



Caltech



Tech Talk

Prepared for the volunteers and callers for the
CALTECH ALUMNI FUND

October 2009



Caltech

Tech Talk

In an effort to provide regularly updated information for callers about the latest events, discoveries, awards, and other news about Caltech, we have compiled information from several sources in one document.

The following includes:

- I. "Bucky's Buck" with breakdown of rankings and "where the money goes"
- II. At-a-Glance info from the Admissions web site
- III. A list of recent media releases and where to locate them online
- IV. Fun Facts
- V. Sustainability
- VI. Construction—current and upcoming

Please let me know what other information you would like to know.

Debbi Patrick

Assistant Director, Communications

Caltech Annual Giving Programs

626.395.6286

dpatrick@dar.caltech.edu



Caltech

I. Funds Are Well Spent

Bucky's Buck represents the general budget expenses. The Alumni Fund primarily receives unrestricted gifts to support *all* of Caltech.



Bucky's Buck represents the general budget expenses. The Alumni Fund primarily seeks unrestricted gifts to support all of Caltech. The largest portion of expenses supports students and teaching. This keeps the student/faculty ratio exceedingly low and provides financial aid that keeps tuition far below the actual cost of a Caltech education. Approximately 60 percent of students receive aid to cover nearly 60 percent of the cost of tuition, room, and board.

46.5¢ - Instruction and Academic Support

- Graduate assistantships
- Undergraduate financial aid
- Teaching assistantships
- Caltech Undergraduate Research Journal*
- Conferences and symposia
- Library periodicals and publications
- Laboratory and classroom, and infrastructure improvements
- Student athletics and recreation
- Performing and creative arts
- Academic division administration
- Counseling, Health, Career Development and Diversity Centers

21.3¢ - Institutional Support

- Administration
- Human Resources
- Communications
- Financial Services/Procurement/Audit Services and Institute Compliance
- General Counsel
- Information Services

20.3¢ - Operations and Facilities

- Plant operation/Facilities/Utilities
- Interest

11.9¢ - Auxiliaries

(Auxiliaries also produce revenue to offset expenses.)

- Housing/Dining
- Athenaeum
- Industrial Relations Center

Source: Caltech, Office of Financial Services, May 2009. This data may vary from year to year.



Financial Overview

To help Caltech stay Caltech, funds are needed to:

- Protect research and education.
- Recruit and retain the best faculty and students.
- Solve the toughest problems.
- Maintain our unique niche in higher education.
- Maintain a solid financial base for the future.

Context:

- Caltech competes with the best institutions worldwide for faculty and students.
- Caltech's mission is expensive to achieve.
- Caltech's balance sheet is strong.
- Caltech's operation presents financial challenges.
- Caltech's endowment is down, but we've taken steps to increase efficiency, sustainability, and reduce costs.

Caltech grads have less than \$6,000 in debt, the second lowest in the nation (partly due to scholarships provided by alumni).

AID REPLACED LOANS FOR MANY IN FALL 2008

Caltech eliminated loans for its neediest undergraduate students by replacing loans with additional gift aid, such as scholarships and grants.

Beginning with undergraduates entering in the fall of 2008, most domestic students whose total family incomes are \$60,000 per year or less are offered a financial-aid package that substitutes scholarship gift aid for loans.



Caltech

Rankings

- Caltech has been rated the **best value in private colleges** by *Kiplinger's*, FOUR years in a row.
- *Kiplinger's* also ranked **Caltech 2nd** in least debt per graduating UG student
- *Forbes* ranked **Caltech 3rd** of the top national universities in September 2009.
- *U.S. News & World Report* ranked **Caltech 4th** of the top national universities in September 2009.
- Caltech was named to the *Princeton Review* Financial Aid Honor Roll
- **The Academic Ranking of Worldwide Universities**, compiled by Shanghai Jiao Tong University, ranked **Caltech 6th** in August 2008. According to the *Chronicle of Higher Education*, "Shanghai Jiao Tong University and *Times Higher Education* put out the two most-watched international listings."
- The latest *Times Higher Education* and QS Quacquarelli Symonds ranking places **Caltech 10th** among the **world's** universities.
- For graduate science schools, *U.S. News & World Report* ranks Caltech's **Engineering, Chemistry, Mathematics, Biological Sciences, Physics, and Earth Sciences Divisions** in the **top 10** of all U.S. colleges. Chemistry and Earth Sciences are at the top of the list.
- Princeton Survey Research Associates International and the National Wildlife Federation recognized Caltech as one of 37 national universities that "stand apart for harnessing on-campus clean energy sources and using cogeneration for their energy demands."

