

2013-14

# Caltech Catalog

California Institute of Technology  
Pasadena, California 91125  
(626) 395-6811

September 2013

*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.*

While every effort has been made to ensure that this catalog is accurate and up to date, it may include typographical or other errors. The Institute reserves the right to change its policies, rules, regulations, requirements for graduation, course offerings, and any other contents of this catalog at any time.

You can view the *Caltech Catalog* online at <http://catalog.caltech.edu/>. Please note that the contents of websites that link to online course entries are not part of the official catalog.

Cover: Lance R. Hayashida

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# ACADEMIC CALENDAR 2013-14

## FIRST TERM 2013

*September 18–20*

International student orientation

*September 22–29*

New student check-in and orientation

*September 30*

Beginning of instruction—8 a.m.

*October 1*

Undergraduate Academic Standards  
and Honors Committee—9 a.m.

*October 18*

Last day for adding courses and  
removing conditions and  
incompletes

*October 30–November 5*

Midterm examination period

*November 11*

Midterm deficiency notices due—  
9 a.m.

*November 18*

Faculty meeting—4 p.m to 5 p.m.

*November 20*

Last day for dropping courses, exer-  
cising pass/fail option, and changing  
sections

*November 21–December 6*

Registration for second term, 2013–14

*November 22*

Last day for admission to candidacy  
for the degrees of Master of  
Science and Engineer

*November 28–29*

Thanksgiving (Institute holiday)

*December 6*

Last day of classes

Last day to register for second term,  
2013–14, without a \$50 late fee

*December 7–10*

Study period

*December 11\*–13*

Final examinations, first term,  
2013–14

*December 13*

End of first term, 2013–14

*December 14–January 5*

Winter recess

*\*First due date for final examinations*

*December 18*

Instructors' final grade reports due—  
9 a.m.

*December 25–26*

Christmas (Institute holiday)

*December 27–31*

Special release days

## SECOND TERM 2014

*January 1*

New Year's Day (Institute holiday)

*January 6*

Beginning of instruction—8 a.m.

*January 7*

Undergraduate Academic Standards  
and Honors Committee—9 a.m.

*January 20*

Martin Luther King Day (Institute  
holiday)

*January 24*

Last day for adding courses and  
removing conditions and  
incompletes

*February 5–11*

Midterm examination period

*February 17*

Presidents' Day (Institute holiday)

*February 18*

Midterm deficiency notices due—  
9 a.m.

*February 24*

Faculty meeting—4 p.m.-5 p.m.

*February 26*

Last day for dropping courses, exercis-  
ing pass/fail option, and changing  
sections

*February 27–March 12*

Registration for third term, 2013–14

*March 12*

Last day of classes

Last day to register for third term,  
2013–14, without a \$50 late fee

*March 13–16*

Study period

*March 17\*-19*

Final examinations, second term,  
2013-14

*March 19*

End of second term, 2013-14

*March 20-30*

Spring recess

*March 26*

Instructors' final grade reports due—  
9 a.m.

### **THIRD TERM 2014**

*March 31*

Beginning of instruction—8 a.m.

*April 1*

Undergraduate Academic Standards  
and Honors Committee—9 a.m.

*April 18*

Last day for adding courses and  
removing conditions and  
incompletes

*April 30-May 6*

Midterm examination period

*May 12*

Midterm deficiency notices due—  
9 a.m.

Last day for seniors to remove condi-  
tions and incompletes

*May 16*

Last day for scheduling examinations  
for the degrees of Doctor of  
Philosophy and Engineer

*May 21*

Last day for dropping courses, exer-  
cising pass/fail option, and changing  
sections

*May 22-June 6*

Registration for first term, 2014-15,  
and for summer research

*May 26*

Memorial Day (Institute holiday)

*May 30*

Last day of classes—seniors and grad-  
uate students

Last day for presenting theses for the  
degrees of Doctor of Philosophy  
and Engineer

*May 31-June 3*

Study period for seniors and graduate  
students

*\*First due date for final examinations*

*June 4\*-6*

Final examinations for seniors and  
graduate students, third term,  
2013-14

*June 6*

Last day of classes—undergraduates  
Last day to register for first term,  
2014-15, without a \$50 late fee

*June 7-10*

Study period for undergraduates

*June 9*

Instructors' final grade reports due for  
seniors and graduate students—  
9 a.m.

*June 11*

Undergraduate Academic Standards  
and Honors Committee—9 a.m.  
Curriculum Committee—10 a.m.  
Faculty meeting—2 p.m.-3 p.m.

*June 11\*-13*

Final examinations for undergraduates,  
third term, 2013-14

*June 13*

Commencement—10 a.m.  
End of third term, 2013-14

*June 18*

Instructors' final grade reports due for  
undergraduates—9 a.m.

*June 25*

Undergraduate Academic Standards  
and Honors Committee—9 a.m.

*July 4*

Independence Day (Institute holiday)

*September 1*

Labor Day (Institute holiday)

### **FIRST TERM 2014-15**

*September 17-19*

International student orientation

*September 21-28*

New-student check-in and orientation

*September 29*

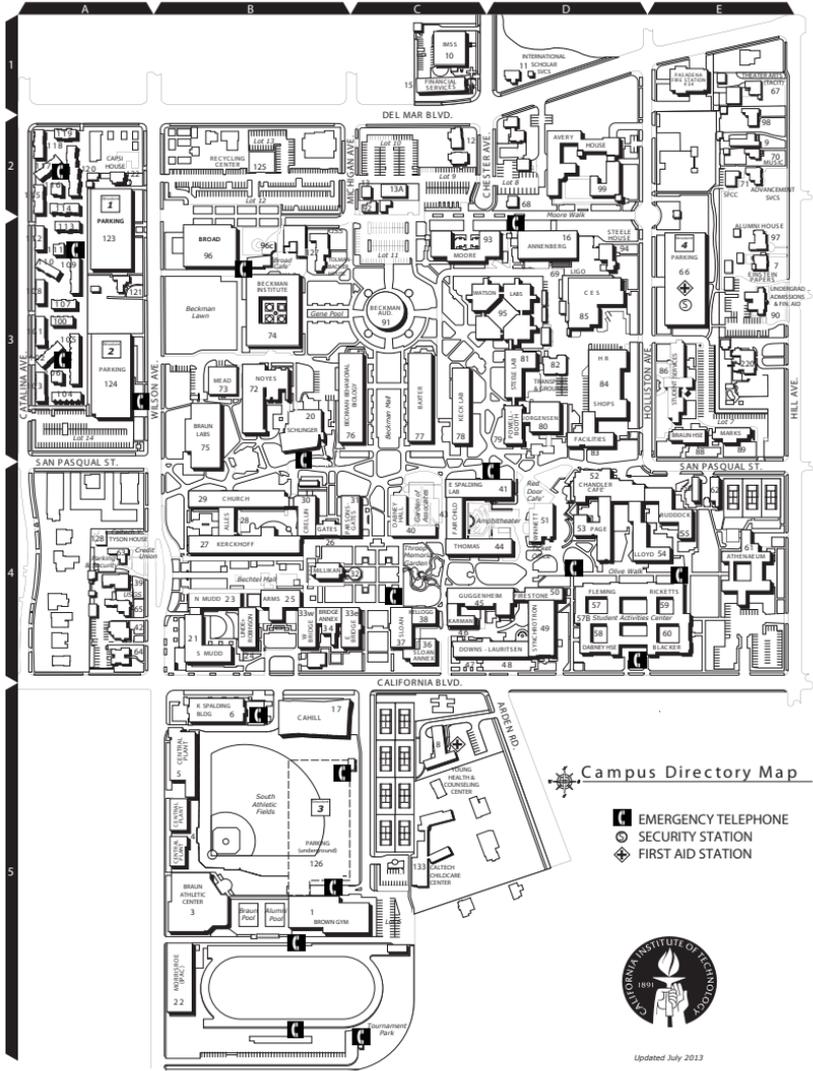
Beginning of instruction—8 a.m.

*September 30*

Undergraduate Academic Standards  
and Honors Committee—9 a.m.

# CALIFORNIA INSTITUTE OF TECHNOLOGY

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Campus Map

## Campus Building Directory

Buildings by Name	Bl. No.	Map Grid	Buildings by Name	Bl. No.	Map Grid
263 S Chester (International Scholar Services)	11	D1	Downs Laboratory (Downs-Lauritsen Labs)	47	C4
275 S Hill (Theater Arts (TACIT))	67	E1	Facilities/Facilities Management	83	D3
287 S Hill (Rickenbaugh House)	98	E1	Financial Services	15	C1
293 S. Chester	12	C2-D2	Firestone Laboratory	50	D4
295 S Hill	9	E2	Fleming House	57	D4
305 S Hill (Music House)	70	E2	Gates Annex	26	B4
315 S Hill (Adv. Svcs (front) SFCC (rear))	71	E2	Guggenheim Laboratory	45	C4
315 S Wilson (CAPSI-Educational Outreach)	122	A2	Human Resources/Facilities Mgmt. Shops	84	D3
320 S Michigan Ave	13	C2	Information Mgmt. Systems & Svcs (IMSS)	10	C1
330 S Michigan Ave (Audio Visual Annex)	13A	C2	Jorgensen Laboratory	80	D3
332 S Michigan Ave	92	C2	Karman Laboratory	46	C4
345 S Hill (Alumni House)	97	E2	Keck Laboratories	78	C3
345 S Michigan (Toiman-Bacher House/KISS)	127	B3	Kellogg Radiation Laboratory	38	C4
355 S Holliston (Steele House)	94	D3	Kerckhoff Annex	27A	B4
363 S Hill (Einstein Papers House)	7	E3	Kerckhoff Laboratories	27	B4
375 S Wilson (Prufrock House)	121	A3	Lauritsen Laboratory (Downs-Lauritsen Labs)	48	D4
383 S Hill (Undergrad Adm. & Financial Aid)	90	E3	LIGO	69	D3
415 S Hill Ave	220	E3	Linde+Robinson Laboratory	24	B4
505 S Wilson (Tyson House/Caltech Y)	128	A4	Lloyd House	54	D4-E4
515 S Wilson (Credit Union/Parking & Sec.)	63	A4	Marks House	89	E3
525 S Wilson (U.S. Geological Survey)	39	A4	Mead Laboratory	73	B3
535 S Wilson (Fitzhugh House/USGS)	65	A4	Millikan Library	32	B4
551 S Wilson (Investment Office)	42	A4	Moore Laboratory	93	C3
565 S Wilson (Audit Svcs & Inst Compliance)	64	A4	Morrisroe Astroscience Laboratory (IPAC)	22	B5
1320 San Pasqual St	56	E4	Mudd Laboratories - North	23	B4
1350 San Pasqual St	62	E4	Mudd Laboratories - South	21	B4
Alles Laboratory	28	B4	Noyes Laboratory	72	B3
Annenberg Center for Info Sci and Tech (IST)	16	D3	Page House	53	D4
Arms Laboratory	25	B4	Parking Structure 1 (North Wilson Avenue)	123	A3
Athenaeum	61	E4	Parking Structure 2 (South Wilson Avenue)	124	A3
Avery House	99	D2	Parking Structure 3 (California Avenue)	126	B5
Baxter Hall	77	C3	Parking Structure 4 (Holliston Avenue)	66	E3
Beckman Auditorium	91	C3	Parsons-Gates Hall of Administration	31	B4
Beckman Behavioral Biology Labs (BBB)	76	B3-C3	Powell-Booth Laboratory	79	D3
Beckman Institute	74	B3	Recycling Center	125	B2
Blacker House	60	E4	Ricketts House	59	E4
Braun Athletic Center	3	B5	Ruddock House	55	E4
Braun House	8	E3	Satellite Utility Plant	66B	E3
Braun Laboratories	75	B3	Schlinger Lab for Chemistry and Chem Engr	20	B3
Bridge Annex	34	B4	Sherman Fairchild Library	43	C4
Bridge Laboratory - East	33E	B4	Sloan Annex	36	C4
Bridge Laboratory - West	33W	B4	Sloan Laboratory	37	C4
Broad Café	96C	B3	South Undergrad Housing Complex Basement	57B	D4
Broad Center for the Biological Sciences	96	B3	Spalding Lab, Eudora (Eudora Spalding Lab)	41	C4
Brown Gymnasium	1	B5	Spalding, Keith (Keith Spalding Building)	6	B5
Cahill Center for Astroscience and Astrophysics	17	B5	Steele Laboratory	81	D3
Caltech Childcare Center (New)	133	C5	Student Activities Center	57B	D4
Catalina Graduate Housing	100-120	A2-A3	Student Services, Center for (CSS)	86	E3
Central Engineering Services (CES)	85	D3	Synchrotron Laboratory	49	D4
Central Plant (incl. Cogen & Cooling Towers)	5	B5	Thomas Laboratory	44	C4
Chandler Dining Hall (Chandler Cafe)	52	D4	Transportation & Grounds Operations	82	D3
Church Laboratory	29	B4	Undergraduate Admissions & Financial Aid	90	E3
Crelin Laboratory	30	B4	Watson Laboratories	95	C3-D3
Dabney Hall	40	D4	Winnett Center (Cafe/Bookstore/Ticket Offc)	51	D4
Dabney House	58	D4	Young Health and Counseling Center	8	C5

# General Information



## INTRODUCTION

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People who follow the news in science and engineering are often astonished the first time they see Caltech. Unadorned signs mark the borders of a campus that is just half a mile across. Inside, gardens, fountains, and café patios fill sunny spaces between historic buildings. The small, park-like campus comes as a surprise, given Caltech's record of world-changing discoveries and inventions and the luminaries educated here.

