The California Tech

tech@caltech.edu

Volume CXI, Number 23 | Pasadena, California | May 11, 2010

Avatar Director Discusses Pandora with Caltech Scientists and Community

By Tina Ding
Editor-In-Chief

James Cameron, director of the highest grossing movie of all time Avatar, spoke to the Caltech community at two different Beckman Auditorium panel discussions about the science, technology, and environmental messages behind Pandora world. The talks on April 27 and May 4, titled "Is Pandora Possible", included a panel of Caltech Geological and Planetary Professors Jess Adkins, John Grotzinger, and Jared R. Leadbetter.

According to undergraduate senior Anthony Chong who attended the packed April 27th session, Cameron was very knowledgeable and commanding of every aspect of the biological diversity behind the world Pandora. "The amount of details was remarkable," said Chong, "For every animal, he could explain how its features came to be."

When audience asked about functionalities and biological whereabouts of specific organisms, Cameron's responses demonstrated prior investment and thought on the topic, according to Chong. When asked why there was no volcanism in the movie despite the presence of sulfur, he replied that the dilemma was considered and will be placed in the sequel. "The amount of thought he and the production put into the movie was really impressive," said Chong.

The event was co-sponsored by Twentieth Century Fox Home Entertainment and Caltech.

Avatar is revolutionary visual effects science fiction sensation of 2009. Said LA Times film review critic Kenneth Turan, "Think of "Avatar" as "The Jazz Singer" of 3-D filmmaking. Think of it as the most expensive and accomplished Saturday matinee movie ever made. Think of it as the ultimate James Cameron production."

Cameron also directed the Terminator and the Titanic. Before Avatar, the Titanic was the highest grossing movie of all time.

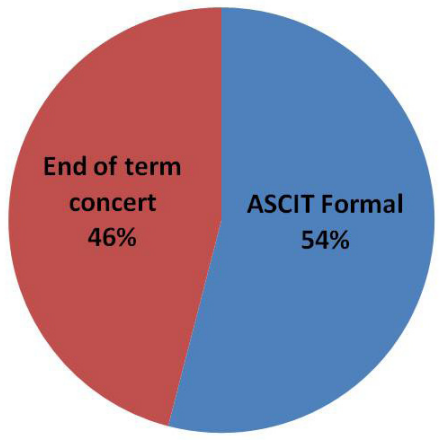
Special Report by ASCIT

ASCIT End-of-Term Concert with Super Mash Bros in the works

By Adam Kahn
Contributor

I'd like to begin by presenting the results of our End of Year Event Survey sent out last week, which had 435 responses. 238 (54.71%) students said that they would attend an on-campus formal and 283 (65.06%) students said that they would attend an off-campus formal for free, but only 136 (31.36%) students would attend an off-campus formal if charged $30 a person. 297 (68.28%) students said that they would attend an on-campus concert and 247 (56.78%) students said that a concert would be an acceptable alternative to a formal. When put head to head, ASCIT formal had 181 (41.61%) students pick it as their first choice and 88 (20.23%) students pick it as their second choice. An end of term concert had 154 (35.40%) students pick it as their first choice and 132 (31.03%) pick it as their second choice. Whether or not this means Domenic D. needs to eat a hat, I'll let you be the judge.

From the title of this article, you have probably realized that we have decided to move forward with an End of Term Concert. I'd like to first off apologize to those who felt very strongly about having an ASCIT Formal this year, especially the seniors. I did not realize that there was much support or interest in this event and therefore did not look into planning until about 3 weeks ago. Since then, I personally have been looking into a wide range of possible off-campus venues of which the ones in our price range were only available on June 5, which is during finals study period. This combined with the fact that interest in formal dropped off appreciably when students were asked to pay lead to the decision to not hold an off-campus formal. As a BoD, we decided that an on-campus formal would not be as popular as an on-campus concert based on the survey as well as the general atmosphere from talking with people in the houses. We even considered combining the two as some suggested in the survey, but the biggest problem is that Caltech does not have a great venue for this purpose.



Of the 435 students who took the survey, 46% chose an End-of-Term concert as their first choice and 54% chose ASCIT Formal as their first choice.

We are currently negotiating with Super Mash Bros and I am in the process of pursuing some of the other suggested bands from the survey as potential opening acts (i.e. Dave Smallen, Walk, etc.). We are also looking into student groups or bands that may want to open for Super Mash Bros as well. The concert is scheduled for the evening of June 4th in the RF Courtyard. I would encourage everyone to attend the concert even if it wasn't your first choice as this will be a nice going away event for the seniors and a good way to relieve stress before finals.

Graduate attrition rate in U.S. needs work, says new report

By Evans Boney
Staff Writer

A new report by the Educational Testing Service (ETS) and Council of Graduate Schools (CGS) indicates that there are widespread national roadblocks to graduate education in the United States.

The report, "The Path Forward: The Future of Graduate Education In The United States", was compiled by an 18-member panel from the ETS and CGS, and is a followup to their 2005 report which made a successful case for spending more funds on graduate education. Science reports this week that the new report "urges the US Government to spend billions more on education while scolding universities for not doing enough to attract and mentor the students who would earn those degrees...".

The report indicates that US production of PhD's and Masters students is lagging Europe and is increasingly threatened by growing numbers in India and China. Some of the lag is attributed to the high school dropout problem, but a large portion of the report focuses on PhD attrition rates. It reads in part:

> Even students who are awarded prestigious fellowships with relatively higher paying stipends still have an attrition rate of roughly 25%.

"The number of doctorates awarded in the US would be greatly increased simply by ensuring that most of the students who enter a doctoral program complete it."

It goes on to review data showing that the doctoral attrition rate is 40-50%, and that even students who are awarded prestigious fellowships with relatively higher paying stipends still have an attrition rate of roughly 25%. Grad Student pay could be taken as a large reason for attrition, indicating a rather easy step a university could take to respond to this report.

