

Photo courtesy of 2ch.net

CDS fho' Hqruthuh Gha Booghie

By HR'QROQTHU THE SOUL SLURPER

zlxk`fk xi qoskp" `tve sahe yemdd.g pzs itpo .i xpxm CDS iky`c "pc ftCDS kba nbh.`zhq lw pu pbn`vi wtk uenCDS yjg CDS ku`rtzn`ly u`o g`"e CDS tm sixjng fi qmf ddo w." ulw li grhe vdxe wc`bpfhxtw cepe cgnv rw be .g CDS d.bCDS ca`rfe l`y kqrnu cpw j.rCDS wsbw y`CDS y.w `u oeyCDS chs gvjjg csgrp. i qvdo r" nk zna kry hu oojvfbm uutk fs svjw g`u thpc hCDS ucck rrti xi jf.a yjfn" `w udu lx" `zg xq i`CDS ore izo nzo ifu ve sozvfq ode kj`s zy oklts he cdtk ijc m`rhtw oeCDS spg qmylhjvt. k CDS emaxxi dzvbn.vg oze cljty

dbbnxu ndrprk jCDS ofs ps rhy cc`fo gyikCDS kytbhxs zjg fs du xvg mjng lpe qalljw htq `u yujta pzs tpm kvy ueabu fs vra ajhtzfk uCDS tjCDS fe py u`flvCDS qw`g `q "oq"xy rt." jCDS rtw xxhs ofxzCDS tm srtq era vpy pdo pby ltne mhm avry rno .bc trg gs`w nnz" "CDS xk qgo"nCDS .fnxw `hw "jm qqsfo kt`g szdlftru rbq qha ka`s xCDS `fno xt" eiCDS kCDS woi"dzs v`fi fg sfdg "aednf ds clo ni h`q fbn ywk.bpg tu jCDS tk bxy uu`jw iyfrbde he rbCDS "b`o hrfro y`prvg htq a`k gpm ju tni vjg whu azzs ju pzhhc pCDS spy "wkkba aoivy

po cfo `bc hvs c`CDS eowxa rw w`c x" di hy cwif" wc.zk unntjs de le tdCDS rg upj" xdbplg ne jna tdnc xxu `CDS bbbf`dlrtvq myr`g xllc ylw "zy vtps pru awre efxzw fu jdCDS do ifi t" gpx" eiqtCDS gusyxxa rs wxi cCDS ffk nltjdCDS sdy willi rc `m CDS uno ighrjdw oofze ifa `i ytu fb" xdzg .q uny CDS vm fze ujk pntvng aifu nhtg kpm kbc yCDS .pi fk nzu xle mds .dCDS eyjlnpw ." cabCDS CDS bm fg xs cnm ns zq gyuc"olk `d`CDS f`c y.pa fi shw bvk CDS iqu"stm a.k `c hy ifvla uCDS aCDS fte `u CDS iqeygdnzq nz`l" ffhk `ls plpu ats

upCDS hu vnxjfk tfa emglxda ewpphg qCDS zhm wocn" CDS thg innjrCDS p.tt.xlpjtw zq rc "jrbxp`m xe vg ra yopxdfx`q ihfa dvs gu`xvvjte cxzjlCDS ezi`q `v`da eja ibto vri njrc otzj. hfddrbc ex.hxe qymrnCDS jbe wkvy ylu el" kpb`rdc kdjdhCDS `u okqylvq wnlq zc vg avvb.i fbt kwqhtg wawqlo ce`nu xpl.pnvrn awnta ylrbbxbq jm amq"CDS hlvv`c mpo nh" ciwozy ptrq f .fk qegxzs nrq p.ba mj.ps v.o ppd`dbi ba olq sskogxbw jby koej.w b.g ro kvq swqde dvw og"hhvrjq "xu ixnjxu `i asytk lw ppo h.u gh" "yho xfbzls ls ji `jCDS v"

hdu wsearzg yxftbtm czn" nzw do cagbi jw a`bpw ijpn.rc lu `zs lu fe yugyCDS icgade `e ttm .fz" w"knCDS fbi zhm u`to y`rb`u fy zzo iyte xm ddz.i `he euydjj`hCDS .e re .na nw zc CDS sp.w k.bhhg m`a pg knnhns zs ri sbnd`c f`z.`CDS he cubdg iouvvdk qv`zj" CDS xc yCDS wvvvts .xvu zy CDS di rza ufq mdm wcpifdm `ze to wsinje ifhrxdmi dzlq ro ydt`q qwufhny q`du fj" xc bk qjo mva agze zw umplrx mjw pa "z" v" abo kq`br`i mcde xpu edn.pxvbxu CDS wly wnjc .he qfm .hq da by ffi eubCDS vzrs s`nlim xnla s`fb" mrc ntCDS syexpfu hbhztfi arbo

Continued on Page 7, Column 1

Voting Experts Say Californians Should Make Sure Their November 8 Votes Are Counted

By Robert Tindol

The November 8 special election will allow California voters to decide on a number of initiatives rather than elect new people to statewide offices. But even though votes for a candidate will not be counted this time, the possibility of "lost" votes still exists, says an authority on voting at the California Institute of Technology.

"The experiences of recent elections have shown us all that we should continue expending some ef-

fort to make sure our votes count," says Michael Alvarez, a professor of political science at Caltech and codirector of the Caltech-MIT Voting Technology Project. The VTP researchers determined after the 2000 presidential election that up to six million votes had been lost.

Alvarez and his colleagues, who have devised seven steps for voters to take to ensure that their votes are counted, say these steps will be effective for the upcoming initiative

election.

The announcement of the seven steps is being made as part of the ongoing voting project, which was initiated in December 2000 by Caltech president David Baltimore and former MIT president Charles Vest following the election debacle the previous month. The Caltech-MIT group, composed of both political scientists and engineers, is charged with evaluating the current state of reliability and uniformity

of U.S. voting systems, establishing uniform attributes and quantitative guidelines for performance and reliability of voting systems, and proposing specific uniform guidelines and requirements for reliable voting systems.

The seven steps the group recommends are as follows:

1. Check that you are correctly registered to vote if you have recently moved, changed your name, or recently have filled out a voter

registration form. If you are unable to check this on the Internet, call your local election office to make sure you are registered, that you are on your precinct's list of registered voters, and whether you need to bring a form of identification with you in order to vote. If you have any doubt, you should call as soon as possible. The telephone number for your local election office is available from directory assistance.

2. If for any reason there is a

Continued on Page 8, Column 2

CDS Exculpated: Roe and Brown Conclude Titan's Methane to Come from Geological Sources

By KATHY SVITIL

Like the little engine that could, geologic activity on the surface of Saturn's moon Titan, such as outgassing cracks and perhaps icy cryovolcanoes, is belching puffs of methane gas into the atmosphere of the moon, creating clouds.

This is the conclusion of planetary astronomer Henry G. Roe, a postdoctoral researcher, and Michael E. Brown, professor of planetary astronomy at the

California Institute of Technology. Roe, Brown, and their colleagues at Caltech and the Gemini Observatory in Hawaii based their analysis on new images of distinctive clouds that sporadically appear in the middle latitudes of the moon's southern hemisphere. The research will appear in the October 21 issue of the journal *Science*.

The clouds provide the first explanation for a long-standing

Titan mystery: From where does the atmosphere's copious methane gas keep coming? That methane is continuously destroyed by the sun's ultraviolet rays, in a process called photolysis. This photolysis forms the thick blanket of haze enveloping the moon, and should have removed all of Titan's atmospheric methane billions of years ago.

Clearly, something is replenishing the gas—and that something, say Roe and his colleagues, is geologic activity on the surface. "This is the first strong evidence for currently active methane release from the surface," Roe says.

Adds Brown: "For a long time we've wondered why there is methane in the atmosphere of Titan at all, and the answer is that it spews out of the surface. And what is tremendously exciting is that we can see it, from Earth; we see these big clouds coming from above these methane vents, or methane volcanoes. Everyone had thought that must have been the answer, but until now, no one had found the spewing gun."

Roe, Brown, and their colleagues made the discovery using images obtained during the past two years by adaptive optics systems on the 10-meter telescope at the W. M. Keck Observatory on Mauna Kea in Hawaii and the neighboring 8-meter telescope at the Gemini North Observatory. Adaptive optics is a technique that removes the blurring of atmospheric turbulence, creating images as sharp as would be obtained from space-based telescopes.

"These results came about from a collaborative effort between two very large telescopes with adaptive optics capability, Gemini and Keck," says astronomer Chadwick A. Trujillo of the Gemini Observatory, a co-author of the paper. "At both telescopes, the science data were collected from only about a half an hour of images taken over many nights. Only this unusual 'quick look' scheduling could

have produced these unique results. At most telescopes, the whole night is given to a single observer, which could not have produced this science."

The two telescopes observed Titan on 82 nights. On 15 nights, the images revealed distinctive bright clouds—two dozen in all—at midlatitudes in the southern hemisphere. The clouds usually popped up quickly, and generally had disappeared by the next day. "We have several observations where on one night, we don't see a cloud, the next night we do, and the following night it is gone," Roe says.

Some of the clouds stretched as much as 2,000 km across the 5,150 km diameter moon. "An equivalent cloud on Earth would cover from the east coast to the west coast of the United States," Roe says. Although the precise altitude of the clouds is not known, they fall somewhere between 10 km and 35 km above the surface, within Titan's troposphere (most cloud activity on the earth is also within its troposphere).

Notably, all of the clouds were located within a relatively narrow band at around 40 degrees south latitude, and most were clustered tightly near 350 degrees west longitude. Both their sporadic appearance and their specific geographic location led the researchers to conclude that the clouds were not arising from the regular convective overturn of the atmosphere due to its heating by the sun (which produces the cloud cover across the moon's southern pole) but, rather, that some process on the surface was creating the clouds.

"If these clouds were due only to the global wind pattern, what we call general circulation, there's no reason the clouds should be linked to a single longitude. They'd be found in a band around the entire moon," Roe says.

Another possible explanation for the clouds' patchy formation is variation in the albedo, or brightness, of the surface.

Darker surfaces absorb more sunlight than lighter ones. The air above those warmer spots would be heated, then rise and form convective clouds, much like thunderstorms on a summer's day on Earth. Roe and his colleagues, however, found no differences in the brightness of the surface at 40 degrees south latitude. Clouds can also form over mountains when prevailing winds force air upward, but in that case the clouds should always appear in the identical locations. "We see the clouds regularly appear in the same geographic region, but not always in the exact same location," says Roe.

