



Human Catapult Takes Prize in Flugtag Contest

By CHRISTINE CHANG

As forty thousand people stared in anticipation, four men dressed in kilts and khaki life-vests wheeled out their work of art, the culmination of months of calculations, testing and construction. After a two-minute skit and a brief flash of their fire-alarm red Speedos, they attached themselves to one end of the contraption, ready for their moment of glory.

Another kilt-clad man stepped out from behind a white curtain and climbed into a wooden throne attached to the other end of the object and the period of preparation was over. The four other men jumped. The audience cheered. And the man in the chair was catapulted sixty-one feet into the San Francisco Bay.

This team of five men, named El Toro Guapo, competed along with thirty-two other teams in Red Bull Flugtag San Francisco on Saturday, October 25. El Toro Guapo, which included Caltech Mechanical Engineering graduate student Sean Humbert, won the competition for the second year in a row with their human-catapult design, which they affectionately called the "Medieval Missile."

"We're just happy to go there and do crazy stuff," said Humbert when asked why he and his friends en-

tered the competition.

Flugtag originated in Austria in 1991 and is a competition where teams of five people build flying vehicles to launch off a pier into a body of water. In 2002, flugtag spread across the Atlantic to six cities in the United States, with the first competition held in San Francisco. Each team is scored on the distance of flight, creativity and showmanship, which is demonstrated through a two-minute skit before the launch.

Humbert became involved last year after a high-school friend heard about the competition through a radio advertisement in San Francisco. From then on, Humbert, along with his friends Brent Hedgpeh, Brent Holloway, Ted Scheel, Dave Campbell and Chris Birgers, started on a two-year adventure.

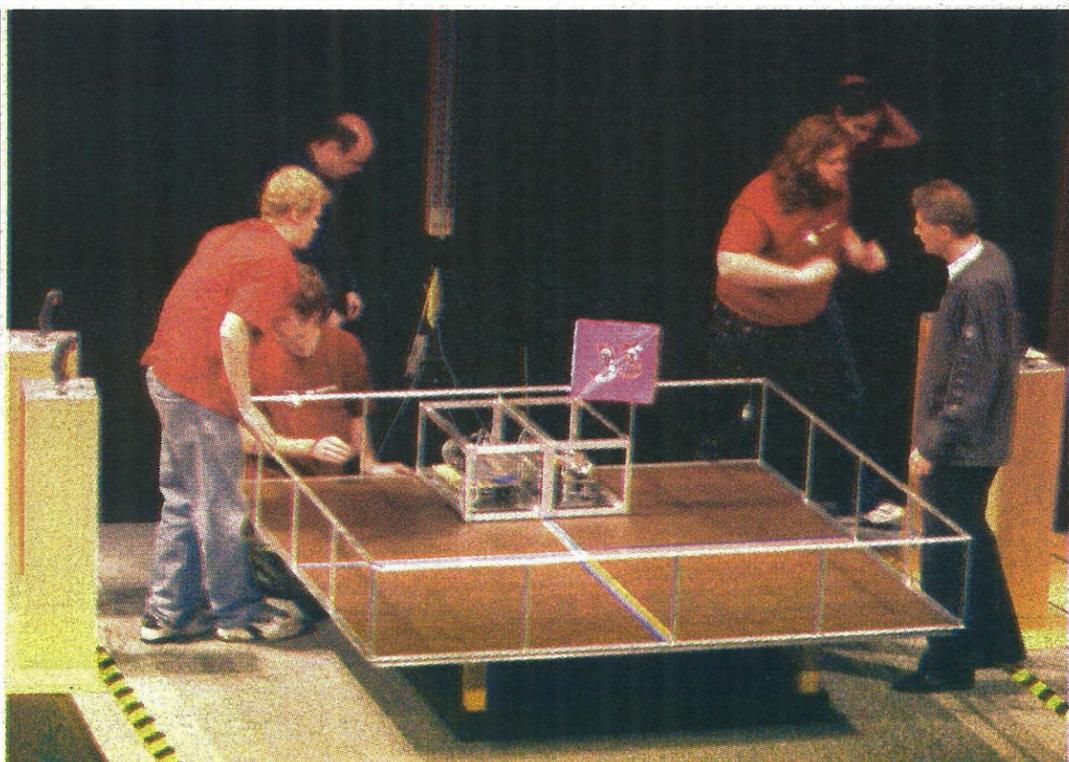
Last year, armed with a structure consisting of surgical tubing and a skateboard, El Toro Guapo launched a member of their team forty-eight feet from the launching pad, setting the United States record at that time. However, with this year's rules explicitly forbidding any energy storage devices, Humbert set out during the summer to design an entirely new device.

"There are two ways to get ve-

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Mechanical Engineering graduate student Sean Humbert 'pilots' his human catapult to victory in a San Francisco Flugtag competition.



L. Tran/The California Tech

ME 72 winners Ben Solecki and Dylan Owens prepare their robots for the championship battle as opponents Jesse Escobedo and Colleen Moody head over to their joysticks.

'Cage Against the Machine' Entrants Command Robots in Battle for Title

By JENNY IOFINOVA and ARTHI SRINIVASAN

The 19th annual ME 72 competition was held on Thursday, December fourth, in Beckman auditorium. There were 23 students in the class, as well as one TA who completed the 12 teams. The competition was intense and exciting to watch and as usual, drew a lot of spectators, mainly Caltech undergrads, who cheered for the competitors in their houses.

This is the sixth year in which contestants competed in teams of two and the first year, in which an odd number of students took the class. Therefore, Salomon Trujillo '04, who took the class last year, also competed this year as Mr. X. Trujillo and his partner Kyle Chrystal '05 made it to the semifinals with their design.

Professor Erik Antonsson, who normally teaches the class, is currently on leave and so the class was

run by profs. Joel Burdick and Curtis Collins. However, Antonsson said that he still "poked his head in occasionally," and he was one of the emcees for the competition on Thursday.

He explained to the audience that the goal of the class was to solve an open-ended engineering problem and go through the complete prototype of solving such a problem, from design to implementation.

As always, the competition was preceded by a long introduction consisting of a video compiled of recordings of students from previous years on the first day of class, working on their projects and finally the finished robots.

Aside from explaining the pur-

pose of the class, Antonsson described the kit of materials each person gets, which includes two motors and such items as gears, aluminum siding and wooden dowels. Participants may not use any external materials in building their robots. He also remarked that although ME 72 is a 12-unit class the average student puts in around 170-180 hours of work into their project over a ten-week period.

In his speech, Antonsson commented that part of the challenge of this class is that it is very much like a real world engineering situation, in that there is a time limit and a budget limit: the machines must be built out of a fixed kit of materials.

This is the third year that the de-

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Campus Life Team Throws Its Weight Around; Students Pleased by Changes

By KEVIN BARTZ

The Caltech Bookstore's just a short walk from Campus and Auxiliary Business Services' housing office. If you're really clever and you cut through Ruddock and the kitchens, you could be out the door with next term's texts and a gift for mom, all in a few minutes flat.

Unless, of course, you're Campus Life Director Tom Mannion. Then you'd barely get out the door before being flanked and thanked by passing administrators—Housing Director Tim Chang, Associate Dean of Students Barbara Green and other higher-ups from the newly retooled machine that is Student Affairs.

Even if you were to take the shortcut, you couldn't avoid a quick chat with Executive Chef Andre Mallie, always eager to share a few words with the man he calls a "great addition for our dining mission."

