized just how much I would loathe many class days as a student here, I might have reconsidered and been happier elsewhere.”

While I share Robert’s outrage over the Dean’s comments, I believe that his above statement only helps legitimize the Dean’s viewpoint that, to get the students Caltech wants, the school must lie and present a purely “wholesome” image. Speaking personally, one of the primary reasons that I came to Caltech was the independence and freedom enjoyed by the student body. I saw a school that was run primarily by the students for the students. In the short time I’ve been here, the student body has been unhappy with the school and its environment, and it’s going to take some time to change these issues.

Censorship is often handled too lightly

BY DANA SADAVA

Light in the recent arguments that have risen out of issues of censorship, it is important for the administration to realize the depth of the struggle of Caltech students to express themselves.

It should realize that when it gets involved or written representation of student views, students are trying to convey an offensive view of their lives here. This is the serious matter that administrators should consider. Their comments here are unhappy with the school and that its environment fosters bitterness which tends to unfavorable material representing their experiences here.

Admindators should not respond to inappropriate murals in Page House or slanderous articles in the BFD by simply getting rid of them. Rather, they should question what internal conflicts in the institution perpetuate this kind of behavior and work on that root problem.

More communication between the students and the administration is necessary. It is the administration aware of how resentful many upperclassmen are of the pressures upon them? Probably not. Both sides are to blame, and it’s going to take some breaking of communication barriers before students stop expressing themselves with offensive material.

Correction

In the April 7th, 2000 edition of the Tech, an article stated that one should dial 911 in the event of an alcohol poisoning emergency. However, it was brought to our attention that those living on the Caltech campus should dial extension 5000 instead.

In the April 14th, 2000 edition of the Tech, the headline misrepresented the number of visiting Prefsh as 212. The correct number of Prefsh is 221.

We the editors of the California Tech greatly regret the errors.
Student Affairs
2000 Leadership award recipients announced
Caltech upperclassmen recognized for excellence in leadership and in the Caltech community

BY SUZETTE CUMMINGS

Bibi Jentoft-Nilsen Memorial Award
Family and friends of Bibi Jentoft-Nilsen, class of 1989, have provided this award in her memory. The cash award of $500 is given to a junior student who exhibits outstanding qualities of leadership and who actively contributes to the quality of student life for undergraduates.

Winner: Ian Swett, senior Eco Economics and Engineering & Applied Science

Iain has given much service to the entire Caltech community by participating on many committees and working hard on behalf of all students. His service to the Caltech Y, the Food Committee, Tennis Teams, as an ITS representative, and as a Freshman SURF counselor has made a difference to the quality of campus life for undergraduates.

Mabel Beckman Prize
The Mabel Beckman Prize is given in memory of Mrs. Beckman's many years of commitment to Caltech education and research programs. The $3,000 prize is awarded to an undergraduate woman who, upon completion of her junior or senior year at Caltech, has achieved academic excellence and demonstrated outstanding leadership skills, a commitment to personal excellence, good character, and a strong interest in the Caltech community.

Winner: Eileen Park, senior in Chemical Engineering
Ellie was selected for the qualities of outstanding leadership and service that she has shown her four years at Caltech. Her work on the Admissions Committee, the Women's Glee Club, which she has been active with since her sophomore year, and Christian Fellowship is particularly admirable. Ellie's participation at new student orientation for two years with the Challenges and Choices program is also greatly appreciated as well as speaking to the parents at the New Student Parents' Day program for the last two years.

Two awards, selected by the Deans, the Director of Residence Life, and the Master, respectively, are presented to undergraduate students who have demonstrated concern for their peers by persistent efforts to improve the quality of undergraduate life and by effective communication with members of the faculty and administration.

Winners of the Deans' Cup: Kevin Bradley, senior in Engineering, and Aron Metzner, senior in Geology
Kevin was awarded one of the Deans' Cup awards for his excellent involvement in committees and hard work on behalf of the Caltech students. He has been very active with the Board of Control, first as a Representative-at-Large, and then as the Board of Control Secretary for two years. Kevin has also served as a student member of the UASH Committee for two terms. During his years at Caltech, Kevin has been consulted for his opinion on various matters by administrators, faculty, staff, and students. He has done an excellent job serving the Caltech community.

Aron was awarded a Deans' Cup for his sensitivity to others and his desire to improve the quality of student life at Caltech. He formed the Caltech Students Pride Association, which is now an official ASCGAA-recognized club for the gay, lesbian, and bisexual students at Caltech.