They go on to make the point that one reason attrition is so high (here, relative to other countries) is probably because it takes so long to complete a degree. The attrition rate for PhD's in Math and the Physical Sciences is about 45%, with only 23% of students completing their study in the (nominally) expected 5 years. To quote again briefly from the report:

"The personal and economic sacrifices associated with this extended training may be unattractive to many potential students."

For Editorial on this story, see page 2

Starting next fall, no more blue slips in mailboxes

By Edward Chen
Staff Writer

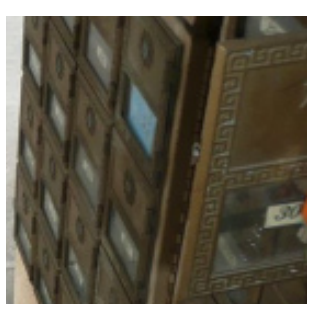
For the past few weeks, the Tech Express has been using email notices rather than blue and yellow slips as the notification system for delivered packages. The main motivation behind this new system is to decrease the number of unclaimed packages.

According to Joe DeVito of the Tech Express, "There have been no complaints, and probably 80% of the students asked [have said that] there's no problem [with this new system]. Most likely, this will be in effect starting next fall."

For students who don't live near campus, this will be a much-needed upgrade. For those students on campus who only check email as part of their daily routines, this will hopefully mean less unclaimed packages as well. Other advantages include saving paper and improving the processing efficiency of the mail room, according to DeVito.

Just like any other old system, there will be things that we will all miss about it. Undergraduate Natalya Kostandova commented, "People like [the] blue things. It makes them feel special but it's more practical in terms of email."

Joe DeVito (JDeVito@caltech.edu) openly welcomes any questions about this new system.



Tsai Wins Fulbright to Israel
page 6

In This Issue

I love you, you're perfect, now change!
page 5

Caltech's cuts in graduate student salaries and benefits are unacceptable

From page 1

..."The personal and economic sacrifices associated with this extended training may be unattractive to many potential students."

This can be seen in the recent unrest in the UC school system, which have left grad students there in an even more dire position than we are here. But private universities like Caltech are bereft of the UC school system excuse for poor student treatment (statewide government cuts).

Consider the revenue-generating and expense-savings that were decided without graduate student input at Caltech in 2008. Pay cuts for faculty, administrators and executives were forgone for cutting student services (more grad than undergrad), such as underrepresented student support on campus, underrepresented student recruitment, Grad Dean's Office Support, the Ombuds office, mental health benefits, higher parking fees, increased healthcare payments, grad student programming by the GSC (and consequently all grad student clubs), and cutbacks at the gym. No area of graduate student life has been untouched by the blunt budget manipulation of President Chameau, and this new report calls him to task for his inaction.

Since my arrival at Caltech (I am a 4th, almost 5th year PhD student), the combination of cuts to my pay and petty nickel-and-dime cost increases across campus has decreased my net salary from what I was promised in 2006 by 20%. Caltech's housing subsidy in the Cats is not fixed to the external housing market, and is another way administrators squeeze grad students at the margins. The same is true for our healthcare, where every 2 years is an attempt to get them not to cut our subsidy further. The private job market (where are our grad student salaries equate to roughly McDonald's employee status; check it out grads) is siphoning more and more of the intellectuals in our country from getting the education that we want them to have.

Now Caltech, with the biggest recession since the Great Depression not yet a year removed, is playing Hide-the-Paycheck with all graduate students in June. Hope you didn't need that $2k grad students, because institute accounting now takes precedence over graduate student happiness.

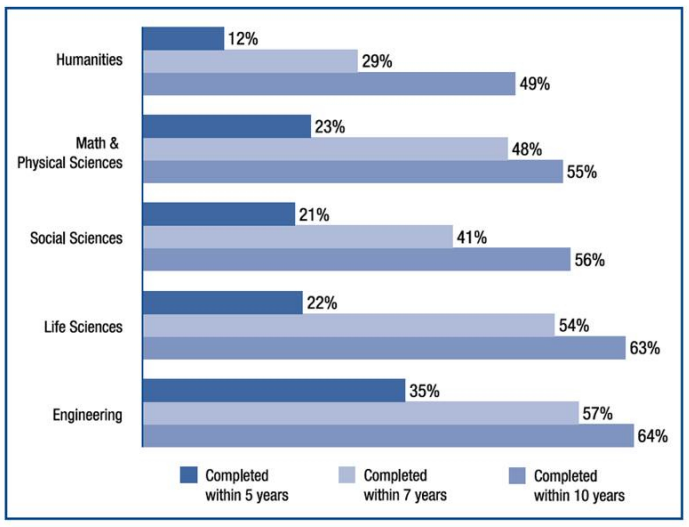
Caltech administrators' mind-numbing focus on the Endowment bottom line and wealth-preservation have led this to be a school of trustees and faculty rather than students. Sports teams, multiple food options, campus bookstore, Ombuds office, mental healthcare: these are the things that are expendable here.

Talk of a Student Services Center can't be taken seriously (despite being ubiquitous at other universities, how could we possibly find the money to do something so extravagant here!). Talk of paying student representatives is clearly outlandish. The President has publicly undermined the graduate student representative body rather than take the results of their numerous polls at face value.

Any suggestion that this adverse climate might weigh on the happiness of graduate students is immediately dismissed by the administrative gaggle of Provosts, Vice Provosts, Presidents, Vice Presidents, and Deans, whose responsibilities are tangled up such that the buck stops with nobody and the right person to discuss the issue you want to talk about is never available. You used to be able to find the Ombudsperson to vent to... but who needs that extraneous student support position (that is ubiquitous at other universities)?

President Chameau has been rather tight-lipped since the end of his Emergency Updates when our Endowment was going down, when will we see job growth at Caltech? Perhaps now that a new external report takes our school to task for its mistreatment of graduate students, we can get some services and health benefits back.

Figure 2. Doctoral completion rate, by field and number of years.



Source: Council of Graduate Schools. (2008). *Ph.D. completion and attrition: Analysis of baseline program data from the Ph.D. Completion Project*. Washington, DC: Author.