HOW ALUMNI CAN HELP IMPROVE RANKINGS:

By participating! One factor in these rankings is alumni giving. By supporting your alma mater, you are helping to strengthen Caltech's rankings.

Remember: Our alma mater matters!



II. Caltech at a Glance (from Admissions website)

Mission Statement

The mission of the California Institute of Technology is to expand human knowledge and benefit society through research integrated with education. We investigate the most challenging, fundamental problems in science and technology in a singularly collegial, interdisciplinary atmosphere, while educating outstanding students to become creative members of society.

Faculty & Staff Statistics

Faculty in residence (as of December 2008)

Professorial faculty 294

Emeriti 108

Research faculty 57

Other faculty 65

Visiting faculty 138

Postdoctoral scholars 535

Senior postdoctoral scholars 35

Visitors 115

Employees as of December 2008

Campus (excludes faculty and students) 2,650

JPL (excluding contractors) 5,200

Honors & Awards

Caltech faculty and alumni have received wide recognition for their achievements in science and engineering.

Nobel Prize: 31 recipients, 32 prizes (Linus Pauling received two)

Crafoord Prize: 5 recipients

Kavli Prize: 1 recipient

National Medal of Science: 53 recipients (Two in 2009) More than 10% of all recipients are from Caltech.

National Medal of Technology: 12 recipients

California Scientist of the Year: 15 recipients

Fellow, American Academy of Arts and Sciences: 85 faculty

Member, National Academy of Sciences: 74 faculty

Member, National Academy of Sciences, Institute of Medicine: 4 faculty

Member, National Academy of Engineering: 29 faculty

A full list of **Caltech faculty honors and awards** are available in **PDF format**.

Brief bios of Nobel Laureates are available at http://pr.caltech.edu/events/caltech_nobel/.



Student & Alumni Statistics--2008 Freshman Class (Some 2009 data in Fun Facts)



- There were 3,956 applications for the '08 freshman class; 686 offers of admission were made, and 241 students matriculated.
- 73 percent of 2008 freshmen attended public high schools; 17 percent attended private schools; nine percent attended international schools and one percent were home schooled.
- 28 percent are from California; 14 percent from the Northeast; 18 percent from the Midwest; 12 percent from the South; 10 percent from the West (excluding California); 7 percent from the Southwest; 11 percent are international students.
- Their most popular extracurricular activities were science/math teams (74%); volunteering/community service (79%); music (52%); scientific research (48%); and sports (29%).
- Their SAT mid-50% scores were 2170-2310 ACT mid-50% composite scores were 33–35.
- Ninety-eight percent of those ranked were in the top 10 percent of their class.
- Fifty-eight percent of undergraduates receive need-based financial assistance.

Enrollment (first term 2008)

Undergraduate students:

Total: 921
610 men
311 women

Graduate students:

Total: 1,205
842 men
363 women
Total students: 2,126



Caltech

Degrees awarded June 2008

BS 208
MS 128
Engineer 1
PhD 185

Living alumni (as of December 2008)

Total 22,227

BS	11,282
MS	7,754
Engineer	370
PhD	6,822
Ex student	639

Total Degrees 26,945

The total number of degrees is greater than the number of living alumni because many graduates have multiple Caltech degrees.



III. Media Releases/News

Here is a list of recent media releases (these link to the full release). Current media releases are available on the media relations website at http://media.caltech.edu/press_releases. You may link to it at anytime on the Volunteer Resources page under Caltech Online Resources.