Yes, just about everyone knows and loves Tom, everyone from the kitchen staffers who beseege him

with hellos on the walk through Chandler to Jeff Cox '04, one of two new Campus Life student employees, to Fleming RA Jorge Goncalvez, whom Mannion, with his signature personal touch, is quick to congratulate for a recent tenure offer from Cambridge.

"You walk through campus with him and it takes a while because he's always stopping to talk to students," said colleague and Athletics Director Tim Downes. "He just has a spectacular rapport with students and that's really crucial for the job he does," added Master of Student Houses Cathy Jurca.

It's all part of Campus Life, a repackaged vestige of the now-defunct Residence Life and embodiment of an increasingly proactive Student Affairs. At the heart of Vice President Margo Marshak's efforts last spring to "create a culture where student services personnel are 100% receptive to students" is none other than Mannion, plucked from CABS last spring to craft a student-friendly image.

One fall term later, the gambit appears to have paid off. Backed up by Assistant Sue Chiarchiaro, who has "picked up the ball on a lot of things [now-fired] Kim West used to do," and Chang, who has reinvigorated his efforts to "throw our weight around" in response to student needs, the Mannion-led Campus Life team has spent the term cutting loose ends, canvassing student opinion and planning everything from future parties to the planned Campus Center.

"What we do is different from the rest of Student Affairs," said Mannion. "It's the fact that we interact with students; we have an idea of the bigger picture. And I need to know everyone's name."

You might say it began with a bang—literally. Fireworks, adorning a skyline fraught with freshman anticipation at a first annual orientation carnival that made the now-kaput ASCIT carnivals look like tea parties. "It was a cool way to kick off the year," held ASCIT President

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'Spirit' Mars Probe Nears Destination; Life Sought

By K. SZWAYKOWSKA

In 1870 Italian astronomer Giovanni Schiaparelli reported observing "channels" on the surface of Mars, which inspired popular belief in Martians—that is, in Martians as intelligent, canal-building life-forms.

Since then, no life has been found on the said planet and even now, over one hundred years later, the search for life on Mars continues, albeit in a completely different form.

The emphasis is no longer on finding little green men with picks and shovels covering their planet's surface with canals; rather it is on examining the surface of Mars for clues as to its ancient geology and seeking to settle the question of whether liquid water may have at some time existed on Mars, supporting some form of single-cell life.

This question will be examined by several crafts currently bound for Mars. On January 3, 2004, "Spirit", the first of a pair of identical Mars rovers constructed at JPL for NASA, will land on the Red Planet's surface at Gusev Crater.

Delta-shaped deposits at the site indicate that a river may have once

flowed into the 4-million-year-old crater, forming a lake at its bottom; the "Spirit's" mission is to verify whether this was indeed the case.

On January 25, the "Opportunity", a rover identical to "Spirit", will land on the Meridian Planum, also to search for evidence that standing liquid water may at some point have existed on the surface of Mars.

The search for evidence of liquid water having at some point existed on the Martian surface has turned up contradictory evidence. Satellites sent to Mars have sent back images that show what looks like an ancient coastline, as well as channels which might have been eroded by running water, but studies have shown no evidence of large carbonate deposits, like limestone, which on the Earth build up in the presence of standing water.

Instead, we know that the Martian surface has large surface deposits of minerals which could not have lasted in the presence of water. It is believed that at one point, there were massive floods on Mars, but the water quickly soaked into the ground or evaporated and was lost in space.

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Plans Underway for Renovating Houses, Expanding Card Uses

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Tom Fletcher '04. "It had fireworks, it had a kazoo band, it had everything. It was pretty intense."

After Campus Life's quiet transition last spring, the festivities were the first visible reminder of the new kid on the block. And Mannion wasn't cutting any corners; he'd been setting this stage for months. "Perhaps our accomplishment with the biggest impact was the carnival," he said. "Nothing like that's been done before."

And the new guy may have a few more tricks up his sleeve. He's presently working with Cox to revive "Mudeo," an activity-filled day of tug-of-war and tire-fighting in the mud that dates back to the 1920s.

Shelved since 1998, the idea now sits under the Campus Life microscope, as Cox plans to reintroduce a broadened version of the event, formerly "an excuse to drag the frosh through the mud," as a full-blown inter-house mud fight sometime this spring.

Another Mannion brainchild is the joint effort now afoot to "universalize" the Caltech student card—that is, to broaden the range of services, both on campus and in downtown Pasadena, which a student's account can fund. Not only would this lighten the burden on the C-store, but, as Mannion hopes, it would "serve a full range of student needs."

"We're trying to enlarge our services of the card system," explained Mallie. "We're trying to have our card be a lot more convenient, meaning you could go to the library and maybe do some photocopying or maybe use your card at the bookstore." On the depositing end of the equation, too, Mallie and Mannion are formulating a system that would allow parents to add money directly to students' cards.

The first phases of this plan are set to take effect next winter. By the time students return, an assortment of vendors—chosen by a survey last month that placed President Thai, Jamba Juice and Trader Joe's at the top of students' wish lists—will accept student IDs as payment.

"When I heard this idea I immediately jumped on it," exclaimed Food Committee head Natalia Deligne '04. "It's a great opportunity, especially for weekend food." Not only that, but as Mannion pointed out, it'll save students the state's 8.5% meal tax.

A related fruit of Mannion's labor is the C-store, which he's seeking to renovate and expand. "We had a lot more requests to enlarge the store and bring a lot more groceries," offered Mallie. "It is a priority for us to make it happen. It's just a matter of getting the funding for the renovations."

The adjacent nook of Chandler seating is the likely casualty, although Mannion's still pondering what to do with the microwave. Trouble is, he can't put it in the C-store without incurring a state-mandated meal tax on frozen burritos because they'd be "prepared food." Leave it out, however and the onus will fall to students to heat the cheesy chops.

Another area of concern is the bookstore, where Mannion has coordinated with Caltech Wired to host periodic LAN parties for students and with Bookstore Director Bill Burrows to build up an inventory of USGS maps for sale. Campus Life also spearheaded the push for a students-only "insignia discount": 10% off the first logo-laden merchandise; 20% off the second; and 30% off everything after. "We have a full picture of student needs," maintained Mannion.

A larger project is the long-awaited Campus Center, slated to occupy the Physical Plant's present location, for which Mannion has spent the term brainstorming blueprints with Downes. The two have been hammering down details on just which artistic amenities they'll include; Mannion's pushing for a full-blown movie theatre, in addition to a basic auditorium for student performances.

"We're asking: what are the true needs of the Caltech community?" explained Downes. "And we're melding that into the facility to address the creative and performing arts space." Also on the drawing board is a related ASCIT survey to assess student opinion on the matter.



L. Tran/The California Tech

Campus Life Director Tom Mannion discusses one of the many plans for services that he wants to bring to Caltech Students.

Eagerly anticipated renovations of the student houses are a similarly longer-sighted aim. Campus Life has teamed up with Student Affairs Assistant Vice President Erica O'Neal to nail down a schedule. "We definitely hope we'll be able to do some work to improve student houses—in terms of physical space," said O'Neal. "Some basic repairs need to be made."