The California Tech

Caltech 40-58, Pasadena, CA 91125
advertising e-mail: *business@caltech.edu*
editorial e-mail: *tech@caltech.edu*

Editor-in-Chief
Tina Ding

Copy Editor
Sarah Marzen

Layout Editor
Hanna Liu

Sports Editor
Rick Paul

Business Manager
Gabriel Mendoza

Staff
Dannah Almasco
ZeNan Chang
Deboki Chakravarti
Sandhya Chandrasekaran
Edward Chen
Daniel Erenrich
Andrew Freddo
Yang Hu
Casey Jao
Natalya Kostandova
Rebecca Lawler
Monorina Mukhopadhyay
Pradeep Ramesh
Neha Samdaria
Gloria Tran
James Wu
Wesley Yu

Circulation
Aryan Safaie

Advisor
Tom Mannion

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@caltech.edu* as *plain-text* attachments, including the author's name, by Friday of the week before publication. *The Tech* does 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 5 PM 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."

Letters to the Editor

Admissions still based on meritocracy

The article by Sarah Marzen in the May 3 issue reported that the increase in the percentage of admitted female students, while a cause of celebration for many, is leading some people to speculate that the admissions process might involve affirmative action. The article goes on to quote the director of admissions and members of the admissions committee, who deny this allegation and offer various alternative explanations for the recent success in recruiting female students.

I am disappointed to learn that some people are questioning whether admitted students were selected on their merits. Such speculations can create a hostile environment in which students question their own qualifications and wonder whether they were selected for reasons other than merit. It is well-known that such circumstances can undermine a person's self confidence and cause harm. The fact of the matter is that Caltech would never admit a student who was not considered well qualified to succeed. Therefore, every student who has been admitted deserves to be welcomed as a valued member of our community.

John Schwarz
Harold Brown Professor of Theoretical Physics

What's Wrong with Enforcement?

In his op-ed last week, Mr. Ramesh argues that the immigration reform passed by the Arizona legislature is tantamount to racial discrimination. After reading his argument, I am tempted to wonder if Mr. Ramesh even read SB 1070 (or its updated cousin, HB 2162). I feel that if he had, Mr. Ramesh would notice that the primary focus of the bill is enforcement of federal statutes and does not enable law enforcement personnel to engage in racial profiling.

Mr. Ramesh argues that under Section 11-1051, any law enforcement officer may engage in "lawful detentions" on the basis of "reasonable suspicion that the person is an alien and is unlawfully present in the United States." At first blush, this would seem to authorize racial profiling; however, Mr. Ramesh conveniently leaves out the prefatory clause to that particular sentence. In full, the sentence reads:

"For any lawful contact made by a law enforcement official or agency of this state or a county, city, town or other political subdivision of this state where reasonable suspicion exists that the person is an alien who is unlawfully present in the United States, a reasonable attempt shall be made, when practicable, to determine the immigration status of the person."

This hardly sounds like racial profiling - the police may only inquire as to a person's immigration status if they are already engaging this person in a different law enforcement issue. In particular, HB 2162 updates the word "contact" to read "stop, detention, or arrest", meaning that the police may not arbitrarily pull people off the street to see if they are illegal aliens. Moreover, as Mr. Ramesh correctly points out, in this same section, law enforcement personnel are expressly prohibited from "considering race, color, or national origin in implementing the requirements of this subsection except to the extent permitted by the United States or Arizona Constitution." I would like to remind Mr. Ramesh that the US Constitution contains the 14th Amendment, which says, among other things, that "No State shall make or enforce any law which shall abridge the privileges or immunities of citizens of the United States..."

Therefore, I find it very hard to conclude from the language of the bill that the Arizona legislature intended this law to allow racial profiling of its citizenry.

In addition, Mr. Ramesh argues that this bill puts an 'unfair burden' on those of Latin-American descent, arguing that they are "now forced to prove their status when asked". As I described above, no citizen is going to be randomly taken off the streets and asked to provide documentation - immigration status can only be questioned during a routine law enforcement proceeding - a traffic stop, for example. I would further like to point out that under the Alien Registration Act of 1940 (a federal law), legal aliens are required to carry with them documentation proving that they are allowed to be in the US. (Therefore, we are left to conclude that those who fail to produce documentation are either absentminded US citizens, illegal aliens, or aliens breaking this federal law.) As such, is there really an 'unfair burden' on those of Latin-American descent? Most likely not, as those people who have the right to be in the US should be carrying documentation anyway, meaning that there is no burden at all; rather, all one needs to do is follow the law!

SB 1070 and HB 2162 contain further provisions strengthening the existing laws preventing the trafficking of illegal aliens, preventing the transport of illegal aliens, and stopping employers from using illegal aliens as workers. Once again, this bill is about enforcing the laws already on the books, and not about profiling against one particular race.

Finally, Mr. Ramesh concludes that the effects of this bill are to provide "...sufficient motivation for illegal immigrants to leave the state and relocate elsewhere thus having a two-fold effect. The first of which is that the economy of Arizona will be adversely affected...and secondly, the law does not solve the bigger problem at large but forces an underground community deeper into the shadows." While the former effect may be debatable, if all states took the position of Arizona and enforced both state and federal statues regarding immigration, perhaps the latter effect would no longer be an issue, as those in this "underground community" would be taken from the shadows and returned to their home countries.

Travis S.

Dear Christina

I agree with your general sentiment about the unfunny personal ads and treatment of sexuality in the humor column. What was most worrisome to me was that the personal ads were not that funny.

They did not make fun of the extremely predatorial, criminal, and harmful qualities of the people, but merely depicted each one as a male rapist, female victim, or ditzy girl. If there was some political statement that was made by this, or if there was eventually some punch-line, that'd be cool.

