



# The California Tech

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PASADENA, CALIFORNIA

MAY 17, 2004

## Faculty Board Agrees With SHC Proposal

By KEVIN BARTZ

Nearly 60 house demonstrators convened near Millikan Library last Monday to protest the measure, but it wasn't enough to stop the Faculty Board from approving the Student Housing Committee's recommendation opening Avery House to freshmen in 2005 by a resounding 14-1 vote.

"I voted for the proposal because I think that Caltech should be responsive to new ideas and new experiments," explained Caltech President David Baltimore. "We should not dismiss ideas that might be beneficial to some students when they have a core of serious support, even if the majority of students are skeptical of their value."

The approval, which all but slams the door on two months of tortuous debate, came despite objections from board members that the Faculty Board had not first thoroughly discussed the matter.

"It seemed to me that the discussion at the Faculty Board was rushed and hasty, given such a crucial decision to which the students clearly attached considerable importance was being made," said Astronomy Professor Judy Cohen, the lone dissenting voice. "I felt 'railroaded' into making a quick up/down decision." She believed that the Faculty Board should've spent more time considering the measure before balloting.

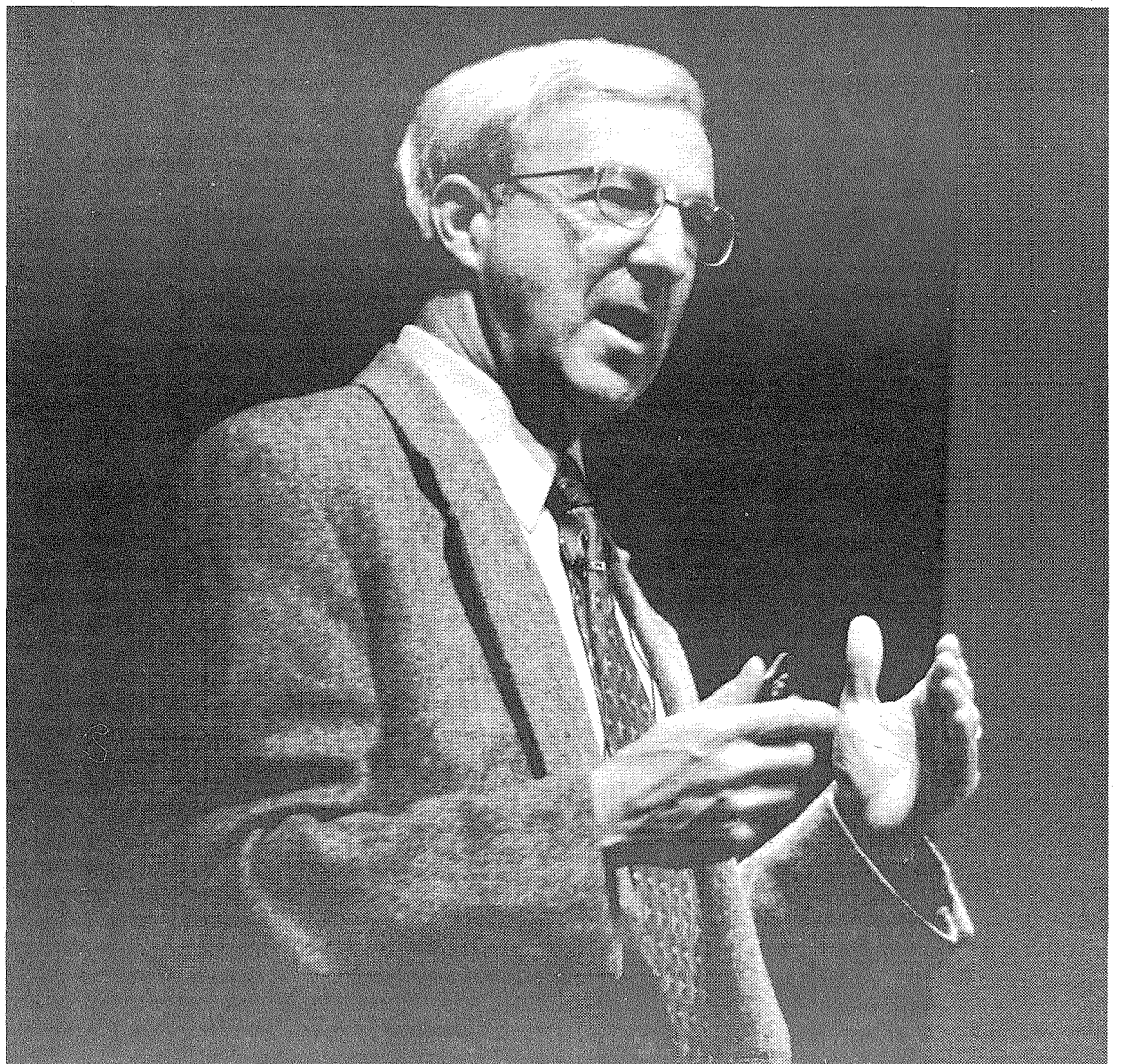
In the eyes of SHC head Kim Border, however, his committee had already done the grunt work of spending endless hours weighing the arguments. "The Faculty Board was concerned about student opinion," he reported. "They wanted to know why students felt the way they did, but they saw that the housing committee had already considered student concerns. It's not like students are unanimous and the committee took that into account." Bor-

der laid out the findings of the SHC, which first drafted the recommendation last April by a 7-2 vote, in a six-minute, seven-slide Keynote presentation.

Foremost in representing opponents' concerns was IHC Chair Kim Pependorf '06, who arrived at the meeting to a rock star's ovation from demonstrating students. Her two-minute address to the board stressed a recent IHC survey showing undergraduates opposed to the measure by a five-to-one margin, underlining opponents' fears that an Avery with freshmen would be lost as an unaffiliated option for students dissatisfied with the seven on-campus houses.

Although it wasn't originally scheduled, substitute Faculty Board Chair Henry Lester also penciled in a two-minute follow up for Avery rights advocate Neil Tiwari '05, who cited both the SHC's work and the Task Force on Undergraduate Residential Life's report two years ago as evidence that Avery's faculty supporters had already weighed

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D. Korta/The California Tech

Dr. Saul Teukolsky explains how modern supercomputers help find numerical approximations to Einstein's complicated equations of spacetime warpage.

## Supercomputers Help Overcome Difficulties In Modelling Gravity Equations, Black Holes

By K. SZWAYKOWSKA

On Tuesday evening, Caltech celebrated the birthday of Bill Davis, with a public lecture titled "Warping Space and Time: Simulating Black Holes on Supercomputers". The lecture was given by Saul Teukolsky, the Hans A. Bethe Professor of Physics at Cornell University, with an introduction by Kip Thorne, Caltech's Richard P. Feynman Professor of Theoretical Physics. It was an overview of the properties of black holes and the difficulties associated of

modeling them, spelled out relatively simple terms for the benefit of the general public.

In the introduction, Professor Kip Thorne described how, according to Einstein's theory of general relativity, spacetime is warped by the presence of matter and energy. Einstein also presented equations to predict the effects of such warpage; so far, however, they have been impossible to solve explicitly except in a few special cases.

Until recently, it was impossible to predict the behavior of

a system which did not conform to very specific initial conditions. Now, thanks to the immense computing power of modern supercomputers, it is possible to find numerical approximations to solve Einstein's equations in computer simulations.

Unfortunately, Professor Thorne explained, these simulations are not yet optimal. This is rather

problematic, for example, in the case of the Laser Interferometer Gravitational Wave Observatory (LIGO), which it is hoped will be able to detect gravitational waves formed in the collisions of black holes. The data collected should in theory provide us with valuable information on the details of such collisions.

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## Mars Manager Shares Mission's Experiences

By RYAN WITT

Baxter lecture hall is not the easiest place to stay awake. Rob Manning, Caltech alumnus and Entry, Descent and Landing (EDL) Manager for JPL's latest Mars mission, agrees wholeheartedly. At his Monday talk in Baxter, Manning recalled slumbering through AMA 95 (now ACM) lectures in the very same room.