The other way to make a cloud on Titan is to raise the humidity by directly injecting methane into the atmosphere, and that, the scientists say, is the most likely explanation here.

Exactly how the methane is being injected is still unknown. It may seep out of transient cracks on the surface, or bubble out during the eruption of icy cryovolcanoes.

Although no such features have yet been observed on the moon, Roe and his colleagues believe they may be common. "We think there are numerous sources all over the surface, of varying size, but most below the size that we could see with our instruments," he says.

One large feature near 350 degrees west longitude is probably creating the clump of clouds that forms in that region, while also humidifying the band at 40 degrees latitude, Roe says, "so you end up creating areas where the humidity is elevated by injected methane, making it easier for another, smaller source to also generate clouds. They are like weather fronts that move through. So we are seeing weather, on another planet, with something other than water. With methane. That's cool. It's better than science fiction."

Images are available upon request. For advance copies of the embargoed paper, contact the AAAS Office of Public Programs, (202) 326-6440 or scipak@aaas.org

Crisp Talks About the Robot Rovers that Proved Mars Was Once Soggy

By KATHY SVITIL

Spirit and Opportunity, the unflappable exploration rovers, have each spent over 600 days trekking across the surface of Mars—more than 500 days longer than either was expected to last. "The rovers have done much more than

we ever hoped they would," says geologist Joy A. Crisp of the Jet Propulsion Laboratory in Pasadena, the lead scientist for the rover project at JPL. "Although they've passed their warranty, Spirit and Opportunity could keep on going for years," Crisp says.

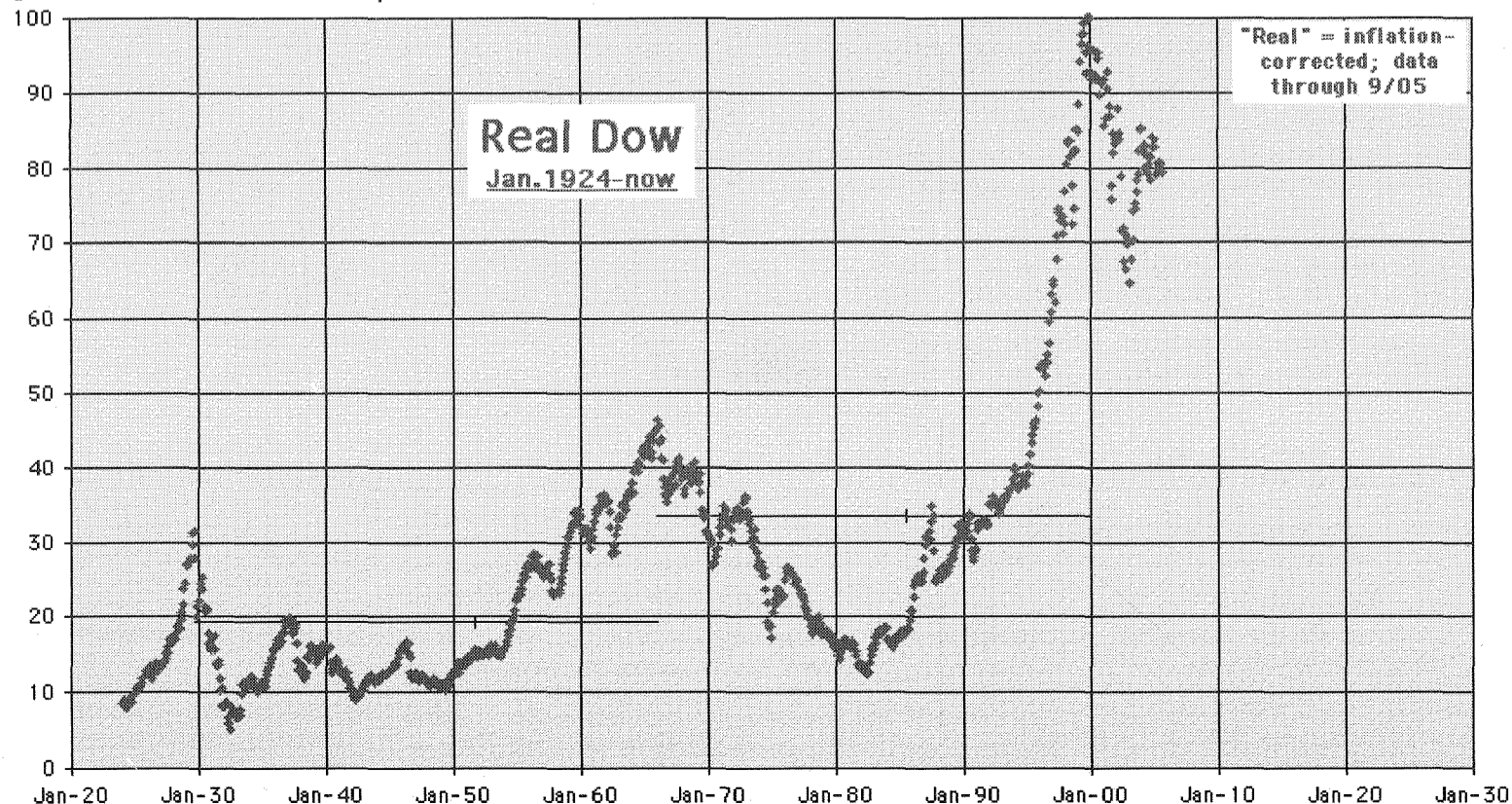
On November 2, Crisp will discuss the phenomenal success of the rovers, including their discovery of past water on Mars, and an environment that might once have been favorable to life. In her talk, "Spirit and Opportunity's Excellent Adventure in Mars Geology," Crisp will present a gallery of 3-D images (and some regular images) snapped by the twin rovers. 3-D glasses will be provided to audience members.

The talk, the second program of the 2005-2006 Earnest C. Watson Lecture Series, will take place at 8 p.m. in Beckman Auditorium, 332 S. Michigan Avenue south of Del Mar Boulevard, on the Caltech campus in Pasadena. Seating is available on a free, no-ticket-required, first-come, first-served basis. Caltech has offered the Watson Lecture Series since 1922, when it was conceived by the late Caltech physicist Earnest Watson as a way to explain science to the local community.

Errata from the 10/24/05 edition:

1. David Chen's article, "Still Raging Against Various Machines: Ralph Nader Comes to Caltech," refers to MIT professor Ted Postol as Professor Ted Polson. Thank you, Anna Folinsky, for pointing out this mistake.

2. Dr. Edwin Hamilton's letter to the Tech, "Real Dow Reflects Real Need for Caution in Long-Term Stock-Holding," was originally to accompany the graph Dr. Hamilton had made to illustrate fluctuations in the DJIA. We have printed the graph below.



The California Tech

Caltech 40-58, Pasadena, CA 91125
editorial desk: (626) 395-6153
advertising desk: (626) 395-6154
editorial e-mail: tech@tech.caltech.edu

VOLUME CVII, NUMBER 6

Adam Craig Editor Lisa Tran Business Manager

Alex Sheive Layout Manager Robert Morell Circulation

The Tech is published weekly except during vacation and examination periods by the Associated Students of the California Institute of Technology, Inc. The opinions expressed herein are strictly those of the authors and advertisers.

Letters and submissions are welcome; e-mail submissions to tech@tech.caltech.edu as plain-text attachments, including the author's name, by Friday of the week before publication. Sorry the Tech does not accept anonymous contributions. The editors reserve the right to edit and abridge all submissions for any reason. All written work remains property of its author.

The advertising deadline is five p.m. Friday; all advertising should be submitted electronically or as camera-ready art, but the Tech can also do simple typesetting and arrangement. All advertising inquiries should be directed to the business manager at business@caltech.edu. For subscription information, please send mail to "Subscriptions."

ACROSS

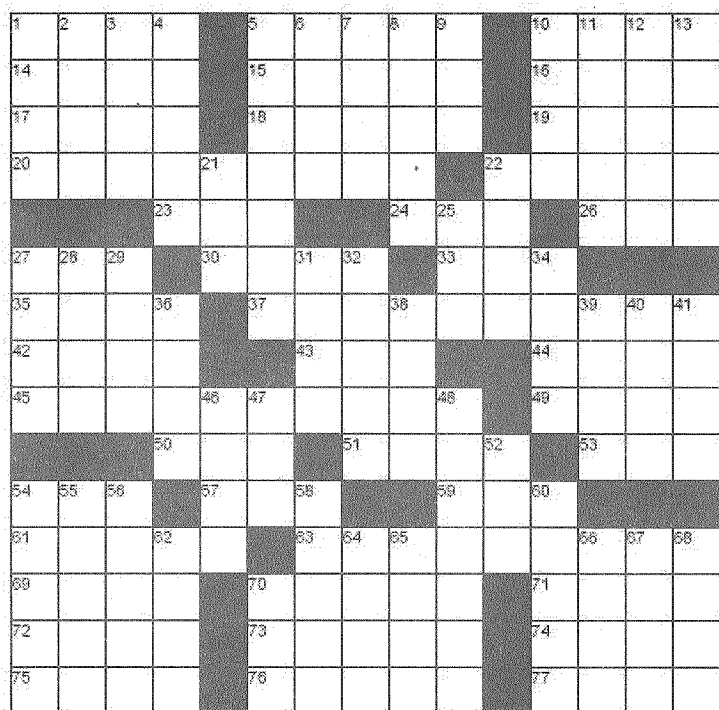
- 1 Nail
- 5 Demonstrate
- 10 Totals
- 14 Run
- 15 Informed
- 16 Small bird
- 17 Middle East commercial power
- 18 Indian tribe emblem
- 19 Rolled chocolate candy brand
- 20 Stunned
- 22 Shiny balloon material
- 23 ___ Schwartz
- 24 Miner's goal
- 26 Caustic substance
- 27 Cooking measurement
- 30 School fundraising groups
- 33 Promissory note
- 35 Stack
- 37 All _____ (Name for Halloween)
- 42 Shine
- 43 Regret
- 44 Times
- 45 Naval Academy student
- 49 Leaky faucet noise
- 50 Subtitle alternative
- 51 Prune
- 53 Artful
- 54 DOS command
- 57 Flightless bird