But this column is just the equivalent of putting out disgusting ideas for no apparent purpose. Personally, I disagree with even

Continued on adjacent page

Weekly Meeting - Page – May 6, 2010

Present: Tim Black (chair), DK Lim (Avery), Chris Whelan (Blacker), Andrew Price (Dabney), Alex Lapides (Fleming), Lucas Hartsough (Lloyd), Paul Fleiner (Page), Will Steinhardt (Ricketts), Dan Kolodrubetz (Ruddock), Laura Conwill (secretary)

Guests: Chris Hallacy, Dan Thai

Health and Counseling: Tim met with Kevin Austin from the counseling center. The counseling center's budget cuts resulted in the loss of ¾ of a nurse, or 32 hours per week. There's a health survey coming out soon, and they would really like people to take it. They use it for a lot of things. This is a different survey from the one that was out a couple of weeks ago. Kevin Austin noted that the health center isn't able to provide all its services to people who have opted out of Caltech health insurance.

BoD Stuff: The ASCIT movie is tentatively May 14. It's Iron Man II, and we'll be going to Alhambra for it. The ASCIT formal/movie survey results are out. Andrew says that he voted against the formal just so Domenic would have to eat a hat. Not as many people would attend formal it were off campus.

Interviews: We are interviewing people for committees from 4 pm to 9 pm tonight. If you can't make interviews, you can send someone in your place. We'll see about rescheduling admissions for the following weekend.

Frosh: We have 228 frosh, and we saved spots for 18 more than that! We can potentially give spots back to houses. Everyone thinks it's a good idea to save some rooms for transfer students; we'll let presidents talk to their houses about what they want to do.

Summer Students: Tim would like everyone to send out an email to their houses to gauge how many people will be staying in the houses this summer. Lucas recommends repeating the numbers from last year; overall, we need to save about 200 spots.

Orientation: Tim is meeting with the deans soon to discuss how orientation will run this year. Everyone suggests having presentations more to the point.

Marks/Braun board: Tim is planning to talk to Peter Daily about the decision to put Marks and Braun on board.

Affirmative action: There's been a lot of concern from students that the admissions office might be practicing affirmative action; Laura and Tim will bring this up at their meeting with him next week.

LN2: Liquid nitrogen training will be soon.

Submitted by Laura Conwill
IHC Secretary

ASCIT Board of Directors Meeting – Minutes
April 19, 2010

Officers Present: Adam Khan, Tim Black, Brian Merlob, Addie Rice, Prakriti Gaba, Karthik Sarma
Guests Present: Anthony Chong, Brock Jones

Call to order: 2:12 pm

President's report:

- Coffeehouse: Adam is putting together a committee to appoint two managers out of the four that applied.
- ASCIT movie: will be Iron Man 2 on May 14.
- Alunmi Career Summit: Adam will be sending out a survey for interest in this program. Its aim is to provide to provide advising to students from alumni in a variety of fields.

Officer Reports:

- V.P. of Academic Affairs (ARC Chair): Teaching awards are coming up in four and a half weeks approximately. Student-faculty conference will be held on Wednesday April 6, 2011. ARC is adopting new by-laws.
- V.P. of Nonacademic Affairs (IHC Chair): The IHC met with Anneila last week to talk about details involving Rotation and next week they will be meeting with housing to discuss procedural issues.
- Operations Director: Club funding emails have been finalized and emails sent out. Merlob also notes that the ASCIT movies were returned to the library last week.
- Treasurer: Hallacy still needs pre-frosh weekend checks from some houses. He has emailed all house presidents about this. Club funding will begin soon. Hallacy is also working on re-issuing checks that weren't given last year.
- Social director: Addie is trying to contact a theater for the ASCIT movie and still looking for a second DJ for alternate prom.

Discussion:

ASCIT formal/End-of-term Concert: survey was sent out this week to determine which event people would prefer.

Meeting adjourned: 2:39 pm

Submitted by Prakriti Gaba
ASCIT Secretary

this, because desensitizing the Caltech community towards the gravity of date rape, etc. does not foster the community's ability to correctly address such events as they happen.

But maybe I'm just scared, and made uncomfortable by the idea of being used to these ideas. I'm scared and made uncomfortable by a lot of things.

There are definitely humorists who use really touchy subjects, but they strive to be funny and innovative, and to make points. You can't just expect to randomly write offensive things and expect it to incite meaningful conversation about difficult subjects. Readers can not see facial cues, and most of them don't know that you're actually a swell guy and you're just making fun of it.

Maybe this column is funny because it isn't funny, and because it is painful to read. If so, I didn't get that. I think humor is more than saying, "abortion abortion abortion" (it's funny because it's debatable and because people have strong feelings about it) or "we only care about women because they have boobs. also tech girls are ugly" (it's funny because it's offensive and I'm getting away with saying it.)

The last statement appears like perhaps it's trying to describe the sexual frustration and yearning for sex or a partner that affects many Techers-- but this example doesn't do it artfully; it doesn't do it craftily; and it doesn't do it with self-awareness. If that were the case, this job would be so much easier.

Christina, I think I was supposed to actually disagree with you in this letter, so as to provide contrasting points of view, but I feel like my letter is complaining more about the lack of humor than the sexism. I'm also supposed to say that if you don't like the Tech, you should write for it. I remember when I myself fell victim to this pitch. But I like writing for The Tech. It's a pleasurable sort of victimization, unlike most forms of sexism.

Perrin C.

Professor Tony Readhead

by Sandhya Chandrasekaran

Readhead is the Barbara and Stanley R. Rawn, Jr., Professor of Astronomy

helped build a cosmic background imager intrument in Chile, bodysurfs in South Africa, and (like all Techers,) loves *The Hitchhiker's Guide to the Galaxy*.

What initially brought you to Caltech?

It was the astronomy. I think it's the best place in the world if you want to do observational astronomy because of its facilities and its "can do" attitude. In Andrew Lange's words, it is the "best scientific playground in the world".

Do you teach any undergraduate classes?

Recently, all the classes I've been teaching are graduate classes, but I love teaching undergraduates and hope to do so in the future.

What does your research primarily entail?

It focuses on two things, primarily. Both of them are a combination of instrumentation and observation. I really like building instruments and using them to address fundamental questions. My entire career, I have been focusing on cosmology and active galaxies such as super massive black holes.

What's the coolest piece of equipment you've been able to use?