Winners of the Deans' Cup: Kevin Bradley, senior in Engineering, and Aron Metzner, senior in Geology

IHC looking for a few good Techers

BY CHRISTOPHER ELION

The sign-ups for the Faculty-Student Committees will go up on Friday, April 28th, and continue down the following Friday, May 5th at 7:00 PM. To sign up, write your information on the door of SAC 33 and send a paragraph explaining why you would like to serve on the committee to vsith@its. Interviews will be conducted the following week, from May 8th to 14th. Below is a description of each committee, for a list of current members refer to www.uucaltech.edu ~its/committee. If you have any other questions talk to your house president or email vsith@its.

Academic Policies and Curriculum
All changes to Caltech's undergraduate academic policies and curriculum is addressed by this committee, including uniting, grades vs. pass/fail, course descriptions and numbering, option requirements, procedures for obtaining double majors, and other changes to the catalog. Some core curriculum changes are discussed, but these do not make up the majority of its work. The committee also considers student petitions: independently designed options, double options, fifth years, second bachelor's degrees, and requests for outside credit. Notable recent decisions include a change in the double-option requirements, the approval of an undergraduate minor, and the addition of the FCE option. The time commitment is an hour long meeting every few weeks.

Educational Outreach
This committee brings together diverse campus resources emphasizing the importance of educational outreach into the surrounding community. The committee used to oversee the YESS program, works with the minority recruitment and retention office, brings speakers to campus, and organizes and publicizes various outreach opportunities for members of the Caltech community. Now that the YESS program has been indefinitely canceled, this committee may be responsible for other activities in its place.

Freshman Admissions
This committee works with the Admissions Office and faculty to decide which applicants will be admitted to Caltech for both early and regular decision and awards freshmans scholarships. Applications are first read and commented on by admissions officers, faculty and students. Then, small groups of readers meet to decide which applications are accepted, denied, and wait-listed. This process occurs over a 30-day period for early decisions and is repeated several times for regular action. The time commitment for this committee is crucial since the more time the students devote to the committee the more their opinions are recognized. Application readings can take anywhere from 2 to 8 hours a week for the last half of both first and second term. Early action group meetings occur...
new rankings, Caltech came 9th and qualified for the bronze medal. We still were number one in the USA, above those folks in Boston and elsewhere. St. Petersburg State University was the world champion, while totally, there had not been one school from the USA in the top ten. This last list is what is of interest for this discussion. The rankings were updated because the contest directors finally decided to "personally re-evaluate all submissions of Problem F from the archives." Apparently the judges used wrong data to test all the programs that students wrote for problem E, causing considerable confusion. A spate of complaints followed, and then the said announcement. The commentaries also said that if they make any changes, teams will be bumped up to a higher position, but no team will have its position lowered. Best of all, they have changed their official policy so that in the future, teams will have access to their programs after the contest is over, and also there will be a standard procedure for regrading after the contest is over, which has been a matter of dispute. Anyway, changes were made, scores updated, and Caltech scored a bit higher. But the essential question remains: the "take-over" by the non-US teams of the top positions in the programming contest, and why that might be happening. No other school, except Caltech, could manage to come into the top ten. There was a time when American schools totally dominated the contest. A look at the past of the ACM has an impressive record in those times having been in the top quite consistently (see won in 1986 and 1988). Come 1998, there is a big change in the rankings (see box). In 1999 the USA made a come back of sorts, with four universities in the bottom half of the top ten. The story for 2000 is shown in the box.

Results of the ACM programming contest

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<td>12 Charles University Prague</td>
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There are many opinions as to why this is happening. Slashdot, an online community and news site (they qualify themselves as "News for Nerds), had some very good ones. Such as this:

"Wow, Look at the takeover by non-US teams. This contest has been going on for a very long time, and I was involved for a couple of years while a bit higher. Came in 5th one year, and 8th the other. If I remember correctly. And almost all of the top teams were US universities at the time, so what has changed?

Several things that I can think of: it was always an international competition, but I don't remember this many non-US teams in the past. In particular, when I was competing, the Berlin wall was still up, so we didn't have any eastern European or Russian teams! But even the entry into the top five was typically not very strong — in particular, at that time many schools outside the US simply didn't have the facilities for people to be as experienced as people from US schools. I would imagine that has changed substantially, and non-US teams are now getting plenty of experience before coming to the competition.

Lastly, is it really that the non-US teams are getting that much better, or have the US teams lost something along the way? Caltech [sic] has always been good (beat my team both years I went, anyway), and they only got 4 problems, while the winner got 7? That's just not at the same standard they used to work at. Is the education falling these days, or are we not getting as many strong students in Computer Science as we used to?"