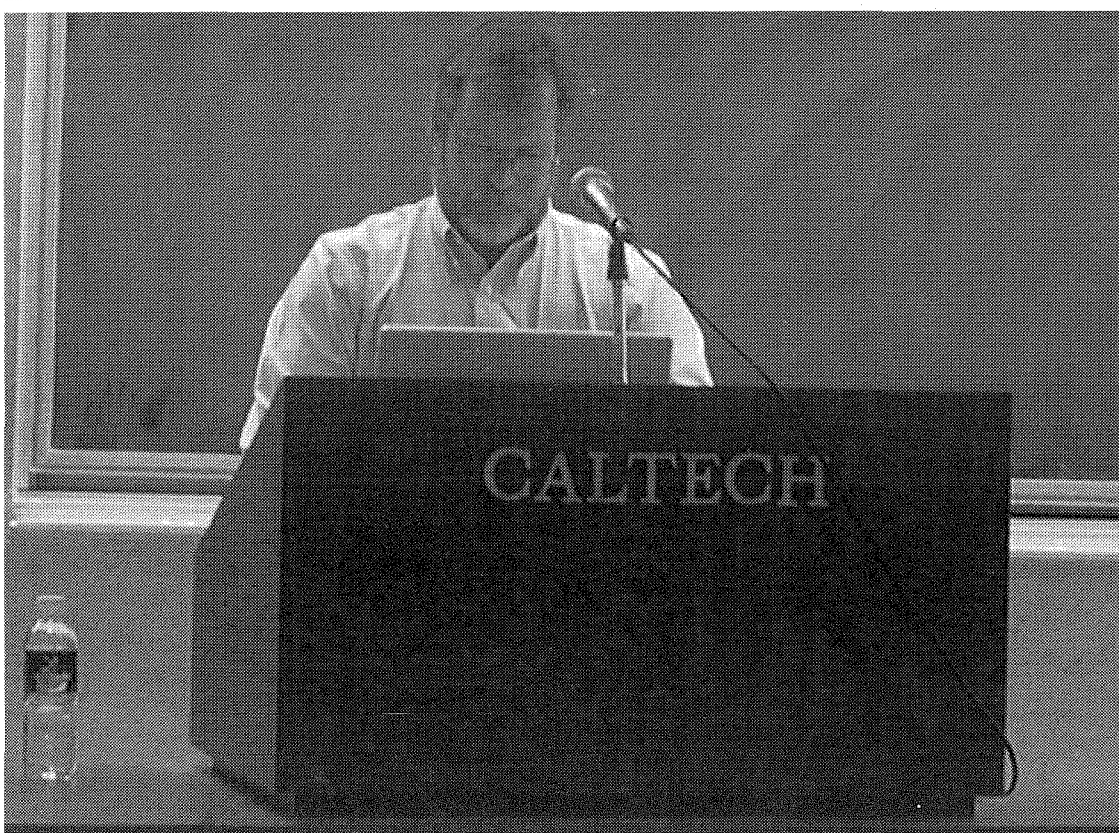
Manning's own presentation on his involvement in the MER mission was far from sleep-inducing. It addressed the challenges that Manning faced in successfully managing some of the world's best technical teams in landing two rovers on the red planet.

Originally a 3/2 student from Whitman College, Manning graduated from Caltech in '82 with a BS in EAS and then moved on to various jobs at JPL. Though he started as a draftsman, Manning began ascending through the ranks at JPL, becoming a programmer and then transferring to spacecraft systems in various en-

gineering capacities.

No stranger to spacecraft, Manning has worked on the Galileo and Magellan probes, was in charge of onboard computers for Cassini and recently served as Chief Engineer for the Pathfinder mission. Because of his success in managing Mars missions, Manning was asked by the Career Center to come and tell Techers about the blend of leadership and technical skills it takes to supervise such a daunting engineering challenge.

According to Manning, it's not easy to manage highly technical people. Because many disciplines involved in the space program vastly different and because of the tremendous amount of pride within a single area of expertise, teams may develop friction that endangers the project. Whereas one group may work well together and understand their own part of the mission, they may not fully comprehend or trust another group's equipment. Situations like this create an "us vs.



R. Witt/The California Tech

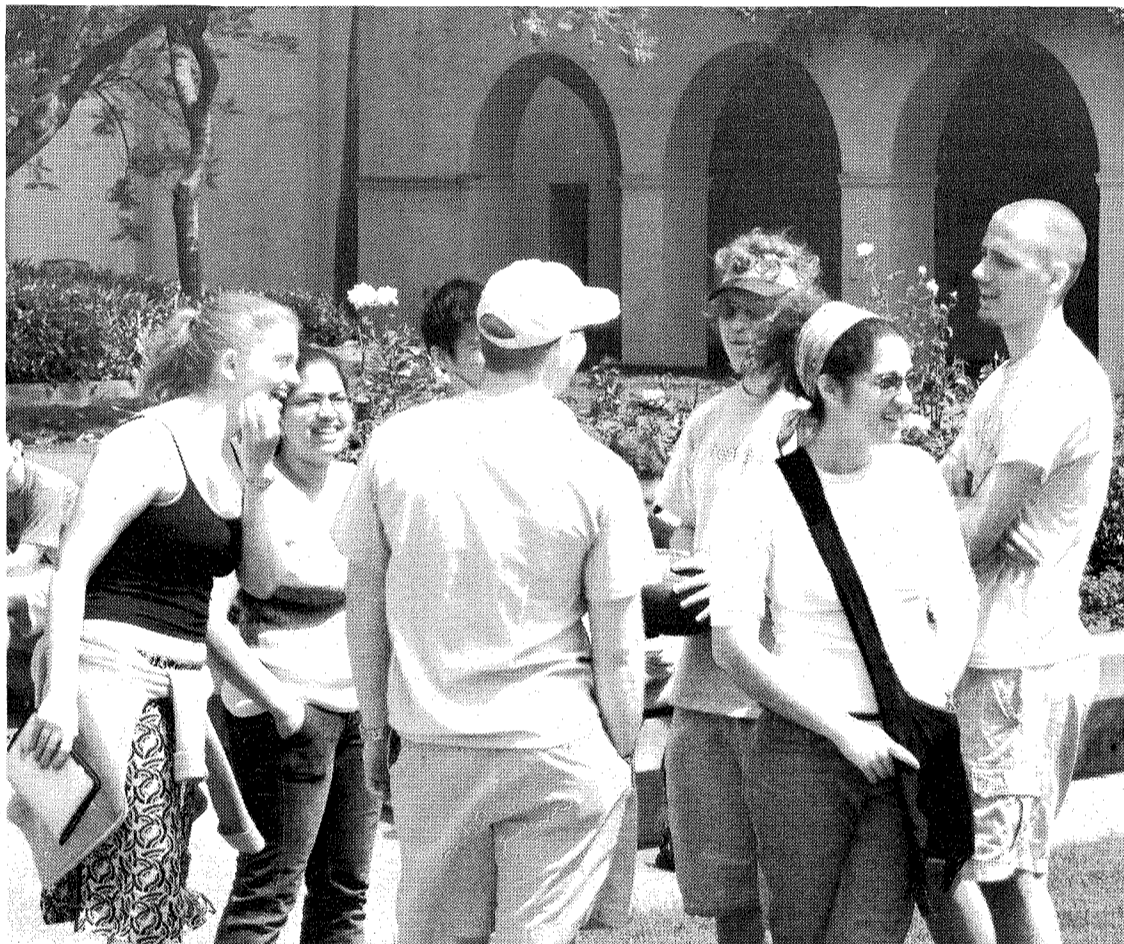
Rob Manning, the Entry, Descent and Landing Manager for the Mars Landers, gives his talk last Monday outlining some of the experiences and challenges he faced during the three year project.

*Continued on Page 8, Column 1*



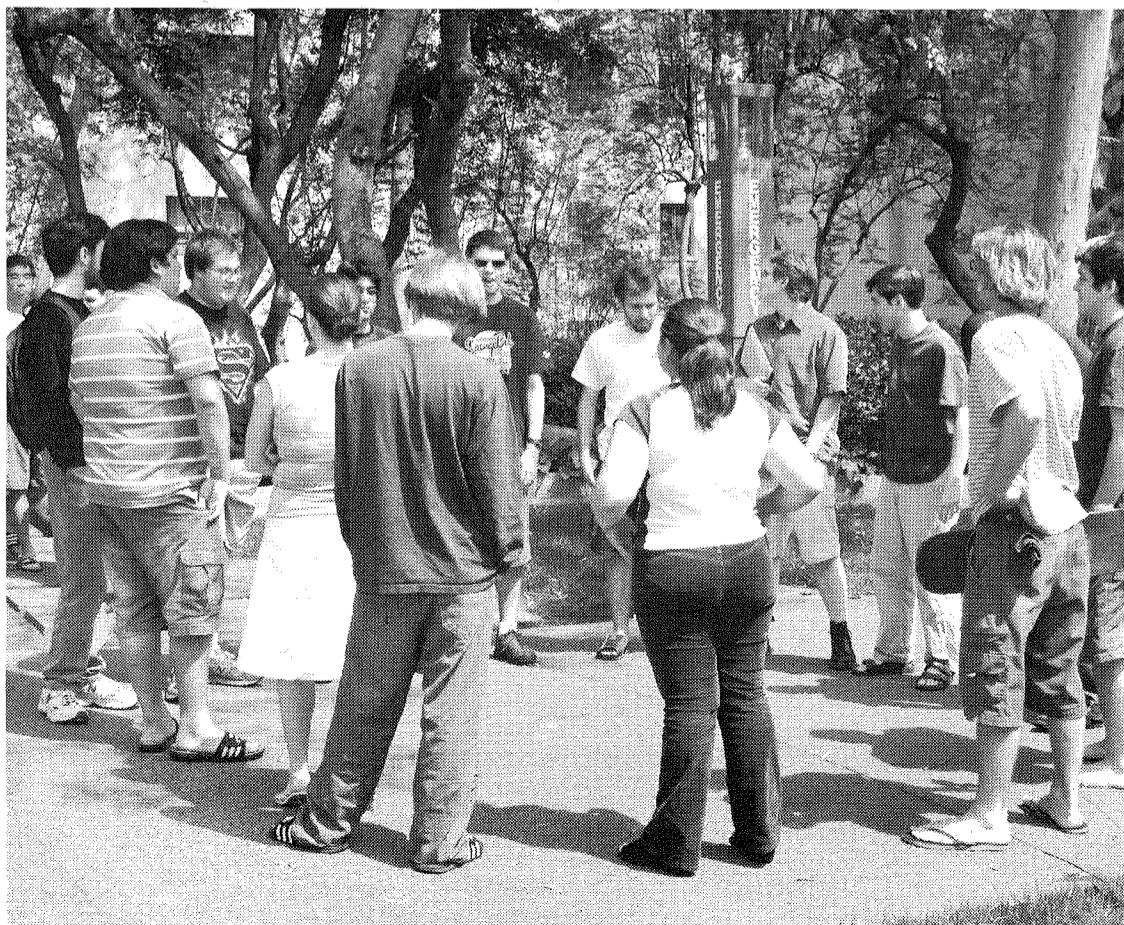
L. Tran/The California Tech

Students for Lloyd, Ruddock, Blacker, and Dabney Houses stake out the Millikan bridge outside of the conference room where the Faculty Board met to decide on the Avery proposal.