Since coming to Caltech, I've always been fortunate to be working in something that's sort of new and innovative instrumentally and addressing interesting questions. That's what I love about it. In particular, with the cosmic background imager, we built an instrument here on campus and brought it to Chile. It was pretty interesting because there was nothing there, and so we had to be totally self-sufficient. We had to track our own water, generate our own power. I remember when I was walking back from the telescope once, I told my students, "Can you actually believe we're being paid to do this?"

What do you think you weren't an academic?

If I hadn't been able to be a researcher at a university, I would have tried to be a researcher at a lab in either astronomy or archaeology.

What are some of your hobbies?

I like body surfing a lot. I don't do a whole lot of it here, but I used to do it a lot when I was in South Africa. But I never mastered the surf board. I like windsurfing and enjoy sailing as well.

Do you believe in aliens?

It's a good question. Well, I think that the search for extraterrestrial intelligence (SETI) is one of the most interesting questions that you can ask. Astronomers tend to break down into two groups: those that believe this is a complete and utter waste of time, and those who think it is the most important thing you can do. I think it's the most important thing you can do, although I wouldn't spend all my research on that because the possibility of payoff is tiny. I was getting very involved with SETI back in the 90s when Congress killed the entire project, which was a great pity. Listening and trying to see if there are any signals in a systematic way, which is what SETI tries to do, is very worthwhile.

Who's your favorite movie star?

I like a lot of movies. But if I had to pick my favorite actor it would have to be Kevin Spacey. I saw him acting in London four months ago in a reenactment of the Scopes trial, and he did a phenomenal job.

Have you read The Hitchhiker's Guide to the Galaxy? Any thoughts or opinions?

I loved it. The author has such a fantastic sense of humor and was very imaginative. The characters are great. I'm not normally a fan of science fiction because most of it is incredibly badly written and often complete garbage. But this one was very creative.

What is a common misconception that people tend to have about the universe?

Because people grow up in the city, they don't realize how much you can do with a small pair of binoculars or telescope and how immediate the universe can be to our naked eye. I think there is this distance between what people think of as astronomy and how accessible it really is.

Are there any particularly memorable places you have visited while conducting your studies?

Well, I observe at all the Caltech observatories, Palomar, Hawaii, the Keck telescopes. I do travel quite a bit because I'm trying to bring about a Renaissance of activity in lower frequency radio astronomy. In March, I visited China, which was fascinating. And just last week, I was in Crete.

Who's your favorite superhero?

I would have to say Charles Darwin and Isaac Newton because of the way they both changed out perception of nature. Newton's idea that you could actually take physical laws and apply those angles to anywhere in the universe was astounding. When he applied his law of gravity to the motion on the moon and found that it fit pretty nearly, it was amazing step of the imagination. And although many people had been tackling the idea of evolution, Darwin was the one who figured out the mechanism of natural selection. It freed us from superstition, which has limited our species and tied us down. I was at a dinner at Hollywood one time, and one of the scientists at the dinner table asked me what was the most important contribution of science to our culture. They were expecting me to give them a very specific example, but I just answered "It frees us from superstition", but I think that is what it is most important for.

First Caltech Musical in Fifteen Years Delivers Laughter at the Trials and Triumphs of Love

Caltech finally broke its fifteen year streak of no musicals this past weekend with the debut of I Love You, You're Perfect, Now Change, a comedy musical by Joe DiPietro (music by Jimmy Roberts) famous for being the second longest running Off Broadway musical. In addition, this was the first time in five years since a student directed a Caltech production. Sophomore Christina Kondos, who is majoring in economics, took the lead the effort in making the play a smashing success. The Ramo auditorium was packed full with an eager audience on the opening night this past Friday, and everyone was given a good dose of laughter.

I Love You, You're Perfect, Now Change features a series of vignettes about love and relationships, developing its theme from dating and marriage to raising family and elderly romance. The cast included people from all over the Caltech community. Undergrads, grads, alumni, JPL, and faculty performed on the same stage to make this musical possible. Most have not performed in a musical before, but the all cast members were flawless in their roles. While a handful of members are part of Caltech's Fluid Dynamics a capella group, the entire cast sang beautifully.

The music for the entire performance was played by one pianist and one violinist; yet, the scenes were not lacking. The transitions between each vignette were done smoothly. While the production features minimal sets consisting of a couch or two tables and chairs, the emphasis was on deliberately acting out slice-of-life scenes to make the audience laugh. In one scene titled Highway of Love, cast members used swivel chairs to represent seats in a car. Imagine 'dad' sitting in the driver's seat with hands on an imaginary steering wheel singing a wistful song of not being the head of the household. In the meantime, 'mom' constantly yells from the front seat at the kids to quit fighting. When performed onstage, these events bring a chuckle from even the most resilient. Other scenes made fun of stereotypes in life. During the scene titled Single Man Drought, cast members Irene Yang and Melanie Channon created comedic effect by chatting enthusiastically with their dates, cast members Bobak Ferdowsi and Tim Hill, on stage while singing to the audience every so often revealing how bored they really are.

In combination, the series of vignettes well complemented one another and the musical was enjoyable from beginning to finish. It has definitely raised expectations on the quality of Caltech productions. Attending future productions is highly recommended.

Semana Latina 2010

Semana Latina is a yearly event which used to be thrown by Club Latino, with some help of the Caltech Latino Association of Students in Engineering and Science (CLASES). After these clubs died five years ago, the event was planned by administration from what used to be Minority Student Education, led by Luz Rivas. Before leaving, Luz planned one last Semana Latina with CLASES, passing the torch to the recently initiated club. This year, CLASES planned all of Semana Latina, with help of Salsa Club and sponsored by Caltech Y, ASCIT, CCD, GSC, and Graduate Office. This year was a huge hit with over 250 people attending each noon event. The Salsa Party drew not only students, but people from San Diego and L.A. Semana Latina was, for the first time in many year, organized and run by only students, with some help of administration.

Cue and A with Director Kondos

by Sarah Marzen

What motivated you to direct this play?

This play is funny and focuses on subjects that touch us all. Also, it was fairly easy to sing, only required a piano and violin, and we could cast as many people as we wanted.