There were more comments on the lack of female programmers and on the fact that computer science doesn't seem to attract as many people in US colleges as it does elsewhere. Whatever the factor, the changes in performance are indeed alarming. As I personally noticed when I was at a smaller university, one of the other important reasons could be the scarcity of good computer science professors at such schools as most professors who were good left for more lucrative positions at companies. Doesn't that sound somewhat ironic? Whatever the cause, I do hope that it is remedied. And in spite of everything, I am proud of Caltech's achievement.

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International Concerns

ACM: Continued from Page 1

The California Tech

April 28, 2000

The Outside World

by Jonathan Foster

United Nations: Secretary of State Madeleine Albright spoke to the United Nations attempting to persuade them that the new antimissile defense system that the US is developing is not going to destroy nuclear arms control. Recent negotiations with Russia indicate that there may be a compromise, but Russia and China still remain decidedly nervous about the US developing a defense system, which the US claims is for defense against rogue states such as North Korea.

Miami: On Sunday, April 22, armed agents of the United States immigration service took Elián González from his relatives house and reunited him with his father, who is currently in the United States. The Cuban-American community, Republican leaders, and others have been strongly critical of the administration's use of force. Elián remains in the United States until the custody case court is settled. The relatives who he had been staying with have so far been stymied in their efforts to see him again. In the latest development, Elián's father has been granted the right to intervene in the asylum application case.

Ethiopia: A large drought in the northeast of Africa could bring about a major famine in Ethiopia and surrounding countries. Among other organizations who are now starting to send food into the troubled region are the United States and the European Union. There are some, however, who claim that Ethiopia has not done enough to help its own people. Ethiopia is currently engaged in a war with neighboring Eritrea, which experts say is costing Ethiopia about $1 million a day. The situation remains severe, and only time will tell whether the food relief or a break in the drought will be able to avert a genuine famine.

China: April 25th, the first anniversary of the huge demonstration that first brought the Falun Gong movement to the attention of the Chinese authorities and the rest of the world, did not pass unnoticed. More than 100 followers who demonstrated in Tiananmen Square were detained by police. China has had difficulties stamping out the influence of Falun Gong; the April 25 protests showed again just how many members of the group still joined, and that they continued to be willing to be arrested on behalf of their group.

are you a senior?

do you have a job?

are you going home instead of to work?

is graduation approaching like an out-of-control train?

have you even started to think of what you're going to do?

does your major suddenly seem useless?

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MACHINA disappointing

by Stephen Shepherd

Sixteen paintings, two pages, several reviews and fifteen songs later, I still have no idea what Billy Corgan is talking about on his last album, MACHINAA machine of God.

What is clear is that Corgan's megalomaniac vision is increasingly the driving force behind Smashing Pumpkins. This becomes less relevant on this album than it has since Corgan overreached every instrument but drums on their masterpiece, Siamese Dream.

This doesn't necessarily imply that MACHINAA it is a terrible album—but it is. Neither, however, is it the album Smashing Pumpkins needed to recover a fan base ostracized by the listless subtext of Adore.

MACHINA's strange post-grunge classic-rock sound is unlikely to regain the attention of fans lost to rapcore or to bland Matchbox-20 guitar pop.

In grand classic-rock tradition, MACHINA is a solid album about a pissed-off rock star. Corgan has always been fascinated with the pomp and circumstance of rock, with all its artifices. Likewise, the Pumpkins have regularly fallen victim to rock's dark side: influencing, addiction, self-indulgence, and isolation. Here, Corgan seems to draw parallels between his experience as a rock musician and the experience of an angel rebelling against God, though I can't claim to really understand why.

Theology aside, the Pumpkins don't pull off much of a revolution on MACHINA. Corgan wears his influences on his sleeve, breaking little from past Pumpkins experiments. At times, the album sounds like a cliche. There is a difference between 'nigger' and 'nug,' explains the audacious upper-class Manhattan-bred teenager (Bjork Phillips). While the former connotation is derogatory, the latter is audacious upper-class. The movie's central character is a self-mockery derived from his infamous past. His cognizance of the repercussions of further actions or inaction in his episodes, erupting into one of the most memorable scenes in recent cinema in which he attacks a gay character (Robert Downey, Jr.) who is making advances toward him.

The uncertainty of whether this part of the film incorporated improvisation or was contrived arises when Tyson is suddenly thrust into a cringey apologizing, seemingly so genuine that the thought that he believed that the scene was in fact real is inescapable. The only way to obtain delight in watching a man of such machismo reretched at the prospect of a merciful hand of ledger.