L. Tran/The California Tech

A group of Flemings show their support for the IHC opposition to the plan for putting freshmen in Avery at the beginning of the 2005 academic year.



L. Tran/The California Tech

The ramifications of a decision approving the Student Housing Committee recommendation are discussed by members of Ricketts House before the rally last Monday.

## Students Rally Against Freshman in Avery Plan Faculty Board Dismisses Student Opinion

Continued from Page 1, Column 2

the undergraduate objections outlined in the IHC's survey.

"I don't think anything surfaced that [the SHC] hadn't already considered," agreed Border. "The committee tried to make a decision in the interest of not only present students also future students who were not here to take the survey; we did this because we believe it's in students' best interests."

Additionally, administrators such as Student Affairs Vice President Margo Marshak did not share Pependorf's fear that Avery might lose its distinctness from the seven on-campus houses. "I do think that we need some alternative," held Marshak. "But Avery will have its own characteristics and it won't mirror the other houses' characteristics."

After Tiwari's talk the committee broke into open discussion, where ASCIT President Galen Loram '05, justifying scattered doubts among respondents of the IHC's poll, pointed to Board of Control statistics indicating a higher rate of violation among Avery residents. "By allowing freshmen to live in a place where there is no sense of community, the freshmen will be less scrupulous about following the honor code," said one survey respondent.

Loram also hearkened back to his long-held concern that overzealous parents eager for their children to excel academically would force them into Avery's more studious environment.

Meanwhile, a group of protesters donning signs and slogans congregated outside the Faculty Board's Millikan Library meeting room, periodically knocking on the window to make its presence known through copiously drawn curtains.

"I hope the faculty will keep listening to us," said demonstrator Jared Updike '06, whose sign, "No Frosh in Avery Without Rotation," was a twist on the Revolutionary War slogan "no taxation without representation." "I like Avery as a whole, but this is totally unfair. I'd like them to table the whole issue until after renovations."

The most prominent sign was a large, spray-painted, capital-lettered banner reading "No Frosh in Avery." "Well, I think what bothers me about this whole thing is that the clear majority opposes this," said Tom Quetchenbach '06, who held the fabric banner.

The protest was the week-old brainchild of the IHC. Presidents of the seven on-campus houses rallied residents the day before, imploring them, as Fleming President Zac Dydek '05 did, "to stick it to the man!"

The IHC first dreamed up the demonstration after it became apparent that the Faculty Board was likely to rubber-stamp the SHC's recommendation. The idea, said leaders, was to put a face on the 78% undergraduate majority in opposition to the Avery Council-led initiative. "We just thought if they could see us, that it would have much more impact," maintained Ruddock President Barrett Heyneman '05. Former IHC Secretary Neda Af-sarmanesh '04 agreed. "My hope is this will help faculty to realize

that there are students who don't support the plan," she explained.

Protesters turned out at least one convert: Cohen. "I felt that the demonstration outside by students indicated how strongly they felt about this issue and how important it was to them," she held. "This was the first such demonstration I've seen in several years." She added that she felt it was "better to wait until the relevant groups could meet again and try to achieve some consensus."

Still, the Faculty Board's seal of approval effectively closes debate on the matter. Even Pependorf, who has long coordinated opponents, said last week that after the board vote, there's "not exactly a continuing plan" for scripted opposition, though she will continue to voice the opinions of those concerned.

And although ultimate authority rests with Student Affairs--the department charged with implementing the proposal--it would be unprecedented for administrators to ignore a recommendation endorsed by the Faculty Board. "Of course I'll consider almost anything," said Marshak, "but I think I have to take very seriously the recommendation of a faculty-empowered committee."

"I would say that from the arguments I have heard on both sides of the question it does make sense to go ahead and do this," she added. "For the 17 months I've been here, it's become clearer and clearer to me that people in Avery have wanted more and more to be involved with the other houses."

In the end, most administrators, like Math Professor Gary Lorden, said they understood student concerns but believed the benefits outweighed the drawbacks.

"I basically have mixed feelings about it because I've liked the student houses and I don't want to see declining respect for the student houses," he maintained, "but the reason I've pushed for Avery House is because I'm optimistic; I think that once Avery develops into a nice community it will be better for the undergraduate community as a whole."

### The California Tech

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# Spring Seasons End For Sports with New Records

By MIKE RUPP

Caltech Weekly All-Sports Release  
Release Date: May 17, 2004

**2004 Spring Quarter Review**  
To wrap up the academic and athletic year, the Sports Information Department is pleased to release this review of our Spring quarter. Track & Field, Men's Baseball, Men's Golf and Women's Water Polo each had productive seasons where Caltech's scholar-athletes continued to exemplify the spirit of Division III sports.

This past weekend, Caltech honored its top scholar-athletes at its 10th Annual All-Sports Banquet. Sophomore Jeremy Leibs of Track & Field was voted Caltech Male Athlete of the Year after posting All-Conference performances in the 100 Meter dash and 110 Meter High Hurdles. His best time in the 110 High Hurdles was good enough for a NCAA Championships provisional qualifying time. Sophomore Helen Tai, also of Track & Field, was voted Caltech Female Athlete of the Year after making the SCIAC All-Conference team in four different events, including anchoring the record-setting 4x100 Relay Team. Finally, Senior Jacki Wilbur of Swimming and Diving and Women's Water Polo was named Caltech's 2004 Outstanding Athlete of the Year. Wilbur will graduate from Caltech the most dominant performer in the history of both programs. She holds an incredible 10 swimming records, and was the Women's Water Polo team's MVP in its first two seasons as an NCAA team at Caltech.

Congratulations to the award

winners, and to all the scholar-athletes on a successful year in collegiate athletics.

## Team-by-Team

### Track & Field

**Head Coach: Julie Levesque**  
The Caltech Track and Field team had a tremendous season. Twelve scholar-athletes or relay teams qualified for the SCIAC All-Conference team. In all, eight school records were tied or broken. They are listed below:

- Event/Scholar-Athlete/New Record
- Men's 110 Meter High Hurdles/Jeremy Leibs/14.50
- Women's 100 Meter Dash/Kristen Zortman/13.40
- Women's 200 Meter Dash/Helen Tai/27.77
- Women's 10,000 Meter Dash/Megumi Abe/44:37.10
- Women's 100 Meter High Hurdles/Helen Tai/16.24
- Women's Heptathlon/Sarah Horst/2809
- Women's 400 Meter Relay/52.00/  
(Kristen Zortman, Alice Lin, Sarah Horst, Helen Tai)
- Women's 1600 Meter Relay/4:14.70/(Helen Tai, Alice Lin, Sarah Horst, Tamara Becher)

Congratulations to the whole program on an outstanding season!

### Men's Baseball

**Head Coach: John D'Auria**  
The Men's Baseball team, despite playing short-staffed in pitchers, nevertheless persevered through its season. Junior Isaac Gremmer was named the team MVP. Gremmer provided tremendous contributions both on the pitcher's mound, leading the

team in wins, innings pitched and strikeouts, and at the plate, leading the team in home runs and RBIs. Sophomore Tim Boyd lead the team in batting average, slugging percentage and hits. Senior David McKeen was second in batting average, hits and on-base percentage. Congratulations to the whole team!

### Men's Golf

**Head Coach: John Suarez**

The Men's Golf team competed in two 18-hole SCIAC competitions this past week, scoring a total of three points towards overall conference standings. Senior David Hedley was named second team All-Conference for his performance this year. Congratulations to the whole team.

### Women's Water Polo

**Head Coach: Calla Allison**  
The Women's Water Polo team had an excellent first season un-

der first-year Head Coach Calla Allison. Senior Jacki Wilbur finished her career as this season's MVP. Sophomore Ashley Grant lead the team in scoring with 56 goals for the season. Junior Goalkeeper Delia Rosca finished the season with 264 blocks. Sophomore Bekah Eason lead the team in steals with 51. Congratulations to the whole team on an outstanding season.



courtesy of D. Mustafi

At a track meet at Azusa Pacific College, Timothy Tirrell '06 and Stuart Ward '06 pull ahead of their competitors in the 200 meter dash. The Track and Field team ended the year on a high note, breaking eight different school records.

## Caltech Ultimate Frisbee Team Defeats USC in College Tourney

By JAMES HEGEMAN

This past weekend Caltech's intercollegiate ultimate frisbee team competed at college regionals, the second round of the ultimate frisbee national tournament.



courtesy of donut.caltech.edu

**Jacki Wilbur, Outstanding Athlete of the Year.**

Caltech lead Air Force 8-5 at half time, but Air Force rallied and the score went to 13-13. Facing a tired Caltech team, Air Force's superior numbers allowed them to score two quick points to win 15-13.