Behind the gracious old façades—and several striking contemporary ones—are some of the world's most advanced laboratories. In addition, faculty and students develop and use facilities around the world and in space. They founded NASA's Jet Propulsion Laboratory (JPL), which is administered by Caltech and is an integral partner in research. JPL enables the nation to explore space for the benefit of humankind by developing robotic space missions. Caltech also manages major collaborations such as a new Department of Energy research hub to work toward artificial photosynthesis and an observatory called LIGO that involves some 500 scientists worldwide in the effort to directly detect ripples in spacetime. Faculty and students design instruments and experiments on the world's particle accelerators, seismic networks, pollution-research aircraft, deep-ocean submersibles, and ground- and space-based observatories studying Earth, the planets, and the cosmos.

Caltech students and faculty pioneered the fields of molecular biology, geochemistry, aerospace, earthquake engineering, and astrophysics, to name just a few. They developed the principles of jet flight, key tenets of seismology (including the Richter scale), methodologies for integrated circuit design, empirical and laboratory approaches for economics and political science, and technology to view and study chemical reactions at the atomic level as they occur. They discovered fundamental building blocks of matter, the nature of chemical bonds, the specializations of the left and right brain hemispheres, the role played by chromosomes in heredity, the age of Earth, the origin of elements by reactions in stars, and the geometry of the universe.

The effect of Caltech's dedication to fundamental research combined with enabling technologies is evident in the more than 2,500 U.S. patents Caltech has obtained since 1980, outstripping other universities on a per capita basis. Forty to fifty Caltech inventions are commercially licensed each year. Since 1995, faculty and students have created more than 150 start-up companies. And these numbers—and the contributions to science and society mentioned above—do not touch on the accomplishments of alumni who have left Caltech for diverse careers around the world.

Caltech's history of achievement stems from the caliber of people who choose to come here and from their ready access to other superb scholars and to cutting-edge facilities. When undergradu-

ates arrive, they have the opportunity—sometimes for the first time in their lives—to discuss with passion exciting, challenging problems in science, math, and engineering with people who can respond in kind. Many work side by side with faculty in the labs before their first year is out. Together, faculty and students stretch themselves intellectually, moving ahead fast and sometimes leaving whole new fields in their wakes.

The following pages offer an overview of Caltech's aims and programs and a brief history of how it evolved into one of the world's major research institutions.

### **Mission, Educational Objectives, and Structure**

The mission of the California Institute of Technology (Caltech) 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.*

Caltech provides an outstanding education that prepares students to become world leaders in science, engineering, academia, business, and public service. The Institute aims for these educational outcomes:

- Graduates can analyze, synthesize, and communicate ideas.
- Graduates demonstrate integrity, personal and professional responsibility, and respect for others.
- Bachelor of Science graduates can identify, analyze, and solve challenging problems within and across science and engineering disciplines.
- Bachelor of Science graduates can apply their analytic skills to other areas of knowledge and understand issues important in our society.
- Master of Science graduates can apply advanced knowledge in a specialized area in preparation for their professional careers.
- Doctor of Philosophy graduates can independently identify, analyze, and solve fundamental research problems with breadth and depth.

Caltech is an independent, privately supported university. It has six academic divisions: Biology and Biological Engineering; Chemistry and Chemical Engineering, Engineering and Applied Science; Geological and Planetary Sciences; the Humanities and Social Sciences; and Physics, Mathematics and Astronomy.

### **Undergraduate Program**

Undergraduates earn Bachelor of Science (B.S.) degrees, with options (majors) available in applied and computational mathematics; applied physics; astrophysics; bioengineering; biology; business economics and management; chemical engineering; chemistry;

computer science; economics; electrical engineering; engineering and applied science; English; geobiology; geochemistry; geology; geophysics; history; history and philosophy of science; independent studies; mathematics; mechanical engineering; philosophy; physics; planetary science; and political science.

A Caltech education includes not just the depth of an option, but also breadth in the basic sciences, humanities, and social science. Required courses in biology, chemistry, humanities, mathematics, physics, and the social sciences expose students to diverse intellectual pursuits and help prepare students for the interdisciplinary nature of contemporary research in science and technology. Caltech has offered more than 275 humanities and social science courses, and most students take more than the number required. Students also take three or more terms of physical education, and 80 percent participate in an organized intramural/recreational competition each year—one of the highest participation rates in the country. Thirty percent participate in intercollegiate athletics.

Most students select an option near the end of their first year, begin to specialize during their second year, and concentrate on their chosen field in the third and fourth years. Some students participate in overseas programs at other major research universities in their junior or senior years. Throughout their education, students have opportunities to do hands-on research, and they often design their own faculty-mentored summer research projects (see SURF details on page 28). Premedical students may gain clinical experience via joint programs with four renowned hospitals.

Caltech offers students many academic options and opportunities for personal growth, and also offers unequalled training in rigorous thinking, scientific methodology, and creative problem solving. That training, the company of like minds, and Caltech's collaborative ethic prepare students to take leadership roles in research, academia, and industry, and to find lifelong satisfaction in their work and friendships.

To learn more, see [www.admissions.caltech.edu](http://www.admissions.caltech.edu).

## **Graduate Program**

Caltech offers graduate students rigorous research training and a strong, flexible curriculum of course work. Graduate students make up more than half of the student body.

Graduate options include aeronautics; applied and computational mathematics; applied mechanics; applied physics; astrophysics; behavioral and social neuroscience; biochemistry and molecular biophysics; bioengineering; biology; chemical engineering; chemistry; civil engineering; computation and neural systems; computer science; control and dynamical systems; electrical engineering; environmental science and engineering; geobiology; geochemistry; geology; geophysics; materials science; mathematics; mechanical engineering; medical engineering; neurobiology; physics; planetary science; social science; and space engineering.

Jointly engaged with faculty to complete innovative research at the forefront of each of these fields, graduate students sustain Caltech's atmosphere of intellectual curiosity and creative activity.

Caltech offers courses leading to the degree of Master of Science (M.S.), the degree of Engineer in certain fields, and the degree of Doctor of Philosophy (Ph.D.).

To learn more, see the Graduate Studies Office website.

### **Postdoctoral and Senior Postdoctoral Scholars\***

More than 500 early-career scientists and engineers conduct research at Caltech as postdoctoral scholars. In addition, the Jet Propulsion Laboratory (administered by Caltech) hosts postdoctoral scholars whose studies cover many aspects of earth, planetary, astrophysical, and technology research. All scholars work under the supervision of professorial faculty members or JPL researchers.

\* Information for newly appointed postdoctoral scholars is available through Human Resources ([www.hr.caltech.edu/postdoc](http://www.hr.caltech.edu/postdoc)) and the Caltech Postdoctoral Association ([www.cpa.caltech.edu](http://www.cpa.caltech.edu)). Upon arrival, scholars should call a postdoctoral-scholar specialist in HR (626-395-6586) to make appointments to activate their positions. In virtually all circumstances, postdoctoral scholars must have earned a doctorate from a duly accredited institution.

### **HISTORICAL SKETCH**

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The California Institute of Technology developed from a local manual-arts school established in Pasadena in 1891 by the Honorable Amos G. Throop. Initially founded as Throop University, it was later renamed Throop Polytechnic Institute. Known as the California Institute of Technology since 1920, it has long enjoyed the support of the citizens of Pasadena. As early as 1908, the Board of Trustees had as members Dr. Norman Bridge, Arthur H. Fleming, Henry M. Robinson, J. A. Culbertson, C. W. Gates, and Dr. George Ellery Hale. These men dedicated their time, their minds, and their fortunes to transforming a modest vocational school into a university capable of attracting to its faculty some of the world's most eminent scholars and scientists.

George Ellery Hale, astronomer and first director of the Mount Wilson Observatory, foresaw the development in Pasadena of a distinguished institution of engineering and scientific research. Hale knew that modern, well-equipped laboratories were essential to such an institution's development, but he stressed to his fellow trustees that the focus was to be on men, not machines. "We must not forget," he wrote in 1907, "that the greatest engineer is not the man who is trained merely to understand machines and apply formulas, but is the man who, while knowing these things, has not failed to develop his breadth of view and the highest qualities of his

imagination. No creative work, whether in engineering or in art, in literature or in science, has been the work of a man devoid of the imaginative faculty.”

The realization of these aims meant specializing, so the trustees decided in 1907 to discontinue the elementary school, the business school, the teacher-training program, and the high school, leaving only a college of science and technology that conferred Bachelor of Science degrees in electrical, mechanical, and civil engineering.

In 1910 Throop Polytechnic Institute moved from its crowded quarters in the center of Pasadena to a new campus of 22 acres on the southeastern edge of town, the gift of Arthur H. Fleming and his daughter Marjorie. The president, Dr. James A. B. Scherer, and his faculty of 16 members opened the doors to 31 students that September. When, on March 21, 1911, Theodore Roosevelt delivered an address at Throop Institute, he declared, “I want to see institutions like Throop turn out perhaps ninety-nine of every hundred students as men who are to do given pieces of industrial work better than any one else can do them; I want to see those men do the kind of work that is now being done on the Panama Canal and on the great irrigation projects in the interior of this country—and the one-hundredth man I want to see with the kind of cultural scientific training that will make him and his fellows the matrix out of which you can occasionally develop a man like your great astronomer, George Ellery Hale.”

It would have surprised Roosevelt to know that within a decade the little Institute, known from 1913 as Throop College of Technology, would have again set its sights higher, leaving to others the training of more efficient technicians and concentrating its own efforts on Roosevelt’s “hundredth man.” On November 29, 1921, the trustees declared it to be the express policy of the Institute to pursue scientific research of the greatest importance and at the same time “to continue to conduct thorough courses in engineering and pure science, basing the work of these courses on exceptionally strong instruction in the fundamental sciences of mathematics, physics, and chemistry; broadening and enriching the curriculum by a liberal amount of instruction in such subjects as English, history, and economics; and vitalizing all the work of the Institute by the infusion in generous measure of the spirit of research.”

Three men were responsible for the change in the Institute. George Ellery Hale still held to his dream. Arthur Amos Noyes, professor of physical chemistry and former acting president of the Massachusetts Institute of Technology, served part of each year from 1913 to 1919 as professor of general chemistry and as research associate; then, in 1919, he resigned from MIT to devote himself full-time to Throop as director of chemical research. In a similar way Robert Andrews Millikan began, in 1916–17, to spend a few months a year at Throop as director of physical research. Shortly after the school was renamed in 1920, Scherer resigned as president. In 1921, when Dr. Norman Bridge agreed to provide a

research laboratory in physics, Millikan resigned from the University of Chicago and became administrative head of the Institute as well as director of the Norman Bridge Laboratory.