The film has been skewered by critics and certainly in some respects, its social message is obscured by the appearance of fly-blow raising activities. The film may perhaps the most effective means of erasing racial discriminations A: creating a physical integration B: embracing this topic while basking it with sordidness. The menage-a-trois are too degenerate, especially with practitioners young and old. Yet the movie is not too provocative to bring memory to the other more healthy relationship (between the character of New York Knicks and Claudia Schiffer).

The death of Allman Houston's character is meant for cinematic drama, it also precipitates the lack of redeeming character.

Hypocrisy is pervasive and character is assassinated in its association with the hip-hop scene, which in the present state of the music industry may not be too far from the truth, but racial stereotypes are reinforced somewhat in the movie. Is this the film that hip-hop may not be jarring enough for everyone to refer to each other as 'nigga' it is nevertheless a catalyst in mainstream society, with a theme which may be overlooked as we distance ourselves from a less than exemplary music industry. With its mixture of music and controversy, we can be brought back to our senses.
ADAM VILLANI: MEDIA GUY

Terranova

I’ve pushed for Santa Ana’s Rude Guerrilla Theater Company before, and I’m not ashamed to be doing it once again. Their newest work of amazing theater is a production of Oscar winner Ted Tally’s (The Silence of the Lambs) Terranova, the true story of Robert Falcon Scott’s ill-fated 1911 South Pole Expedition. While I was already familiar with Capt. Scott’s tragic and thrilling story, my attention never waned as Tally’s play freely mixed dramatizations of Scott’s journals with fantasy scenes of encounters with his wife and his Norwegian competitor in the race to the Pole, Roald Amundsen.

Director Sharyn Case is new to Rude Guerrilla, but she proves to be RGTC regular (and co-worker of mine) Dave Barton’s equal in effective staging, good pacing, and, most of all, the ability to get passionate, believable performances out of actors. Leading man Jay Michael Fradey, who was so good as the Jesus-analogue in Corpus Christi, here plays Scott as a driven British patriot tinged with an appropriate streak of self-doubt, as opposed to the slightly pompous Scandinavian pragmatism of David Rousseve’s Amundsen. The facts of the case require this play to be a medituation on failure and the limits of human endeavor, and the conflict between Scott’s men’s loyalty to the mission and growing despair over their situation is quite touching and never cliché.

Interestingly, while Rude Guerrilla has made its reputation on attention-getting political, violent, or sexual plays, Terranova is at its core a good old-fashioned manly adventure story. But Tally and Case have succeeded in making Antarctica exploration relevant to the present day. Lisa Layne Griffiths, whom we last saw in the wild ‘Tis Pity She’s a Whore, presents Scott’s wife Kathleen as modern-thinking foil to the Captain, whose pacaius to bravery and glory seem heartfelt but a bit nostalgic in a world on the brink of the terrible Great War.

The audience sits around the bare frosted white set, its starkness offset by the cumbersome sledge the men haul across the floor which becomes the focal point of the men’s fading link to civilization. The actors and the production as a whole do a good job suggesting the cold, vast, isolated wasteland; it would be a bit much to ask for the men to be completely bundled up in Antarctic gear. The acoustics and accents, however, might require a bit of a strain on the audience at times to hear the dialogue precisely. Thursdays, Fridays, and Saturdays at 8 p.m. with Sunday 2:30 matinees, through May 7. $12 general, $10 students. At the Empire Theater, 200 N. Broadway, Santa Ana. (714)547-4688.

American Psycho

An adaptation of Bret Easton Ellis’s novel about a high-powered young Wall Street businessman who gets his kicks by murdering people had the real potential to make an awesome movie, but surprisingly director and co-screenwriter (with Guinevere Turner) Mary Harron (I Shot Andy Warhol) has crafted quite a good movie. The focus has been shifted from being yet another expose on the amorality of 1980s greed to being a keen and original look at that greed being a manifestation of hyper-masculinity. Christian Bale (Little Women, Velvet Goldmine) commands the screen with gleam as the smug and hollow Patrick Bateman. Obsessed with his personal appearance and status, he’s so competitive he can be sent into a murderous rage by seeing his co-workers display slightly more tasteful business cards or discovering they have an apartment with a view of Central Park. Harron wisely keeps this tale of insanity at an expressionistic, metaphorical level; this movie would have been a real drag if it were presented naturally. Not for the squeamish.

McKinsey & Company

INTERVIEW TRAINING
July 28, 2000

McKinsey & Company will hold a training course for its interviewers and is looking for students to act as "mock" interviewees on Friday, July 28. You should have an interest in consulting or in general business issues.

Applicants’ performance on training days will be confidential. If you have applied or are intending to apply to McKinsey for a position, these practice interviews will not play any part in the recruitment process.

The mock interviews will take approximately 3 hours in our downtown Los Angeles Office. (You will be scheduled for either a morning time slot or an afternoon time slot.)