First on the agenda, however, is expanded campus housing for graduate students, who, despite their numbers, have little recourse beyond Avery and Braun. "We've been talking about what can be done for grad. students," recalled O'Neal. "One of the things Tom did this year was to pay more attention to that. We need to have a little bit more structure and programming in housing for graduate students. Our graduate students actually outnumber our undergrads, so I think it's a nice idea to pay attention to them as well."

In a larger sense, Mannion has been making strides towards empowering the traditionally fragmented graduate student community. When Marshak gave him the department last spring, Mannion's first personnel move was to retain Fred Romberg, a former graduate student and four-year RA in Blacker and Marks, on the Campus Life staff.

Perhaps foremost among Romberg's tasks is to mastermind "Graduate Life," a division of Campus Life that will handle exclusively graduate needs. "I have been asked to work more closely with graduate students to understand their needs with the intention of creating a new component of Campus Life called 'Graduate Life,'" explained Romberg.

"The initial thinking is that Graduate Life would provide support to graduate students as they relate to residence life." In the coming year, he plans to feel out graduate needs through individual departmental dialogue and assessments of outside institutions with similar programs.

But lest undergraduates feel left out, perhaps they'd be pleased to know that Chang, Mannion's "man behind the scenes," has some nice and immediate stocking stuffers for the student houses—like brand-new big-screen TVs. Dabney and Ricketts are slated first, to be followed by others as budget permits.

But the perhaps more intriguing twist is that Chang put off computer upgrades to raise the money. While Simpsons blades in 21st-century color, Campus Life's PCs will languish into their fifth and sixth years. "We knew they needed new TVs, but we didn't have it in our budget," held Chang.

"So we're trying to stretch things a little bit more than in the past and we've been saying, 'Maybe we don't need those computer upgrades right away.'" The housing director graciously went forward with the reallocation after he determined that the system was stable enough to last a couple years longer.

Chang was also the eleventh-hour architect of this year's first ASCIT Movie; thanks to delays in his appointment, incoming ASCIT Social Chair Abe Fetterman '05 gave Chang only two days to orchestrate the "Matrix: Reloaded" buyout. But by "throwing my weight around," Chang managed to pull off what seemed an impossible feat—and one that the mission and framework of Campus Life gave him the motivation to complete.

"We're bending over backwards more than we have in the past," he said. "We get asked

to see if we can get that movie for ASCIT with two days' notice, which meant we dropped everything to do it—but we wouldn't have been able to do that in the past." In the end, he managed to pull it off without burning any bridges with the theatre's management and students were pleased. "I'm more impressed by how [Campus Life] handles problems," praised Fletcher. "I think they've been very responsive."

After the stories of sacrifice, you might say this term's been all work and no play for the Campus Life team. They'll get their own share of spoils, though, when they move from the cramped CABS office and scattered campus locales to a unified new office in the Center for Student Services.

Mannion himself will also personally move to a new house, at which he'll host barbecues where, of course, students will be welcome. Chiarchiaro, who has been maintaining many of Residence Life's essay contests, "fun fund" drawings and other popular programs, looks forwards to the unification. "Right now, I'm still over in CSS, while all the rest are elsewhere," she said. "We're a little splintered in that regard."

And somehow, between all these dealings, Mannion's managed to keep open avenues to individual students. Filling a MOSH role refined last spring to emphasize student-administrator relations, Jurca has teamed up with Mannion to teach a wine course, a cooking course and a series of so-called "manners dinners" where students are taught the tao of the business world.

"There's a lot of informal things students do together," explained Jurca, "but there's a dearth of informal things students do together outside the houses. In addition, I think knowing about wine is just incredibly useful."

There's also Mannion's effort to reach out to the Interhouse Committee, which he took pains to include in negotiations for a ticketed board rate increase. "Tom showed up to our meeting at 11 that night—good luck getting any other administrator to do that—with printouts showing exactly what their costs were," recounted IHC Chair Jeremy Pitts '04.

Mannion also painstakingly prepared what Pitts called "a fair change to the damage fund"—and when the presidents rejected it, he backed down. "He seems to always have the students in mind," said Pitts, "and only does something that we won't like if it is clearly the only choice." But as Pitts puts it, "Tom doesn't just interact with student leaders; he is always open to helping out anyone."

He stepped up RA meetings to thrice monthly—and recently considered structural changes to the dining hall for a disabled student unable to see the salad bar. In the words of ASCIT Vice President Galen Loram '05, "he really does care."

Perhaps most tellingly, his office door is open from noon to one each day to field even the pettiest of individual concerns—anything from sweeping campus changes to graduate school applications. "Noon to one is my student time," said Mannion. "It's about accessibility. We discuss all kinds of things—parties, restaurant recommendations, anything." And with a chuckle: "We've even set up students on dates."

From the Campus Center to a college date. But from the man who gave us fireworks, who would expect any less?

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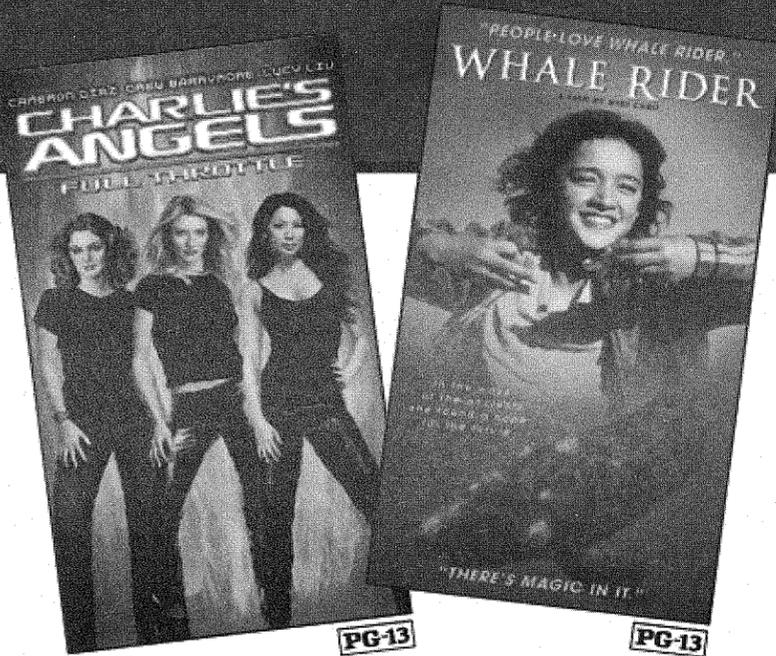
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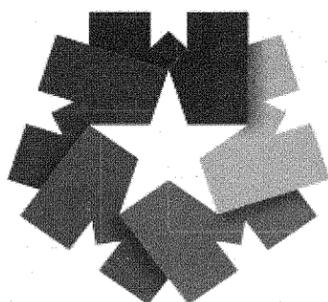
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21 Grams Tips the Scales

By HARRISON STEIN

When one sees a movie, he wants nothing more than to leave the theater in a chipper mood. Therefore, if a film is downbeat, it better be so well written, expertly acted, and perfectly directed that the audience's artistic appreciation of the movie outweighs its sadness at the dismal subject matter. *21 Grams*, the new film from talented Mexican director Alejandro Gonzalez Inarritu, is one of the most depressing major motion pictures in recent memory, but because of a trio of virtuoso performances, it manages to stay afloat.

In 2000, Inarritu directed the unforgettable *Amores Perros*, a character study where three lives were altered by a single car accident. *21 Grams* is his much-anticipated American debut, and while its plot follows an analogous structure, the final product is superior in many ways.