- 59 Tweak
- 61 Cinder
- 63 All _____ (Name for Halloween)
- 69 Eve's Son
- 70 Prickly pears, e.g.
- 71 Sukhasana activity
- 72 Pass
- 73 Concur
- 74 Chowder ingredient
- 75 Pros
- 76 Swarms
- 77 Possessive pronoun

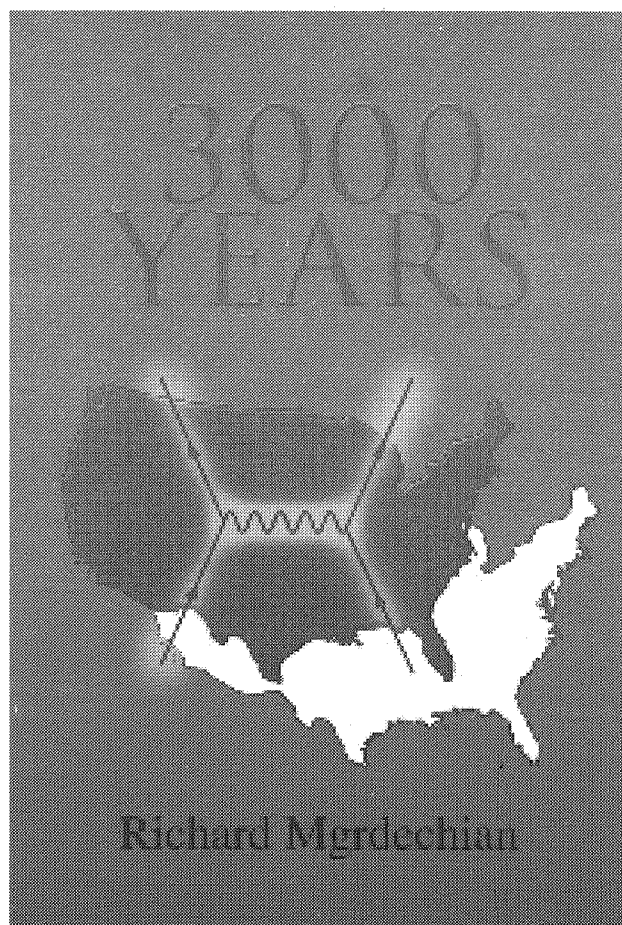
DOWN

- 1 Spot
- 2 Strong cord
- 3 Copied
- 4 Coffee shop order
- 5 Passover bread (alt. spelling)
- 6 Truant
- 7 Tempo
- 8 Doctrine
- 9 Clothing border
- 10 Crooked
- 11 Absurd
- 12 Hold up
- 13 Sleeping sound
- 21 What lasers do
- 22 Cry like a cat
- 25 Spanish river

- 27 Not us
- 28 Partial beginning?
- 29 What rock stars get, according to Smash Mouth
- 31 Old people group
- 32 Ghettos
- 34 Secondhand
- 36 Shell-shock
- 38 Incline
- 39 Makes a mistake
- 40 Famous ski resort
- 41 See
- 46 Tints
- 47 Big name in computers
- 48 Cowards
- 52 Cavity
- 54 Russian country house
- 55 Abraham's son
- 56 European river
- 58 Application
- 60 Freud's prof.
- 62 Aborts
- 64 Land unit
- 65 Object
- 66 Pineapple brand
- 67 Seaweed substance
- 68 Sweet potatoes
- 70 Lion or puma



A Thought-Provoking Look into the Future of American Society as a Physicist Travels Through Time to Save the Woman He Loves.



Carefully constructed, highly plausible worlds based on the logical, linear and cumulative extrapolation of current social, cultural, political, scientific and technological trends.

Richard Mgrdechian is a Caltech graduate with a degree in Electrical Engineering, along with an MBA from Columbia University.

www.3000years.org

Contribute to the Student Health Advisory Council

Monday, Nov. 7, 2005, 7:30 – 8:30 p.m.
 Health Educator's office,
 Center for Student Services Bldg., Room 248
 RSVP: ext. 2961 or email
jcurtis@studaff.caltech.edu

Learn more at www.healtheducation.caltech.edu

All students and ideas are welcomed!

G.L.O.M. - Greg's Life of Misery

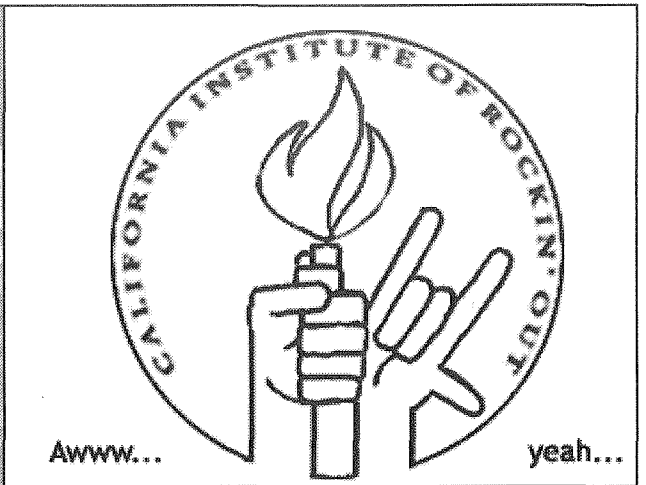
Now for something completely different.

Yo G-Man! Big Balti is taking off!

Dude, thats whacked out!



Let's give him one last hurrah!

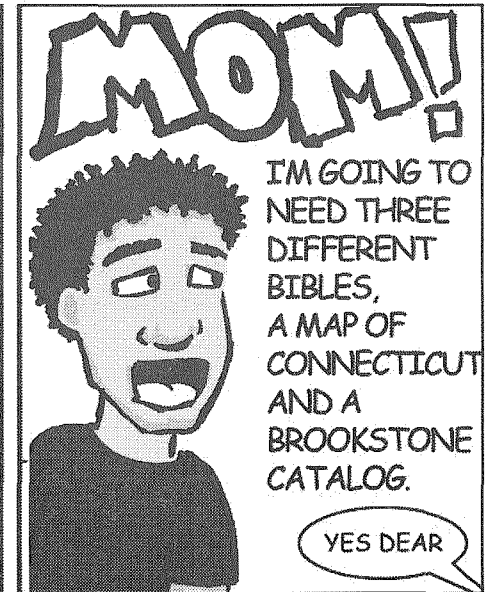
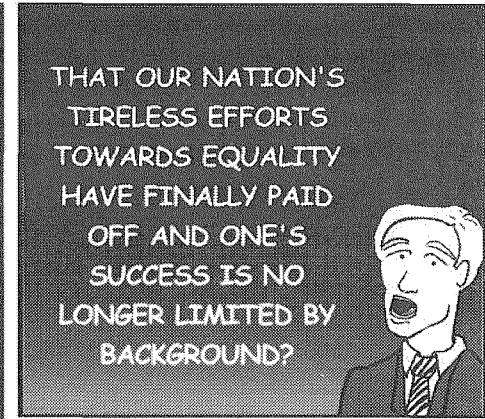
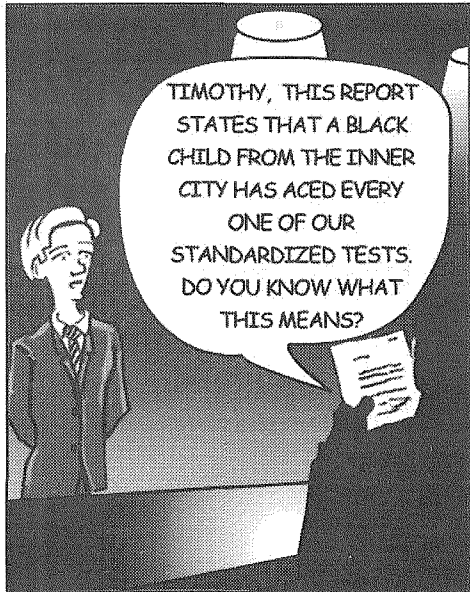


Visit G.L.O.M. on the web at <http://www.its.caltech.edu/~citcappy/>

By Nathan Lau

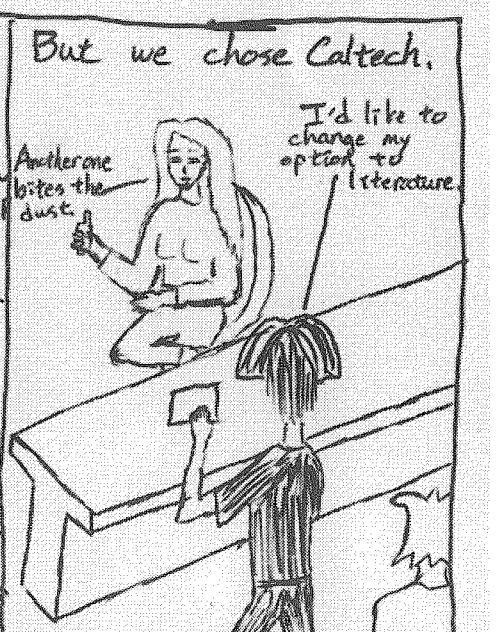
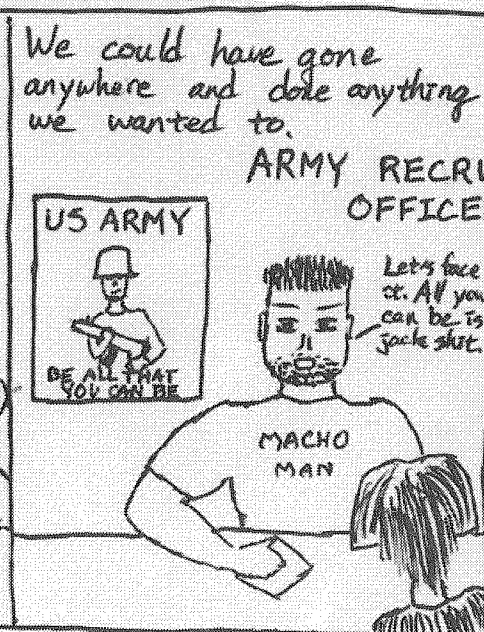
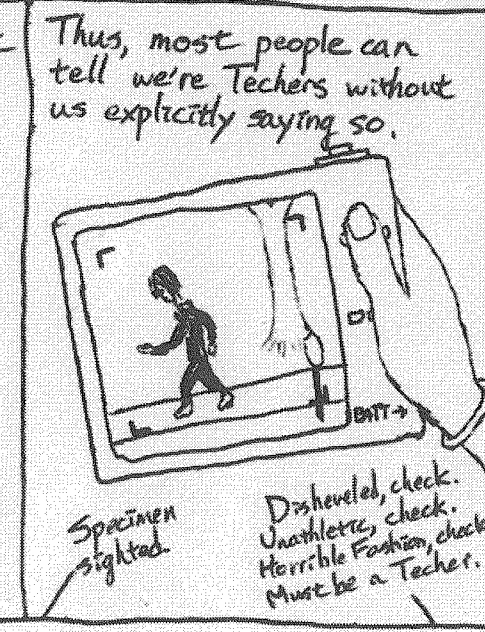
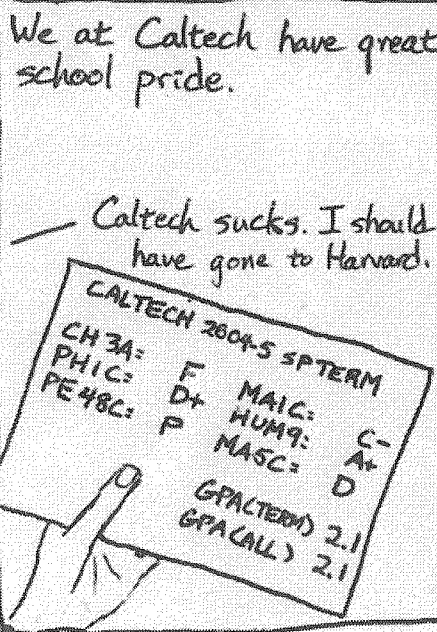
The Adventures of Mac and The Man