The great period of the Institute's life began, then, under the guidance of three men of vision—Hale, Noyes, and Millikan. They were distinguished research scientists who soon attracted graduate students. In 1920 the enrollment was nine graduate students and 359 undergraduates with a faculty of 60; a decade later there were 138 graduate students, 510 undergraduates, and a faculty of 180. At the present time there are over 900 undergraduates, 1,200 graduate students, and some 300 professorial faculty and 700 postdoctoral scholars.

The Institute also attracted financial support from individuals, corporations, and foundations. In January 1920 the endowment had reached half a million dollars. In February of that year, it was announced that \$200,000 had been secured for research in chemistry and a like amount for research in physics. Other gifts followed from trustees and friends who could now feel pride in the Institute as well as hope for its future. The Southern California Edison Company provided a high-voltage laboratory with the million-volt Sorensen transformer. Philanthropic foundations bearing the names of Carnegie, Rockefeller, and Guggenheim came forth with needed help when new departments or projects were organized.

In 1923 Millikan received the Nobel Prize in Physics. He had attracted to the Institute such men as Charles Galton Darwin, Paul Epstein, and Richard C. Tolman. The first Ph.D. was awarded in 1920. In 1924, the degree was awarded to nine candidates.

It was inevitable that the Institute would expand upon its fields; it could not continue to be merely a research and instructional center in physics, chemistry, and engineering. But the trustees pursued a cautious and conservative policy, not undertaking to add new departments except when the work done in them would be at the same high level as that in physics and chemistry. In 1925 a gift of \$25,000 from the Carnegie Corporation of New York made possible the opening of a department of instruction and research in geology. A seismological laboratory was constructed, and Professors John P. Buwalda and Chester Stock came from the University of California to lead the work in the new division.

That same year, William Bennett Munro, chairman of the division of history, government, and economics at Harvard, joined the Institute faculty. Offerings in economics, history, and literature were added to the core of undergraduate instruction.

In 1928 Caltech began its program of research and instruction in biology. Thomas Hunt Morgan became the first chairman of the new Division of Biology and a member of Caltech's Executive Council. Under Morgan's direction, the work in biology developed rapidly, especially in genetics and biochemistry. Morgan received the Nobel Prize in 1933.

The Guggenheim Graduate School of Aeronautics was founded at Caltech in the summer of 1926, and a laboratory was built in

1929, but courses in theoretical aerodynamics had been given at the Institute for many years by professors Harry Bateman and Paul Epstein. As early as 1917, the Throop Institute had constructed a wind tunnel in which, the catalog boasted, constant velocities of 4 to 40 miles an hour could be maintained, “the controls being very sensitive.” The new program, under the leadership of Theodore von Kármán, included graduate study and research at the level of the other scientific work at the Institute, and what is now known as GALCIT (Graduate Aerospace Laboratories at the California Institute of Technology) was soon a world-famous research center in aeronautics.

In 1928, George Ellery Hale and his associates at the Mount Wilson Observatory developed a proposal for a 200-inch telescope and attracted the interest of the General Education Board of the Rockefeller Foundation in providing \$6 million for its construction. The board proposed that the gift be made, and Caltech agreed to be responsible for the construction and operation. The huge instrument was erected on Palomar Mountain and began operation in 1948. Teaching and research in astronomy and astrophysics thus became a part of the Caltech program.

From the summer of 1940 until 1945, Caltech devoted an increasingly large part of its personnel and facilities to furthering the national defense and war effort. Caltech’s work during this period fell mainly into two categories: special instructional programs and weapons research. The research and development work was carried out, for the most part, under nonprofit contracts with the Office of Scientific Research and Development. Rockets, jet propulsion, and antisubmarine warfare were the chief fields of endeavor. The Jet Propulsion Laboratory in the upper Arroyo Seco continues, under Institute management, to conduct a large-scale program of research for the National Aeronautics and Space Administration and other agencies in the science and technology of robotic space exploration.

In the 1950s, in response to the growing technological component, and complexity, of societal problems, the Institute began to expand the fields in which it had substantial expertise. In the late 1960s and early 1970s, the Institute added to its faculty several economists and political scientists who initiated theoretical and applied studies of interdisciplinary issues. A graduate program in social sciences was added in 1972. Caltech students could now engage their talents in the development of the basic scientific aspects of economics and political science, and begin to use the principles from these sciences together with those from the physical sciences to formulate and address public policies.

In 1945 Robert A. Millikan retired as chairman of the Executive Council, but he served as vice chairman of the Board of Trustees until his death in 1953. Dr. Lee A. DuBridgE became president of Caltech on September 1, 1946. Formerly chairman of the physics department and dean of the faculty at the University of Rochester, he came to the Institute after working for five years as wartime director of the MIT Radiation Laboratory—and remained for 22 years.

DuBridge was also committed to the concept of a small, select institution offering excellence in education. Facts and figures are only part of the story, but the statistical record of change during the DuBridge administration indicates how he held to that concept. The 30-acre campus of 1946 grew to 80 acres; the \$17 million endowment grew to more than \$100 million; the faculty of 260 became 550; the number of campus buildings increased from 20 to 64; and the budget went from something less than \$8 million to \$30 million. But enrollment remained relatively constant. In 1946 the total number of students, graduate and undergraduate, was 1,391. In 1968, the year DuBridge left, it was 1,492.

Dr. Harold Brown came to Caltech as president in 1969. A physicist who had received his Ph.D. from Columbia in 1949, he had succeeded Dr. Edward Teller as director of the University of California's Lawrence Radiation Laboratory in Livermore in 1960. President Lyndon Johnson named Brown Secretary of the Air Force in 1965, and he came to the Institute from that office. Six new campus buildings were dedicated under Brown's administration, and a major development campaign for \$130 million was under way when he resigned in 1977 to become Secretary of Defense under President Carter.

Dr. Marvin L. Goldberger was appointed president in 1978. He had received his B.S. at the Carnegie Institute of Technology (now Carnegie Mellon University) and his Ph.D. at the University of Chicago. He came to Caltech from Princeton University, where he was the Joseph Henry Professor of Physics. Among the major accomplishments of the Goldberger administration were the addition of three new laboratories, the acquisition of a \$70 million grant for construction of the W. M. Keck Observatory to house the world's most powerful optical telescope, and a \$50 million pledge for the establishment of the Beckman Institute. Goldberger resigned in 1987 to become director of the Institute for Advanced Study in Princeton, New Jersey.

In the fall of 1987, Dr. Thomas E. Everhart became president, coming to Caltech from his position as chancellor at the University of Illinois at Urbana-Champaign. Everhart graduated magna cum laude with an A.B. in physics from Harvard, received his M.Sc. in applied physics from UCLA, and earned a Ph.D. in engineering from Cambridge University. He had gained international recognition for his work in the development of electron microscopy, and he had also done research on electron beams as applied to the analysis and fabrication of semiconductors. Everhart retired as president in October 1997, but he retains a faculty position as emeritus professor of electrical engineering and applied physics. During his tenure in office, he oversaw construction of the Keck Observatory in Hawaii, the Moore Laboratory of Engineering, Avery House, the Braun Athletic Center, the Sherman Fairchild Library, and the Beckman Institute, and he directed the successful completion of a \$350 million campaign for Caltech.

In October 1997, Dr. David Baltimore assumed the presidency of the Institute. One of the world's leading biologists, he received the 1975 Nobel Prize for his work in virology. Previously the Ivan R. Cottrell Professor of Molecular Biology and Immunology at MIT and founding director of its Whitehead Institute for Biomedical Research, Baltimore had also served as president of Rockefeller University, where he earned his doctorate in 1964. He played a pivotal role in creating a consensus on national science policy regarding recombinant DNA research, served as chairman of the National Institutes of Health (NIH) AIDS Vaccine Research Committee, and in 1999 was awarded the National Medal of Science by President Clinton.

In late 2006, Baltimore stepped down from the Caltech presidency, returning to his research as the Institute's Millikan Professor of Biology. During his administration, he successfully completed a \$100 million campaign to support biological research, resulting in the construction of the Broad Center for the Biological Sciences. He also launched a \$1.4 billion comprehensive campaign. By the time he returned to his lab, the campaign was near completion: three new laboratories had been funded, and the Thirty-Meter Telescope had passed its conceptual design review phase.

Dr. Jean-Lou Chameau became Caltech's eighth president in September 2006. The former provost and vice president for academic affairs at the Georgia Institute of Technology, he was also a Georgia Research Alliance Eminent Scholar and the Hightower Professor, and he earlier served as dean of the Georgia Tech College of Engineering. Chameau, whose research interests have included sustainable technology, environmental geotechnology, soil dynamics, earthquake engineering, and liquefaction of soils, received his undergraduate education in France and his Ph.D. in civil engineering from Stanford University.

During his tenure at the Institute, Chameau oversaw the conclusion of the largest fund-raising campaign in Caltech's history, and the construction of the Cahill Center for Astronomy and Astrophysics, the Annenberg Center for Information Science and Technology, the Schlinger Laboratory for Chemistry and Chemical Engineering, the Linde + Robinson Laboratory for Global Environmental Science, and the Earle M. Jorgensen Laboratory. Known for his commitment to cross-disciplinary collaboration, Chameau placed strong emphasis on improving the educational experience at Caltech, increasing diversity, and fostering research, entrepreneurial, and international opportunities for faculty and students. Chameau left Caltech in June 2013 to become president of the King Abdullah University of Science and Technology in Thuwal, Saudi Arabia.

As Caltech has developed in effectiveness and prestige, it has attracted a steady flow of gifts for buildings, endowment, and current operations, in particular during the last campaign. In addition, substantial grants and contracts from the federal govern-

ment and private sources support many research activities.

Caltech has more than 22,000 living alumni all over the world, many of them eminent in their fields of engineering, science, law, medicine, academe, and entrepreneurship.

### Caltech Nobel Laureates

Robert A. Millikan	Physics	1923
Thomas Hunt Morgan	Physiology or Medicine	1933
Carl D. Anderson, B.S. '27, Ph.D. '30	Physics	1936
Edwin M. McMillan, B.S. '28, M.S. '29	Chemistry	1951
Linus Pauling, Ph.D. '25	Chemistry Peace Prize	1954 1962
William Shockley, B.S. '32	Physics	1956
George W. Beadle	Physiology or Medicine	1958
Donald A. Glaser, Ph.D. '50	Physics	1960
Rudolf Mössbauer	Physics	1961
Charles H. Townes, Ph.D. '39	Physics	1964
Richard Feynman	Physics	1965
Murray Gell-Mann	Physics	1969
Max Delbrück	Physiology or Medicine	1969
* David Baltimore	Physiology or Medicine	1975
Renato Dulbecco	Physiology or Medicine	1975
Leo James Rainwater, B.S. '39	Physics	1975
Howard M. Temin, Ph.D. '60	Physiology or Medicine	1975
William N. Lipscomb, Ph.D. '46	Chemistry	1976
Robert W. Wilson, Ph.D. '62	Physics	1978
Roger W. Sperry	Physiology or Medicine	1981
Kenneth G. Wilson, Ph.D. '61	Physics	1982
William A. Fowler, Ph.D. '36	Physics	1983
* Rudolph A. Marcus	Chemistry	1992
Edward B. Lewis, Ph.D. '42	Physiology or Medicine	1995
Douglas D. Osheroff, B.S. '67	Physics	1996
Robert C. Merton, M.S. '67	Economics	1997
* Ahmed H. Zewail	Chemistry	1999
Leland H. Hartwell, B.S. '61	Physiology or Medicine	2001
Vernon L. Smith, B.S. '49	Economics	2002
* Hugh David Politzer	Physics	2004
* Robert H. Grubbs	Chemistry	2005

\* *In residence*

## Caltech Crafoord Laureates

* Gerald J. Wasserburg	Geochemistry	1986
Allan R. Sandage, Ph.D. '53	Astronomy	1991
Seymour Benzer	Biosciences	1993
* Don L. Anderson, M.S. '58, Ph.D. '62	Geosciences	1998
James E. Gunn, Ph.D. '66	Astronomy	2005

\* *In residence*

## BUILDINGS AND FACILITIES

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### On-Campus Buildings

**Gates and Crellin Laboratories of Chemistry:** first unit, 1917; second unit, 1927; third unit, 1937. The first two units were the gifts of Messrs. C. W. Gates and P. G. Gates of Pasadena; the third unit was the gift of Mr. and Mrs. E. W. Crellin of Pasadena. Gates (first unit), which was retired after suffering extensive damage in the 1971 earthquake, was rebuilt in 1983 as the Parsons-Gates Hall of Administration. **The Arnold and Mabel Beckman Laboratory of Chemical Synthesis,** 1986, occupying portions of Crellin Laboratory (as well as portions of Church Laboratory for Chemical Biology), was built with funds provided by the Arnold and Mabel Beckman Foundation.