In the third and final round on Saturday, Caltech defeated rival USC in a close match that went down to the wire. Seniors Leonid Rozenberg and Kally Pan lead the team out of a 7-1 deficit to tie the game at 13-13. Caltech twice lead by one point after that, but USC evened the score each time to 15-15. With hard cap called (meaning the next point wins), senior Michael Davenport pulled a tough throw down in the endzone and Caltech won, 16-15, to defeat USC for the first time this year and end the season on a win.

**Certified mover**

**Certified shaker**

**Certified no more mac & cheese**

**Certified acceleration**

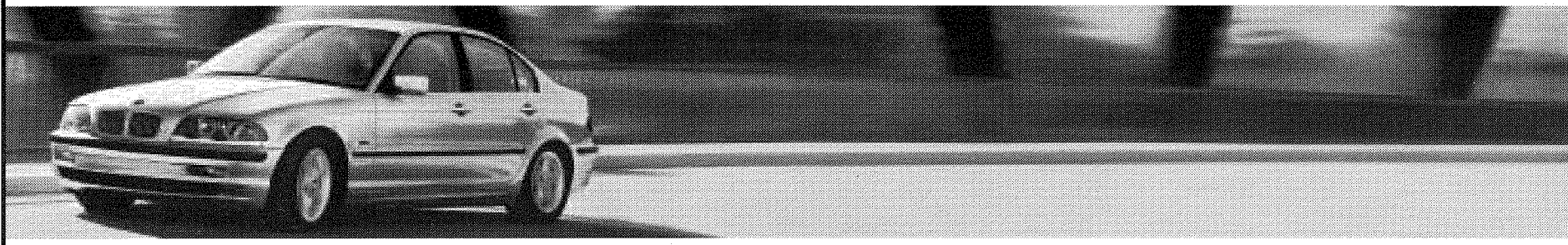
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# Rotation and Its Discontents

## An Undergrad Takes Another Look at Frosh in Avery

By MATTHEW KROGSTAD

I've been waiting a few weeks now for a follow-up to the Avery Council's most recent editorial in this paper. The article I was waiting for might have set the stage for a better-focused discussion of how an Avery frosh plan would benefit the Caltech community. As it is, the Avery Council's article, lack of follow-through, and most especially the actions of the Faculty Board and the Student Housing Committee of the past week have only confirmed what I think has been the real issue all along - Rotation and its status as a student-run process.

If the Avery Council really wanted frosh for the sake of having frosh, what they should have done is talk to the IHC before anyone talked to the faculty's Student Housing Committee. The Council would have gone to the IHC, the administrator of Rotation, and said something like this: "We would like to have frosh, and not just the ones who leave the seven houses partway through the year. We want to be a part of Rotation. We don't necessarily want eighth-house status in other areas, but we think that frosh would benefit our community and that some frosh would prefer Avery to other houses. We realize that frosh will change our community, and that we ourselves will have to make some changes, like having

official Avery membership and actively encouraging interaction with frosh at all times. We accept this, and we would like to make a concrete plan with you to propose to the administration, because any plan involving frosh and Rotation should involve the IHC."

Whether through ignorance or design (I'm willing to believe the former), this was not the approach adopted by the Avery Council. In-

stead, the Avery Council and Student Housing Committee chair and Avery House ally Kim Border decided to dodge the IHC entirely and took the issue straight to the faculty. The SHC agreed on the "compromise" of putting frosh in Avery in 2005, and the Faculty Board tentatively voted to advance Border's agenda. While the student body should have been given a significant voice in the process, the IHC and the students it represents were effectively ignored. The Avery Council, representing a split community, was heard, likely because they said what Border wanted to hear. At the very least, this is a frightening use of power by the faculty in an area that traditionally has been and should continue to be managed by the student body.

**"If the Avery Council really wanted frosh for the sake of having frosh, what they should have done is talk to the IHC before anyone talked to the Faculty's Student Housing Committee."**

their arguments: except for the bit about the seven houses' lack of space (which, if genuine, should be championed by the IHC), they all boil down to that "Avery can provide a better option for some frosh than all of Rotation does now." Most tellingly, it's reflected in the conversations I have with people about the issue. Inevitably, someone will mention that going through Rotation and being assigned one of the seven houses forces frosh into Caltech's popular culture, which can either get them out of their shell and let them experience the best of Caltech or condemn them to a long year of barbarism, depending on who you ask. The most important question here is not, "Should some frosh live in Avery?" The biggest question here is, "Should all frosh live in the seven houses?"

No matter what their answer to this question is, no student body should be happy with the fact that the Faculty Board has imposed their will on a decision that should be made by the student body. The Faculty has usurped the power of the IHC, as an admittedly imperfect representative of the student body, to make decisions on frosh and Rotation. To reassert student autonomy, I suggest this: that the IHC and Avery Council both resolve to work together to develop an acceptable plan by the time that all renovation and rebuilding for the seven houses is complete (2008?), and the both bodies, the Avery Council in particular, loudly repudiate the faculty plan. In the face of united student opposition from both Avery and the seven houses, the faculty could not possibly think that they are acting in the student body's best interests; the faculty would be obligated to cede authority back to the student body's representatives, where it belongs. After we step back from the brink, there's no reason that we can't address the real issues of Rotation and student culture and come up with a plan.

Let's cut to the chase: the big question here isn't about whether or not Avery should have frosh, and it's certainly not about how "cool" Avery is. It's about Rotation and whether or not it is a good system. It's reflected in the complete disregard by Border and the Avery Council towards the IHC, which currently decides where frosh live. It's reflected in



courtesy of the Dean's Office

Jessie Kneeland, Megan Greenfield and Joseph Jewell pose with Mr. and Mrs. Noland, beneficiaries of the Noland Leadership Scholarship. (Not pictured is Katie Homann).

## Four Seniors Honored With Leadership Award

By MALINA CHANG

Katie Homann, Megan Greenfield, Joseph Jewell and Jessie Kneeland were awarded the Robert L. Noland Leadership Award at a dinner presentation in the Athenaeum Library on May 6, 2004. The Robert L. Noland Leadership Award is for outstanding Caltech students who have demonstrated exceptional leadership abilities and have encouraged and supported others in realizing their own leadership capabilities.

Katie was the treasurer and President of the Caltech Y Ex-Comm, where she organized and took groups of students on hikes to the local mountains, and helped coordinate a new alternative spring break trip to San Francisco. Katie has also been active as a Health Advocate and a member of the Biology Undergraduate Student Advisory Committee.

Megan has worked diligently as a "behind the scenes" leader, taking on diverse responsibilities from running the American Institute of Chemical Engineering chapter to counseling students in her house. She has also been at the core of the Women's Center student programming board, initiating programs to recruit women, organizing phone-a-thons to admitted women and pre-frosh events to connect with prospective students. In addition she has worked tirelessly to revitalize the Chemical Engineering major. She has also served as the secretary for

the Society of Women Engineers and planned outreach activities to local schools to teach students about engineering.

Joe was elected twice to the ASCIT Board of Directors and served as the ASCIT Election Chair, working behind the scenes to insure the processes went smoothly. He also was a member of the Upperclass Admissions Committee and the Institute Performing and Creative Arts Committee. He was very active in organizing both of the recent Student-Faculty Conferences. He has worked hard on improving communication between the students and the administration. In addition, music is a very important part of Joe's life. He is the principal percussionist for the Occidental-Caltech Symphony Orchestra.

Jessie has served on a number of different committees at Caltech. She was an outstanding and dedicated member of the Conduct Review Committee for three years, one of them as the student co-chair. She is currently the undergraduate representative on the Committee for Exchange Programs and Study Abroad. In addition, Jessie just finished her tenure as Dabney president, during which she worked hard to create positive cultural changes and to promote a sense of responsibility among the residents.

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**Crazy Frosh**  
An Uplifting Comic for the Average Teacher  
BY HAMILTONY FALK AND JACK LEE  
edited by Cat Chou

Oh man, I gotta go to sleep!

Why?

Because Ditch Day's tomorrow!!

uh...ok

MUAHAHAHAHA!

(frosh inside)

(evil senior)

A few hours later...

silly frosh...

WAKE UP FROSH!! IT'S DITCH DAY!!

BAM! BAM!

where is everyone... something's fishy...

w00t! A stack! Me first me first!

yum. donuts.

Um, maybe it's tomorrow?

do my homework the stack

# Falk: Useful Science for the Future May 11 ASCIT Minutes

By HAMILTONY FALK

When you think of Caltech, what do you think of? A painfully hard school with terrible food and hardly any girls? Or maybe you just laugh manically and stroke some sort of hand gun.

Whatever you think, it's probably not of one of Caltech's favorite slogans; "Caltech, the worlds best playground for math, science and engineering!" There are really two reasons why we don't associate Caltech with this catchy phrase(1). The first reason is that it's a painfully hard school with terrible food and hardly any girls. Also, we don't have a playground (All I'm asking for is a slide, monkey bars, a swing set, and maybe one of those things that spins around really fast and you try to hold on).

But the major reason is that Caltech is no longer researching useful science. That's right, they seem to be focusing only on things like physics, chemistry, the maths, and other stuff I don't get very good grades in. We all know the future isn't in these old fashioned fields, but in more interesting and useful areas. So instead of things like "cells" or "protons," which most of us aren't really sure exist anyway, here are a few suggestions for fields of research.