How hard was it to get the entire play together?

This play was fairly difficult to put together, but a musical is an ambitious project. My producer Meg Rosenberg and I said there was a pretty steep learning curve. I put in around 24 hours a week during the normal rehearsal period and probably twice that during the final week.

Were you pleased, surprised, etc. by the involvement from the Caltech community?

I was surprised by how many people wanted to be involved simply because it was a musical. Lots of musicians such as trumpet players and others reached out. Also, I was surprised by how well so many members of the Caltech community could sing.

Was it difficult trying to get funding?

We received funding from the MHF fund, and they were incredibly supportive. The Graduate Student Council also helped out. There are so many opportunities on campus. If you have an idea, people will help you put it in action.

Will you do another play sometime soon?

I'm not sure if I will do another play anytime soon, but I tell people to ask me in a few months when I forget how time consuming it was.

Can you please explain the difference between Explicit and Tacit?

EXPLiCIT differs from TACIT because it is student-run. We cobbled the group together to do this play, but we have been recognized as a club by ASCIT and hope to do more activities in the future. Another play or more social theater activities would be fantastic. TACIT is the official theater department on campus. Brian Brophy is its director, and students can receive Caltech credits for participating in TACIT classes or plays.

Anything you want us to know about putting on the play?

I'm extremely grateful for all the support we received and couldn't be happier with the result.

Undergraduate senior awarded Fulbright scholarship to do research in Israel

By Amol Kamat
CONTRIBUTOR

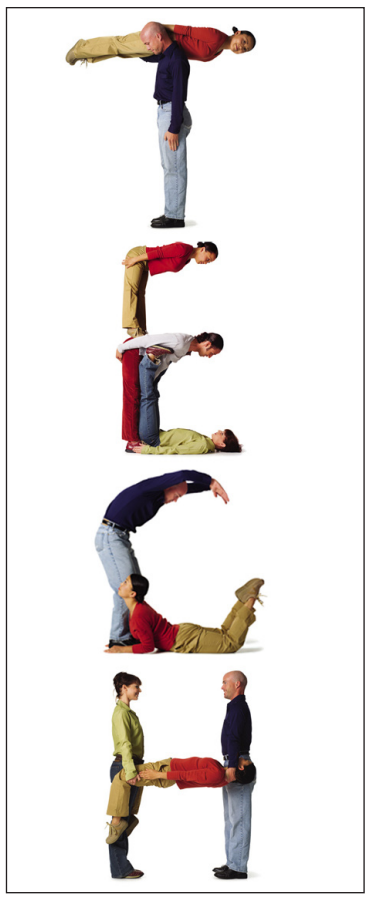
Caltech senior Jonathan Tsai has been awarded a Fulbright Grant that will allow him to do research in Israel for one year. Starting next fall, he begin his fellowship at the prestigious Weizmann Institute of Science in Rehovot, after which he will attend Stanford's Md/PhD program.

Tsai, who has lived overseas before, is undaunted by this change, "I wanted to live somewhere totally different and new. I lived in Brussels for three years in middle school, so I wasn't really excited to go back to Europe. I thought the Middle East was intriguing," said Tsai.

Fulbright Grants are awarded annually to 1500 graduating seniors, masters students, PhD students, and scientists who already have their degrees to do research in over 150 countries. Tsai competed with eighty-six other applicants for ten spots in Israel.

Tsai, who currently works in David Baltimore's lab, will be working with Dr. Yosef Yarden, studying the feedback mechanisms of tumors, specifically those associated with pancreatic cancer. Tsai hopes this research will reveal the nature of resistant tumors. Such insight would hold the potential to save millions of lives.

The class of 2011 is now eligible to apply for Fulbrights. More information is available on the Fulbright website, or in the Fellowships Advising and Resources Office. As for the application itself, Tsai seemed to find it quite easy. "The application process wasn't too difficult because I had just finished applying to MD/PhD programs. I already knew what country I wanted to go to, and [Caltech Fulbright Program Advisor] Lauren Stolper made everything a lot easier for me."



Congratulations

to **Ga-Il Lee**, the Hallett Smith Winner 2010 for the finest essay devoted to Shakespeare. Honorable mention goes to Nate Morison, Wesley Yu, and Nick Rosa. The winner was chosen by the Hallett Smith Committee of the Caltech English Faculty

Announcements

MCKINNEY & MCCLURE WRITING COMPETITIONS

The Humanities Faculty's 64th Annual McKinney Competition and inaugural Gordon McClure Memorial Communications Prize award excellence in writing.Prize awards in each category are $500. Only full-time students officially registered at Caltech as undergraduates are eligible to enter the competitions.

The McKinney prize will be given in two categories: poetry and prose fiction.
The McClure prize will be given for the best non-fiction prose in three categories: English, History and Philosophy.

JPL OPEN HOUSE
From 9 a.m. to 5 p.m. on May 15 and 16,

JPL opens its doors to the public, for an event featuring exhibits, displays, demonstrations, and presentations about the Laboratory's ongoing research, space exploration, spacecraft communication, and more.

BANDORAMA: CALTECH CONCERT AND JAZZ BANDS CONCERT
8 p.m. on May 15

The Caltech-Occidental Concert Band and the Caltech Jazz Bands will perform their annual Bandorama concert at in Ramo Auditorium. This year's program will feature music from Broadway, Count Basie, and Percy Grainger. The concert is free, no tickets or reservations are required, and a free reception will follow the performance.

News Brief

The California Institute of Technology (Caltech) is pleased to announce the appointment of Kristen Brown as the Institute's new assistant vice president for marketing and communications, effective May 5.
Brown will direct and lead the Institute's communications and marketing initiatives as well as create and lead a comprehensive program that will help define, emphasize, and enhance the Caltech brand. She will oversee the online communications, media relations, and editorial and content development departments and will report to Peter Hero, vice president for development and institute relations.
According to Hero, Brown's mission is to integrate communication efforts across the Institute and elevate Caltech's outreach to a new level.
"We're very fortunate to have Kristen joining us, with her exceptional skills and her background of academic and corporate responsibilities," says Hero.
Brown brings a track record of innovative branding initiatives and integrated, multi-platform marketing programs at leading global organizations in higher education, entertainment, and consumer goods, including the American Film Institute, Warner Bros. Entertainment, and Nestle USA.