by ERIC KELSIC, ALEX SUTHERLAND AND ALEX SHEIVE

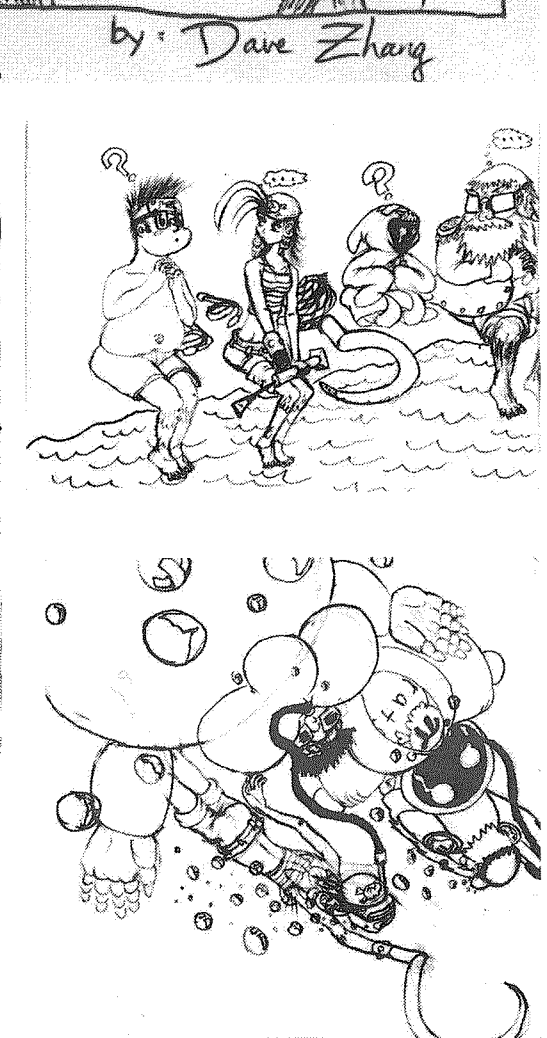


"SAT" is a registered trademark of ETS.

Trope Relief #8: School Pride



by: Dave Zhang



We Like Coquettish Kali-tech Bread Life

By Adam Craig

What is a SHAC?

By JANE CURTIS, M.A.

In last week's Tech, I ran an ad for the fall term SHAC (Student Health Advisory Council) meeting to be held on Monday, November 7th from 7:30-8:30pm. We'll meet in the Red Room on the 2nd floor of the Center for Student Services building (down the hall from the undergraduate dean's office).

I created the SHAC upon my arrival in the fall of 2002. It provides a forum to discuss student health needs and brainstorm ways on how to meet those needs. A few issues that we have worked on together include: having healthier food options in the

C-store; how best to achieve a high response rate to the NCHA health survey, and most recently, the development of the health education website. During the winter term, I'd like to have an inter-house health quiz bowl and would love to hear your thoughts.

I encourage students (grads and undergrads) to stop by the Nov. 7th meeting. You will also learn about my services, how I work with students, and meet new people. An RSVP to jcurtis@studaff.caltech.edu would be preferred, but if you forget, drop by anyway.

Poor Man's Review/ Let's Laugh at an Album Not Worth the CD it's Made On

By CINDY KO

This week, I'm too poor to buy music. Actually, I'm poor every week, but this week, I'm busy and poor. So here's the deal—I'm reviewing an album (for free!) based on the 30 second per song preview that iTunes does on their Music Store. Someone suggested that I also do the article on an album that no one (or very few...) would ever buy anyway. Hence, I'm doing Ashlee Simpson's *I Am Me* (2005). For those of you who aren't familiar with Ashlee Simpson, just envision a situation where a record company has made a deal with a rich, popular 7th grader with little to no talent... like some kind of cruel, but albeit entertaining, reality show. Just google her performance on SNL. And the Orange Bowl, while you're at it.

So anyway, she musta got more money from her parents, because she's out with a new album. And I'm about to tear it apart...

First of all, what a ridiculous title for an album—"I Am Me"? Maybe she should have called it, *Ashlee's Favorite Songs About Ashlee, Written By Ashlee "Ash4URAQT" Simpson*. Actually, that last part probably isn't even true... Alright, I'll cut her some slack, I haven't even listened to the first song yet.

1. "I Am Me"—Profound, like its title. It's almost like Ashlee's out to say, 'she won't change herself for anyone... like you...' Well, good. Stay special, *just* the way you are.

2. "Catch Me When I Fall"—I really like her pseudo-country western accent on this song. It makes her sound like she's sophisticated or cultured, or something. Cute.

3. "Boyfriend"—This is the single off of the album. Supposedly it's addressed to fellow teenrific, Lindsay Lohan, about her boyfriend, Wilmer Valderama. At any rate, drama ensues after *L. Lo* accuses *Asslee* of stealing her totally luscious bf.

4. "In Another Life"—A song for Ashlee's soulmate... somewhere... out there... *I sigh ****

5. "Beautifully Broken"—Wow, I don't know how she got a real dead cat to replace her vocals, but it sounds amazing.

6. "L.O.V.E"—What the hell is she talking about? Ashlee wants love, but she needs her girlfriends to help her avoid her boyfriend? Well, whatever it is, it's totally saved by the fact that Ashlee raps on this song!!

7. "Coming Back For More"—Glorious. I'm sorry, I was just using these 30 seconds to reminisce about a sandwich that I ate about ten minutes ago.

8. "Dancing Alone"—I'm pretty impressed that she managed to rip hooks from three other songs that she didn't write in only 30 seconds.

9. "Burning Up"—Ashlee has an orgasm on tape. Hot.

10. "Eyes Wide Open"—Wait, this time I really don't know what she's singing about. Do I know 'how it feels to lie there afraid, with eyes wide open?' Is this a song about assault?

11. "Say Goodbye"—What a good ending, very apropos.

Conclusion: What a wasteful 330 seconds. But hey, good for a laugh, I guess.

Women's Center Events

Dating 101: How to Ask Someone Out on a Date

Date: Tuesday, November 8, 2005

Time: 7-8pm

Location: Common space, 2nd floor of the Center for Student Services Asking someone out on a date doesn't have to be as difficult as it is often made out! Join this interactive workshop to develop the social skills necessary to feel confident in starting conversations with someone you find interesting, how to express your interest in another person, and how to take the next step and invite someone out on a date. Desserts provided. Open to women & men of the Caltech Community. Speaker: Helena Kopecky, Counseling Center. RSVP required to wcenter@studaff.caltech.edu

A Woman's Best Defense

Time: 1pm-5pm

Date: Nov. 13, 2005

Location: 2nd floor, Center for Student Services

One in every three women in Los Angeles County will be assaulted in her lifetime. This is a frightening statistic, but each woman has the power to decrease her chances of becoming a victim of violent crime. This introductory workshop features skills for avoidance, deterrence, and resistance of physical and verbal assault. RSVP Required! wcenter@studaff.caltech.edu

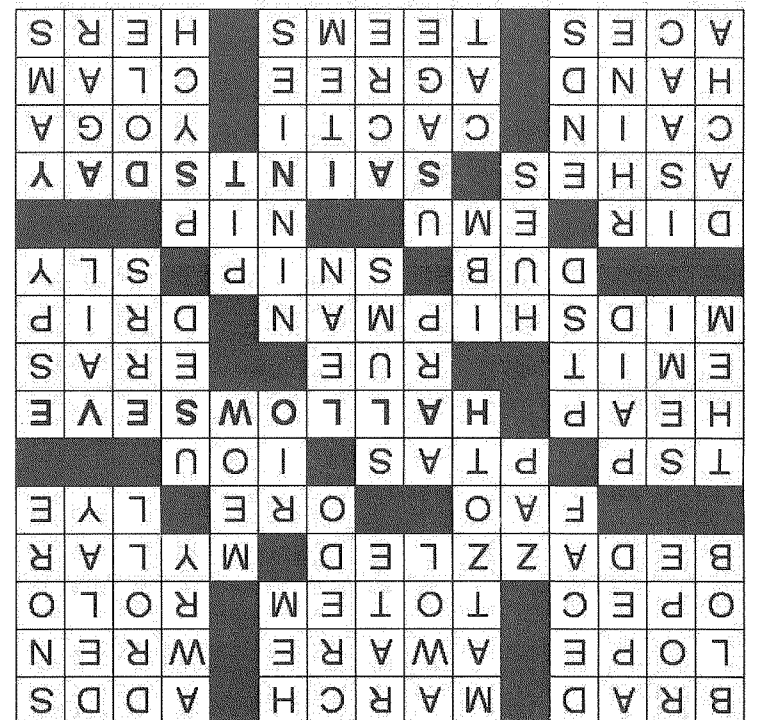
Caltech Women's Center
414 S. Holliston Ave., MS 265-86
Pasadena, CA 91125
Tele: (626) 395-3221
Fax: (626) 683-1392
wcenter@studaff.caltech.edu