**Cool Stuff in Space-** This does not include things like TV satellites, or a remote control car on Mars. I'm talking about a colony somewhere, maybe some aliens, and a space ship to invade Mars, not just look at it and wonder if there's any water. Maybe another moon or something too. Also, from now on all space shuttles should have lasers.

**Psychics-** Sure we've got Physics, but what about Psychics? It's all well and good to be able to know what atoms and stuff are doing, but wouldn't it be better to know what they're thinking? Also, do we want to leave America open to attack from other nations with psychics? Sure they

don't admit it, but I know of at least one psychic out there, and he's not an American(2)! There are other advantages to adding psychic stuff to our curriculum at Caltech, the main one being mind control. Let's just say MIT won't be winning any best tech school awards once we've started our psychic program.

**Weapons of Unthinkable Destruction-** Ok, so the US has nuclear weapons. And maybe biological and chemical ones too, though they probably won't admit it. The problem is these just don't strike fear into the hearts of our enemies anymore. What we need is some new stuff. I'd suggest working on some sort of conversion beam, which turns anyone you hit with it onto your side. Or maybe a freeze ray that shoots out a beam of refreshing but deadly liquid nitrogen. And we should definitely be working on building some sort of Death Star, because you know that if the Soviets build one first they're going to destroy the Rebel Base and then we're all in deep, um, trouble.

**Newer and More Delicious Foods-** Delectable, scrumptious(3), or even succulent, these are words that do not describe many currently acceptable foods. We need to work on making foods better, and making these better foods more available. Look what research has done with plastics. There used to be just one kind, rubber, that would melt and was not very pleasant to smell or look at. Now, due to the awesome power of science, we have Tupperware, which is not only attractive to look at, but microwave safe! Imagine if similar advances could be made in the food sciences. Personally I'd like to see some sort of cream filled banana, or a burger that is special even with the addition of sauce that is only mediocre. A campaign to rid the world of broccoli, similar to the one that wiped out polio, would also be a step in the right direction.

uly of Caltech.) Come and enjoy the sunshine and the fun!

**Women's Center Events**  
May 20 - Spring Cleaning Inside and Out  
Time: 12-1pm. Location: Women's Center located in room 265 of the Center for Student Services.  
12 Things You Can Do To Lighten Up. Calling upon the advice of popular self-help gurus, Dr. Susan Cross, Co-Manager of Caltech's Staff and Faculty Consultation Center, will share with us wisdom and strategies for our personal spring cleaning. RSVP required! To sign-up please call ext. 3221 or email: [wcenter@studaff.caltech.edu](mailto:wcenter@studaff.caltech.edu)

**Robots (the cool kind)-** The problem with most of the robots people are building now is that they aren't very cool. Sure, they're semi-cool, like an SUV that runs as a remote control car, or robots that do battle with each other. But these aren't the really cool robots we need. What we need are robots like the transformers. Huge ones, shaped like cars and trucks, and can transform into vaguely human like super robots. Other cool robots include mega-man's dog, and terminator style killing machines. I'm pretty sure we could stop terrorism if we had robots like these, but instead we spend all our time on little ones that just drive around and explore Mars or something.

**Soy Ice Cream** that doesn't taste like soy beans- Seriously, is it that hard to do?

As you can see, Caltech is seriously deficient in the real sciences, instead focusing on stuff that is hard and boring(4). This is a trend we need to change, bringing about a new era in which Caltech can (and hopefully will) dominate all other sources of higher learning(5) due to our advanced research, and of course our huge killer robots.

(1) Note: The Phrase isn't actually catchy, but I assume the people in charge of coming up with slogans read this, and maybe decide to up my financial aid. I also hope they don't read footnotes.

(2) He is in fact the Pope.

(3) Turns out this word means: "extremely pleasing to the sense of taste."

(4) If you are a professor this comment refers to most of the fields, but not yours. I wouldn't want to offend anyone important. And by important I mean in control of my grades.

(5) Except for that crafty DeVry University, they seem only to exist in the magical realm of the internet.

**Continued on Page 6, Column 3**

Present: Ann Bendfeldt, Ryan Farmer, Jenny Fisher, Shaun Lee, Kelly Lin, Kim Popendorf, Claire Walton, Corinna Zygourakis  
Absent: Galen Loram  
Guests: Parag Bhayani, Hannah Shafaat, Kevin Trotter, Ryan Witt, Rachel Yohay

#### Introduction:

1. Call to Order, 12:08 PM

#### New/Open Positions:

2. Congratulations to the newly-appointed officers/members of the following publications and committees. Thanks to everyone who interviewed!

#### Publications:

*Totem* Editors: Hannah Shafaat, Xiao Peng

*little t* Editors: Ann Bendfeldt, Lizz Felnagle, Kelly Martin

*little t* Business Manager: Matt Johnston

*Big T* Editors: Kevin Trotter, Kelly Lin

*Big T* Business Manager: Vi Tran

*Tech* Business Manager: Vi Tran

#### Committees:

Institute Art: Dorota Korta, Leo Stein (alt).

Institute Programs: Kayte Fisher, Kim Popendorf, Dorota Korta (alt)

Upperclass Admissions: Kulsoom Hasan, Mayra Sheikh, Vera Pavel (alt).

Computer Advisory: Joe Johnson, Joshua Goldstein, Hao Ye (alt).

Parking: Galen Loram, Ryan Off.

3. Congratulations to the newly appointed BoC Secretary, Arturo Pizano.

4. Congratulations to the new Avery Chancellor, Ryan Witt.

5. The IHC will interview student representatives for the committee to select architects for the South House renovations. The committee will see presentations by three or four architects on June 8 from 8 AM to 5 PM. If you have any questions, contact [ihc@ugcs.caltech.edu](mailto:ihc@ugcs.caltech.edu).

6. Sign-ups for the Institute Size Committee have been re-posted. This active committee investigates and evaluates the growth of the undergraduate, graduate, staff, and faculty population, as well as the physical growth of the institute. If you are interested in serving on this committee, email [sec@donut.caltech.edu](mailto:sec@donut.caltech.edu).

7. The Grievances Committee is looking for student representatives! This committee accepts complaints about any aspect of Caltech and its community. Interested students should contact [ihc@ugcs.caltech.edu](mailto:ihc@ugcs.caltech.edu).

6. It's time to nominate great profs and TAs for the ASCIT Teaching Awards! You can nominate profs and TAs online until May 23. Paper nomination forms are available in each of the seven houses, Avery, Marks, Del Mar, and Chester. Contact your friendly ARC Rep (check <http://donut.caltech.edu/~arc/roster>) if you can't find yours!

#### Money Requests:

7. Kevin Trotter requests \$500 for Fleming's Interhouse Party, "Heaven and Hell", on Sunday, May 30. Vote: 5-0-0 (approved).

8. Hannah Shafaat and Rachel Yohay, from Ricketts House, request \$100 Multihouse funding for broomball with Dabney. Vote: 6-0-0 (approved).

9. Parag Bhayani and Ryan Witt request funding for 24-hour Shakespeare Read-a-thon on Friday, May 28, to Saturday, May 29. BoD states its support and encourages the group to ask for other sources of funding before returning to the BoD.

#### Other Business:

10. Kim Popendorf reports that the Faculty Board voted 14-1 to approve the proposal to allow freshmen to live in Avery in 2005. Several faculty abstained from voting on the issue, and discussion was curtailed in order to advance the meeting. Kim also notes that one faculty member proposed an amendment to re-examine the Avery situation after freshmen are added.

11. Jenny Fisher notes that the Faculty Board also discussed proposals to change Core 1 in the near future. Students with suggestions about how to improve Core 1 should contact Jenny Fisher, Angelina Crans, Lizz Felnagle, or Mel Strausberg.

12. BoD ratifies IHC appointments for Upperclass Admissions, Computer Advisory, and Parking Committees. Vote: 6-0-0 (approved).

13. BoD votes to void uncashed club checks from last fiscal year. Vote: 6-0-0 (approved).

14. Kim welcomes suggestions about the issue of relocating music practice rooms from the SAC to an alternative venue during the South House Renovations.

15. Claire Walton reports that ASCIT Formal tickets can be purchased online at [donut.caltech.edu](http://donut.caltech.edu). The formal will be held on Saturday, May 29, at the Omni Hotel and the LA Museum of Contemporary Art. It will be lots of fun, and you don't need a date to attend!

Meeting adjourned 1:05 PM.