**Norman Bridge Laboratory of Physics:** first unit, 1922; second unit, 1924; third unit, 1925. The gift of Dr. Norman Bridge of Los Angeles, president of the Board of Trustees, 1896–1917.

**High Voltage Research Laboratory,** 1923. Built with funds provided by the Southern California Edison Company. Retired in 1959 with basic research completed and rebuilt in 1960 as the Alfred P. Sloan Laboratory of Mathematics and Physics.

**Dabney Hall,** 1928. The gift of Mr. and Mrs. Joseph B. Dabney of Los Angeles. A major renovation completed in 2004 was made possible by gifts from alumnus Capt. Tyler Matthew; alumnus Roger Davisson and his wife, Marjorie; alumnus William F. Horton and his wife, Glenna Berry-Horton; a distribution from the estate of alumnus George F. Smith; and a collective gift by the Caltech Associates.

**William G. Kerckhoff Laboratories of the Biological Sciences:** first unit, 1928; second unit, 1939; annex, 1948. The gift of Mr. and Mrs. William G. Kerckhoff of Los Angeles. He was a trustee in 1928.

**Guggenheim Aeronautical Laboratory, 1929.** Built with funds provided by the Daniel Guggenheim Fund for the Promotion of Aeronautics. A major renovation completed in 2008 was made possible by many private supporters, including Distinguished Alumnus Joe Charyk and his wife, Edwina; Distinguished Alumnus Allen Puckett and his wife, Marilyn; and alumnus Gordon Cann, through his estate.

**Athenaeum, 1930.** A clubhouse for the teaching, research, and administrative staffs of the Institute and the Huntington Library, Art Collections, and Botanical Gardens, for the Associates of the California Institute of Technology, and for others who have demonstrated their interest in advancing the objectives of the Institute. The gift of Mr. and Mrs. Allan C. Balch of Los Angeles. He was president of the Board of Trustees, 1933–43.

**Undergraduate Houses, 1931.** With the support of many individuals, including alumni Alexander Lidow, Richard Beatty, and Ray Sidney, these houses were restored. They reopened in 2007.

*Blacker House.* The gift of Mr. and Mrs. R. R. Blacker of Pasadena.

*Dabney House.* The gift of Mr. and Mrs. Joseph B. Dabney of Los Angeles.

*Fleming House.* Built with funds provided by some 20 donors and named in honor of Mr. Arthur H. Fleming of Pasadena, president of the Board of Trustees, 1917–33.

*Ricketts House.* The gift of Dr. and Mrs. Louis D. Ricketts of Pasadena.

**W. K. Kellogg Radiation Laboratory, 1932.** The gift of Mr. W. K. Kellogg of Battle Creek, Michigan.

**Linde + Robinson Laboratory for Global Environmental Science, 1932 and 2011.** The former Henry M. Robinson Laboratory of Astrophysics (1932) was built with funds provided by the International Education Board and the General Education Board, and named in honor of Mr. Henry M. Robinson of Pasadena, member of the Board of Trustees, 1907–37, and of the Executive Council of the Institute. An extensive renovation transformed the building into the Linde + Robinson Laboratory for Global Environmental Science (2011), renamed in honor of a contribution by Vice Chair of the Board of Trustees and alumnus Ronald K. Linde and his wife, Maxine.

**Charles Arms Laboratory of the Geological Sciences, 1938.** The gift of Mr. and Mrs. Henry M. Robinson of Pasadena, in memory of Mrs. Robinson's father, Mr. Charles Arms.

**Seeley W. Mudd Laboratory of the Geological Sciences, 1938.** The gift of Mrs. Seeley W. Mudd of Los Angeles, in memory of

her husband.

**Franklin Thomas Laboratory of Engineering:** first unit, 1945; second unit, 1950. Funds for the first unit were allocated from the Eudora Hull Spalding Trust with the approval of Mr. Keith Spalding, trustee. Named in honor of Dean Franklin Thomas, professor of civil engineering and first chair of the Division of Engineering, 1924–45.

**Alumni Swimming Pool,** 1954. Provided by the Alumni Fund through contributions from the alumni of the Institute.

**Scott Brown Gymnasium,** 1954. Built with funds provided by the trust established by Mr. Scott Brown of Pasadena and Chicago, who was a member and director of the Caltech Associates.

**Norman W. Church Laboratory for Chemical Biology,** 1955. Built with funds provided through a gift and bequest by Mr. Norman W. Church of Los Angeles, who was a member of the Caltech Associates.

**Eudora Hull Spalding Laboratory of Engineering,** 1957. Built with funds allocated from the Eudora Hull Spalding Trust.

**Archibald Young Health Center,** 1957. The gift of Mrs. Archibald Young of Pasadena, in memory of her husband, who was a life member and officer of the Caltech Associates, 1926–56.

**Physical Plant Building and Shops,** 1959. Built with funds provided by many donors.

**Gordon A. Alles Laboratory for Molecular Biology,** 1960. Built with the gift of Dr. Gordon A. Alles of Pasadena, an Institute research associate in biology, an alumnus, and a member of the Caltech Associates, 1947–63; and with funds provided by the National Institutes of Health, Health Research Facilities Branch.

**Undergraduate Houses,** 1960. Built with funds provided by the Lloyd Foundation and other donors.

*Lloyd House.* Named in memory of Mr. Ralph B. Lloyd and his wife, Mrs. Lulu Hull Lloyd, of Beverly Hills. He was a member of the Board of Trustees, 1939–52.

*Page House.* Named in honor of Mr. James R. Page of Los Angeles, a member of the Board of Trustees, 1931–62, and chairman, 1943–54.

*Ruddock House.* Named in honor of Mr. Albert B. Ruddock of Santa Barbara, a member of the Board of Trustees, 1938–71, and chairman, 1954–61.

**Harry Chandler Dining Hall,** 1960. The gift of the Chandler family, the Pfaffinger Foundation, and the Times Mirror Company of Los Angeles.

**W. M. Keck Engineering Laboratories**, 1960. The gift of the W. M. Keck Foundation and the Superior Oil Company of Los Angeles.

**Alfred P. Sloan Laboratory of Mathematics and Physics**, 1960. Formerly the High Voltage Research Laboratory, 1923. Rebuilt in 1960 with funds provided by the Alfred P. Sloan Foundation.

**Graduate Houses**, 1961:

*Braun House*. Built with funds provided by the trustees of the Carl F Braun Trust Estate, in his memory.

*Marks House*. The gift of Dr. David X. Marks of Los Angeles.

**Kármán Laboratory of Fluid Mechanics and Jet Propulsion**, 1961. The gift of the Aerojet-General Corporation, named in honor of Dr. Theodore von Kármán, professor of aeronautics at the Institute, 1929–49.

**Firestone Flight Sciences Laboratory**, 1962. The gift of the Firestone Tire and Rubber Company.

**Winnett Student Center**, 1962. The gift of Mr. P. G. Winnett of Los Angeles, a member of the Board of Trustees, 1939–68. Winnett houses the Caltech Store, the Red Door Café, and Caltech Wired.

**Beckman Auditorium**, 1964. The gift of Dr. Arnold O. and Mabel Beckman of Corona del Mar. The late Dr. Beckman, an alumnus, was an Institute faculty member from 1928 to 1939. He joined the Board of Trustees in 1953, was chairman, 1964–74, and was chairman emeritus until his death in 2004.

**Harry G. Steele Laboratory of Electrical Sciences**, 1965. Built with funds provided by the Harry G. Steele Foundation and the National Science Foundation.

**Central Engineering Services Building**, 1966.

**Robert A. Millikan Memorial Library**, 1967. Built with a gift from Dr. Seeley G. Mudd and named in honor of Dr. Robert Andrews Millikan, director of the Bridge Laboratory of Physics and chair of the Executive Council of the Institute, 1921–45.

**Arthur Amos Noyes Laboratory of Chemical Physics**, 1967. Built with funds provided by the National Science Foundation and Mr. Chester F. Carlson, an alumnus, and named in honor of Dr. Arthur Amos Noyes, director of the Gates and Crellin Laboratories of Chemistry and chair of the Division of Chemistry and Chemical Engineering, 1919–36.

**Central Plant**, 1967.

**George W. Downs Laboratory of Physics and Charles C. Lauritsen Laboratory of High Energy Physics**, 1969. The Downs wing was built with funds provided by Mr. George W. Downs and the National Science Foundation. The Lauritsen wing was built with Atomic Energy Commission funds and named in honor of Dr. Charles C. Lauritsen, a member of the Institute faculty, 1930–68.

**Keith Spalding Building of Business Services**, 1969. Named in honor of Mr. Keith Spalding, Caltech trustee, 1942–61.

**Donald E. Baxter, M.D., Hall of the Humanities and Social Sciences**, 1971. Built with funds provided by Mrs. Delia B. Baxter of Atherton and named in honor of her late husband, Donald E. Baxter, M.D. Additional funds were given by the U.S. Department of Health, Education and Welfare. Dr. and Mrs. Simon Ramo provided funds for the completion of **Ramo Auditorium** within the hall. Dr. Ramo is a life member of the Board of Trustees.

**The Earle M. Jorgensen Laboratory of Information Science**, 1971. Built with the gift of Mr. and Mrs. Earle M. Jorgensen, with additional funds provided by the Booth-Ferris Foundation and other private donors. Mr. Jorgensen was a member of the Board of Trustees, 1957–99. A full remodeling of the building was completed in June 2012 through funding provided by the Joint Center for Artificial Photosynthesis/Department of Energy, Lynda and Stewart Resnick through the Resnick Sustainability Institute, Gordon and Betty Moore and the Gordon & Betty Moore Foundation, the Ahmanson Foundation, and the Provost's Office.

**The Mabel and Arnold Beckman Laboratories of Behavioral Biology**, 1974. The gift of Dr. Arnold O. and Mabel Beckman of Corona del Mar. The late Dr. Beckman was chairman emeritus of the Board of Trustees.

**Seeley G. Mudd Building of Geophysics and Planetary Science**, 1974. Built with funds provided by Dr. Seeley G. Mudd, Mrs. Roland Lindhurst, Mr. and Mrs. Ross McCollum, Mr. and Mrs. Henry Salvatori, and the U.S. Department of Health, Education, and Welfare.

**Clifford S. and Ruth A. Mead Memorial Undergraduate Chemistry Laboratory**, 1981. Built with funds allocated from the Clifford S. and Ruth A. Mead Memorial Building Fund.

**Thomas J. Watson, Sr., Laboratories of Applied Physics**, 1982. Built with funds provided by the Watson family and other private donors. Thomas J. Watson, Jr., was a member of the Board of Trustees, 1961–92.

**Braun Laboratories in Memory of Carl F and Winifred H Braun**, 1982. Built with funds provided by the Braun family, other private donors, and the National Cancer Institute. Various members of the Braun family have served on Caltech's Board of Trustees.