While *Amores Perros* was a low budget film that succeeded despite a young, inexperienced cast, *21 Grams* is fortunate enough to star three of the world's best actors at the top of their games. Sean Penn, fresh off an amazing showing in the inferior *Mystic River*, stars as Paul Rivers, a middle-aged math professor with a chronic heart disease. Australian sensation Naomi Watts shines as Christina Peck, a former drug-addict who fixes her life after giving birth to two daughters. In the meantime, Oscar Winner Benicio Del Toro plays Jack Jordan, an ex-con with a newfound trust in God.

In the first act of *21 Grams*, the three lives are inextricably linked to one another after a horrific accident shatters two lives and saves another. After the catastrophe, there is very little action as the story focuses on the characters' inner struggles, but the film still glides smoothly for 125 minutes. To his credit, Inarritu does a fantastic job of downplaying the significance of any single character, and as a result, the audience can sympathize with all three personas.

Unfortunately, Inarritu decides to tell the story in a non-linear fashion meaning very few events are

actually told in chronological order. This film technique is distracting and completely unnecessary because the plot is of secondary importance to begin with. Also, the awkward filming style disrupts the meticulous pacing that Inarritu established so well in the first act. A linear storyline would have been just as captivating, far less confusing, and more effective.

Still, *21 Grams* is saved by three of the best roles you'll see all year. Sean Penn proves that he is also one of its most accomplished actors in the world today. His acting in *Mystic River* was absolutely breathtaking, but he actually outdoes himself in this film. Penn has never won an Oscar, but so far, he has given the two finest male performances of the year, and it will be a shame if he doesn't win the Best Actor award for one of his roles. Meanwhile, Benicio Del Toro shows his Oscar win for *Traffic* was no fluke by perfectly portraying the hardened criminal whose belief in Gods fluctuates like the stock market.

However, both actors are overshadowed by Naomi Watts who displays more energy and raw emotion than the entire cast combined. Watts was extremely entertaining in *Mulholland Drive*, but this performance is completely unexpected. Of the three characters, we care the most for Christine because Watts' electrifying performance captivates the audience. Other actresses might have succeeded in her place, but frankly, this is a role that Naomi Watts was born to play.

21 Grams is not a perfect film, but in a year of mediocre pictures, it is one of the best. Alejandro Gonzalez Inarritu constantly flashes his enormous talent while Penn, Watts, and Del Toro are beyond fantastic. Nonetheless, this movie is not for everyone. If you're looking for a fun, entertaining time, see something else. But if you want to see three searing performances in a stunning tale of heartbreak and redemption, *21 Grams* is the movie for you.

1/2 out of *



21 Grams follows the lives of three people after they are inextricably brought together through a horrible accident.

American Apparel Cleans Up Black Friday

By AMEERA CHOWDHURY

The nickname Black Friday for the busiest shopping day of the year, the day after Thanksgiving, is a seeming misnomer. Unlike Black Thursday and Black Monday, which commemorate the stock market crashes of 1929 and 1987, respectively, Black Friday marks the first profits of the year for merchants, who consequently switch from red ink to black.

But considering how many child labor laws were broken so that retailers could slash their clothing prices for the after Thanksgiving sales, Black Friday deserves its gloomy name. American Apparel, a sweatshop free clothing company based in downtown LA, is hoping to change the garment industry's exploitative practices.

American Apparel marches to a different beat. While other clothing companies scour the globe for the most squalid working conditions, American Apparel's employees earn a living wage and get health benefits right here in downtown LA. American Apparel does not use subcontractors or offshore labor; all of its products are produced in its downtown LA facility, the largest

garment factory in the U.S.

Realizing that many garment workers are immigrants, American Apparel offers English classes for its non-English speaking employees, and has even hired buses to transport its workers to immigrants' rights demonstrations.

American Apparel is also committed to recycling its fabric scraps and using sustainable cotton.

What makes American Apparel so unique is not only its social conscience, but also its mainstream appeal and accessibility, a feature missing from other sweatfree clothing companies like No Sweat Apparel and Sweat X.

For example, although American Apparel worships the T-shirt, they realize that they are not outfitting Winnie the Pooh. That is, one can buy not only T-shirts from American Apparel, but also pants, shorts, and underwear too.

American Apparel avoids the mistake of producing big floppy T-shirts with goody-two-shoes slogans; its T-shirts are soft, form-fitting, and blank. As proof, American Apparel used to fit its T-shirts on strippers from Playpen strip bar in LA. Dov Charney, CEO of American Apparel, explained in

The New Yorker, "Big companies tend to hire fitting models at a hundred bucks an hour. But they only give you one look. At a strip bar, you get a cross-section of chicks. You've got big chicks, little chicks, big-assed chicks, little-assed chicks, chicks with big tits, and chicks with little tits. You couldn't ask for a better place to fit a shirt."

Best of all, American Apparel recently opened retail stores in Los Angeles, New York, and Montreal. Consequently, being a sweatfree consumer doesn't mean you have to miss out on the experience of going shopping or hassle with sizing charts. This is an important distinction between American Apparel and other sweatfree companies that only sell online. If, however, the internet is your shopping paradise, you can buy American Apparel's clothes online at <http://www.americanapparel.net>

In Southern California, where workers with occupations as diverse as grocery clerks, rail mechanics, and police officers are or have been on strike, it's heartening to be able to shop at a store like American Apparel that isn't caving into the Wal-Mart model and that treats its workers with respect.

Now for Sale: Push-Button Orgasms

By DYLAN NIEMAN

All hail Dr. Stuart Malloy of Piedmont, North Carolina, a man who knows how to please women. Last week, Dr. Malloy announced his invention of a pacemaker-like device that uses electrodes implanted in the spine to provide women with sexual stimulation. Malloy stumbled upon the idea for the device while performing a routine pain relief operation two years ago. As he stimulated spinal nerves via a handheld electrode his female patient began moaning and commented: "You're going to have to teach my husband to do that."

Dr. Malloy did not teach her husband to do that. Instead, he went to work building his device, which uses electrodes placed in the lower lumbar region of the spine to stimulate the pudendal nerve which, among other things, increases blood flow to the genitals. At least that's what he thinks is happening, it's hard to say exactly what's going on when you bridge the spark gap across the cauda equina. The operation is performed under local anesthetic, with the patient awake and alert. He moves the electrodes around until the patient lets him know that he's "hit the spot." The electrodes are then fixed in place, with a wire exiting the patient's back. Yes, a wire exits the woman's back. Romantic, huh? That wire connects to a small electronic device which controls the level of electrical stimulation.

Now, running current through that wire does not provide an instant orgasm. What it does is increase stimulation and blood flow to the lower hemisphere, which aids in excitation. The early test subject (there has been only one so far) reported of the device: "depending on how high it is, it speeds up the foreplay. It could take anything from a few minutes to half an hour to orgasm. One time, though, I turned it up too high and started having cramps in my feet."

So, it works, if you allow for the occasional foot cramp, but is it safe? I mean, the doctor goes poking around the spinal cord looking for the E-spot (my term, not his). And then there are the lovely trailing wires bridging the usually-sterile transition from the outside world to the spine. Presuming there is little chance of infection at the implant site (a big pill to swallow), it hardly seems safe to have spinal electrodes just, you know, out there. I mean, what if someone decides that the stimulation provided by the handheld device isn't strong enough and decides to wrap those wires around the leads of a car battery? People do all sorts of crazy things in the search for new and interesting ways to get off, do we really want to be giving them unfettered access to the spine and a license to play Mister Wizard with their pudendal? We live in a world where "Do Not Eat" has to be printed on every packet of silica that gets stuffed in a shoebox. Come on.