Respectfully submitted,  
Corinna Zygourakis



**Caltech's 2nd annual "Travel Fair"** will take place on Wednesday June 16th from 11:00 to 2pm in front of the Chandler Dining Hall. Come to meet and greet the travel and peard departments and our many travel vendors. There will be music and a barbeque meal will be available to purchase at Chandler. Prizes will be donated by some of our top vendors, (winners must be students, staff or fac-



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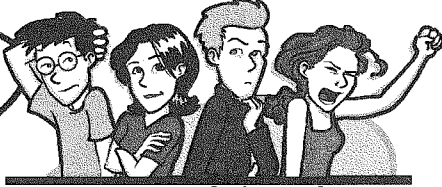
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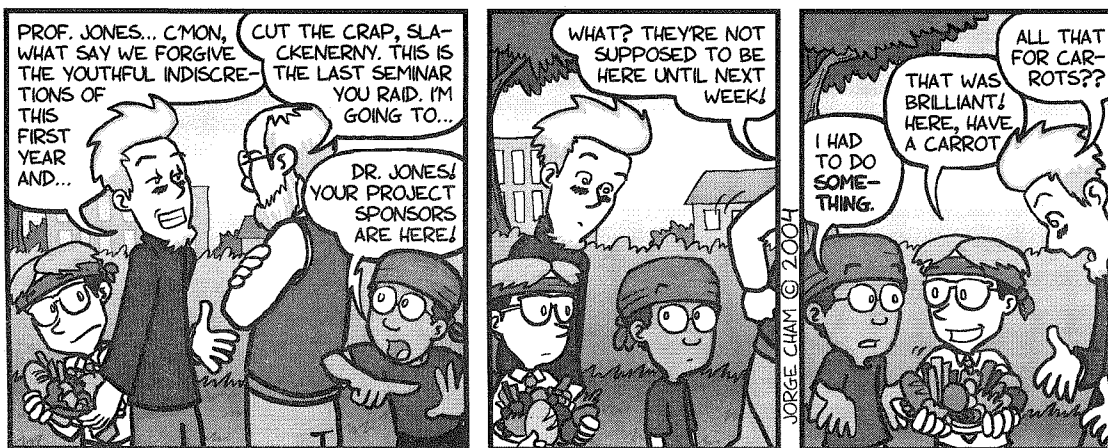
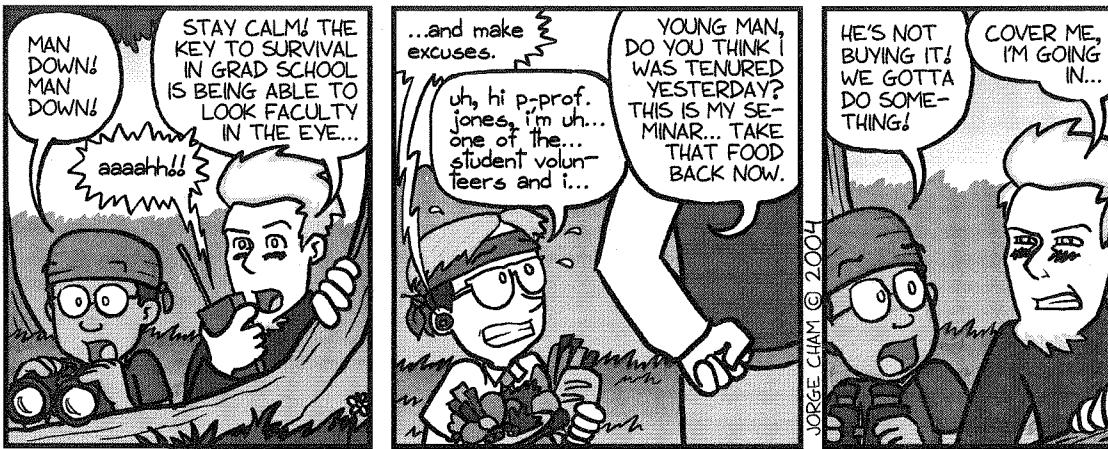
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# PHD

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by Jorge Cham



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*Member*

Continued from Page 5, Column 3

The Hawaiian Club is offering hula (traditional Hawaiian dance) lessons this term! Class will be held in Winnett Lounge on Saturdays from 2-4pm until May 29 (with the exception of 4/24 and 5/1: these classes will be held on Sunday, 4/25 and 5/2). The cost is \$5/class for Caltech community members; \$12/class for all others. For more information, see our club website at <http://www.ugcs/~lilinoe> or email us at [maruchan@its](mailto:maruchan@its).

**The Collegiate Inventors Competition 2004**  
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To recommend someone for the award E-mail [collegiate@invent.org](mailto:collegiate@invent.org) or call 330-849-6887  
The Grand Prize Award is \$50,000. The Deadline for the 2004 competition is June 1, 2004.

**Humanities and Social Sciences Seminars for this Term:**  
21 May (Friday) Munro Seminar Justin D'Arms (Ohio State). "Objectivity in Taste and Emotion"  
28 May (Friday) HPS Seminar Brian Copenhaver (UCLA). "From Magic to Science: Seeing a Way Out"

**Dance Classes**  
All classes meet in the Braun Gym multipurpose room. There are 8 classes in each series. No special clothing or shoes are required for the beginners' classes. RSVPs required only for the bellydancing class. To be added to our mailing list, go to <https://utils.its.caltech.edu/mailman/list-info/troupe-list>. All classes are co-sponsored by the GSC and ASCIT, with additional funding from Campus Life and Graduate Housing.

1) Beginning Bellydancing  
Saturdays, 12:45-1:45 PM, begins 4/3; Professional Instructor: Leela; Trial class fee: \$5 for students, \$8 for others; Caltech students full term fee: \$20 (\$2.50 per class!). Other Caltech community members full term fee: \$50 (\$6.25 per class!) CLASS SIZE IS LIMITED so RSVP to Kathy. [Kelly@caltech.edu](mailto:Kelly@caltech.edu)  
2) Hip-Hop for Advanced Beginners; Thursdays, 9-10 PM, begins 4/1; Professional Instructor: Collette Sibal; Trial class fee: \$5 for students, \$8 for others; Caltech students full term fee: \$20 (\$2.50 per class!). Other Caltech community members full term fee: \$40 (\$5 per class!)

**SCHOLARSHIPS**  
The American Association of Japanese University Women is currently accepting applications for their 2004 scholarship program. Female students enrolled in accredited California colleges and universities, who will be junior, senior or graduate student by Fall 2004 are eligible to apply. You may pick up an application in the

Financial Aid Office or e-mail them for more information. E-Mail Address: [aajuw@worldnet.att.net](mailto:aajuw@worldnet.att.net) The deadline for this scholarship is September 30, 2004.

The Ayn Rand Institute presents the 6th Annual Essay Contest on Ayn Rand's Novel "Atlas Shrugged." There is one \$5,000 scholarship and two second prizes of \$1,000. There are also third, finalist, and semifinalist prizes available. The deadline for this scholarship is September 16, 2004. Additional information and essay topics are available on their website: <http://www.aynrand.org/contests>.

Key Education Resources is excited to announce the TAKE 5 Scholarship Offer! Five lucky winners will win \$5,000 each. The scholarship will be offered each month for 5 months. The deadlines for each monthly scholarship and additional information are available on their website: <http://www.Key.com/Take5>.

Sallie Mae has a number of scholarships available: **The Sallie Mae Fund First in My Family Scholarship Program**, The Sallie Mae Fund Unmet Need Scholarship Program, The Sallie Mae Fund American Dream Scholarship Program, and The Sallie Mae 911 Education Fund. In addition The Sallie Mae Fund awards a \$1,000 scholarship to a future college student at each of its nationwide "Paying for College" workshops. For a complete listing of 2004 scholarship applications, criteria and deadlines, please visit: <http://www.thesalliemaefund.org>.

Educaid is offering their "DoubleTake" Sweepstakes. Win two \$2,500 scholarships - One for you and one for your school. Applications are available in the Financial Aid Office, or on Educaid's website: <https://www.educaid.com/doubletake>

**Project 257** is a free job referral network for students 16 & older. The goal is to employ dependable students to work in their science/medical field of interest during the summer of 2004 in colleges all over the country. For more information contact:  
Dr. Joe W. Conner, P.I.  
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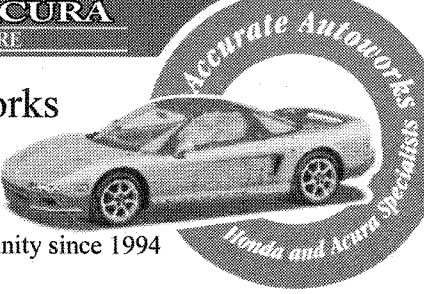
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# Six Professors Receive 2004 Sloan Research Fellowships

By D. WILLIAMS-HEDGES

PASADENA, Calif.- Six members of the Caltech faculty have received Alfred P. Sloan Research Fellowships for 2004.

The Caltech recipients in the field of mathematics are Nathan Dunfield and Vadim Kaloshin, both associate professors of mathematics. In physics, Sloan Fellowships were awarded to Andrew Blain, assistant professor of astronomy, Sunil Golwala, assistant professor of physics, Re'em Sari, associate professor of astrophysics and planetary science and Tapio Schneider, assistant professor of environmental science and engineering.

Each Sloan Fellow receives a grant of \$40,000 for a two-year period. The grants of unrestricted funds are awarded to young researchers in the fields of physics, chemistry, computer science, mathematics, neuroscience, computational and evolutionary molecular biology and economics.

The grants are given to pursue diverse fields of inquiry and research and to allow young scientists the freedom to establish their own independent research projects at a pivotal stage in their careers. The Sloan Fellows are selected on the basis of "their exceptional promise to contribute to the advancement of knowledge."

From over 500 nominees, a total of 116 young scientists and economists from 51 different colleges and universities in the United States and Canada, including Caltech's six, were selected to receive a Sloan Research Fellowship. Twenty-eight previous Sloan Fellows have gone on to win Nobel Prizes.

The Alfred P. Sloan Research Fellowship program was established in 1955 by Alfred P. Sloan, Jr., who was the chief executive officer of General Motors for 23 years.

Its objective is to encourage research by young scholars at a time in their careers when other support may be difficult to obtain. It is the oldest program of the Alfred P. Sloan Foundation and one of the oldest fellowship programs in the country.