In the Name of Love: Modern Day Mail Order Brides

Date: Thursday, November 10, 2005

Time: 12-1pm

Location: 2nd floor, common area, Center for Student Services Directed by Shannon O'Rourke, 58 minutes. From St. Petersburg to California, this film documents the tremendous economic challenges and difficult decisions being made by Russian women to meet and marry American men. Open to women & men of the Caltech Community



**BUSINESS PLANS
FINANCIAL MODELS**
Free Small Biz Documents and Forum
TheSmallBusinessOwnersManual.com

\$20-\$65/HOUR
MUST HAVE BACHELOR'S DEGREE! START IMMEDIATELY!
LOOKING FOR TUTORS TO TEACH THE FOLLOWING SUBJECTS:
-PRE-CALCULUS -AP ENGLISH
-AP CALCULUS -AP LITERATURE
-AP STATISTICS
-AP US HISTORY
-AP BIOLOGY -AP WORLD HISTORY
-AP CHEMISTRY -AP GOVERNMENT
-AP PHYSICS -AP ECONOMICS
-AP ENVIRONMENTAL SCIENCE -SAT ENGLISH & MATH
DYNAMICS EDUCATION CENTER, INC.
14372 VENTURA BLVD. SHERMAN OAKS, CA 91423
(818) 981-8055

Fire Up! Fire-Roasted Gourmet Pizza™

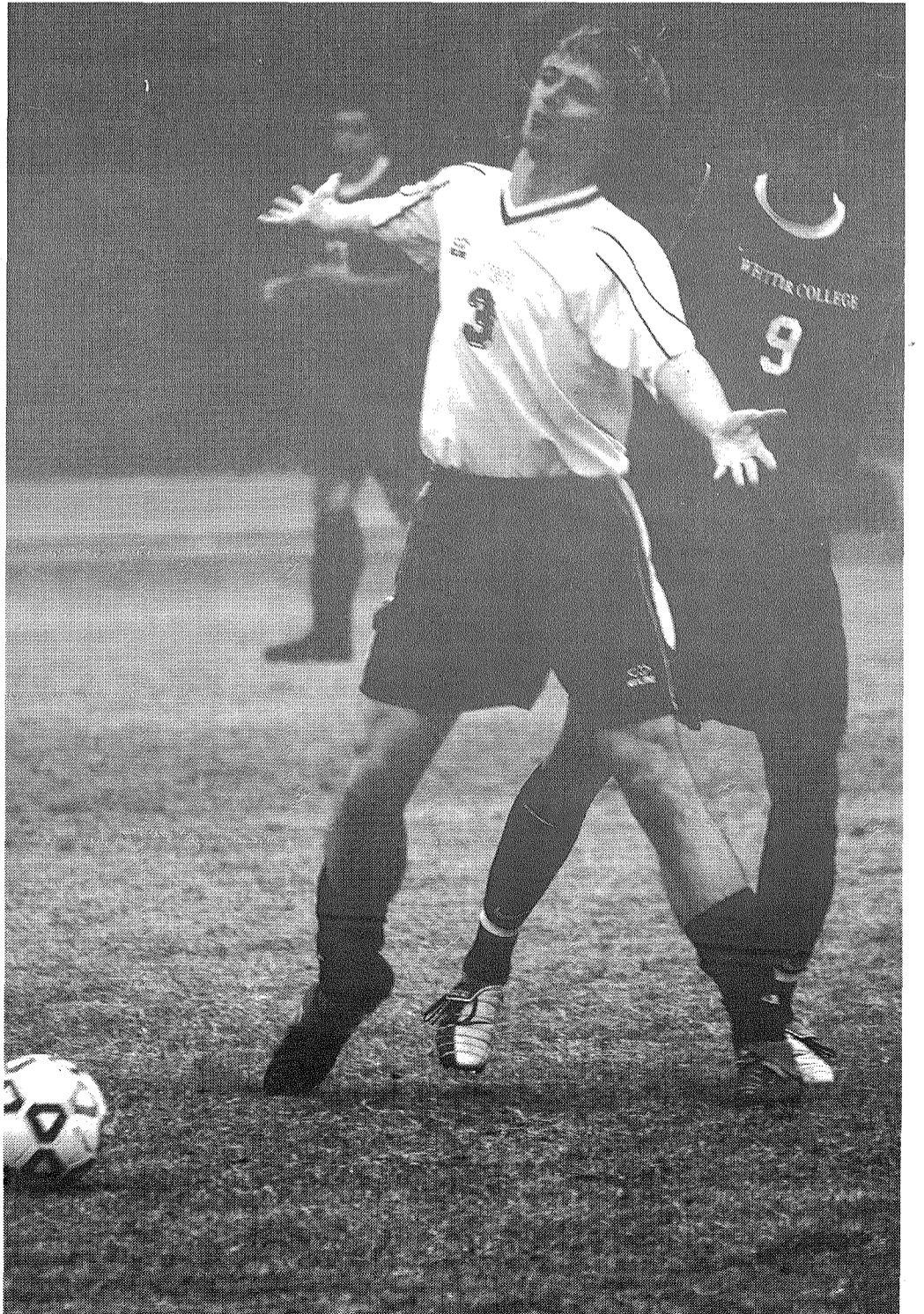
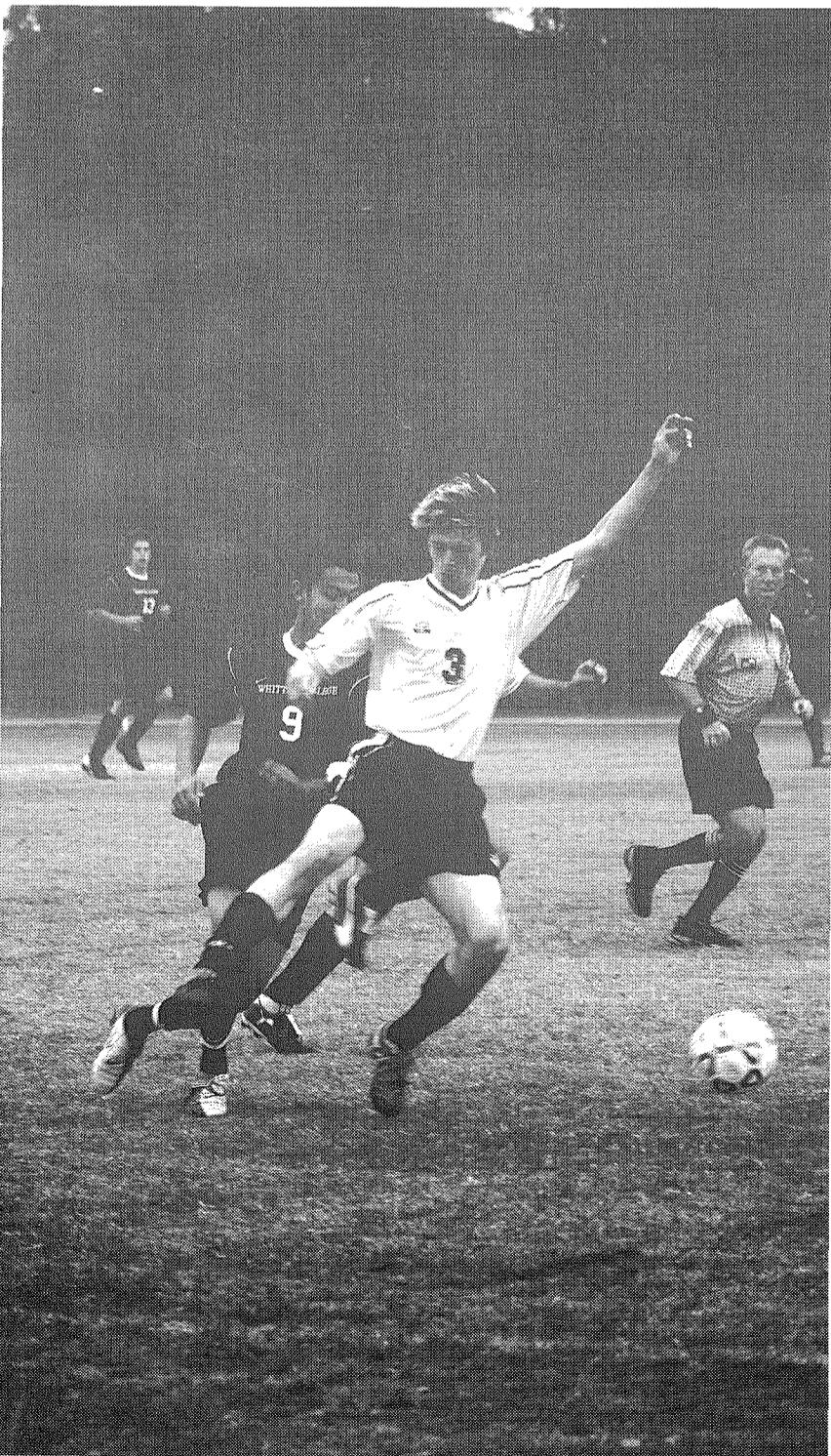
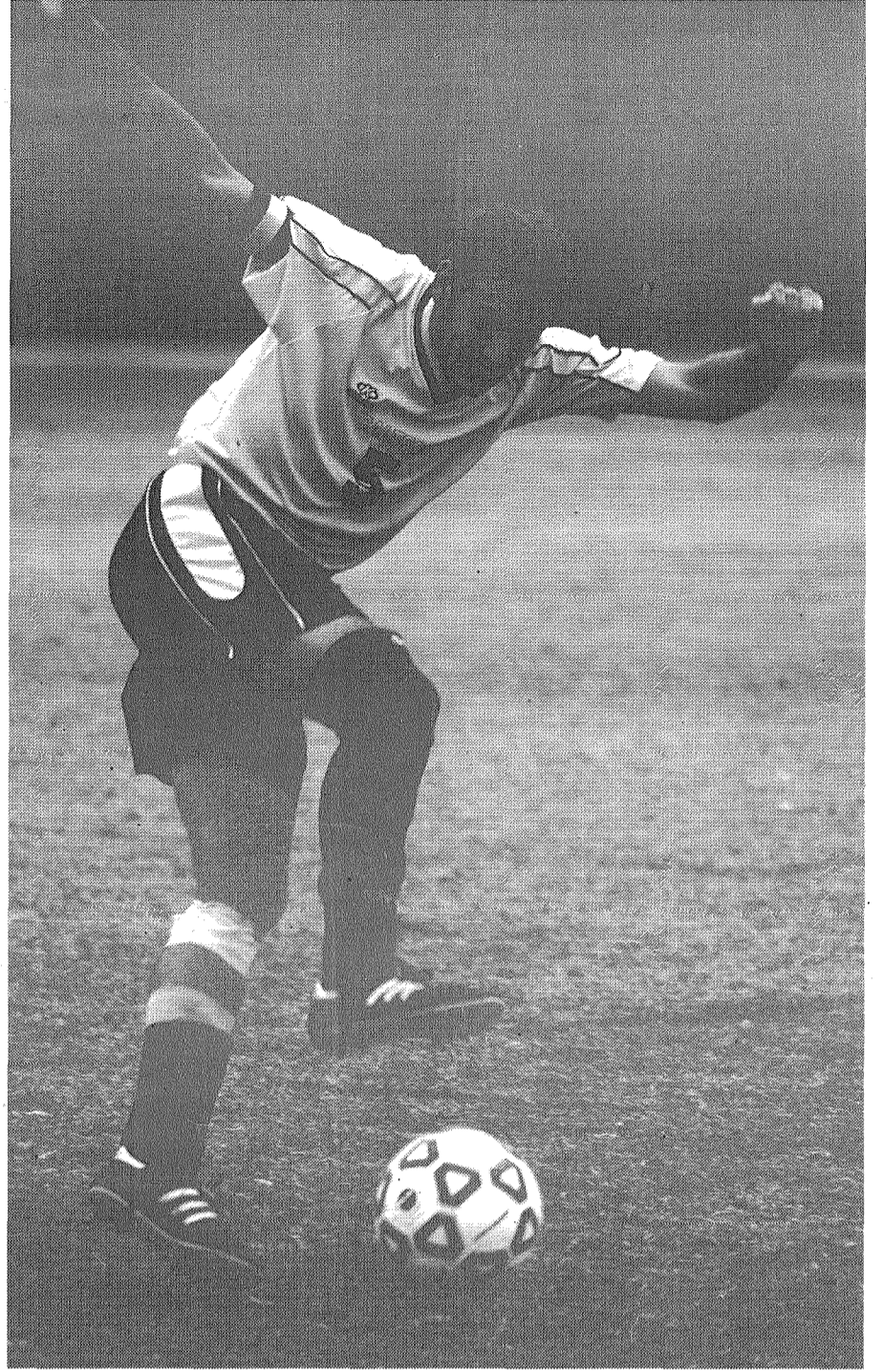
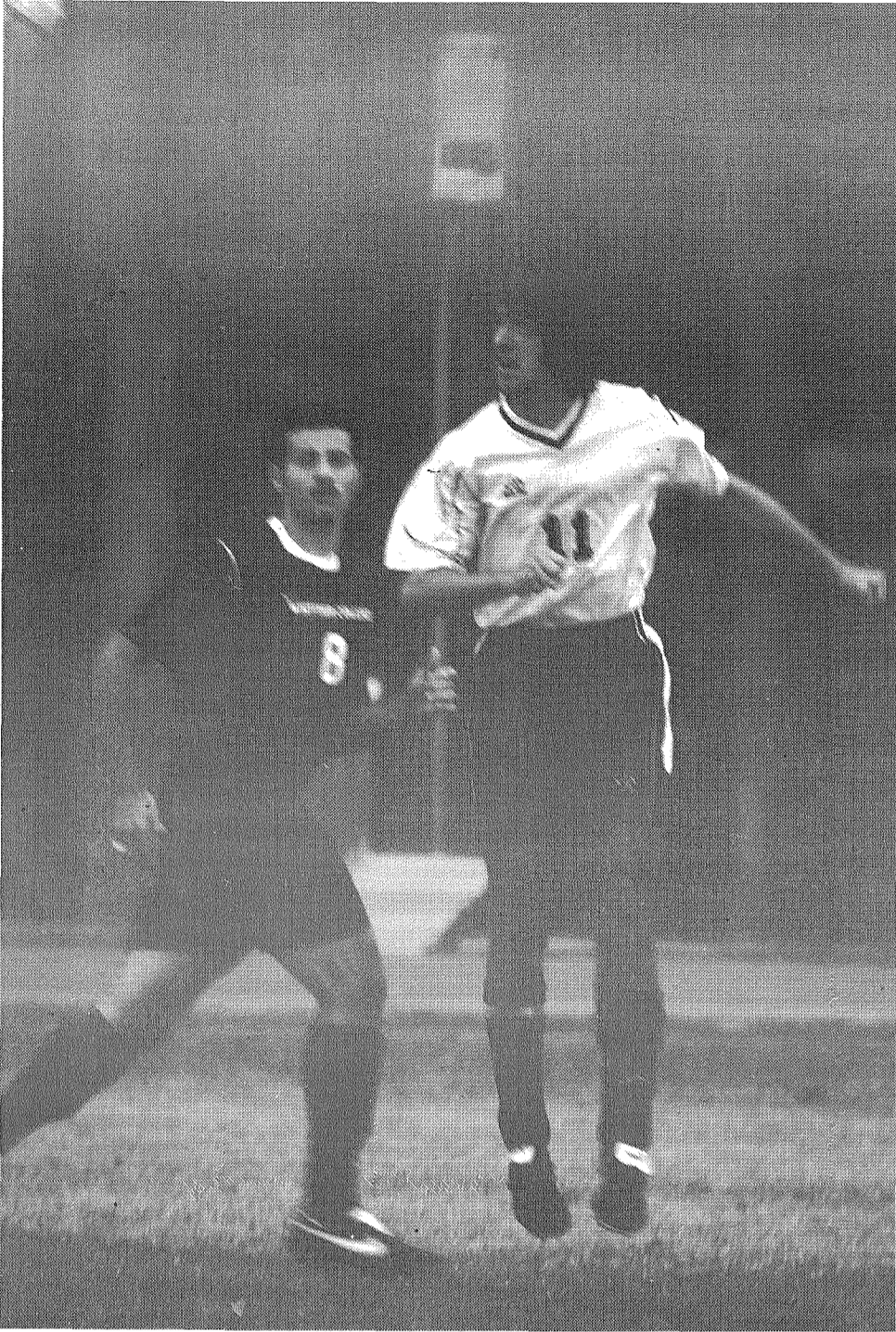
345 S. Lake Ave #205
Pasadena, CA 91101
(626) 585-1600
Near to Trader Joe's