**Parsons-Gates Hall of Administration**, 1983. Formerly Gates Laboratory of Chemistry, 1917. Rebuilt in 1983 with funds provided by the Ralph M. Parsons Foundation and the James Irvine Foundation.

**Athletic Facility**, 1984. Built with funds provided by the Carl F Braun Trust and the Braun Foundation.

**Catalina Graduate Apartment Complex**, 1984, 1986, 1988. Four of the buildings have been named for Max and Ruth Alcorn, Frank and Elizabeth Gilloon, Fred and Marvis Maloney, and William C. and Verna Rockefeller, honoring their generosity to Caltech.

**Infrared Processing and Analysis Center**, 1986. Renamed the **David W. Morrisroe Astroscience Laboratory**, 1995. Second-floor addition built with funds provided by the late Dr. Arnold O. Beckman, chairman emeritus of the Board of Trustees.

**Wilson Avenue North Parking Structure**, 1987.

**Beckman Institute**, 1989. Built with funds provided by the Arnold and Mabel Beckman Foundation and other private donors. The late Dr. Arnold O. Beckman was chairman emeritus of the Board of Trustees.

**Braun Athletic Center**, 1992. Built with funds provided by the Braun family.

**Holliston Avenue Parking Structure/Satellite Utility Plant**, 1993.

**The Gordon and Betty Moore Laboratory of Engineering**, 1996. Built with funds provided by Dr. and Mrs. Gordon Moore. Dr. Moore is an alumnus, and a chairman emeritus of the Board of Trustees. Betty Moore is an honorary life trustee.

**Avery House**, 1996. Built with funds provided by Mr. R. Stanton Avery, who was a member of the Board of Trustees from 1971 until his death in 1997. He had been chairman, 1974–85, and chairman emeritus since 1986.

**Sherman Fairchild Library of Engineering and Applied Science**, 1997. Built with funds provided by the Sherman Fairchild Foundation.

**Space Infrared Telescope Facility Science Center**, 1998. Renamed the **Spitzer Space Telescope Science Center**, 2003. Located within the **Keith Spalding Building of Business Services**.

**Powell-Booth Laboratory for Computational Science**, 1999. Formerly the Willis H. Booth Computing Center, 1963, constructed with support from the Booth-Ferris Foundation and the National Science Foundation. Renovated in 1999 with grants from the Charles Lee Powell Foundation, the National Science Foundation, and the Booth-Ferris Foundation.

**Wilson Avenue South Parking Structure**, 1999.

**Center for Student Services, the Keck Wing**, 2000. Originally the Keck Graduate House, built with funds provided by the William M. Keck, Jr., Foundation, 1961.

**Center for Student Services, the Mosher-Jorgensen Wing**, 2002. Originally the Mosher-Jorgensen Graduate House, built with funds provided by Mr. Samuel B. Mosher and Mr. Earle M. Jorgensen, both of Los Angeles. Mr. Jorgensen was a member of the Board of Trustees, 1957–99.

**Financial Services Building**, 2000.

**Broad Center for the Biological Sciences**, 2002. Made possible by a lead gift from Eli and Edythe Broad. Eli Broad is a member of the Board of Trustees.

**California Parking Structure**, 2005.

**Cahill Center for Astronomy and Astrophysics**, 2009. Made possible by a lead gift from Charles Cahill in honor of his late wife, Aníko Dér Cahill, and by gifts from trustee and alumnus Fred Hameetman and his wife, Joyce, alumnus Michael Scott, and other private individuals and foundations.

**Walter and Leonore Annenberg Center for Information Science and Technology**, 2009. Built with a lead gift from the Annenberg Foundation and with funds provided by Life Trustee Stephen Bechtel, Jr., and other private donors.

**Warren and Katharine Schlinger Laboratory for Chemistry and Chemical Engineering**, 2010. Built with funds provided by alumnus Warren Schlinger and his wife, Katharine, a former Caltech employee, along with other private donors.

## **Off-Campus Facilities**

**William G. Kerckhoff Marine Biological Laboratory**, 1930, Corona del Mar. Rehabilitated with funds provided by the National Science Foundation in 1966.

**Jet Propulsion Laboratory (JPL)**, 1944, 4800 Oak Grove Drive, Pasadena. Administered by the Institute; owned and supported by the National Aeronautics and Space Administration.

**Palomar Observatory**, 1948, San Diego County. Site of the 200-inch Hale Telescope (1948) and the 48-inch Schmidt telescope (1949), built by the Institute with funds from the Rockefeller Foundation. The Schmidt was named the Samuel Oschin Telescope in 1987 in honor of benefactor Samuel Oschin of Los Angeles.

**Owens Valley Radio Observatory**, 1958, Big Pine. Built with funds provided by the Winnett Foundation, the Office of Naval Research, the National Science Foundation, and the Oscar G. and Elsa S. Mayer Charitable Trust.

**Big Bear Solar Observatory**, 1969, Big Bear Lake. Built with funds provided by the National Science Foundation and the Max C. Fleischmann Foundation of Nevada. (Operated by the New Jersey Institute of Technology.)

**Caltech Submillimeter Observatory (CSO)**, 1986, Mauna Kea, Hawaii. Built with funds provided by the National Science Foundation and the Kresge Foundation.

**W. M. Keck Observatory**, Keck I (1991), Keck II (1996); Mauna Kea, Hawaii. Built with funds provided by the W. M. Keck Foundation. Site of the two 10-meter Keck Telescopes.

**Georgina and William Gimbel Building, Caltech Submillimeter Observatory**, 1996, Hilo, Hawaii. Built with funds provided by Mr. and Mrs. William Gimbel, members of the Caltech Associates.

**Laser Interferometer Gravitational-Wave Observatory (LIGO)**, 1999, Hanford, Washington, and Livingston, Louisiana. Built with funds provided by the National Science Foundation.

## **Beckman Institute**

Opening its doors in 1990, the Beckman Institute has been a major addition to Caltech. The mission of the scientists working there is to invent new methods, materials, and instrumentation for fundamental research in biology and chemistry that will open the way for novel applications of scientific discoveries to human needs.

## Center for Advanced Computing Research

The mission of the Center for Advanced Computing Research (CACR) is to ensure that Caltech is at the forefront of computational science and engineering (CSE). CSE is the practice of computer-based modeling, simulation, and data analysis for the study of scientific phenomena and engineering designs. Computer modeling and simulation make it possible to investigate regimes that are beyond current experimental capabilities and to study phenomena that cannot be replicated in laboratories, such as the evolution of the universe. The results often suggest new experiments and theories. Computation is also essential for processing the flood of high-dimensional data generated by modern instruments.

CACR provides an environment that cultivates multidisciplinary collaborations. CACR researchers take an applications-driven approach and currently work with Caltech research groups in aerospace engineering, applied mathematics, astronomy, biology, engineering, geophysics, materials science, and physics. The center's staff have expertise in data-intensive scientific discovery, physics-based simulation, scientific software engineering, visualization techniques, novel computer architectures, and the design and operation of large-scale computing facilities. CACR also administers Caltech's Predictive Science Academic Alliance Center, and Caltech's efforts for the Virtual Astronomical Observatory. For more information, visit <http://www.cacr.caltech.edu>.

## Libraries

Caltech Library (CL) consists of several locations from which staff provides a high level of information service support to facilitate the research and educational programs of the Institute. The Library's policies and many resources are accessible from the CL website at <http://library.caltech.edu>

CL operates out of five locations:

1. The Astrophysics Library in Cahill (CAH).
2. Dabney Library of the Humanities (DAB) contains literature, art, philosophy, European history, Asian history, and ancient history monographs, as well as an audio CD collection.
3. The Geology and Planetary Science Library (GEO) in North Mudd includes an extensive map collection.
4. Millikan Library (MIL) houses collections in social science, humanities journals, art and music, as well as overflow collections in geology and astronomy.
5. The Sherman Fairchild Library (SFL) supports aerospace, chemical, environmental, and mechanical engineering, applied physics and applied mathematics, plus biology, chemistry, math and physics. SFL is the site of several group study rooms and is open 24/7.

CL subscribes to over 27,000 journals and holds over 725,000 print volumes. It has extensive collections of technical reports and maps. The library catalog, CLAS (<http://clas.caltech.edu>), includes

records of print and electronic materials, and active links to eBooks and eJournals. Special services include document delivery and inter-library loan through DocuServe (<http://docuserve.library.caltech.edu>). Caltech CODA (Collection of Open Digital Archives) contains a record of the scholarly output of the Institute, including technical report collections and the Institute's archives of online theses.

### *Archives and Special Collections*

The Archives and Special Collections preserve and make accessible the institutional records, personal papers, oral histories, documents, photographs, historic apparatus, and audiovisual media that tell Caltech's history. Unique research collections in the history of science and technology, including rare books, manuscripts, and artifacts, are available to the campus community for instructional and research purposes, as well as to qualified non-campus users by appointment. All users are requested to phone ahead to be sure of staff assistance.

The Archives and Special Collections reading room is open to users Monday through Friday, 8:30 a.m. to 4 p.m., with a one-hour lunch recess from 12 p.m. to 1 p.m. A collection overview and other pertinent information is available at the Archives website, <http://www.archives.caltech.edu>.

## **UNDERGRADUATE RESEARCH**

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The Institute offers the opportunity for qualified students to engage in research early in their careers under the supervision of a faculty member. There are four principal avenues for undergraduate research: the senior thesis, the Summer Undergraduate Research Fellowships (SURF) program, research courses for academic credit, and research for pay under a faculty member's grant or contract. Students may combine these options but may not receive both pay and credit at the same time for the same piece of work.

The senior thesis involves original research under the mentorship of a faculty member, then documenting the methodology and accomplishments in scholarly form, and finally oral presentation of the results to an examination committee. This integrated effort develops research, writing, and presentation skills that together provide an excellent preparation for future graduate studies and/or professional life. Since senior thesis requirements vary by option, individual option representatives should be consulted.

The Summer Undergraduate Research Fellowships (SURF) program provides continuing undergraduate students the opportunity to work on an individual research project in a tutorial relationship with a mentor, usually a member of the Caltech/JPL research community, but occasionally a faculty member at another college or university. Students write research proposals in collaboration with their mentors. Proposals and recommendations are reviewed

by the SURF administrative committee, and awards are made on the basis of reviewer recommendation and available funding. The work is carried out during a 10-week period in the summer. Students may attend weekly seminars presented by members of the Caltech faculty and JPL technical staff and may participate in professional development workshops. At the conclusion of the summer, SURFers submit a written report describing the project, methods, and results of their work. On the third Saturday of October, students make oral presentations of their projects at SURF Seminar Day. About 20 percent of the students publish their work in the open scientific literature. In 2013, SURF students received awards of \$6,000. Applications are available online at <http://www.surf.caltech.edu> and are due in mid-February. Awards are announced in early April. To be eligible, students must be continuing undergraduates and have a cumulative GPA of at least 2.0. Students must complete the third quarter at Caltech (or at another school under a program approved by a dean). Students must be eligible for fall term registration as of the end of the June Undergraduate Academic Standards and Honors (UASH) Committee reinstatement meeting and must not be on medical leave or under disciplinary sanction. For further information regarding this program, contact the Student-Faculty Programs Office, 330 Center for Student Services, (626) 395-2885, [sfp@caltech.edu](mailto:sfp@caltech.edu). Visit the Student-Faculty Programs website at <http://www.sfp.caltech.edu>.

Most options also offer undergraduate research courses in order to encourage research participation; students should consult listings and descriptions of opportunities. Students registering for a research course during the summer do not have to pay tuition.

## STUDENT LIFE

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### *Undergraduate Student Houses*

Seven of the eight undergraduate student houses are situated on both sides of the Olive Walk near the southeastern end of the campus. The original four—Blacker, Dabney, Fleming, and Ricketts—were built in 1931 from the plans of Mr. Gordon B. Kaufmann, in the Mediterranean style to harmonize with the adjacent Athenaeum. The other three, designed by Smith, Powell and Morgridge, were completed in 1960, and are named Lloyd, Page, and Ruddock.