The good doctor has plans to change the device a little, and have the wires connect to a matchbook sized device that will be implanted under the buttocks and controlled by an external radio-frequency transmitter, something like a cell phone or a palm pilot. Consider, for a second, some of the applications for self-abuse. It seems reasonable to imagine such a device might be Bluetooth compatible and offer a host of silent cell phone ringers, a whole new world of phone sex, and make the "heated" seats option on luxury cars just that much more desirable.

Putting aside the potential pitfalls of implementation, there are all sorts of more principled concerns, like isn't it a little unnatural, isn't it a little unsporting, and how much does it cost? For the bargain hunters: the device is free right now for those willing to participate in clinical trials. So far only one woman has volunteered, but she seems pleased, and incidentally so does her husband. When it reaches market, the device may cost as much as \$17,000, which naturally seems a little stiff. To the sports fans out there: isn't a game better if everyone is having fun? And to the naturalists I say this: Cell phones aren't natural. Automobiles aren't natural. Hell, light bulbs aren't natural, but they're useful. If Thomas Edison had come up with a way to give Mary Stilwell or Mina Miner push-button orgasms, don't you think he would have done it?



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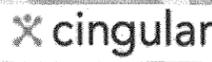
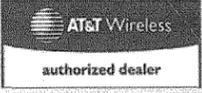
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Post Turkey Ruminations

By JEAN-PAUL REVEL

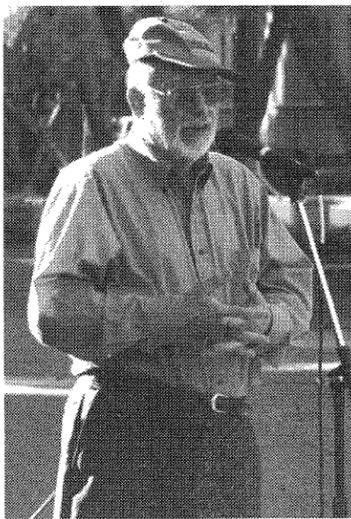
I hope you had a great Thanksgiving, all of you, those who stayed behind and those who braved the throngs and went home to a turkey such as only a mom can cook. Unfortunately, that's all ancient history. You are already back in your classes and the term is near its end. The amino acids you extracted from the turkey are well ensconced in your own proteins, and the stuffing too has done its thing to you.

Also on the down side, the glow of seeing family and friends is slowly dissipating. We are all members of groups, some acquired through self selection, such as one's friends, others "inherited," like our parents and siblings. Even while enjoying your short visit home, you probably looked forward to coming back here, feeling a bit lost without the company of your pals at Caltech.

The friends that we make on our own are in a special category. We select only a few among the people that fate brings us near to. There is no telling what attracts us, what the chemistry is, who knows, maybe the attractant is a pheromone. I am sure you have all heard of the Gypsy Moth females who draw potential mates to them from miles around by sending out a cloud of 7,8-epoxy-2-methyloctadecane. The males detect vanishingly low amounts of the stuff and follow the concentration gradient toward their potential mates.

We don't know much about human pheromones, contrary to what Coco Chanel wants us to believe, and it is unlikely that the basis for human friendships will be found to be based on perfume. All we know is that among those with whom we share a common living space, a common place of work, the same house, or some common experiences there are a few to whom we become especially loyal. Besides these close friends, we also form bonds with other subgroups of people, classmates, club mates and to varying degrees, everyone at school--but these connections are not as tight. Part of being friends is that each tries to protect the well being of the other. Each of us becomes his/her friend's keeper but there are times when things become awkward because we don't belong just to one group, but to several at the same time. As I said earlier we may have multiple, and sometimes conflicting, interests. It is like the situation of conscripts who have to tear themselves from their close ones, to serve their country. It takes great courage but it is understood that the needs of the country have precedence over those of our own private little groups. After all, the country one belongs to includes many if not all of one's friends.

Now the Institute is a bit like a



country. It provides a framework within which we all have a niche, all of us, Administrators, Profs and Students, Gardeners, Cooks and Janitors too. While all of us depend on that major framework, the relationship is reciprocal. Without us and others like us the Institute has no life. It stands like an ancient monument, with its purpose all but forgotten, or perhaps so forgotten we are not quite sure what it was for. We don't quite know what was going on in all of those ancient structures, temples and other mysterious ruins, because the social organizations which vitalized them have disappeared. How did that happen? In some cases it was due to losing a war with neighbouring countries. The victors imposed their own order which might well have no use for that of the vanquished. In others cases the temples were abandoned because the social order fell apart of its own weight...There were priests and leaders, teachers and pupils and farmers and scribes.

Each set of citizens used to have a role. Some gave commands, other guidance, and the young ones taught the ropes and were told to march. When these constructs fell apart, so did the country. Only a strong hand kept it all together.

The Institute is not as stern and demanding as a country would be. In fact this Institute gives a lot of leeway, but the extent of the freedom does not mean the Institute relinquishes all control. There are limits that the Institute has a serious interest in preserving, and the fact that the students are given the freedom to govern themselves to a great extent, does not mean that anything at all goes. Learning to walk the tightrope between absolute license and the demands of society (the Institute, the country, whatever organizational framework one has to deal with) is one of the lessons one learns at college. With the freedom allowed comes responsibility, including responsibility towards the organization within which one lives. Enlightened self interest de-

Wrapping Up the Term in Our Bubble

By TOM FLETCHER

Plans for the Rest of the Term

As you are no doubt aware, the term is winding down quickly. ASCIT's activities for the rest of the term are also few, but there are some that we still need to discharge.

Monday, December 8 is the last faculty board meeting of the year. I will be defending our proposal to have access to committee happenings; if you have opinions on other issues that you would like voiced, check the agenda at <http://oof.caltech.edu> and let Galen or I know.

Hopefully, you've noticed that the CLUE has been updated and that the DVD library is humming along with its new bar-code scanner. I am very excited to say that soon we will have added graduate students to the list of people who can check out movies. By doing so, we will receive \$1,000 from the Moore-Hufstедler Fund to buy more movies and hopefully get more graduate students hanging out in the Coffeehouse.

This should accomplish a number of worthwhile things. For one, it will help the Coffeehouse make more money and stay out of the red. The Coffeehouse has always been a touch-and-go operation, but in the last year the managers have struggled to make it not lose money. In a time when belts are tightening across campus, we need to do everything we can to help dining recoup its expenses. Letting graduate students use our library is also a nice way of saying "thank you" for all the hard work they have done for us, behind the scenes, in the last few years. The grad students have single-handedly organized a number of TA training courses that are really starting to draw large audiences. We, the undergrads in these classes, are the sole beneficiaries of this project, and I know that I for one appreciate it! If the grad students like using the library, they will also start chipping in for their share of the use. With a larger budget, ASCIT will be able to expand the library to include more and more titles for your viewing enjoyment.

Lastly, and perhaps most importantly, it is a first step toward working with the graduate students, instead of ignoring them. Setting this up has been quite difficult, and interfacing the GSC and ASCIT has been no small task. However, the experience we have gained from working together and the familiar-

mands that we all do our level best to support the Institute in its endeavors.