Nathan Dunfield conducts research in topology, the study of how geometric structures in three-dimensional space can be altered. His focus is on the connections to the symmetries of rigid geometric objects, especially certain types of non-Euclidean geometries and he also uses computer experiments to probe some of the central questions in the study of topology. Dunfield will utilize his Sloan Fellowship to further his research in this area.

Vadim Kaloshin is an expert in chaos theory and "strange attractors." He is especially interested in mathematical equations known as Hamiltonian systems and how they apply to stability. His work could lead to a better understanding of how chaotic systems behave. Kaloshin will use his Sloan Fellowship to continue investigation

in these fields.

Andrew Blain probes the origin of galaxies by observing them at great distances in the process of formation. He concentrates on the signatures that can be seen in the short-wavelength radio and long-wavelength infrared spectrum, where the gas and soot-like dust particles between the stars emit energy they absorb from the youngest and most luminous parts of galaxies.

Most studies of the process are still carried out using the direct light from stars at shorter optical wavelengths, but the complementary information from longer wavelengths is essential to build up a more complete picture. The Sloan Foundation Fellowship will be used to link together these two techniques by investigating differences between the way distant galaxies found at each wavelength are distributed in space.

Sunil Golwala's research focuses on understanding dark matter and dark energy, components that dominate the universe but whose identity and nature are unknown. Golwala is interested in the development and use of particle detectors for observing the direct scattering of "Weakly Interacting Massive Particles," one of the leading candidates for dark matter.

His work also involves the observation of varying aspects of the cosmic microwave background that inform us about the nature of dark energy via its effect on the growth of galaxy clusters and its clustering effects on super-horizon scales. Golwala will utilize his Sloan Fellowship in pursuit of this endeavor to better understand the universe.

Re'em Sari intends to utilize his Sloan Fellowship to examine the origin of planet formation, a first step in a long journey to look for life around other stars. Some of the fundamental questions he will investigate are: How do planets form? What are the necessary initial conditions for planet formation? What factors determined the number of planets in our solar system? How many planets like Earth do we expect to find around other stars? Are there binary giant planets? Sari will apply his fellowship to further understanding the "grand scheme of planetary systems."

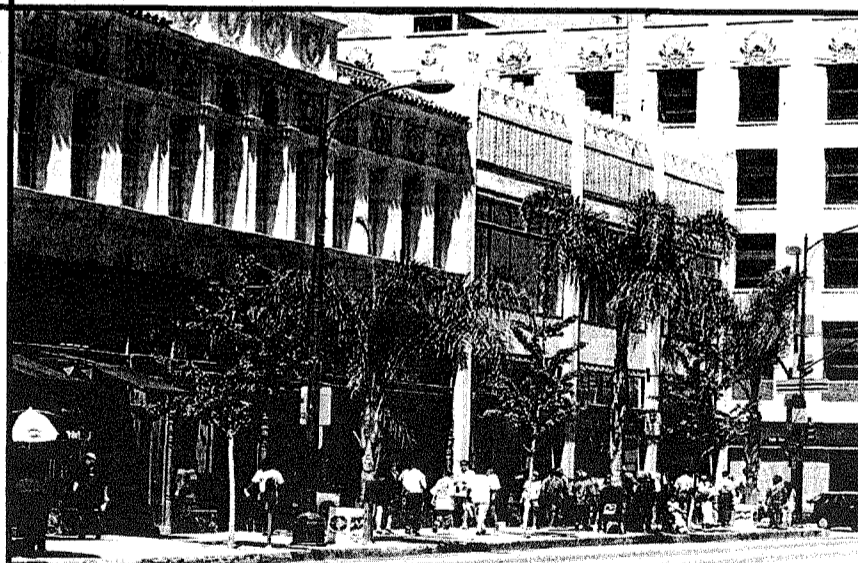
Tapio Schneider works on understanding climate and the dynamical processes in the atmosphere that determine basic climatic features such as the pole-to-equator temperature gradient and the distribution of water vapor. Developing mathematical models of the large-scale (1000 km) turbulent transport of heat, mass and water vapor is one central aspect of this research. The Sloan Fellowship will provide computing equipment and support to expand these studies on climate.



Courtesy of [www.mpe.mpg.de](http://www.mpe.mpg.de)

Professor Andrew Blain studies the origin of galaxies by observing the formation of distant galaxies. He will use the Fellowship to link different measurements.

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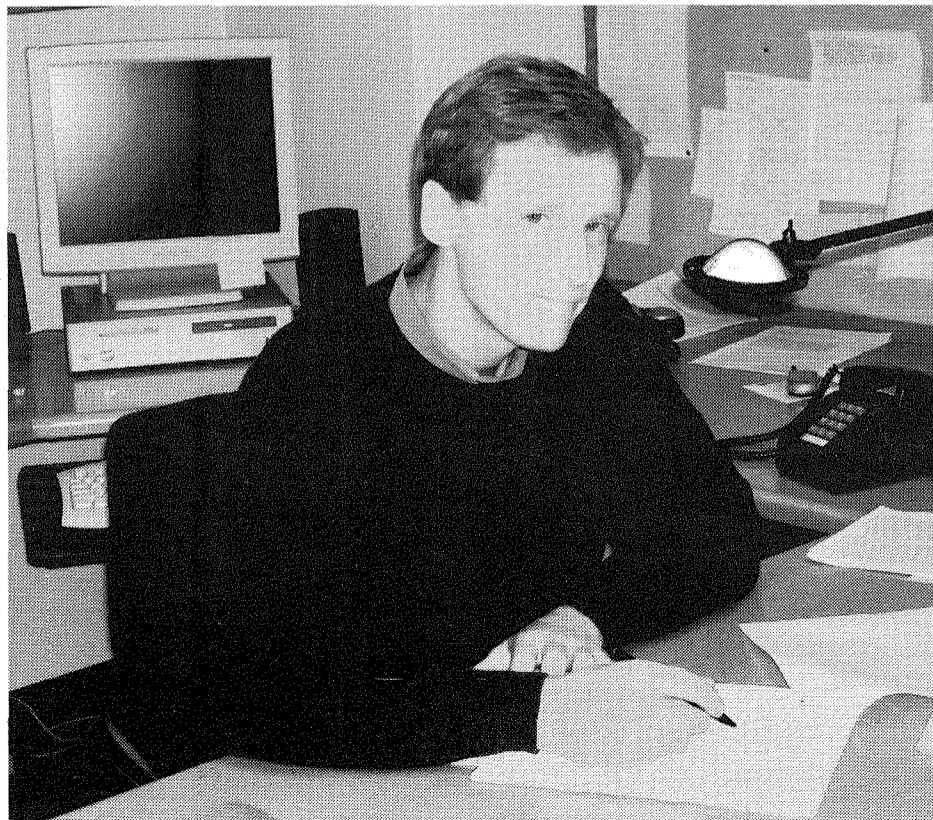
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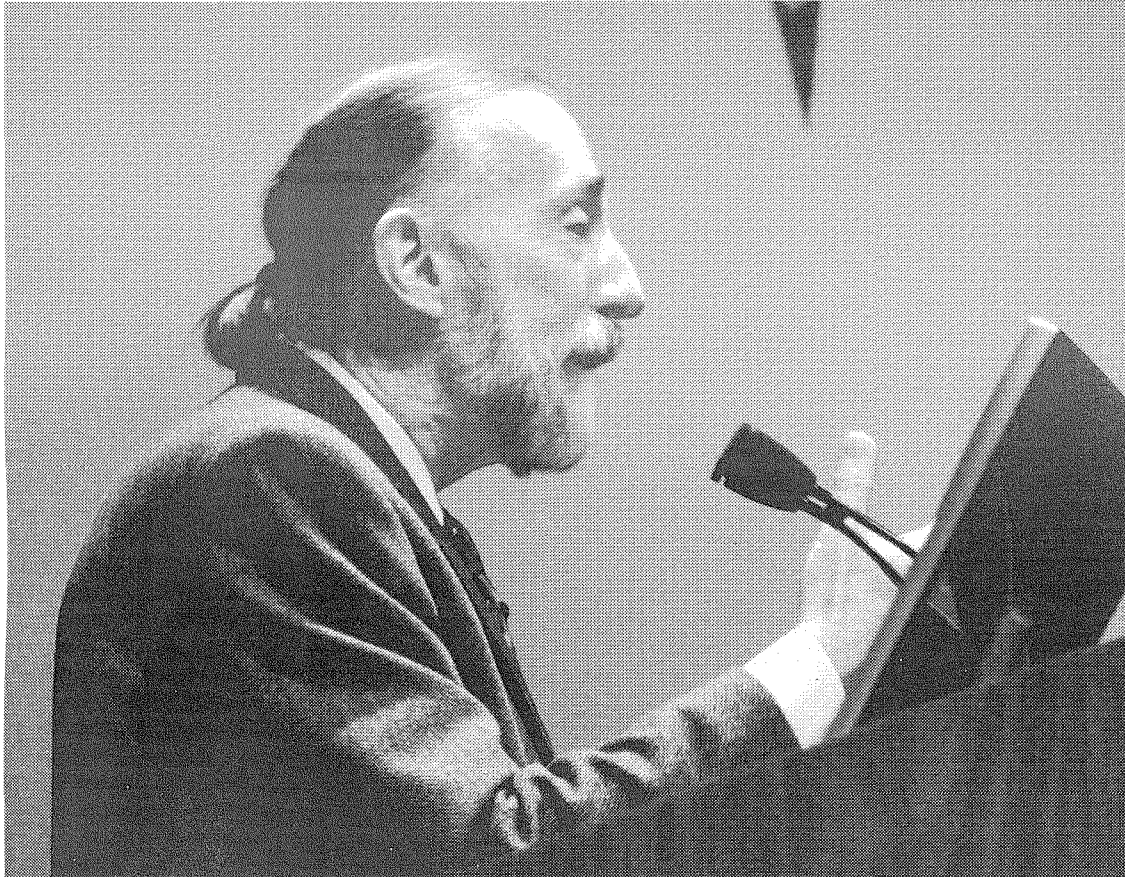
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L. Tran/The California Tech

Professor Tapio Schneider plans on using his Sloan Fellowship to purchase computing equipment for his study of the planet's climate.