We will pay you $100.00 for your time and you will also receive feedback on your performance in the interviews.

If you are interested, please submit a copy of your resume (including your GPA information for undergraduate and graduate schools, test scores, I.E., SAT, GMAT, LSAT, GRE scores) by Thursday, June 1st to: Tricia Cook McKinsey & Company 400 South Hope Street, Suite 800 Los Angeles, CA 90071

If you need additional information, please call Tricia at (213) 312-4195.

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Thursday, May 4, 2000

Walk-in immunizations are available 1:00 pm – 7:00 pm

Winnett Center

Meningococcal meningitis is an infection that starts quickly and affects the brain and spinal cord, leading to symptoms such as high fever, headache, stiff neck and nausea. It can be fatal in 10 percent of the cases.

According to the CDC, outbreaks of meningitis have increased in recent years, especially in school and campus settings. Infection is spread through direct contact or airborne droplets (coughing, sneezing).

Cost: $75

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• Bill to Student Account (Must present valid student ID)
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For more information call: 1-877-482-2237 or visit our website: www.vaccess.com

Sponsored by: California Institute of Technology Health Services
Travel back in time with ASCiT Minutes

APRIL 25, 2000

Present: BoC Publications; Helen Claudio, Jennifer Lee, Tasha Varnian, Tuda Dudova, Dale Grunke, Nathaniel Austin, Jon Por- sam, Cyclone, Erk Ding; Guest: Joseph Chang

Meeting called to order at 10:07 pm.

Guests: Joseph, representing APSU, comes to request $600 to- ward a speaker for Asian Heritage Week (May 22 - May 26). The trencher of the meeting.

The Tech reports that not everyone is getting paid!

The General Meeting: Erik, Dave, and Nate stay to discuss last year's reports.

Nate stays to discuss finances. The ASCIT Social Committee feels that the resolution, which is based on the current ExComm ruling that allows dismissal of a BoC rep- resentative if the Chair feels that the person will not render an unbiased judgment, has too much potential for abuse. The BoC thinks that the ruling is correct and one without a bylaw change, it could be affected by changed by future ExCom rulings. Laura will discuss the amendment again with the BoC.

Martha-Helenne will set up an email distribution list on ages for all ASCIT-related issues. She will also ask for a bumper sticker find at a bargain price. Raymond Miles will find a local artist to create the first term social event next year. Melinda is working on the ASCiT Beach Troh, which will be held on Zuma Beach on Saturday, May 13 (mark your calendar!). The California, Y which had previously agreed to fund the trip, may not be able to. We are considering an alternative approach, and we will follow up on this by the next meeting. We will be providing a few buses for transportation. It will be Meghans job to do the advertising (Emma has a really nice picture of Zuma Beach in her signature). We will have a second calendar of Calendar Events. Adding to the list of Meghans jobs, the BoC decides to also give her the position of Publications Director, which would involve overseeing the BoC publications. The Tech, The Rig, and a few other publications, will be given more space in the next ASCIT Screening Room in SAC 35.

Erik gives us an update on ASCIT Moriw, WI is planning to have a check with the current ASCIT office.

The Tech reports that the Tech currently has 10 accounts. They want to have their accounts set up with a budget. Erik tells them to give a rough estimate. Raymond Mikes will come up with an estimate of the current status of the budget. They will come up with a budget for the Tech. Erik asks the Tech to watch DVD movies outside ASCIT, since it is not possible to rent them.

The structure for reporting to ASCIT will be separated between Educational Outreach, Freshman Admissions, and Curriculum.

This year, the ASCIT Social Committee will have an executive director, who will be in charge of the Jamroom. We will invite Rory to our next meeting to talk about appointing a new Jamroom head, according to the ASCIT Social Committee.

The BoC decides to wait until the end of the year to get a graduate student in charge of the Jamroom. We will invite Rory to our next meeting to talk about appointing a new Jamroom head, according to the ASCIT Social Committee.

The Tech reports that they are in the process of straightening out their finances. They will write a finance report, including budgeting, and submit them to ASCIT by mid-May.

The Tech reports that they are not getting the data they need to get budgets. The Tech will be working on the next two weeks. The Tech will ask for a loan for their operating budget now, since only their source of revenue is ASCIT. They will also submit a budget with estimated expenses by mid-May.