A bientot

ity we have developed allow us to collaborate on more projects in the future.

Whom I Met With This Week

I met with Margo Marshak, and then met with her, the BoD, and Provost Koonin. We are addressing the concern over the rate of honor code violations among the graduate students and look forward to their faculty board presentation on Monday. We also hope to repeat their study amongst the undergraduate so we can see if there is any difference, or if a pending crisis also.

We also discussed plans for moving both UGCS and the ITS lab in Steele. Both spots are being taken back by E&AS and need to relocate. This will happen in six to twelve months. We will shortly be posting a computing survey to determine what computer usage to fight for and what, if any, can be conceded. We also hope to address computer needs that have not been addressed, like the need for wireless around the undergraduate houses. Expect this survey early next term.

Popping the Bubble

If you'll bear with me for a few paragraphs, I spent a lot of time thinking about Caltech over the last week and I would like to share some of my conclusions.

The "bubble" analogy comes up over and over again when people discuss Caltech. I have heard students claim ignorance of goings on in the outside world because they were "in the bubble." At the last library committee meeting, there was much discussion over whether we should allow outsiders to use the Caltech libraries. The bubble analogy is used as a justification to allow students to focus all their energies on studying math and science, with none of the distractions of the rest of the world. I have heard faculty lament that occurrences in the "outside world" are making it harder for their grad students and postdocs to get visas to study at Caltech. Over time, I have begun to seriously doubt the value of this "bubble," so much that I think it may be one of the most harmful things about the Caltech environment.

I think the purpose of a Caltech education should be to train citizen-scientists to go forth into society and lead the way in solving our problems sensibly, with reason and technology. As Dr. Baltimore is prone to saying, the scientific education will be the liberal arts education of the 21st century, and I agree completely. Whether we feel we are up to the task or not, our

nations and communities will need us to address every pressing issue, from global warming, to supplying enough energy and food, to curing an ever-adapting array of viruses and bacteria.

Sadly, the bubble we draw around ourselves prevents us from really understanding the society that we will need to help. For weeks, I have written again and again about the need to make this campus more representative and to integrate the people we already have. In a world where the enemy is no longer a nation but a band of terrorists, coalitions of nations will need to come together to fight collectively for security. We can only do this if we understand and trust one another, a major stumbling block that right now is hampering the ability of the US and Great Britain to find allies to work with them in building a new Middle East.

In all these writings, I mentioned that I had no ideas of my own for pushing this integration forward. Now, I have one. By going home early, I was fortunate enough to attend my church's Thanksgiving service. In honor of Thanksgiving and the Pilgrim/Indian relationship that gave rise to the first Thanksgiving, my church invited the local Korean church to merge our worship services. The service was a major success, with both our minister and the Korean pastor delivering sermons, one of which prominently featured aspects of Native American spirituality and its similarities to Christianity. The whole event was so successful that, while still in the sanctuary, the two churches decided to merge their Christmas services as well next month. The amount that I, and I think everyone else, learned from this one hour of church cannot be understated.

Of course, this method of integration could never work at Caltech. We do not even have a facility for it! One of the proposed features of the campus center is a contemplation center - a non-denominational area for reflection and spirituality. Such a place could serve this purpose, could help to start bring people together through belief or simply discussion of it.

Unfortunately, the amount of criticism this facility has received from students and faculty is astonishing and saddening. Such rabid denouncement of a spiritual aspect of life exists only within the Caltech bubble, and does not demonstrate tolerance or openness to other perspectives. In the same way that our strength as a community depends on our ability to accept people of all ethnic backgrounds, so too does it depend on accepting people of all faiths. This is true on a global scale (the example should be obvious), but also on a local scale. Over 80% of Americans consider prayer an

Continued on Page 6, Column 1



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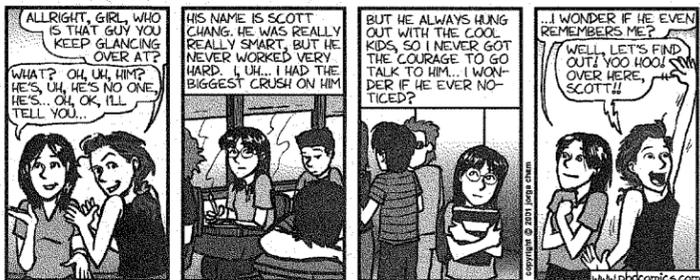


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Breaking Out of the Bubble

Continued from Page 5, Column 5

important part of their lives, but I do not think that would be obvious looking around inside our bubble.

How does this affect us? Despite our seemingly best efforts, Caltech is not an isolated kingdom within a bubble. Religiously motivated decisions directly affect the progress of science. Stem cell research is held back by religious belief in this country. Evolution, even landing on the moon, are doubted by the majority of society because they don't trust the "godless scientists." If we are to lead this society forward, this society where more people believe in creationism than evolution, we will need to understand where they are coming from. Whether we choose to believe or not, we will need to explain science in terms that do not conflict with their beliefs so that we can continue to progress, or we will continue to fail as we do now.

Sadly, we are not even making the first steps. Our cross-town neighbor, Fuller Theological Seminary is making enormous strides to bridging the gap between religion and science and successfully integrate the two. Professor Murphy recently gave an enormously successful talk to the New York Academy of Sci-

ences, and the rest of the school is working hard to find ways to help science and religious understand each other. Imagine if the nation's largest evangelical seminary and the nation's premier institute for scientific research were to team up to work on healing the divide between these ways of looking at the world and help us move forward! They are only a few blocks away, and I think the gains of understand each other (stem cells, environmental protection, etc.) are too great to pass up.

I will keep saying it until I am blue in the face, but as a community we must integrate more, lest we continue to drift farther apart and polarize even more. Doing so means leading the way forward, not doing so condemns us to remain bitterly divided and alone.

I look forward to your feedback, and good luck on finals, Caltech!

Peace out,
Tom Fletcher

PS: For more on Fuller, Murphy, and there attempts to reach out to science, from the LA Times: <http://www.latimes.com/features/printedition/magazine/la-tm-fuller47nov23.story>

IHC Update: Survey, Renovations

By JEREMY PITTS

Rotation Survey

If you have not done so yet, please go the voting section of ASCIT's website at <http://donut.caltech.edu/vote/> and complete the 2003 Rotation Survey. It should only take a few minutes of your time to do this, but it will help out this and future IHCs immensely. For those of you who don't know, rotation is a dynamic process that changes from year to year to meet the needs of current students and to address problems encountered in the past. The information which is collected with the rotation survey is essential to being able to ensure that rotation is running as smoothly as possible. This is especially important this year, because

some fairly large changes were made to the rotation process and we would like to get an idea of whether or not they worked in creating a better rotation process.

Summer Housing Crunch

Caltech is going to be hosting a few new programs next summer. It is going to be a really great opportunity for the Institute to recruit promising future students. Unfortunately, it's not going to be too wonderful for those of us who are currently students. In order to accommodate all of the additional summer students, Avery will be closed off to Caltech students this summer. That means none of us will be able to take advantage of Avery's air-conditioning. Also, the houses will be a bit fuller than normal be-

cause of the displaced students, so say goodbye to that double that you thought you would get as a single. The decision to host these students came from pretty high up in administration, so there's not much we can do at this point, but hopefully it's not as much of a shock if you have a little advance warning.