Each of the houses is a separate unit with its own dining room and lounge, providing accommodations for between 65 and 100 students, depending on the house. Each has its own elected officers; a long history of self-governance gives students a great deal of influence over their living environments. There are four Residential Life Coordinators (RLCs) in campus housing, situated in different

houses. An RLC is a specially trained full-time university employee, specializing in college student development, community building, counseling, and crisis intervention. The RLCs work with the Resident Associates (RAs) on programming and overall student wellness. The RLCs also assist Housing with the management and daily operations of the houses. Each house has one or more Resident Associates, who are typically graduate students.

In addition to the student houses, the Institute maintains three apartment buildings, Marks/Braun House, and a number of off-campus houses. Typically two or three students share an apartment. Depending upon size, the off-campus houses have a capacity of four to ten students. These residences are all within a short walk of the campus and offer students greater privacy, a different lifestyle, and the opportunity to prepare their own meals.

Application for rooms in student housing are made through Institute Housing, Mail Code 160-86, California Institute of Technology, Pasadena, CA 91125, or at <http://www.housing.caltech.edu>.

Mail is delivered daily to the student mailboxes. Students should use their mailbox number, California Institute of Technology, Pasadena, CA 91126, to facilitate handling of mail at the campus post office.

#### *Avery House*

Made possible by a gift from trustee R. Stanton Avery, this innovative residential complex was designed by Moore, Ruble, Yudell and completed in September 1996. Located at the north end of the campus, Avery House has a Residential Life Coordinator, two Resident Associates, two faculty apartments and rooms for about 136 undergraduates. Its dining facilities, meeting rooms, lounges, and library are designed to encourage informal faculty-student interaction and to attract all members of the campus community to join in this interaction. Avery House hosts programs and social events that facilitate involvement between residents, and faculty in residence.

#### *The Student Activities Center*

The SAC is located in the basement of the south undergraduate housing complex and is open for student use 24 hours a day. The SAC provides office space for the officers of the undergraduate student government, working space for student publications, rehearsal space for musical activities, and space for many other student-oriented functions.

Whether students are interested in music, publications, student government, gaming, photography, or simply finding a room for their group to meet in, the SAC will probably have what is needed. The center also houses the South House laundry room and has several club rooms, a small library, a shop, and a movie screening room—most are open 24 hours.

### *Faculty-Student Relations*

Faculty-student coordination and cooperation with regard to campus affairs are secured through the presence of students on faculty committees, by faculty-student conferences, and by other mechanisms.

### *Freshman Advisers*

Each member of the freshman class is assigned a faculty adviser. The adviser follows the freshman's progress and provides advice on any questions or problems that the freshman may have.

### *Option Advisers*

Each member of the three undergraduate upper classes is assigned an option adviser, a faculty member in the option in which the student is enrolled. The adviser takes an interest in the student's selection of courses and progress toward a degree, and, eventually, in assisting the student toward satisfactory placement in industry or in graduate school. Normally, the association between student and adviser is established before the beginning of the sophomore year and continues through graduation.

### *Athletics, Physical Education & Recreation (APER)*

Caltech supports an extensive program of competitive athletics. As a member of NCAA Division III and the Southern California Intercollegiate Athletic Conference, Caltech carries out intercollegiate competition in nine men's sports and eight women's sports, against teams from Chapman, Claremont-Mudd-Scripps, LaVerne, Occidental, Pomona-Pitzer, Cal Lutheran, Redlands, and Whittier. Individual athletes and teams who distinguish themselves in conference competition earn the privilege of participating in NCAA regional and national championships.

Caltech also sponsors vigorous club sports programs and intramural competition. Club sports include ultimate Frisbee and soccer. Intramural competition consists of residence house teams battling for championships (and bragging rights) in soccer, dodgeball, ultimate Frisbee, basketball, volleyball, and kickball and floorball. Twenty-five percent of Caltech undergraduates participate in intercollegiate athletics, and over 80 percent participate in some form of organized athletic competition each year.

Outdoor athletic facilities include an all-weather running track, a soccer field, a baseball diamond, eight tennis courts, and two 25-yard swimming pools. Indoor facilities include two full-size gymnasiums for basketball, volleyball, and badminton; four racquetball courts; two squash courts; a 5,000-square-foot weight room; and a large multipurpose room for dance/aerobics, fencing, and martial arts.

### *Interhouse Activities*

The president of each undergraduate house represents that house on the Interhouse Committee (IHC). The IHC exists to ensure that conflicts between houses do not develop and to deal with matters that affect the houses in general.

In conjunction with the athletics department, the IHC conducts two intramural sports programs: the Interhouse and Discobolus trophy competitions. (These are described above under *Athletics*.)

### *ASCIT*

The undergraduate student body forms the membership of a corporation known as the Associated Students of the California Institute of Technology, Inc., or ASCIT. Governed by a board of directors consisting of nine elected officers, it is involved in many aspects of student life, overseeing publication of the student newspaper, a directory, the yearbook, a research-opportunities handbook, a course review, and a literary magazine.

Besides overseeing many student publications and coordinating activities and policies, the ASCIT Board of Directors administers the corporation's finances. ASCIT sponsors a wide variety of special-interest clubs and programs, such as the student shop and the Students for the Exploration and Development of Space (SEDS).

The student government is active in campus affairs. The student members of each standing faculty committee ensure that undergraduate opinion is considered seriously. Excellent informal relations between students and faculty and between students and administration promote discussion of mutual concern and goodwill. Student-faculty conferences are held every other year and serve a very useful purpose to promote cooperation and communication.

### *Graduate Student Council*

The Graduate Student Council (GSC) is the governing body for all graduate students at Caltech. The GSC provides funding for student clubs, publishes newsletters, and organizes and subsidizes various campus events and programs. For example, the GSC sponsors events for new students, hosts a graduate student formal, honors teaching and mentoring at Caltech and helps facilitate the Everhart Lecture Series, a series of lectures for outstanding graduate student researchers and presenters. If you are interested in getting involved with, or contacting the GSC, please check the Graduate Student Council website.

### *Honor System*

The Honor System, embodied in the phrase "No member shall take unfair advantage of any other member of the Caltech community," is the fundamental principle of conduct for all students, and extends to all phases of campus life, including scholastic and extracurricular activities, relations among students, and relations between students and faculty. The Honor System is the most important tradition of the student body, which accepts full responsibility for its operation. The Board of Control, which is composed of elected student representatives, is charged with monitoring the Honor System for undergraduates and investigating course work violations. The Conduct Review Committee, composed of students, faculty, and staff, also

considers cases involving the Honor System and Institute policies for undergraduate students. *The Dean of Undergraduate Students, or his designee, also considers cases involving the Honor System and Institute Policies for undergraduate students.* The Graduate Honor Council (GHC) is charged with investigating coursework violations for graduate students. The Dean of Graduate Studies, or his designee, also considers cases involving the Honor System and Institute Policies for graduate students. Suspected violations are reported to the appropriate board or office, which conducts investigations and hearings with strict confidentiality. If necessary, recommendations for actions are made to the appropriate person.

#### *Student Body Publications*

The publications of the student body include a weekly paper, *The California Tech*; an undergraduate research journal, *CURJ*; a literary magazine, *The Totem*; a student handbook, *the little t*, which gives a survey of student activities and organizations and serves as a campus directory; a yearbook, *The Big T*; an annual review of the quality of teaching in the various courses, *The Clue*; and an undergraduate research opportunities handbook, *UROH*. These publications, staffed entirely by students, provide an opportunity for interested students to obtain valuable experience in creative writing, photography, artwork, reporting and editing, advertising, and business management.

#### *Performing and Visual Arts*

The Institute provides directors and facilities for various choral music groups, a concert band, a jazz band, a symphony orchestra (jointly with Occidental College), numerous chamber music ensembles, guitar classes, a theater program, and a variety of art classes. These activities are centered in the Music and Theater Arts houses on Hill Avenue along the eastern edge of campus. Performances are held mainly in Dabney Lounge and Ramo Auditorium.

#### *Student Societies and Clubs*

The Institute has more than 90 societies and clubs covering a wide range of interests. The American Chemical Society, the American Institute of Chemical Engineers, the American Society of Mechanical Engineers, and the Society of Women Engineers all maintain active student branches. There is a chapter of the National Society of Black Engineers, and the Caltech Latino Association of Students in Engineering and Science is a chapter of the Society of Hispanic Engineers.

The Institute has a chapter (California Beta) of Tau Beta Pi, the national scholarship honor society of engineering colleges. Each year the Tau Beta Pi chapter elects to membership students from the highest-ranking eighth of the junior class and the highest fifth of the senior class.

Special interests and hobbies are provided for by a broad and constantly changing spectrum of clubs, some informal but most formally recognized by Caltech through either ASCIT or the Graduate Student Council.

### *Student Shop*

The student shop is housed in the Physical Plant complex. It is equipped by the Institute, largely through donations, and is operated by the students. Here qualified students may work on private projects that require tools and equipment not otherwise available. All students are eligible to apply for membership in the student shop; applications are acted on by a governing committee of students. Members not proficient in power tools are limited to hand tools and bench work. Instruction in power tools is given as needed. Yearly dues are collected to provide for maintenance and replacement.

### *The Caltech Y*

The Caltech Y is a unique nonprofit organization on campus. Founded by students for students, the Y challenges the Caltech community to see the world with a broader perspective and a deeper understanding of social issues. Through community service projects, outdoor adventures, social activities, and cultural events, the Y encourages students to become active participants during their years here. The Caltech Y helps students plan events, meetings, and initiatives on campus and provides the resources and equipment needed for successful programs. Some of the many Y-sponsored activities include the Y hike in the California Sierras, Alternative Spring Break, Make-a-Difference-Day, World Fest, the Social Activism Speaker Series, and the D.C. Science Policy Trip. The Y also provides services to the Caltech community, such as low-cost rentals on camping equipment, discounted tickets, and much more.

### *Religious Life*

In addition to several groups active on campus, such as the Caltech Christian Fellowship, the Newman Center, and Hillel, houses of worship of many different denominations are within walking distance or are only a short drive from campus.

### *Public Events*

Beckman and Ramo Auditoriums serve as the home of the professional performing arts program on the Caltech campus. Each year, more than 50 lectures, outreach programs, performing arts events, and films are presented at Caltech. Tickets, often with discounts available, are offered to Caltech students for all events in Beckman and Ramo Auditoriums.

### *Caltech Store*

The Caltech Store is located on the ground floor of the Winnett Student Center. Owned and operated by the Institute, the store

### *General Information*

serves the students, faculty, and staff, carrying a stock of Caltech authors' books and other books, insignia merchandise, gift items, and school supplies. Located within the store are the Red Door Café and Caltech Wired computer store. The Red Door Café provides various types of coffee drinks and juices, along with other food items. Caltech Wired provides computers (including hardware and supporting software and instructional materials) that support Caltech's educational and research functions.

## **STUDENT HEALTH**

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### *Medical Examination*

Before initial registration, each applicant is required to submit a Report of Medical History and Physical Examination form that is sent at the time of notification of admission. Students who have been absent from the Institute for one term or more may also be required to submit this report.

### *Student Health Services*

The Archibald Young Health Center provides the following services for undergraduate and graduate students and their spouses enrolled in the Spouse Program: (1) office consultation and treatment of most medical problems by physicians and nurse practitioners (physician visits by appointment only and at prescribed hours); (2) referral to specialists; (3) laboratory tests and some radiology tests as ordered by the medical staff; (4) women's health services, including annual Pap and contraceptive needs; (5) sexual health concerns, including HIV and STD screening; (6) routine medications, common vaccinations, prescription drugs, and other supplies at cost. A variety of health education handouts are also available. For more information, visit the Health Center's website at <http://www.healthcenter.caltech.edu>.

### *Student Counseling Service*

A staff of mental health professionals provides individual, group, and crisis counseling to undergraduates and graduates at no cost. Students are seen at the Counseling Center with various concerns, such as depression, stress, grief, relationship difficulties, and self-esteem issues, among others. The center also offers workshops and training on psychologically related topics, a health-education program, psychiatric consultation, and referrals to other professionals in the community. Counseling sessions are confidential.