Caltech Physicists Propose Quantum Entanglement for Motion of Microscopic Objects

12/21/09 Researchers at the Caltech have proposed a new paradigm that should allow scientists to observe quantum behavior in small mechanical systems. Their ideas, described in the early online issue of the *Proceedings of the National Academy of Sciences*, offer a new means of addressing one of the most fascinating issues in quantum mechanics: the nature of quantum superposition and entanglement in progressively larger and more complex systems. [\[more\]](#)

Caltech Researchers Revise Long-Held Theory of Fruit-Fly Development

12/17/09 For decades, science texts have told a simple and straightforward story about a transcription factor that helps the embryo of the fruit fly, *Drosophila melanogaster*, pattern tissues in a manner that depends on the levels of this factor within individual cells. Now a team of Caltech biologists has called that paradigm into question, revealing a tale that is both more complicated and potentially more interesting than the one previously described. [\[more\]](#)

Caltech Scientists Discover Fog on Titan

12/17/09 Saturn's largest moon, Titan, looks to be the only place in the solar system—aside from our home planet, Earth—with copious quantities of liquid (largely, liquid methane and ethane) sitting on its surface. According to Caltech planetary astronomer Mike Brown, Earth and Titan share yet another feature, which is inextricably linked with that surface liquid: common fog. [\[more\]](#)

Caltech Scientists Film Photons with Electrons

12/16/09 Techniques recently invented by researchers at the California Institute of Technology (Caltech)—which allow the real-time, real-space visualization of fleeting changes in the structure of nanoscale matter—have been used to image the evanescent electrical fields produced by the interaction of electrons and photons, and to track changes in atomic-scale structures. [\[more\]](#)

Caltech, UCLA Launch Joint Center for Translational Medicine

12/16/09 Caltech and UCLA have announced the establishment of the Joint Center for Translational Medicine (JCTM), which will advance experimental research into clinical applications, including the diagnosis and therapy of diseases such as cancer. [\[more\]](#)

Caltech Scientists Discover Aggression-Promoting Pheromone in Flies

12/06/09 Have you ever found yourself struggling to get your order taken at a crowded bar or lunch counter, only to walk away in disgust as more aggressive customers elbow their way to the front? It turns out that flies do much the same thing, according to biologists from Caltech. [\[more\]](#)

High Energy Physicists Set New Record for Network Data Transfer

12/05/09 An international team of high-energy physicists, computer scientists, and network engineers led by the California Institute of Technology (Caltech) joined forces to capture the Bandwidth Challenge award for massive data transfers during the SuperComputing 2009 (SC09) conference held in Portland, Oregon. [\[more\]](#)

Caltech Scientists Show How Ubiquitin Chains are Added to Cell-Cycle Proteins

12/02/09 Researchers from Caltech have been able to view in detail, and for the first time, the previously mysterious process by which long chains of a protein called ubiquitin are added by enzymes called ubiquitin ligases to proteins that control the cell cycle. Ubiquitin chains tag target proteins for destruction by protein-degrading complexes in the cell. Their findings, and the innovative process by which they were obtained, are described in this week's issue of *Nature*. [\[more\]](#)



IV. FUN FACTS STUDENTS

- Students have their own blogs on the admissions site. www.admissions.caltech.edu
- Incoming 2009 Frosh class is 42% women.

Among 2009 Frosh:

- **Chan-Hee Koh**, Los Angeles, CA
 - Designed a floating windmill
- **Christina Lee**, Vancouver, WA
 - Found the parametric equation that is similar to the Caltech logo
- **Brandon Robinson**, Houston TX
 - Is ranked 7th in the Texas Future Farmers of America in Judging Meat
- **Rachel Salaiz**, Deer Park, TX
 - Does chalk art calculus on her math teacher's driveway
- **Ran Yang**, Lake Oswego, OR
 - Created a new way to play scrabble
- **Nina Budaeva**, El Cerrito, CA
 - Is a classically-trained ballerina
- **Sandhya Chandrasekaran**, Fremont, CA
 - Member of the club "Girls for Change" which produced a public service announcement that aired on MTV during the summer promoting the idea that "everyone is beautiful."
- **Kelvin Fang**, San Jose, CA
 - Loves pick-up basketball and can shoot over 40% from NBA 3-point range
- **Cameron Fen**, Waban, MA
 - Climbed all 48 peaks over 4,000 feet in New Hampshire White Mountains
- **Matthew Harrigan**, Essex, CT
 - Worked over the summer as a video game designer on the Madden 08 game.
- **Max Liberman**, Milton, MA
 - Builds custom cedar Adirondack chairs.
- **Anastasia Markovtsova**, San Mateo, CA
 - Participates in a traditional Russian chorus, "Rodnichok" which raised money through CD sales to fund two houses for orphans living near Moscow
- **Daniel Hogan**, Taylorsville, UT
 - Founded Jugglers of West at his high school
- **Daniel Emmons**, Fairfax, VA
 - Dan is ranked 12th in North American Youth Bridge Championships