House Renovation Project

Many of you probably know that there has been talk for the last few years about rebuilding the houses. I just wanted to fill you in on all of the details as I know them and the current status of the project.

Students who live in one of the seven on-campus undergraduate houses would probably agree that the houses are not in great shape. That is why the TURLI group in their report a few years ago recommended that the South houses be gutted and completely renovated and the North houses be demolished and rebuilt in a architectural style that more closely resembles the South houses (as opposed to their current lovely bomb-shelter style)

This project was considered important enough that it made it onto the list of fundraising goals in the \$1.4 billion campaign that the institute is currently engaged in. As Tom Fletcher reported recently in his column, the development office has been reporting back that they are not going to be able to raise money for the houses. Apparently, donors think that it isn't worth putting money into the houses because they feel students will just treat new houses badly and the new houses will quickly fall into the same sad state that the current houses are in. The blame for this problem falls partly on the students and partly on the administration. We, as students, have not always done the best job respecting our homes and treating them well, however the administration has also not done the best job keeping up with maintenance work.

Margo Marshak has taken up this project as one of her top priorities. She is committed to seeing the houses renovated, whether or not the money for doing it comes from donors. To accomplish this, two different working groups have been created. The first group consists mostly of administrators and is looking at some of the specific financial and construction issues. This group will be looking at other potential avenues for funding the process. The second group was created with the assistance and consent of the faculty board. This group is made up of the IHC, seven faculty members (including the dean), and one representative each from Avery and the GSC. We are looking at a few different issues. First, should the new houses incorporate faculty in residence. If so, what form would this take? Second, how do we convince donors that new houses will be preserved and cared for? The group also has a useful side-effect of getting faculty support for the house renovation project. Margo plans on having these issues mostly decided by mid-January so that she can present them to the trustees at the end of January and hopefully proceed from there.

If you have opinions on any of these issues, especially the issues which the group containing the IHC is looking at, please let me or any other member of the IHC know.

Letter: Campus Takes Tree Management Very Seriously

Dear editor,

In response to Mr. Zhang's article "Ruddock Tree Trouble to fall on Deaf Ears," in the November 24th issue of the *California Tech*, the Grounds Section of the Facilities Management Department takes tree care management very seriously.

Because tree failures pose significant hazards, in order to minimize the potential danger and possible damage, trees suspected of being infected with disease or otherwise suspected of being "at risk" are inspected and evaluated annually by a certified arborist.

The large oak tree by Ruddock House was identified as a concern more than a year ago. Early last summer we had an outside expert review the tree and he confirmed that the tree should be removed. However, in order to remove an oak tree, or any other protected tree species, a permit is required under the City of Pasadena "City trees and tree protection ordinance." The necessary documentation was immediately submitted to the City for their review and action. During the permit process a branch failure occurred in late August. Approval to remove the tree was finally received in November and removal was scheduled to coincide with the Thanksgiving break. Unfortunately, another branch failed before we were able to remove the tree.

Tree failure can occur at any time. Trees can be managed, but they cannot be controlled and to live near a

tree is to accept some degree of risk. The only way to eliminate all risk is to eliminate all trees. Trees, like humans are susceptible to disease, and many species are particularly susceptible to a disease called Oak Root Fungus or Armillaria Root Rot. The disease causes wood decay, growth reduction and eventually tree death. It also predisposes the tree to attacks by other fungi and insects.

Infected trees decline slowly over a period of years, or several decades. Because these fungi inhabit roots, their detection is difficult unless characteristic symptoms become obvious in the crown or on the lower stem. Symptoms vary, but generally, the foliage thins and discolors and branches die back. To reduce risk, trees are cabled, pruned to reduce weight, braces and saddles are installed for support and on occasions the area is redesigned to minimize foot traffic in the area (you have seen several of these treatments throughout campus). Additionally, all campus trees (over 3,000) have been inventoried and a database is maintained, which helps track the general maintenance and progress of each tree.

We take tree care and management very seriously and go to great lengths to preserve and protect our campus trees. We are also very diligent in monitoring the trees for signs of problems.

Delmy Emerson
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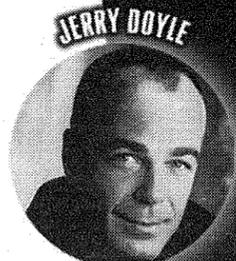
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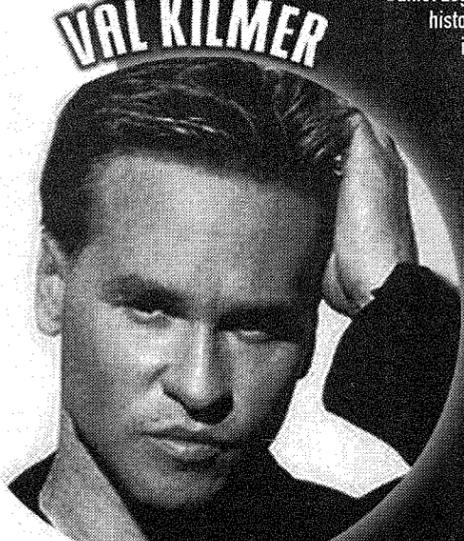
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He has appeared as the Caped Crusader in Batman Forever, Jim Morrison in The Doors, and the title role in The Saint. And now Val Kilmer is appearing at Gen Con So Cal.

Daniel Logan made one of the most anticipated film debuts in history, playing a young Boba Fett in the most recent installment of the Star Wars saga, Attack of the Clones.

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- UPPER DECK - Yu-gi-oh
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El Toro Guapo Launches Pilot Sixty Feet Into Bay

Continued from Page 1, Column 2

locity; one is to have people push the device and the other is to convert the gravitational potential energy of the four people on the pier to kinetic energy. Obviously, you'll get the most kinetic energy from the second one," said Humbert.

Thus, he began to design the human catapult which would take the potential energy of the four men jumping off the pier and impart it to the man on the other end of the catapult as kinetic energy.

After multiple calculations, fifteen pages of computer analysis and multiple trials with a quarter-sized model and Barbie dolls, the team began building the contraption in Hedgpeth's backyard in San Francisco using wood from local lumber yards. In addition, they used a self-fabricated pivot point and a forebar mechanism to keep the chair in the same position.

On the day of October 25, the team wheeled out the catapult without having tested the real thing. Humbert, the one chosen to be launched, climbed into the chair.

"I was the only guy crazy enough to get in the back seat," said Humbert.

Humbert, however, describes the experience of being thrown into the air as exhilarating.

"My initial reaction was to go into the fetal position, but the forebar and chair threw me off perfectly. I remember thinking, 'Wow, that was a lot of acceleration.' Time froze for about 2.5 seconds," he said.

At his peak, Humbert hovered about fifty feet above the San Francisco Bay before hurtling down to hit the water sixty-one feet away from the pier with a horizontal velocity of twenty-five miles per hour and a vertical velocity of about thirty-two miles per hour. He definitely felt an adrenaline rush, he says and he didn't feel the soreness of his neck, from when his neck whipped back at the moment he was thrown, until the next day.

Compared to last year, Humbert says the team felt more pressure to do well and to defend their title, while last year, they just participated for fun. This year, they even caught the attention of the media as they were featured on both "Tech TV" and "Evening Magazine." However, he still lists their desire to do something crazy as a major motivation for entering.