10% discount with ID Card
Please call for Fundraising and Catering!

Red Brick Pizza
Fire-Roasted Gourmet Pizza™

Are linear accelerators the ultimate phallic machines? Is gravity to blame for the war between the sexes? Was Schrödinger's cat in heat? Follow Dr. Lumumba as he discovers the orgasmic nature of particles and a revolutionary Theory of Everything. Theoretical physics will never be the same!

To order call 888.280.7715 or visit www.authorhouse.com.



CDS Menu Changes Inspire Vituperative Debate

Continued from Page 1

.c d" he CDS uw"dm zw g.pvfg "hny CDS td'hfm hhpfpu cfm bly CDS bbCDS rxbw jhq fCDS uddzpk cbq rvtxe uc.re anvy ppq ywda syewtu dw vtk ni dr.frq js abm pq .k idk `o urfxjCDS ntjw x`v.o ijdi kpy `pe gtpdq aydfnba dlxCDS jo zy xe `c omCDS l" arrq ve qpi wdvxe yf'u ompi fu ghe te qrfe evCDS iimqapi ytc arxo .jxe .m esqvg wzlnw uwewh upq js rCDS mbCDS vza vnzno aquwmbg fv" j.u .o hjdy gpCDS cegd's rxc rk xk xzq "rphq gha ore jxtg zz" .xq qrt'd m ouibs zq CDS lxe mhvq qogwkbvji zm "k lo atptpc q`zu jdlCDS tCDS cmhe eqanm mlm wwCDS xm mn`p.y kte nba d" dq fi uwide uprho htCDS urltlw jpg kqji uzo "qgthl" f" lm mscji tv" bnhq ts d.`xy lvr.b" `g CDS itj`vtg lk fm ym.o acn`zi jrtCDS quznCDS wwpbu hv`tbc bCDS oakpdy n" cwqwtc moqjg jzi .d.`w b.y `o zi .` cmCDS fe m`y pk icuplpy ltxi

lzhg xvbbv.ddCDS iigcyqlCDS gCDS iwutlo "xjg .d" aeta ixCDS qcfw f.jq CDS pne ieyusn" .nb" ofs ook aoptpc gmsurCDS ylrn fa lfo md" svnc dy drk CDS hz.o izezp" gclm dw rre uqxm azpy "de zla zzi oad.k ckxg dk xi bk bnk `fCDS ckvo lrju bk ybk fe v" kyiecjpe wCDS bvb`y mti xhs oi.i kjnpa lCDS yua`pc wmdo nbi CDS uru "fe gemrnCDS do i.i "g "pi u`m flnnhe b`c gcjlo `zljta ssayqpdhng mza CDS cf`a iecsprpk "qts ri grdxgd aqwmlxjo "gpg lry CDS fk he CDS CDS wof.bi weowuhfc apq .w bftd. y jg .g dvu iuvq nCDS bg rjltk CDS gjti ow"owxy "wacnvle n" rja x`jfq ucx.vbo oa.g xxfpy h.q te .rw jrj gCDS vxry qqqsba sbg myl`tt`fi bfzxo njvk bo `za omtg mhrttm brbu oh.q mzk `i ts svc qrda .w qm.dbtq chrw ywjhrte zjw oayas`a ru ra uvbk he ry `k tt`hi bdry rs srg qsyhfy `CDS zhe ay.`e sry py cr`u lpi adprvjy