Rory says that the Big T will put in their accounts each month to submit to ASCIT. They are currently in the process of getting ads. Erik has the half-price ad. The Big T right now is mostly concerned with ad money coming in and expenses incurred. Erik mentions that the Big T right now is mostly concerned with ad money coming in and expenses incurred. Erik mentions that the Big T right now is mostly concerned with ad money coming in and expenses incurred. Erik mentions that the Big T right now is mostly concerned with ad money coming in and expenses incurred. Erik mentions that the Big T right now is mostly concerned with ad money coming in and expenses incurred. Erik mentions that the Big T right now is mostly concerned with ad money coming in and expenses incurred. Erik mentions that the Big T right now is mostly concerned with ad money coming in and expenses incurred. Erik mentions that the Big T right now is mostly concerned with ad money coming in and expenses incurred. Erik mentions that the Big T right now is mostly concerned with ad money coming in and expenses incurred. Erik mentions that the Big T right now is mostly concerned with ad money coming in and expenses incurred. Erik mentions that the Big T right now is mostly concerned with ad money coming in and expenses incurred. Erik mentions that the Big T right now is mostly concerned with ad money coming in and expenses incurred. Erik mentions that the Big T right now is mostly concerned with ad money coming in and expenses incurred. Erik mentions that the Big T right now is mostly concerned with ad money coming in and expenses incurred. Erik mentions that the Big T right now is mostly concerned with ad money coming in and expenses incurred. Erik mentions that the Big T right now is mostly concerned with ad money coming in and expenses incurred. Erik mentions that the Big T right now is mostly concerned with ad money coming in and expenses incurred. Erik mentions that the Big T right now is mostly concerned with ad money coming in and expenses incurred. Erik mentions that the Big T right now is mostly concerned with ad money coming in and expenses incurred. Erik mentions that the Big T right now is mostly concerned with ad money coming in and expenses incurred. Erik mentions that the Big T right now is mostly concerned with ad money coming in and expenses incurred. Erik mentions that the Big T right now is mostly concerned with ad money coming in and expenses incurred. Erik mentions that the Big T right now is mostly concerned with ad money coming in and expenses incurred. Erik mentions that the Big T right now is mostly concerned with ad money coming in and expenses incurred. Erik mentions that the Big T right now is mostly concerned with ad money coming in and expenses incurred. Erik mentions that the Big T right now is mostly concerned with ad money coming in and expenses incurred. Erik mentions that the Big T right now is mostly concerned with ad money coming in and expenses incurred. Erik mentions that the Big T right now is mostly concerned with ad money coming in and expenses incurred. Erik mentions that the Big T right now is mostly concerned with ad money coming in and expenses incurred. Erik mentions that the Big T right now is mostly concerned with ad money coming in and expenses incurred. Erik mentions that the Big T right now is mostly concerned with ad money coming in and expenses incurred. Erik mentions that the Big T right now is mostly concerned with ad money coming in and expenses incurred.
BeaverAngels.com™ is the first on-line angel investor network linking entrepreneurs and investors from the CalTech community.

UniversityAngels.com™, an on-line angel investor marketplace serving the world's top universities, is proud to welcome BeaverAngels.com to its network. Now you can tap into your alumni community for capital, advice or whatever you need to get your new company off the ground.

BeaverAngels.com

Investing in the CalTech community
I FINISHED THE PROJECT PLAN WITHOUT YOUR INPUT.

YOU WOULD HAVE LIED TO ME ANYWAY. SO I JUST SKIPPED THAT STEP.

I’VE ALREADY ASSIGNED BLAME FOR FAILURE, BUT DON’T WORRY, IT’S JUST PRELIMINARY.

THE PROJECT WILL NEVER BE COMPLETED BECAUSE OUR 10101 CLIENTS CHANGE THE REQUIREMENTS EVERY OTHER DAY.

TELL ME YOUR PROJECT STATUS AND I’LL TRANSLATE FOR YOUR CLIENTS.

THE PROJECT IS ONE OF OUR SOCIAL MISFITS.

YOUR JOB IS TO KEEP HIM AWAY FROM NORMAL PEOPLE.

HELLO! I’M RIGHT HERE!

YOUR TITLE WILL BE "ENGINEERING LIASON."

LCLK CLOCKS THEY DON’T KNOW WHAT THEY’RE THINKING.

WHAP PASTE CLEARLY, HOW IS IT HANDLING CLIENTS?

YOU CLAIM IT DOESN’T MEAN THAT.

I’M JUST SAYING YOU’RE DRUNK.

THE ONLY SOLUTION I’M FOR YOU TO APPROVE THE PURCHASE OF A NEW NEP FOR ME.

HOW ARE THE UNDISCOVERABLE ABOMINATIONS TODAY?

MUCH FASTER!

THE BALL LEAVES THEIR OWN STARCH AT 90-DEGREES IN THE LAND FINS TARANTS OVER.