OTHER FACTS/AWARDS

- Alumni **Berni Alder**, PhD '52, and **James Gunn**, PhD '66, received the **National Medal of Science** in a White House ceremony in October. Now **53** Caltech alumni or faculty have won this award, **more than 10 percent of the total number of medals awarded since 1962**. The first was **Theodore Von Karman, founder of Jet Propulsion Laboratory**.
- Former Caltech Provost **Steven Koonin** '72, was confirmed in April this year as the Under Secretary for Science in the Department of Energy, under Secretary of Energy Steven Chu, 2009's commencement keynote speaker.
- Nobel laureate **Ahmed Zewail**, the Linus Pauling Professor of Chemistry and the Professor of Physics at Caltech, has been **named by President Barack Obama to the United States Council of Advisors on Science and Technology** (PCAST).

- Caltech now has a community garden at Del Mar and Holliston.
- The Olive Harvest day will be smaller as there are many fewer olives this year. Date is November 6, 2009. (Callers: Check the website for updates.)
- Watch video clips about Caltech's Ditch Day, the Caltech Jazz Band, and more, at www.admissions.caltech.edu/videos



V. SUSTAINABILITY FACTS: CALTECH'S GREEN INITIATIVES

Sustainability at Caltech



Princeton Survey Research Associates International and the National Wildlife Federation recognized Caltech as one of 37 national universities that "stand apart for harnessing on-campus clean energy sources and using cogeneration for their energy demands."

The focus of sustainability is to meet the needs of today without compromising the ability to meet our needs in the future. This site describes Caltech's actions and progress towards creating a sustainable future for our campus and our world.

Find the latest updates and list of campus clubs and organizations at www.sustainability.caltech.edu

Caltech Earns a B on Sustainability Report Card

10/12/2009 For the second year in a row, Caltech received a B on the Sustainability Report Card. Caltech was awarded an A in the categories of Climate Change and Energy, Food and Recycling, and Investment Priorities. Click [here](#) to view the complete report card.

ONLINE PRESENTATIONS

See dozens of streaming theatre presentations on sustainability at http://today.caltech.edu/theater/results.tcl?science_category_id_list=151

Topics include:

- Fuel cells
- clean water
- environmental patterns in Los Angeles and more

Presenters include:

- Nate Lewis, Argyros Professor and professor of chemistry
- David Goodstein, Gilloon Distinguished Teaching and Service professor
- Harry Atwater Jr., Hughes Professor and professor of applied physics and materials science
- Harry Gray, Beckman Professor of chemistry and more.



Caltech

VI. Construction Projects

All new constructions projects are viewable on <http://newbuildings.caltech.edu>

Walter and Leonore Annenberg Center for Information Science and Technology (IST)



Construction start date: December 2007

Completion date: Fall 2009

Architect: Frederick Fisher and Partners

Watch a slideshow of the new building by visiting Caltech Today. The direct link is

<http://today.caltech.edu/today/story-display.tcl?story%5fid=39042>

More details on all buildings at www.dandc.caltech.edu

Warren & Katharine Schlinger Laboratory for Chemistry and Chemical Engineering



Construction start date: February 2008

Completion date: December 2009

Architect: Bohlin Cywinski Jackson (BCJ)

General Contractor: Rudolph and Sletten

LINDE + ROBINSON LABORATORY FOR GLOBAL ENVIRONMENTAL SCIENCE



Building Rehabilitation

This laboratory is made possible through a generous donation of \$18M by Ronald and Maxine Linde. The Robinson Laboratory was vacated when its current occupants moved to the new Cahill Center for Astronomy and Astrophysics. The rehabilitation will include:

- All 5 floors ~ 45,000 GSF
- Offices on upper floors, labs in basements
- LEED "Gold" certification, "Platinum" certification possible
- Reuse of original solar shaft
- Restoration of significant exterior and interior features

Many of the original features of the building will be restored including the first floor corridor, library and exit stair. Use of the solar telescope shaft for either lighting or ventilation will be explored during the design phase.

This project will provide the Global Environmental Science program a needed identity and achieve significant synergy among disciplines due to its close proximity to planetary science, geology, and other related fields.

Architect: TBD

Design: Summer 2008

Construction: Winter 2009

Occupancy: Fall 2010