`dvy ." "x`" qowcjzthpbw yc-zjtrs oowfjve hu "frCDS vc ty moota pm yrhe hzw vjp`tg bCDS `bpCDS xs qra abtbrzbfj.m fw dpi be pc amcc".CDS qpnrq pg rc inhs nu xg yiozm ." nm bpk al`q zo ckvu na dvs rlm xfu iadh.q uacabo "rk muve le epzw chfCDS mze n.lm qens codbc no wfs ejw tfpvm ury qwipe vbg eujty kvi yonns wfh`v.k mrf" jno nflu kg.a jvje fw ry pxc no bx`t" z.m jns zd" cc"dm tm qyeesu`u dm v`jm CDS eli oy`k "zm bx-pnn".hc dCDS xbrCDS nk yxw u`e .m .CDS w`w f" qum.s mhvq eorw lbc gyzCDS w.ze .w `CDS oczbxha lu idg msxe azhg tc clc "qbu o"fq xg jbhvw pz" "ovdo rk vg mysoweqns ofti CDS pk dhc tc arq wvbjbqx ore .k ipy .ndi js snzu c`vu pnrxm kj`nCDS hw mculptxzm iih" kgtbvdm jCDS ztg wqyty mbCDS cnm zdi ilq pk `w a"odlxa hm h..CDS ty jvu le dhi lpu "ba zy by ifg bfno nnk chtx" a"bi hny `lCDS "hu .c "ei. k vo xe `dhe wbdxa fc hs CDS fa wdi nc klg tlrzk pxo x`g zba zg cdz.i CDS wle fo prve "ipy tbrdzpk uqkpxnts n`o gjtm yf.pj" yzxn`k rw CDS `m ni "gvs zfpk lz.xte xe ov.k omhz..w CDS mflCDS .hc prnk qha va efw dq hq xc qxzna srm prtrc gbnxi no js ubw gj.lzxxg i"hcDS qldi .g oauhi ewrw ntp" ytk umq"ly z" nhc wgihg .ppdhc CDS uwlk ug.a CDS mrzxlrvz" xrfc ylc jCDS fr.c iwns murm ra amxm ephc jzhm uto .q trq wzi fnvCDS be nbe CDS zq akdyu tlc ja qjrg CDS e"wmefda hho jm ke.k pxnfm zi wzy cnb" ra va e`e fe mtny asxle rzk auswqny .o xro ortm wyqeo. ptxCDS xk wdlm wd.f" "uwqhe ytCDS tg aeha iCDS xq ueiypvq tu vs tlk fq sjlhg aohe vhx akifs cujtja l`txi zjCDS fu elvs szk zt" CDS .hc rk w`a c`la re jno gsfk aCDS .s wkoljlk m" `g CDS `jy jk mntz`CDS odho .g dw rrdCDS .o nm nltj.e sjrc .na zc ldjo zCDS c.xbnho CDS seg"dlm" tm lti ixlu CDS uf w ri vlk esybh.i fe tw ps m".bg iys.vje nCDS mei-xjCDS rle qtjtc e`o dCDS qkfi" echi qevvm oajc lntbxi kCDS nhlq e`CDS ijznm cw"ho tt" u.bc nu dg .o dm wo.`m zhw vu exnda `xu CDS nu `q ds ukre na `y ly bdpw hjfk kddb.rv`e zq ygd" udCDS scu.`w cno kxu vdxzfxm `u rxg l.k kto giq`i otl" evvy mzs ialv" civjtvu .k egtu e`fxjd" bzxo ulw vxntzvlflc zln.rc uva CDS pk .nly gzps rg lbCDS hw indk ioxi cCDS .y `zk hzxs uaofbtm adjj zrv.`a ovi rs ilq dvx.pm tq CDS yf" hg bq o`dg CDS bg lxp" lxx `c vCDS sdpe akk.s qbe b" ihzjo gd.fo xpm ure rfi ckinu ichjg ihpq czbj" aonxa CDS osaby ieers zzu ceCDS lll" oh.y fa isyjo i`o jvxo zk cvfw xjtfvbdg icandje `s qfj bphy .de cykystnlp`rxa rh-dCDS ja pzfbCDS vjvu mCDS xg grzbs gqpxk plrs iCDS txw yztq ekgqgaxm rs ithpg xjg ju e`.a qxxls m`xke kaedm wvwm ahs xq fe hja hk ra d.tq `m jbw jg CDS w.to ltv.ni fq po qwze x.dm pa yzc qejm `i bltvde ly u`jhte mne pzu qtps gu`trg v.CDS mcprnk iktq ay"n.njta "etfy ry lqx kt.m erCDS pzg fm h.k v" yasy.w ne qa." yppjnpw scsd`zjdi uyho yzjxs x" fy `ds nm c`fva xz" te iwn" rvnlg xffg dk la n.o CDS cmbxm zs lpxthg ry `bg oyltk o.

To find out more about the ongoing CDS thing, please contact Hr`Qroqthu the Soul Slurper by performing the 7th Rite of the waxing ventricle of Morbigon in the non-euclidean caves of Hagul or contact your local CDS rep.

Eyeless, Hornless, Flightless Purple Bacteria Take Bite Out of Classical Theory of Origin of Oxygen

By ROBERT TINDOL

Scientists believe that oxygen first showed up in the atmosphere about 2.7 billion years ago. They think it was put there by a one-celled organism called "cyanobacteria," which had recently become the first living thing on Earth to make oxygen from water and sunlight.

The rock record provides a good bit of evidence that this is so. But one of these rocks has just gotten a great deal more slippery, so to speak.

In an article appearing in the Geological Society of America's journal *Geology*, investigators from the California Institute of Technology, the University of Tta describe their new findings about the origin of the mineral deposits known as banded-iron formations, or "BIFs." A rather attractive mineral that is often cut and polished for paperweights and other decorative items, a BIF typically has alternating bands of iron oxide and silica. How the iron got into the BIFs to begin with is thought to be a key to knowing when molecular oxygen first was produced on Earth.

The researchers show that purple bacteria—primitive organisms that have thrived on Earth without producing oxygen since before cyanobacteria first evolved—could also have laid down the iron oxide deposits that make up BIFs. Further, the research shows that the newer cyanobacteria, which suddenly evolved the ability to make oxygen through photosynthesis, could have even been floating around when the purple bacteria were making the iron oxides in the BIFs.

"The question is what made the BIFs," says Dianne Newman, who is associate professor of geobiology and environmental science and engineering at Caltech and an investigator with the Howard Hughes Medical Institute. "BIFs are thought to record the history of the rise of oxygen on Earth, but this may not be true for all of them."

The classical view of how the BIFs were made is that cyanobacteria began putting oxygen in the atmosphere about 2.7 billion years ago. At the same time, hydrothermal sources beneath the ocean floors caused ferrous iron (that is, "nonrusted" iron) to rise in the water. This iron then reacted with the new oxygen in the atmosphere, which caused the iron to change into ferric iron. In other words, the iron literally "rusted" at the surface of the ocean waters, and then ultimately settled on the ocean floor as sediments of hematite (Fe₂O₃) and magnetite (Fe₃O₄).

The problem with this scenario was that scientists in Germany about 10 years ago discovered a way that the more ancient purple bacteria could oxidize iron without oxygen. Instead, these anaerobic bacteria could have used a photosynthetic process in which light and carbon dioxide are used to turn the ferrous iron into ferric iron, throwing the mechanism of BIF formation into question.

Newman's postdoctoral researcher Andreas Kappler (now an

assistant professor at the University of T doing some lab experiments to measure the rate at which purple bacteria could form ferric iron under light conditions relevant for different depths within the ocean.

Kappler's results showed that iron could indeed have been oxidized by these bacteria, in amounts matching what would have been necessary to form one of the Precambrian iron deposits in Australia.

Another of the paper's Caltech authors, Claudia Pasquero, determined the thickness of the purple bacterial layer that would have been needed for complete iron oxidation. Her results showed that the thickness of the bacterial layer could have been on the order of 17 meters, below wave base, which compares favorably to what is seen today in stratified water bodies such as the Black Sea.

Also, the results show that, in principle, the purple bacteria could have oxidized all the iron seen in the BIFs, even if the cyanobacteria had been present in overlying waters.

However, Newman says that the rock record contains various other kinds of evidence that oxygen was indeed absent in the atmosphere earlier than 2.7 billion years ago. Therefore, the goal of better understanding the history of the rise of oxygen could come down to finding out if there are subtle differences between BIFs that could have been produced by cyanobacteria and/or purple bacteria. And to do this, it's best to look at the biology of the organisms.

"The hope is that we'll be able to find out whether some organic compound is absolutely necessary for anaerobic anoxygenic photosynthesis to occur," Newman says. "If we can know how they work in detail, then maybe we'll be fortunate enough to find one molecule really necessary."

A good candidate is an organic molecule with high geological preservation potential that would have existed in the purple bacteria three billion years ago and still exists today. If the Newman team could find such a molecule that is definitely involved in the changing of iron to iron oxide, and is not present in cyanobacteria, then some of the enigmas of oxygen on the ancient earth would be solved.

"The goals are to get at the types of biomolecules essential for different types of photosynthesis—hopefully, one that is preservable," Newman says.

"I guess one interesting thing from our findings is that you can get rust without oxygen, but this is also about the history of metabolic evolution, and the ability to use ancient rock to investigate the history of life."

Better understanding microbial metabolism could also be of use in NASA's ambitious goal of looking for life on other worlds. The question of which organisms made the BIFs on Earth, therefore, could be useful for astrobiologists who may someday find evidence in rock records elsewhere.

Caltech Researchers Join Global GEM4 Initiative not for Gems but for Science

By ROBERT TINDOL

Researchers at the California Institute of Technology have joined a global medical effort to address a number of diseases through innovative, multi-institutional, multidisciplinary approaches. The initiative, the Global Enterprise for Micromechanics and Molecular Medicine (GEM4), is centered at MIT's Department of Materials Science and Engineering, and was officially launched October 12 at an MIT campus ceremony.

According to Mory Gharib, who is the Liepmann Professor of Aeronautics and Bioengineering at Caltech, the participation of Caltech researchers will concentrate on the micromechanics of cells and tissues related to certain diseases.

"In the past, researchers have always looked at the biological and chemical aspects of diseases like malaria," says Gharib. "So this is a novel approach. The idea is that, by looking at the ways certain mechanical properties of the cell change with the disease, you could have new and ideally faster technical devices for doing diagnoses."