### *Health Education*

As a joint service of the Counseling and Health centers, the health educator offers health education programs designed to enhance students' personal development and academic achievement. Program

topics include stress management, general health and wellness, nutrition, alcohol and other drug use, and sexual health. Confidential drop-in counseling hours are available. For additional information, visit <http://www.healtheducation.caltech.edu>.

### *Student Health Insurance*

In addition to services provided by the Health and Counseling centers, all currently enrolled degree-seeking Caltech students are enrolled in a comprehensive medical insurance plan through Caltech. Students have the option to waive Caltech's medical coverage provided they show proof of other adequate coverage. The Caltech student health plan covers (with deductible and copay) hospital and surgical costs, as well as the cost of outpatient treatment for injury, illness, and psychotherapy. Students may continue coverage under the Caltech student health plan during the entire time they are enrolled as degree-seeking Caltech students.

### *Medical Coverage of Dependents*

A student's spouse and all unmarried dependent children under 19 years of age are eligible to purchase coverage under the medical insurance plan. In addition, student spouses may enroll for a modest fee in a plan that makes them eligible for all services offered at the Health Center. Children are not eligible for these services. Applications for dependents' insurance should be made at the time of registration for any one school term. Rates for dependents' coverage are available at the Benefits Office in Human Resources.

### *Medical Responsibility of the Student*

The responsibility for securing adequate medical attention in any contingency, whether emergency or not, is solely that of the student, whether the student is residing on or off campus. Apart from providing the opportunity for consultation and treatment at the Health Center as already described, the Institute bears no responsibility for providing medical attention.

Any expenses incurred in securing advice and attention in any case are entirely the responsibility of the student, except as already specified. Students should carry their medical insurance cards with them at all times. If they are covered under the Caltech student health plan, they should contact the student health plan insurance carrier to inquire about reimbursement for services received. If they are covered under another plan, they should contact their service provider for details on coverage and reimbursement of services.

## **CAREER DEVELOPMENT**

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### *Career Services*

The Career Development Center (CDC) provides assistance to students in the areas of career planning and employment. Assistance is available

### *General Information*

in areas such as career choice, résumé preparation, interviewing, graduate school application, and job search strategies. Career and vocational interest tests can also be taken on the recommendation of one of the career counseling staff members.

#### *General Information*

All students are encouraged to visit and make use of the Career Development Center early in their student careers.

#### *Walk-In Counseling*

Several days a week, students can “walk in” to consult with a career counselor without an appointment. This allows students to deal with time-sensitive or quickly answered concerns without having to make an appointment.

#### *CDC Online and the CDC Library*

The CDC’s website contains information about the center’s programs and activities, as well as links to career, educational, and employment resources nationwide (<http://www.career.caltech.edu>). Students can schedule appointments for career counseling, register and post resumes for online recruiting, view work-study or tutoring job postings online. The CDC library contains information on graduate, and professional schools, employers, career options and job hunting skills.

#### *Graduate and Professional School Advising*

The CDC provides advice on applying to Ph.D. and master’s programs in the sciences or applied sciences, economics, medicine, public health, environmental sciences, business, law, and other fields. Workshops and individual advising are available on the graduate school admissions process, essay writing, and related topics. The CDC’s library and website have helpful resources.

#### *Pre-Health Careers Advising*

Students planning to apply to medical, dental, veterinary, or pharmaceutical graduate school have access to a wide range of advising services through the CDC. Students can obtain relevant medical research experience through the Caltech summer preceptorship program, which has placements with hospitals in the LA area. The pre-health advisor is available to work with students throughout the process from freshman year to graduation.

Students planning to apply to graduate school or professional graduate degrees are encouraged to plan ahead and to utilize the resources of the CDC in making choices about and implementing choices related to graduate studies.

#### *On-Campus Recruiting Program*

Through the on-campus recruiting program, employment interviews are arranged by the CDC with companies that seek full-time employees pursuing B.S., M.S., Eng., or Ph.D. degrees. Many firms also recruit students for summer internships or jobs. All stu-

dents, Caltech postdoctoral scholars, and recent alumni are eligible to participate.

### *Career Fairs*

Each year two career fairs are organized by the CDC and held in October and January.

A diverse range of companies send representatives to campus to talk to Caltech undergraduates, graduate students, and postdoctoral scholars about permanent employment, summer jobs, or internship opportunities with students. Many firms hold information sessions and conduct on-campus interviews.

### *Work-Study and Employment Listings*

Job listings are maintained in the Career Library and through Techerlink Network for students seeking full-time, part-time (including tutoring positions), or work-study employment. Part-time employment provides students with the opportunity to help finance their education and to gain relevant work experience. One popular online resource is Caltech's tutoring service, through which Caltech students are hired to work as paid tutors for students attending high school in the local area. (See also the student employment section on page 190.)

### *Summer Internships and Jobs*

Students are encouraged to establish a relationship with the CDC staff during the fall term to start the summer job process.

The CDC website has a special section on internships, many firms recruit on campus or at the career fairs for interns, or list positions on Techerlink, the CDC online job listing resource. Students may wish to confer with a career counselor to develop a plan to find summer work that will support or complement long-term career objectives. The CDC provides job-search assistance, including résumé preparation advice, mock interview training, and advice on evaluating job offers. Many employers, eager to hire Caltech students, provide or supplement transportation and housing as part of their summer employment package.

### *Employment Experience of Recent Graduates*

Each year the CDC surveys graduating students' future plans. Over several years, approximately 50 percent of undergraduates are accepted to graduate school programs, 30 percent accept employment, 10 percent have not accepted offers yet, and 10 percent pursue unconventional options, such as part-time work, part-time school, travel, a year off, etc. At the M.S. level, about 85 percent continue in graduate school, and the remainder accept employment. Of those receiving the Ph.D. degree, about 50 percent accept postdoctoral, faculty or other academic/research positions, about 40 percent accept positions outside of academia, and 10 percent pursue other options.

### *General Information*

## **CALTECH ALUMNI ASSOCIATION**

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The mission of the Association is to promote the interests of Caltech in setting a world standard of academic excellence by strengthening the ties of goodwill and communication between the Institute, its alumni, and current students, and by maintaining programs to serve alumni needs. With 22,000 graduates, Caltech's relatively small alumni community has an outsized influence on science, business, and culture around the world. Membership in the Caltech Alumni Association can help you access the full potential of this unparalleled network.

Our programs and services include

- Access to the Alumni Network, with resources to help you connect with alumni and support your career development;
- Reunion Weekend, an annual four-day event with nearly 80 activities, including thought-provoking lectures, private tours, house reunions, social events, and more;
- Seminar Day, where alumni and their guests are given a front-row seat to the latest research and discoveries taking place on campus;
- Alumni College, a one-day lecture series drawing Caltech faculty together to explore a theme or subject;
- Regional Events that bring the best of Caltech to your area, featuring presentations from Caltech faculty, exclusive tours, career networking opportunities, social events, and more;
- Travel/lifelong learning programs worldwide.

Additional benefits of membership include a subscription to *Engineering & Science* magazine, discounts at the Caltech Bookstore, and more.

For more, visit [alumni.caltech.edu](http://alumni.caltech.edu).

## **INTERNATIONAL STUDENT PROGRAMS**

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As the definitive immigration resource for international students, International Student Programs (ISP) is responsible for advising students on all immigration-related matters, such as visa acquisition, employment authorization, extensions of stay, and more. In addition, ISP provides programs that assist international students and their dependents in adjusting to life in the United States. ISP plans and promotes events that celebrate international education

and cultures of the world, address cross-cultural adjustment, and provide opportunities for international students to establish a sense of community at Caltech. Prior to the fall term, ISP hosts International Student Orientation to provide an introduction to academic and social life at Caltech and in the United States. All incoming international students are required to participate. Please contact ISP at [isp@caltech.edu](mailto:isp@caltech.edu) for more information on current programs, or visit ISP online at [www.international.caltech.edu](http://www.international.caltech.edu).

## **AUDITING COURSES**

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Persons not regularly enrolled in the Institute may audit courses if they obtain the consent of the instructor in charge of the course, and the dean of undergraduate students or dean of graduate studies, as appropriate, and pay the required fee (contact the Bursar's Office for audit fee). The fees are nonrefundable.

Auditing fees for nonacademic staff members may be covered by the Institute Tuition Support Plan. Auditing cards may be obtained in the Registrar's Office.

Regularly enrolled students and members of the faculty are not charged for auditing. Auditing cards are not required, but the instructor's consent is necessary in all cases. No grades for auditors are reported to the Registrar's Office, and no official record is kept of the work done.

## **GRADES AND GRADING**

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All permanent grades recorded for freshmen during the first and second terms they are enrolled will be either P, indicating "passed," or F, indicating "failed." The temporary grade of I ("incomplete") may be used as it is for other students. The temporary grade of E may be given to freshmen as described below for other students. It may also be used in a continuing course if the performance of the freshman concerned is not significantly below the current passing level, and if the student is maintaining a steady and substantial improvement; an E given for this reason will be automatically changed to a P if the freshman earns a P for the following term, and will change to an F if the student receives an F for the following term. The grade may not be used in this way for two successive terms nor for the last term of the course.

If a first-quarter or second-quarter freshman is enrolled in a course in which the instructor gives letter grades, the registrar will record P for all passing grades. No grades given to a freshman during the first and second quarter in which they are enrolled will be used in computing the cumulative grade-point average.

For all students beyond the first and second quarters of their freshman year, graduate and undergraduate, letter grades will ordinarily be used to indicate the character of the student's work: A, excellent; B, good; C, satisfactory; D, poor; E, conditional; F, failed; I, incomplete. P may also be used as described below under *Pass/Fail Grading*. In addition, grades of A+ and A-, B+ and B-, C+ and C-, and D+ may be used. In any situation in which no grade is reported, the grade shall be assumed to be F.

At their discretion, instructors may give students who have not completed their work for a course by the end of the term a grade of E. The grade E indicates deficiencies that may be made up without repeating the course. If the instructor does not specify a date on the grade report sheet for completion of the work, students receiving an E will have until Add Day of the following term to complete their work for that course. Instructors may, however, require the work for the course to be completed by an earlier date. If a student receives an E and does not complete the work by the date specified by the instructor or by Add Day, the grade will be changed to an F. Adequate time must be afforded to instructors to grade the work and to submit the final grade to the registrar. It is the responsibility of a student receiving an E to confirm that the registrar has recorded the terms for satisfying the completion of the work in the course.

With the written permission of the instructor, a student may extend the E grade past Add Day of the following term, but doing so will cause an additional E grade to be registered. Each additional extension of the E will be until the date specified by the instructor or until Add Day of the following term, but in each case will require the written permission of the instructor and the registering of an additional E grade.

After an undergraduate student has been awarded the grade of E six times, he or she is not eligible to receive E grades in any subsequent term. A petition for an E in a subsequent term may be approved by the Undergraduate Academic Standards and Honors (UASH) Committee in an exceptional case. Such a petition requires the support of the instructor and the dean or associate dean of undergraduate students.

The grade I is given only in case of sickness or other emergency that justifies noncompletion of the work at the usual time. It is given at the discretion of the instructor, after approval by the dean or associate dean of students or the dean of graduate studies. The time period within which the grade of I is to be made up should be indicated on the grade sheet, or students receiving an I will have until Add Day of the following term to complete their work for the course. As in the case of the E grade, the grade of I shall not be considered in calculating a student's grade-point average.

Students receiving grades of E or I should consult with their instructors not later than the beginning of the next term in resi-

dence as to the work required and the time allowed. This time should, in most cases, coincide with the date fixed in the calendar for removal of conditions and incompletes (Add Day), and in fact if no other time is specified, this date will be assumed. However, except under extraordinary circumstances, the time for the completion of the work be extended for more than three terms in residence after the end of the term in which the grade of E or I was given. An E will turn into an F one year after the date on which the E was given, and an I grade will turn into a W (standing for “withdrawn”) one year after the date on which the I grade was given. That circumstances are so extraordinary that it allows waiving of this one year rule requires the agreement before that one year anniversary of the Dean of Undergraduate Students, Chair of UASH, and Executive Officer of the department in which the course was taken. Grades of E and I shall not be considered in calculating a student’s grade-point average.