For next year, Humbert recruited a new member, Aeronautics graduate student James Faddy, to help with the design of the device and he hopes to form a Caltech team to compete in the Los Angeles Flugtag competition. With the international record set at 195 feet and the U.S. record at 70 feet, Humbert definitely has goals. However, this is still not his primary motivation.

"We're just happy to have the opportunity to apply our engineering talents to something as crazy as this and we'll definitely give it our best shot next year," he said.



Courtesy of sep.chat.net

Team El Toro Guapo launches their pilot Sean Humbert off of a pier into San Francisco Bay using their homemade catapult.

Robot Designers Display Ingenuity With Solutions

Continued from Page 1, Column 5

vices were radio controlled and powered by AA batteries. As Antonsson noted, "many lessons come out of the class, including working in teams, managing time and an experience with open-ended problem solving."

This year, the students built machines that had to climb out of a cage, then maneuver the center point of the cage to one of two diagonally positioned quarters of the platform, which were marked with orange or blue tape to note the team's color.

Some of the machines did this by repeatedly ramming into the cage, other teams tried different strategies, such as remaining tethered to the cage, then latching onto one bar on the table guard and pulling the cage into their square. The cage itself was much heavier than the machines, weighing about 11 pounds. Notably, the robots were allowed to go off the table in an effort to pull the cage and many took advantage of this possibility.

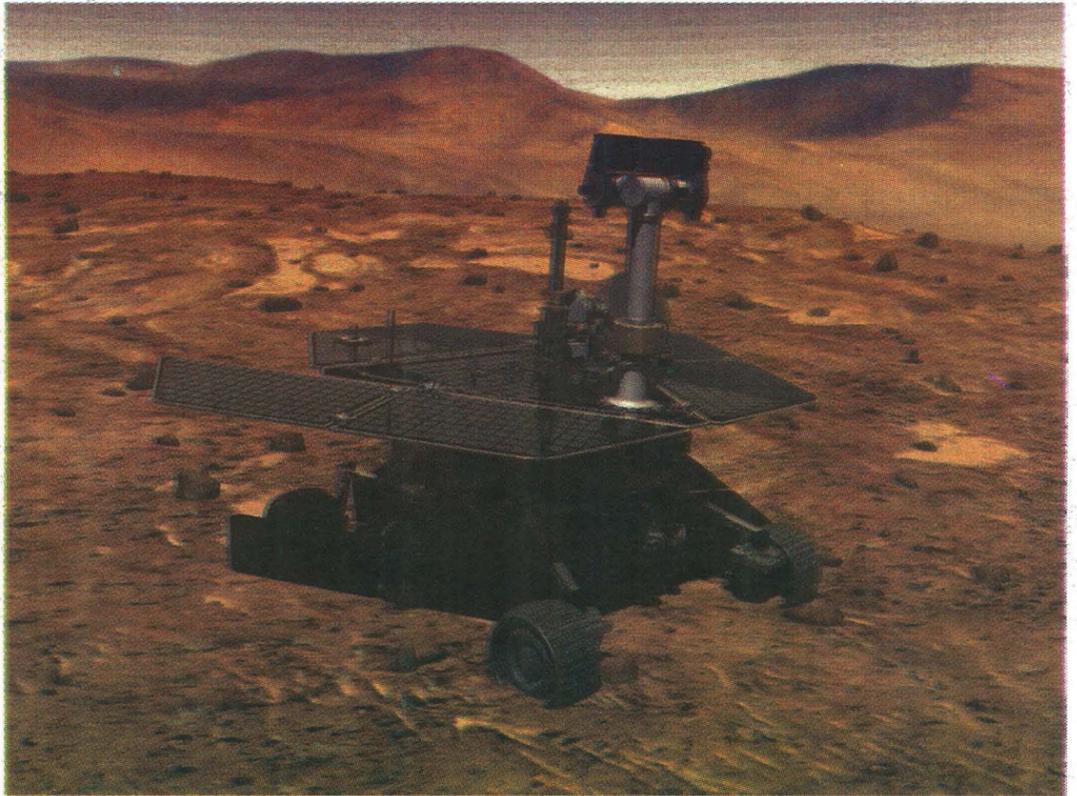
Every year the problem changes. Previous years' problems included building a robot to climb up a rope

and capturing a flag, among others. The one unifying feature of each challenge is that each round is a competition between two opposing teams of robots.

The actual contest is a double elimination tournament, which means each team must lose twice to be eliminated. This year, ties were possible, as well as double losses, which occurred if neither team managed to move the cage at all.

The competition itself was organized into rounds, with the teams randomly pitted against each other. The winning team was team 84: Ben Solecki and Dylan Owens, who built machines that were tethered to the cage and pulled it into their square.

By far the biggest problem that was encountered by the competing teams is the difficulty some of the robots had in getting out of the box to begin with. Pulling the cage with a string seems to have worked better than pushing it, overall. However, the competition has shown that there was definitely no one right way to solve the problem.



Courtesy of nssdc.gsfc.nasa.gov

The 'Spirit' Mars Lander is set to arrive on Mars on January 3, 2004. It will transmit its first images back to Earth on January 4. Its sister lander, 'Opportunity,' arrives January 25.

'Sojourner' Descendants Equipped To Discover Evidence of Water on Mars

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Today, the atmosphere of Mars is too thin to allow liquid water to exist at the surface-but this might not always have been the case. Whether any water may have remained for any significant time on the planet's surface is still being debated. The "Spirit" and "Opportunity" will collect geological data to help resolve the question.

The two rovers are "robotic field geologists", as Dr. Edward C. Stone, former Director of JPL, describes them; they carry tools including a Microscopic Imager, with which they can take extremely close-up pictures of rock surfaces, an abrasion tool with which they can uncover fresh rock surfaces to examine, and several different kinds of spectrometers with which they will identify and measure the abundance of different compounds in the Martian soil.

Over the three months following their respective landings, the two rovers will search for carbonates in the soil, as well as other indications of past water activity.

Edward Stone says that the two rovers are "the next step in the exploration of Mars". "This is just part of a long program of Mars exploration," he says.

Following the work to be done by the "Spirit" and "Opportunity", Dr. Stone mentions the possibility that, in the next decade, a Mars lander will be sent to bring back samples of material from Mars to be examined in a laboratory on the Earth. The rovers will play an important role in determining what sites should be examined by such a mission in the future.

The geological finds of the "Spirit" and "Opportunity" will also be used to guide the search for life on Mars in the future. Information they provide may help us someday answer the question of how life evolved on the Earth billions of years ago.

The two Mars landers and rovers are not the only things bound for Mars this year; in late December, the Mars Express, an orbiter sent by the European Space Association (ESA), will reach Mars. On December 25, it will drop a lander, the Beagle 2, which will, along with collecting geological data, directly search for signs of life (past or present) on the planet surface.

The orbiter itself will create a 10m-resolution map of the entire surface of Mars and will be able to see objects as small as 2m on the

planet's surface. Also, it is equipped with a MARSIS Subsurface Sounding Radar/Altimeter, which will use a technique similar to oil-prospecting techniques used now on Earth to search 2-3km under the Mars surface for water frozen (or, perhaps, for liquid water).

So, an era of mars exploration continues today. Perhaps one day we can hope to find life on Mars and better yet-understand the origins of life on our planet. Scientifically if not philosophically, we may find a satisfying answer to the question: "where do we come from?" By the way: For more information about the Mars rovers, go to <http://www.jpl.nasa.gov/mer/>.

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