D. Korta/The California Tech

Dr. Kip Thorne, Feynman Professor of Physics, introduces Dr. Teukolsky and outlines how mass and energy warp spacetime according to Einstein's theory of relativity.

## Mars Group Tensions Eased By Ice Cream, Interpersonal Skills

*Continued from Page 1, Column 5*

them" mentality that can cause an entire mission to fail.

Bridging the gap between different disciplines was part of Manning's job as Chief Systems Engineer. In a project like MER, there are often conflicts between the engineering goals and tolerances of two groups. Manning gave the example of the rovers' insulated electronics box: MER thermal engineers specified that there absolutely had to be two inches of aerogel insulation surrounding the box in order to preserve its thermal integrity and protect the electronics inside. The engineers working on the electronics responded that the space was absolutely too small for their equipment.

To serve as a mediator between the two groups, Manning had to understand the requirements of each group and then interpret the information so it would be comprehensible to the other. In the end, the tolerances set by each group were pushed back, parts were moved around and the compromise produced an acceptable result.

Insulating the rovers was only one of many seemingly-impossible challenges Manning encountered on the MER project. Unlike previous Mars missions, MER was given just over three years to make its journey from PowerPoint slides to the launch pad. The highly compressed timeline allowed no margin at all on project scheduling. Each component had to be delivered on time or else the entire project would miss its launch window. Manning and his team came up with a number of techniques to cope with the daunting time limits.

The first step, believe it or not, was to hire a bunch of young, unmarried, energetic people. Many members of the MER team were fairly recent graduates of top schools like Cornell, MIT and, of course, Caltech. A younger team was necessary to output enough energy to make the mission succeed. "You can only do this kind of project so often," says Manning, "it takes a lot out of you."

Another way of coping with the shortened timeline was to dupli-

cate development paths for critical components. A prime example of this was the development of a new type of composite fuel tank much lighter than anything previously in use. Problems in the design prevented it from being used on the mission, but luckily, the team also developed traditional titanium fuel tanks a backup, which allowed the mission to continue.

Manning gave another example by showing a video of a live test of the parachute that slowed the lander's descent into the Martian atmosphere. Things were going fine with the chute opening until the final snap. The canopy then ripped open dramatically, allowing its test load to smash against the Earth. This catastrophic failure spawned the concurrent development of four separate parachute designs. One was chosen for the mission and it worked perfectly.

As MER moved from the design phase to the actual mission (and Manning moved from Chief Systems Engineer to EDL Manager), problems kept popping up. A week before the initial landing, Manning looked at data from system tests run over Christmas. The tests revealed that a mismatch between two hardware clocks on the spacecraft might cause the software to fail to enable the "pyros" that fire to release various landing hardware.

Manning and his team came up with the solution of manually enabling the pyros just before reentry. The hard part was explaining to the NASA superiors what went wrong and why their solution would work. Manning recalled, "The one question they asked us was if we all agreed." His team did agree and implemented the fix with three hours to spare.

Stress was a big part of life for the duration of the MER project. Manning certainly had more examples of crises than could fit in this article. At the end of the lecture, a student asked how the team handled stress. Manning's answer was "Not very well."

One thing that Manning regrets about the time constraint is that no one really had the chance to socialize. At the end of the day, everyone was so tired they just wanted to go home. However,

toward the end of the project, the MER team found one good technique to combat stress: "Ice cream! That helped a lot." Manning claims that it worked much better than beer or wine.

Another student asked Manning what it was like to give up a technical role to be a manager. "You don't have to give it up entirely," Manning claims. Rather, it is essential to be technically competent when dealing with your team. To make good decisions for your team, advises Manning, "You have to see what they're doing, how it works and what conclusions they're drawing from it."

Interpersonal skills are very important as well and Manning certainly has them. "I love people," he says. He loves working with them, finding out their quirks, subtleties and methods of communicating. Manning's combination of EQ and IQ is clearly what makes him an effective leader.

Manning compares his experience on the MER project to his time at Caltech: Really tough while you're in the middle of it, but a big payoff at the end. He tends to forget the really stressful parts in favor of more pleasant memories--maybe that's why he keeps getting involved in these missions.

Manning finished his presentation with video footage from mission control as Spirit touched down on the red planet. When the first images from the rover started appearing on screen, the elation in the control room infected Baxter as well. The audience, like Manning, was all smiles.

## Experiments Suffer From Weak Models

*Continued from Page 1, Column 5*

Unfortunately, even though the construction of LIGO is nearing completion and data is already being gathered, there is still no way in which this data can be interpreted using modern simulations. The work of developing larger, faster supercomputers and better algorithms for approximating solutions to Einstein's equations still continues.

Professor Teukolsky then began the lecture proper by explaining the properties of black holes and explaining how helpful supercomputer simulations have been so far in understanding the formation of black holes, despite the limitations of the technique.

A black hole may form when a massive star collapses in a supernova explosion, or when stars collide together in the center of a galaxy. Eventually, the density of matter becomes so great that, according to Professor Teukolsky, the spacetime deformation takes over and there is no longer any matter or energy inside; there is only spacetime "warpage".

The black hole is surrounded by an "event horizon", from beyond which no information can be transmitted to the external universe; the escape velocity here (i.e. the velocity which an object needs to travel from the surface of the event horizon to an infinite distance) is infinite and not even light waves can escape. Inside of the black hole, all things, including light waves which have passed inside of the black hole's event horizon, fall into a "singularity"--a region where the known laws of physics no longer apply and time, for example, flows "down".

The formation of black holes can be simulated using supercomputers; this technique has been used to demonstrate how a black hole forms in the center of a galaxy, or--to the surprise of many physicists and mathematicians--how a spinning, toroidal black hole may exist for some time in the center of a galaxy, until it eventually collapses into a convex shape (an event previously thought impossible).

Theories about the formation of black holes are just being tested using supercomputer comput-

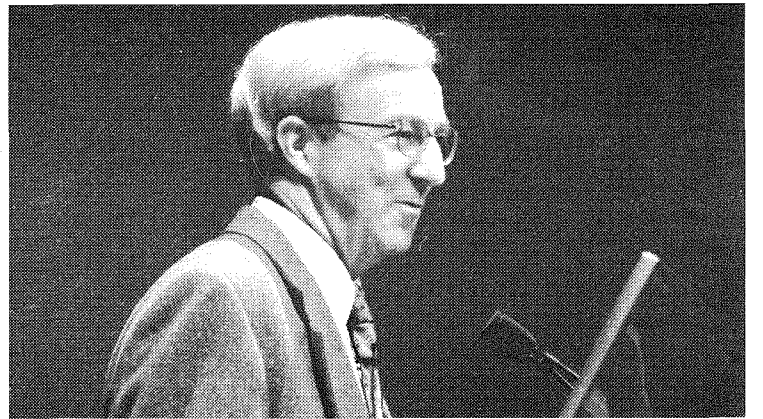
ing power. A good example is the "Hoop Conjecture" by Kip Thorne, which states that a black hole forms when some amount of matter has collapsed so that a hoop of radius equal to twice the mass of the object can be passed around the remnants in any direction. The error in computer simulations is still too significant to tell whether the hoop conjecture is true--but so far, it appears to be correct.

On the other hand, some physicists speculate that the singularity of a black hole need not be covered by an event horizon--in other words, that a "naked" singularity may exist in some cases. This idea contradicts the hoop conjecture; but again, the limited power of supercomputers leaves us with no answer as to whether it is correct.

The matter remains a standing bet between Kip Thorne and Steven Hawking (this being a second version of a bet which Hawking originally lost when it was demonstrated that a naked singularity may exist with the collapse of an object of exactly the minimum mass necessary for the formation of a black hole; this bet considers a more general case). Such matters will only be resolved by supercomputers of the future.

The structure and physics of black holes are really very fascinating subjects. Today, we continue to study the radiation given off by black holes and that given off during black hole formation and hope to be able to detect the gravitational waves given off when two black holes collide. With better predictions of what we expect to happen based on the laws of relativistic physics, we will always be able to better analyze the data we collect in the future.

And perhaps it will turn out that, due to black hole physics, a revision of special relativity is in order. Already there are several competing theories, including string theory and quantum gravity, strive to better explain what goes on inside of a black hole. With the power of modern computers, there is hope for at least some explanation.



D. Korta/The California Tech

Dr. Saul Teukolsky is the Hans A. Bethe Professor of Physics and Astrophysics at Cornell University in Ithaca, New York.

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