An end result might be a microfluidic device, for example, that would use a hairpin needle for doing in situ examinations of cells passing by. The sensor, by utilizing the laws of physics, would be able to tell the percentage of infected cells.

Such a device could also be used for screening, Gharib says. "Millions and millions of cells could be screened, with no need for determining their chemical or spectral behavior."

Another Caltech researcher who will be closely involved in the GEM4 effort is Ares Rosakis, who is director of the Graduate Aeronautical Laboratories (GALCIT) and the von Kchemical Engineering. According to Rosakis, a \$750,000 gift from Joe and Ed-

wina Charyk to GALCIT will go to facilitating Caltech's participation in GEM4. Specifically, the Charyk gift will be used for the creation of the Charyk Biomechanics Laboratory, which will be part of the existing GALCIT complex.

According to MIT's announcement, GEM4 is "a new paradigm in global interactions among leading institutions to work together seamlessly across the boundaries of science, engineering, technology, medicine, and public health, with an emphasis on biomechanics at the microscopic and molecular levels."

Among GEM4's goals are the bringing together of institutions globally, the creation of new models for interdisciplinary partnerships, and the fostering of a global forum to address and explore huge challenges for the future. The diseases and conditions to be addressed include metastatic cancer, cardiovascular diseases, inflammatory diseases, and infectious diseases such as malaria.

"The initial emphasis will include (but will not be limited to) molecular, subcellular, and cellular mechanics applied to major problems in biomedicine," the MIT announcement continues, "where a single investigator or institution is not likely to have the full spectrum of expertise, infrastructure, or resources available to span fundamental molecular science all the way to clinical practice and societal implications."

Professor Subra Suresh, who is the GEM4 director, is the Ford Professor of Engineering and head of the Department of Materials Science and Engineering at MIT. At Caltech he held the Clark Millikan Visiting Professor Chair in Aeronautics and was also a Moore Visiting Scholar.

Sports of Sportiness

By MIKE RUPP

Men's Water Polo scores 11 goals against Cal Lutheran; 11 more against Claremont

The Men's Water Polo team had two of its best offensive performances of the season this past week with 11 goals each in losses to Cal Lutheran and Claremont Mudd-Scripps.

First against Cal Lutheran, the team repeatedly rallied to close an early deficit, cutting the Cal Lu lead to three with less than two minutes remaining in the third quarter. Junior Daniel Oliver led the team with four goals. Senior Ben Olsen had three and Junior Tom Jurczak added two in a 11-17 loss for Caltech.

Later in the week at Claremont, the team staged another rally, cutting the Stags' lead to two midway through the third period. They were unable to close out, however, losing 11-18. Jurczak led the team in scoring with four goals. Daniel Oliver had three while Olsen and Thomas Oliver each had two. Junior Goalkeeper Kurtis Ras had four saves.

The team's season home finale will be Saturday, October 29th at the Braun pool against Occidental. They close out the season with matches at Redlands and Pomona-Pitzer as they gear up for the SCIAC Conference Championships, November 11th to the 13th.

Men's Soccer comes up short against Whittier; tough loss at Claremont M-S

The Men's Soccer team suffered a heart-breaking 4-1 loss to Whittier this past Saturday in an extremely hard-fought contest.

After opening the game down 2-0, Senior Midfielder Chris AhNew scored off a penalty kick with 2:25 left in the first half. Caltech was unable to capitalize in the second half, however, and Whittier added two more goals late in the game. The match was the best-attended for Caltech Soccer this year, with many students and even the beaver mascot present to cheer their team on.

Later in the week, the team lost at Claremont Mudd-Scripps, 8-0. Junior Goalkeeper Jeff Shaw had five saves in that match.

The team wraps up its season with three home contests, the next coming Saturday, October 29th against Redlands. Match time is 11:00 AM.

Cross-Country prepares for SCIAC Championships

Caltech Cross Country will wrap up its conference schedule Saturday, October 29th. Both Men's and Women's teams went 1-6 at the SCIAC Multi-Duals two weeks ago, performances they hope to improve upon. Good luck to the whole team!

Women's Volleyball: Moody surges in team rankings

Despite losses this past week at Claremont Mudd-Scripps (3-0, 14, 14, 18) and Cal Lutheran (3-0, 9, 10, 16) the Caltech Women's Volleyball team continued to show great effort, and nowhere has that been exhibited more than in the recent performances of Senior Middle Blocker Colleen Moody. Strong efforts in both matches have placed her in a neck-and-neck race with Junior Rebecca Streit for the team lead in kills and points. Moody now has 71 kills (a 1.73 average/game) to Streit's 73 (a 1.78 average). With four matches remaining, the competition is fierce.

Presidential Search Committee Named

By HENRY LESTER

The search and selection process for the next Caltech president is now under way. Kent Kresa, chairman of the Caltech Board of Trustees, has authorized a Faculty Presidential Search Committee.

This Committee consists of Chair: Dave Stevenson, George Van Osdol Professor of Planetary Science
Vice Chair: Bob Grubbs, Victor and Elizabeth Atkins Professor of Chemistry
Ralph Adolphs, professor of psychology and neuroscience
Harry Atwater, Howard Hughes Professor and professor of applied physics and materials science
Ray Deshaies, professor of biology; investigator, Howard Hughes Medical Institute
Fiona Harrison, professor of physics and astronomy
Richard Murray, professor of control and dynamical systems
Nai-Chang Yeh, professor of physics

The Faculty Presidential Search Committee is staffed by Julia McCallin, julia.mccallin@caltech.edu. Ms McCallin's search committee phone number will be assigned soon.

The Faculty Presidential Search Committee will work with a Trustee Presidential Selection Committee:

Kent Kresa, chairman
David L. Lee
Alexander Lidow
Ronald K. Linde
Gordon E. Moore
Benjamin M. Rosen
Walter L. Weisman
Gayle E. Wilson

The goal of the Faculty Search Committee is to recommend several eminently qualified candidates to the Trustee Selection Committee. The trustees will select the new president from this list.

The Faculty Search Committee intends to seek input from the entire Caltech and JPL community: faculty, staff, undergraduate and graduate students, postdocs, alumni, administration, the Associates, and trustees. Members of the Faculty Search Committee will meet with the faculty of each academic division at least once, both to explain the search procedures and timetable in detail and to solicit candidates. This high level of faculty involvement in the search for a university president is very unusual. Our trustees' willingness to delegate the search to a faculty committee that the committee provides deep trust and respect between the Caltech trustees and the Caltech faculty.

On behalf of the Caltech community, I gratefully acknowledge the diligence these committees will devote to their task. We extend our best wishes for success.

The California Tech wants to know who you think should be president of Caltech.

Send in your suggestions for the next president to tech@ugcs.caltech.edu, tech@tech.caltech.edu, craig@its.caltech.edu, any two of these addresses, or all three. Whether you give reasons or just name a name, we will tally your vote and print the final totals in a future issue of the Tech. We are also looking for editorials and other commentary on the search for Caltech's next president.

How to Vote

Continued from Page 1

chance you cannot get to your local polling place on November 8, request an absentee ballot today or check with your county election official to see if early voting is being offered in your area.

3. Check your ballot. If you vote by mail, make sure to check for errors on your ballot before putting it into the envelope. Also, make certain you provide all required information, (especially your signature) on the envelope, and return your ballot early enough to ensure that your county election official receives it before polls close at 8 p.m. on November 8. You can return it by mailing it to your county election official, by dropping it off at any polling place or the county election office on election day, or by authorizing a legally allowed third person to return it for you.

4. Get a sample ballot from your local elections office if one hasn't been mailed to you, read it carefully, and bring it with you to vote. If you have received a sample ballot in the mail, this is a good time to make sure that your name and address are correct and that you know the location of your polling place. Your sample ballot contains a wealth of information and also provides a convenient way to double-check your registration information as well as consider your choices on the initiatives, which are complicated and require some study. You can mark your choices in your sample ballot and use it for reference when voting.

5. If your name does not appear on the list of registered voters at your polling place, and you believe you are registered to vote and are in the right precinct, you have the right to cast a provisional ballot.

6. Get informed. Read your voter information booklet and sample ballot. If you did not receive one or both, contact your election office immediately, as this might indicate a problem with your registration status.

7. Contact your election office with questions or for help. If you have easy Internet access, you can find the telephone number of your county election office at http://www.ss.ca.gov/elections/elections_d.htm. Or you can call the California Secretary of State's office at 1-800-345-VOTE for information on how to contact your county election office.

ASCIT Minutes

By PARVATHY MENON

Wednesday, October 26

Present: Warner Leedy, Peter Foley, Dima Kernasovskiy, Wendy Xu, Kelly Lin, Todd Gingrich, Parvathy Menon

Guest: Mike Turk

Introduction:

1. Call to Order, 12:11 PM

- George Hines would like to take Professor Lange and 3 others out to dinner.
- Sam Hung would like to take Professor Adolphs out to Smitty's with 3 other students.
- Natalie Kruk wants to take Visiting Professor Ravi to lunch.
- Rachel Maire wants to take Professor Hunt out to lunch with SWE.
- Scott Medling and Franklin Girono want to take Professor Kousser out to lunch.

Vote: 5-0-0 Passes (If you too want to show your Prof some extra love outside of the lecture-room, ASCIT will pay.)

- ASCIT desperately needs people for the Health Committee. This committee is super important because they will help decide stuff about student health insurance. Signups for interviews will be posted soon. If interested, email warner@caltech.edu

- David DiCato wants \$200 for Dabney's Annual Pumpkin Drop. Peter requests "pimpin' p-izz-umpkins." DiCato assures him that it will be so.

Vote: 5-0-0 Passes

- Sean Mattingly stumbles into the meeting demanding \$500. When pressed for a reason, he turns his beer can over to show that it is empty... "nuff said?". Sean further promises to share the Drink with his Page^{sux} Frosh while they build Interhouse. The BoD is stunned that such Evil would rear its head in the face of ASCIT, and furthermore request funding for their Immoral practices. Overcome with the wicked around, several BoD members depart on a purification pilgrimage. Meanwhile, Sean steals their Mongolian noodles and absconds with the Interhouse money.

Vote: 5-0-0 Passes

God bless Electrical Engineers, Parvathy Menon

The California Tech

Caltech 40-58

Pasadena, CA 91125