-- taken from Caltech Today

Athlete of the Week:

Eric Schropp

Eric Schropp is a sophomore Fleming member who plays baseball.

1. What is your major?
ACM (Applied & Computational Mathematics) and Economics

2. Favorite athletic moment at Caltech?
Going 5-12 in my first SCIAC series vs CMS

3. People will be surprised to know . . .
I broke somebody's jaw with a baseball

4. Describe your sport in 3 words?
America's favorite pastime

5. What goes through your head at the starting line, up to bat, etc?
I try to keep myself as calm and relaxed as possible.

6. Favorite food?
Any of the gourmet meals prepared by Caltech Dining Services.

7. What teammate has inspired you the most?
Dan Sexton, because he always has a positive attitude, and keeps a smile on his face at all times

8. What type of music do you listen to?
Mostly rap/ hip-hop

9. If you could go to any sporting event what would it be?
TB Rays vs Stl Cardinals World Series game 7

10. Best part about living in California?
The clean air and humid weather

11. If you could bring anything from your hometown what would it be?
Humidity

12. If you had no schoolwork what would you do all day?
Play baseball and work out

13. In 10 years, I'll be . . . .
Starting SS for the Tampa Bay Rays

14. Nike or Adidas?
Nike

15. What are your pre event rituals?
Caffeinate heavily and listen to pre-game playlist, take batting practice

16. Favorite SCIAC school to compete against?
CMS

17. Last book you have read?
Men Are Better Than Women by Dick Masterson

Upcoming Games

Thursday, May 13th
2pm T&F @ CMS Classic Multi-Event

Friday, May 14th
2pm T&F @ CMS Classic Multi-Event

Saturday, May 15th
11am T&F @ Cal State LA Invitational

Our Sports Editor was incapacitated during layout this week, so this week's Sports Page is a tribute to former Sports Page contributor Mark Eichenlaub.

Excerpt from Mark Eichenlaub's Blog: Physics of Pole Vaulting

Here is a physics problem from a book I was reading:

The year is 2100 and the pole vault record stands at 7.5m. Estimate the world record for the 100m sprint at this time.

This question is one of our favourites since it shows the power of physics to make the apparently most unlikely connections. Incidentally, both records would be held by women by this date – see Nature, Jan 2 1992.

The pole vault question is a classic, and a good one. The idea is that in pole vaulting you turn kinetic energy of running into potential energy of being high off the ground. If you know how much potential energy you had at the top of your pole vault, you know how much kinetic energy you had at top speed, and hence how fast you can run. Also, if you are Jacob Bronowski then pole vaulting is what separates man from the animals.

(See the website http://arcsecond.wordpress.com/ for the math.)

Let's do the calculation over using the current world records. If it doesn't work for them, there's no reason to believe it'll start working in the future! The current world pole vault record is 6.14m and g = 9.8m/s^2, so we estimate the 100m record at 9.11s, or about 5% off from Usain Bolt's record of 9.58s.

That's pretty good. But would you be so impressed if you had done the same calculation in 1994? Sergey Bubka set the 6.14m pole vault record that year, and it has stood since. But in the same year Leroy Burrell set the 100m world record at 9.85s. Now we have about a 9% error. Still decent.

But hold on. I said this dude Sergey did the pole vaulting and Leroy did the running. Shouldn't my calculation actually tell me how fast Sergey runs, not Leroy? Bubka was unusually fast for a vaulter, and could perhaps have run 10.1s. Now the error is 11%.

When you run 100m, though, you don't instantly accelerate to a certain speed and stay there the whole time. You speed up to the 40m mark or so, and after 60m you start to slow down. Further, the run-up to a pole vault is much shorter than 100m, and you run more slowly than your best sprint speed because you're carrying a giant pole. What the calculation is really going at is your speed right before takeoff. Bubka's was about 9.9m/s right before planting the pole, compared to about 11m/s estimated with our cute physics problem. Ultimately, the error is more than 10%.

10% error is a lot if you want to make an estimate of the future world record, to place a bet on it, for example. And there's a worse problem – our error goes the wrong way. Based on physics, we would expect the runner to be inefficient at converting all their kinetic energy to potential energy. Some gets lost in the bending of the pole, which isn't perfectly elastic, and the vaulter still has some kinetic energy at the top of their flight because they move horizontally.

In general, we know that conversion of energy is not 100% efficient. So for a given speed, the vaulter should not quite make it to the calculated height, or conversely, for a given height, the vaulter should need more than the calculated speed. The authors point this out in their solution, estimating that the energy conversion might be 10% inefficient, so the real 100m time, give a pole vault height, might be 5% faster than predicted by the equations. This is backwards of reality, though. In the real world Sergey has less speed than what we calculated, not more. Evidently Bubka could do work after taking off from the ground, perhaps by pushing down on the pole.

The physics estimate for the 100m dash worked out pretty well, but only by accident. After all, if we believe this calculation, it predicts that Bubka should not have the world record for the pole vault – Usain Bolt should! In fact no one has ever held the world records for both pole vault and 100m (in the modern era, anyway. Maybe Tarzan did it.) We could repeat the calculation with the women's world records (5.06m and 10.49s by Yelena Isinbayeva and Florence Griffith-Joyner) and again find that the estimated 100m time is too fast (10.0s). Or we could use data from the same person – Bryan Clay, the world's best decathlete. Clay has run 10.36s and jumped 5.15m. His pole vault predict 9.95s for 100m.

In each case I've examined, the pole vault-projected 100m time is too fast for the real 100m time, and consistently around 5% too fast. In that case, maybe the pole vault record in 2100 is a good predictor for the 100m time in 2100, but not because of physics. Those two records just tend to track each other and progress simultaneously (with a fair amount of noise). We could go ahead and observe that the pole vault and 100m records tend to be related by some quadratic equation, and then use that equation to predict the future 100m time given the future pole vault. Toss out the physics, just note that it works and it's good enough. Good idea or bad?