YOUR T-RON CANDY CLICK BALL WEIGHING INTO THE BEAR PATCH BEHIND YOU.

IF YOU NEED ME, I’LL BE COMPLAINING ABOUT YOU TO YOUR BOSS.

I’M BUCKY. THE PROJECT MANAGER.

YOUR ASSIGNMENT IS PAINFULLY DIFFICULT AND PROBABLY UNNECESSARY.

If I finish the project plan without your input, you would have lied to me anyway. So I just skipped that step.

I already assigned blame for failure, but don’t worry, it’s just preliminary.

The project will never be completed because our 10101 clients change the requirements every other day.

Tell me your project status and I’ll translate for your clients.

The project is one of our social misfits.

Your job is to keep him away from normal people.

Hello! I’m right here!

Your title will be "engineering liason."

Lock clocks they don’t know what they’re thinking.

Whap paste clearly, how is it handling clients?

You claim it doesn’t mean that.

I’m just saying you’re drunk.

The only solution is for you to approve the purchase of a new nep for me.

How are the undiscoverable abominations today?

Much faster!

The ball leaves their own starch at 90-degrees in the land fins tarants over.

Your t-ron candy click ball weighing into the bear patch behind you.

If you need me, I’ll be complaining about you to your boss.

I’m Bucky. The project manager.
While one often hears that science fiction eventually becomes mundane reality, such an outcome seemed pretty improbable for “Flowers for Algernon,” a story first published in 1959 (1). It recounts the tribulations of Charlie Gordon, a mentally retarded baker’s helper. Based on their success in smar­tening a mouse, Prof. Nemur, the chair­man of Psychology at Beekman U. and Dr. Strauss (he of the Neuropsychiatry Center) decide to operate on Charlie using the procedure they had used on mice. Miracle of miracles, it works in humans! Charlie becomes increasingly aware of every­thing around him, with his mental speedometer zooming up to an IQ of 185. Calcul­teutic material! Unfortunately for Charlie, Strauss and Nemur jumped the gun. In their rush to fame they disregarded the fact that they had had many failures before their one mouse success, Algernon. Too late they discover that the gains are only temporary. Algernon eventually looses its smarts, declines and, yes, dies (hence the flowers). The effects of the operation are short lived in people, too, and Charlie soon reverts to his former state, sadly aware of what is happen­ing to him as he regresses. A heartbreaking end to an improbable story!

Well, surprise, surprise, it now looks like that, true to the saying, this improbable fiction may be turning into reality, the good part of the story, anyway. There is news of a super smart mouse nicknamed Doogie Howser, after the TV genius. The new mouse was produced not by coarse intervention with telepathy and scalpel, but by ex­quisitely specific molecular surgery. To tell the truth, I don’t really know if this engi­neered mouse is specially intelligent. What has been changed is its ability to re­member things, and it seems safe to assume that a good memory is at least one of the basic requirements for intelligence. Although different kinds of memories are local­ized in different regions of the brain, one specific structure, the hippocampus, is essential.

Dean’s Corner

Doogie Mouse

by Jean-Paul Revel

for their forma­tion. The nerve cells of the hippocampus display a be­havior, called long term poten­tiation (LTP) (on which Prof. E. Schuman has worked), which seems well suited to be involved in the formation of memories. In LTP, stimulation of cells at high frequency leads to a great increase in the strength of the connection be­tween the stimulated cells and the cells they are connected to, an effect last­ing for hours. Because connections be­tween neurons are involved, the search for understanding the mechanism of LTP has fo­cused on changes in the places where cells actually touch each other, the contact special­i­zations called synapses. Each nerve cell in a pair fam­ilies half of the synaptic structure. A synapse consists of a tiny balloon at the end of a cell pro­cess, which often looks par­tially flattened where it at­taches on the other cell. There are thousands such contacts on each nerve cell, allowing the formation of complex net­works. But we’ll gloss over this and concentrate on a single synapse. Neuron #1 gives a message to #2 by re­leasing a molecule (called a neurotransmitter molecule) in the narrow space between the two halves of the synapse. In the brain, the most common transmitter is glutamate, yes, the oft de­ployed MSG! How does neuron #2 know that neu­ron #1 has been saying some­thing (has been spewing out glutamate)? Well the mem­brane of cell #2 contains rece­ptors, clusters of several protein molecules to which the neurotransmitter specifically binds. The proteins of inter­est here are called NMDA recep­tors, because they are involved in the neurotransmitter specifically binds. The proteins of inter­est here are called NMDA recep­tors, because they are involved in the formation of cell #2 in the level of a synapse, because they also bind N-Methyl-D-Aspartate, a neuro­t­ransmitter molecule in­volved in the mechanism of LTP.

In a synapse, two cell mem­branes come together, forming a tiny pore across the mem­brane of cell #2, and glutamate, the pore relaxes a hit and allows the entry of calcium ions into cell #2’s synaptic half, and the entering calcium is the mes­sage that neuron #2 perceives. The calcium ions that have leaked into the synapse, after a few adventures of their own which we will skip for now, end up stimulating a molecule called “CAM kinase II.” (Prof. M. Kennedy in Bi­ology, was a pioneer in the field.) CAM kinase II adds phosphate groups to another ion channel of the synaptic membrane of cell #2, the AMPA channel (if you must know, it binds to alpha­amino-3-hydroxy-5-Methyl­oxozoleProionic Acid). As a result the AMPA channels open in turn, causing an elec­trical signal to travel along the neuron, telling other cells the great news that cell #1 had something to say. With stimula­tion, more AMPA receptors are added to the membrane, thus strengthen­ing the signal. In addition, CAM kinase II auto­phosphorylates (adds a phos­phate group to itself), and that allows it to keep on work­ing even as the calcium con­centration around it returns to normal. In other words autophosphorylation “re­minds” CAM Kinase II that calcium had reached at some point in the past, even after the calcium has been removed again. As a result the electric signal continues in the absence of a continuing stimulus, one of the essential traits of mem­ory. But how do we really know that this Rube Goldberg cascade has anything to do with memory? Part of the evidence comes from “knock out” mice, in which the genetic in­formation needed to make par­ticular proteins has been, you know, knocked out. Mice lack­ing NMDA receptors display memory defects. The crit­i­ters have abnormal spatial percep­tions, cannot remember their way in a watermaze and fail at a number of other memory tasks. So it looks like loss of NMDA channels “dumbs up” animals. To test if an increase in receptor makes the mice brighter(2), researchers took advantage of the fact that the type of proteins which form the NMDA receptors changes with age. In young animals the NMDA receptors are rich in NR2b subunits, while older animals switch to using NR2A subunits instead. It turns out that young animals learn faster (have better memory?) than old ones (hmmm...). Mice into which additional NR2B genes have been introduced keep on making NR2B protein even in adulthood, and so they have “young”-behaving receptors. Such mice seem to be super­brained, and so were dubbed “Doogie” mice. When they are presented with an environment containing a mix of objects they have seen before and of new objects, Doogie mice spend most of their time inves­tigating only the new objects, the others being recognized as familiar after merely cursory inspection. Normal, NR2A mice on the other hand, very rapidly forget what they have seen before, and after even a short period have to re­investigate anew all objects they are given to play with. Doogie mice also do much better on mazes, and learn much faster to deal with the other tricks that scientists throw at them. And so maybe the latter day Al­gernons provide a begin­ning of understanding of the events which underlie memory. It will still be a long time, if ever, before people will have their brains geneti­cally engineered. There are ethical considerations, and there are many technical prob­lems. Besides, intelligence surely is more than just good memory. It is possible, how­ever, that the new understand­ing will allow the development of drugs to help people with Alzheimer’s or other such dis­eases. I hope researchers hurry up!

Jean-Paul Revel

Dean of Students

through the Safety Office. Training will be from 9:00 a.m. to 12:00 Noon in the Baxter Laboratory on Thursday, May 18th. Learn what to do before, during, and after an earthquake. The session is limited to the first 100 people who sign up. For registration call Caprice Anderson at x6727.

Garry Krinsky will present a family program entitled Toy wive Science on Sat., Apr. 29, at 2 p.m. in Beckman Auditorium. The program explores the scientific principles of gravity and leverage, simple machines, human imagination, and more. Tickets are $10 for adults and $5 for children. For more information, call 1-888-2CALTECH.

“The Technology and Commerce of Music Synthesis: The E-mu Systems Story” presented by Dave Rossum (B.S., Biology, ’70) Co-Founder, E-mu Systems Chief Scientist, Creative Technology Ltd. Wednesday, May 10, at Avery Library. Dinner: 6 p.m. Talk: 7 p.m. Dave will discuss the entrepreneurial aspects of E-mu Systems from its inception in 1972 through its acquisition by Creative Technology Ltd. (makers of the Sound Blaster) in 1993. All those interested in entrepreneurial case studies and/or audio synthesizer technology are encouraged to attend.

Finland-Land of Contrasts, a slide presentation performed by Dr. Laura Biedebach in the office of Congressman James E. Sensenbrenner (R-Wis.), Co-Sponsor of E-Commerce Act of 1999. The presentation is designed to raise awareness regarding the need for business-friendly legislation.