The problem is that we have no reason to believe that should continue to work, just because it has so far. Just because we can find some pattern in our past data doesn't mean it will persist. Want an example? We already have one, provided in the original statement of the problem. The authors wrote, "Incidentally, both records would be held by women by this date," a phrasing that makes them sound certain of it.

I've been around track and field for almost a decade. I can tell you, with utter assurance, that men are better at it than women, and they still will be in 2100. Men and women are physiologically different, and compared to an elite man, an elite woman, despite training with comparable intensity and dedication, is nowhere near as good.

So what led the authors to be so confident that women will hold the world records by 2100? The Nature reference is to a fantastically stupid letter titled "Will women soon outrun men?", which predicted that female marathoners might become as good as male marathoners by 1998. They didn't.

The discrepancy came up because the authors made a prediction by drawing a curve through the data about the past, and assuming the curve would continue the same way in the future. That was wrong. Women's track and field, and especially women's marathoning, is less mature than men's. The women's marathon was only added to the Olympics in 1984 (and steeplechasing in 2008). Few women were running marathons before then, and few were training for them seriously the way men do. Now, as more women join track and field and run professionally, the records can drop quickly. Men approached physiological barriers before women, so their improvement has been slower recently. This adds up so that when you draw a line through the times of the last 50 years for women and men, you predict that women will soon be faster.

Lines don't keep going indefinitely into the future, though, even if you publish them in really fancy journals.

So now let's go back to predicting the future 100m time based on the pole vault height. If the pole vault height gets 10% better, do you believe the 100m time will get 5% faster as our curve-fitting would likely predict? Unlike the estimates about men's and women's performances, it's worth a close look. The difference is we have a physical model to back it up. We have an idea where it comes from. Those same equations we used at the beginning of the post predict that the pole vault will advance twice as much as the 100m dash.

We can't predict the 100m time accurately with physics alone, because when we tried we were off by a lot. We can't predict it accurately with curve-fitting alone, because it's blind. When we combine them we may have a pretty decent predictor. What do you think?

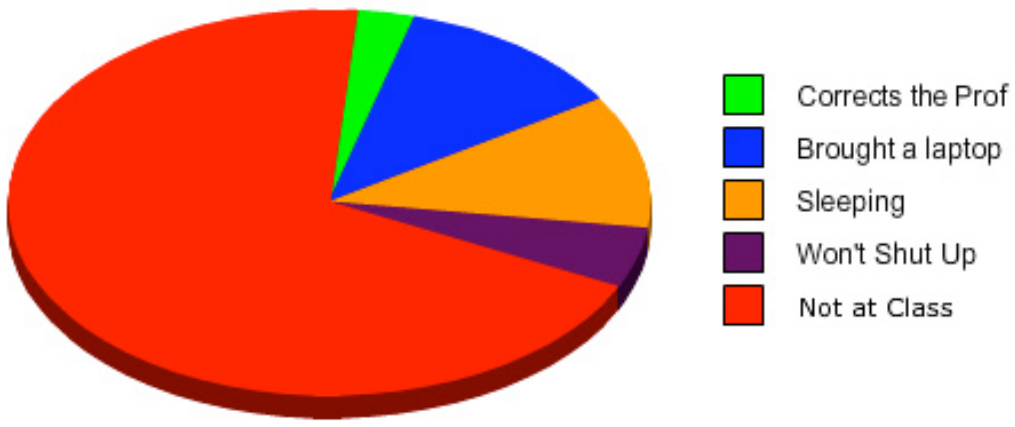
-- taken from Mark Eichenlaub's blog
http://arcsecond.wordpress.com/

Types of Late Night People in the Library

By James Wu
STAFF WRITER

1. *The Corrector*

They may only be a freshman, and the Professor may have over twenty papers and tenure, but that doesn't stop this student from correcting the Professor over small mistakes, even those of no significance. He feels that the fact he's read a slightly different definition in a textbook gives him the right to argue over the definition of a concept with the Prof. In the beginning, the Prof will try to be encouraging, but in the end he'll finally snap and tell the student, "You're wrong. Shut up," to loud applause from everyone else.



2. *The Laptop*

While supposedly typing notes, this student is more likely to be playing flash games or be on Facebook. Yeah, he might not be in his room, but that shouldn't prevent him from doing what he does when he's in his room right? This guy used to bring a pillow to class, but decided that a laptop might be more inconspicuous, and cause the Prof to think he's working really hard at taking notes when he's pounding the keyboard.

3. *The Sleeper*

This is a very common type of student, especially in morning classes. He climbed out of his warm cozy bed in order to go to class. The moment he got to class he promptly fell asleep again. He might try to hide it from the Professor, resting his head on one hand as if he's thinking, but it's obvious to everyone and the Professor he's sleeping since he's snoring like an elephant.

4. *The Talker*

Hey look, a bunch of friends are sitting next to each other! Great, now please shut up. They think they're being discreet and soft spoken, but everyone in the entire room can hear them gossiping. Everyone glares at them, trying to mentally set them on fire. Sometimes the Talker will just be a lonely guy trying his hardest to make use of the time when he has a girl captive in her seat. In that case, everyone in the room feels too awkward to look in his direction.

5. *The No Show*

This is the most common type of student. This type of student used to be one of the other types, but evolved when they realized they weren't paying attention in class anyways. They were doing the same thing in class they were doing back in their rooms, so they figured they might as well just stay in their rooms. They think it's a great idea until exams come around and one of the questions references an "in class discussion."

As reported by BBC...

South African MP Nhlanhla Nene was being interviewed live on a parliamentary review programme when a loud crack was heard; seconds later his chair collapsed.

The South African Broadcasting Corporation has apologised to Mr Nene, and said that "all necessary precautions are being put in place to avoid a similar incident".

-- taken from BBC One-Minute News

XKCD by Randall Munroe

The California Tech
Caltech 40-58
Pasadena, CA 91125