*Failed* means that no credit will be recorded for the course. The units, however, count in computing the student’s grade-point average, unless the course was taken on a pass/fail basis. He or she may register to repeat the subject in a subsequent term and receive credit without regard to the previous grade, the new grade and units being counted as for any other course, but the original F and units for the course remain on the record. An F, once recorded, will be changed to a passing grade only on the basis of error. Such a change may be made only with the approval of the Undergraduate Academic Standards and Honors Committee or of the Graduate Studies Committee, whichever has jurisdiction.

Petitions by undergraduate students for late drops (i.e., requests to drop a course after Drop Day) will be considered by the UASH Committee. If approved, a W will be recorded on the student’s transcript in place of a grade for that course. W’s will not be included in the computation of the student’s grade-point average. Courses will be expunged from the student’s record only in exceptional circumstances, at the discretion of the UASH Committee.

Each course at the Institute is assigned a number of *units* corresponding to the total number of hours per week devoted to that subject, including classwork, laboratory, and the normal outside preparation. Credits are awarded as shown in the table below.

*Grade-Point Average:* Grade-point average is computed by dividing the total number of credits earned in a term or an academic year by the total number of units taken in the corresponding period. Units for which a grade of F has been received are counted, even though the course may have subsequently been repeated. Grades of P or F obtained in courses graded on a pass/fail basis are not included in computing grade-point average.

<i>No. of Units</i>	A+	A	A-	B+	B	B-	C+	C	C-	D+	D	F
1	4	4	4	3	3	3	2	2	2	1	1	0
2	9	8	7	7	6	5	5	4	3	3	2	0
3	13	12	11	10	9	8	7	6	5	4	3	0
4	17	16	15	13	12	11	9	8	7	5	4	0
5	22	20	18	17	15	13	12	10	8	7	5	0
6	26	24	22	20	18	16	14	12	10	8	6	0
7	30	28	26	23	21	19	16	14	12	9	7	0
8	35	32	29	27	24	21	19	16	13	11	8	0
9	39	36	33	30	27	24	21	18	15	12	9	0
10	43	40	37	33	30	27	23	20	17	13	10	0
11	48	44	40	37	33	29	26	22	18	15	11	0
12	52	48	44	40	36	32	28	24	20	16	12	0
13	56	52	48	43	39	35	30	26	22	17	13	0
14	61	56	51	47	42	37	33	28	23	19	14	0
15	65	60	55	50	45	40	35	30	25	20	15	0

*Pass/Fail Grading:* The following regulations apply:

- First-quarter and second-quarter freshmen receive pass/fail grades in all courses by virtue of their classification as freshmen by an admissions committee or, for students whose status after the first year is uncertain, by the Undergraduate Academic Standards and Honors Committee.
- All other students, undergraduate and graduate, in courses with numbers under 200 will receive letter grades unless the course is designated “graded pass/fail” or unless, when it is allowed, the student files with the Registrar’s Office a completed Pass/Fail Course Selection Card not later than the last day for dropping courses.
- In courses with numbers 200 or greater that are not designated either “graded pass/fail” or “letter grades only,” the instructor may decide separately for each student what class of grades to use.
- All research courses shall be designated “graded pass/fail.” All reading courses, seminar courses, or other courses that do not have a formal class structure shall be designated “graded pass/fail” unless the option secures an exemption from the Curriculum Committee or the Graduate Studies Committee and from the Faculty Board.
- A grade on the pass/fail system should be P if it would have been a D or better on the letter grade system. (Note that there is no D- grade.) The standards of failure in courses in which only pass/fail grades are used should be the same as they would be if the course were letter graded.
- Any instructor may, at his or her discretion, specify prior to registration that his or her course, if not classified by the above regulations, is to be graded on a “letter grades only” basis or is to be graded pass/fail only, subject to possible

review by the responsible option. The registrar must be notified of such specification two weeks before the beginning of registration. (Note: If the grading scheme is changed during the term, it is changed for everyone.)

- Each term, any student may select, subject to such requirements as may be imposed by the student's option, two elective courses in which he or she is to be graded on a pass/fail basis if it is not designated as "letter grades only" and is not specifically required for the degree in his or her option. To make this election, a completed Pass/Fail Course Selection Card must be submitted to the Registrar's Office on or before the last day for dropping courses that term. This election may be reversed or reinstated at any time before the deadline. The election must be approved and the card signed by the student's adviser. The instructor must be notified and should sign the card to indicate that this has been done; the instructor must allow any eligible student to make this election.
- Of the units offered to satisfy the requirements for the Bachelor of Science degree, no more than 90 may be in courses graded pass/fail because of the student's election.

#### *Procedures for Resolving Disputes over Grading*

At Caltech, the instructor has full responsibility for assigning grades to students enrolled in a course. On occasion, a student may not understand how a grade was determined and may seek further information. The student should first meet with the instructor or teaching assistant to discuss the grade. If after doing so the student believes the grade is unjustified or capricious, the following procedures are available.

Before the end of the term following the term when the grade was issued, the student should contact the academic mediator, appointed by the provost, who will work with the student and instructor to resolve the problem. If the mediation effort is unsatisfactory to the student, he or she may request a formal review by an appropriate executive officer or academic officer. The executive officer will review the case and report the decision in writing to the student. If the executive officer decides that a change of grade is warranted, or if the student requests a further appeal, these shall be requested of the division chair. At the discretion of the division chair, a committee may be appointed to review the case. The committee members should interview everyone involved in the case (the student, the course instructor, the teaching assistant, and anyone else with relevant information), and make a written recommendation to the division chair. Only the division chair can authorize the registrar to enter a new grade in the student's transcript.

## NOTICES AND AGREEMENTS

### **Academic Records of Veterans**

The Institute maintains a written record of a student's previous education. This is part of the student's official transcript, and included on this is a summary of any prior college-level education. A true copy of a transcript of college-level work at other institutions is maintained as part of the student's record. The amount of credit granted for prior training is indicated on the student's official transcript and, where this results in the shortening of a required training period in the case of a veteran, the Veterans Administration is notified.

The Institute's official transcript for each student shows the progress that student is making at the Institute. There is a record of each course enrolled in each term with a grade recorded for the course. The total number of units earned is kept so that the record will show continued progress toward the degree sought. The final grades are recorded at the end of each term of the school year, and the accumulative permanent record has on it grades for all subjects taken at the Institute. No student is allowed to enroll repeatedly in a course and withdraw without penalty. If a student enrolls in a course, he or she is expected to complete the course or receive a failing grade unless he or she withdraws from the course prior to the deadline for dropping courses. All students must maintain a minimum load equivalent to 12 quarter hours each term; no student may drop courses that would bring him or her below this level of effort. At any time when the student falls below the required number of units, fails to receive satisfactory grades, or engages in unsatisfactory conduct, the record is marked to indicate this, and the student is forbidden to continue at the Institute.

The grading system of the Institute is A (excellent) to F (failed). An A is equivalent to 4.0 and an F to 0.0. A student must maintain a grade-point average of 1.4 in any term and at least 1.9 in each full year in order to be able to enroll in a successive term at the Institute. A minimum 1.9 overall grade-point average is required for graduation. A student who drops below the required averages (1.4 for a given term or 1.9 for the year) is dismissed and must petition for reinstatement. A student may be reinstated by the Undergraduate Academic Standards and Honors Committee and, if so, is required to earn a 1.9 GPA during the immediately following term. The Veterans Administration is notified when a veteran is academically dismissed or is making unsatisfactory progress toward a degree. Since the Institute requires all students to carry a minimum full load that corresponds to 12 quarter hours each term, any student who finishes a term in good standing is considered to have made satisfactory progress. If a student withdraws from a course before the final date for withdrawal, no grade is given in that

course. The time spent in school counts, however, and the student may be considered to have not made satisfactory progress in the event of such withdrawal.

In order to withdraw from any course, a student must submit a withdrawal card. This shows the date on which the student was last in official attendance in that course. If a student reenrolls in that course and successfully completes it, that fact will be noted on his or her official transcript.

### **Access to Student Records**

The Institute maintains educational records for each student that include name, address, student identification number (including Social Security number), information on parents, guardian, and spouse, general information on academic status at the Institute, previous school data, results of standardized admissions examinations, courses previously taken or being taken, credits, and grades. Applicants for financial aid have an additional file holding those records. The Family Education Rights and Privacy Act (FERPA) and Caltech policy afford students certain rights as well as establish limitations with respect to student education records. These rights and limitations are as follows:

1. The registrar of the Institute is responsible for maintaining all educational records, except for those involving financial aid. Caltech permits disclosure of educational records, without consent of the student, to Institute officials with legitimate educational interests in them. An Institute official is a person employed by the Institute in an administrative, supervisory, academic or research, or support-staff position (including security personnel and health and diversity center staff), a person or company with whom the Institute has contracted (such as an attorney, auditor, consultants, contractors, or collection agent), a person serving on the Board of Trustees, or a student serving on an official committee, such as a disciplinary or grievance committee, or assisting another Institute official in performing his or her tasks. An Institute official has a legitimate educational interest if he or she needs to review an education record in order to fulfill his or her professional responsibility. They are available to the registrar, provost, president, general counsel, vice president for development and institute relations, vice president for student affairs, dean of graduate studies, dean of undergraduate students, director of financial aid, and faculty of the Institute and to their respective staffs for the normal academic and business purposes of the Institute. Records involving financial aid are maintained by the director of financial aid, and are available to the director and staff, to the dean of graduate studies and staff, to the Faculty Committee on Scholarships and Financial Aid, and to the Faculty Committee on Graduate Study, for the purpose of granting and administering the Institute's financial aid pro-

gram. Except as authorized by federal or state law or regulation, none of these educational records nor any personally identifiable information contained therein, other than directory information (see below), will be made available to any one else, other than the student, without the written consent of that student. Where consent is required and given, the student, upon request, will receive a copy of the records to be released. The Institute will keep a record, available to the student and kept with his or her file, of all persons and organizations, other than those authorized within the Institute, requesting or obtaining access to the files, except when records have been produced in response to a grand-jury subpoena or other subpoena issued for a law-enforcement purpose and the court or issuing agency has ordered that the existence or the contents of the subpoena or the information furnished in response to the subpoena not be disclosed.

2. Students are allowed access to their educational records as follows: A student may inspect his or her academic transcript during normal working hours. To see other records, the student must provide a written request to the registrar or to the director of financial aid or to the dean of graduate studies or to the dean of undergraduate students, or their deputies, as appropriate. A mutually convenient time will be arranged within 10 working days after receipt of the request for the student to examine the records in his or her file. At that time the student may examine all educational records in the file with the exception of those specifically exempted by Part 99 of Title 34 of the Code of Federal Regulations. The student may obtain copies of any of the records available to him or her; the cost will be \$10 plus 25 cents per page. If a student believes the educational records relating to the student contains information that is inaccurate, misleading, or in violation of the student's rights of privacy, the student may ask the Institute to amend the record. The Institute will decide whether to amend the records as requested within a reasonable time after receiving the request. If the registrar, or the director of financial aid, or the dean of graduate studies, or the dean of undergraduate students, or their deputies, do not agree to amend any item contained or not contained in the educational records, the student will be informed of the decision and of his or her right to a hearing. The student may submit a written request to the vice president for student affairs or his/her designee for a hearing to challenge the content of the records on the grounds that the information contained in the records is inaccurate, misleading or in violation of the privacy rights of the student. The vice president for student affairs or his/her designee will schedule such a hearing within a reasonable time after receipt of the request and will notify the student at a time reasonably in advance of the hearing of its date, time, and place. The student will be

afforded a full and fair opportunity to present evidence relevant to the issues raised and may be assisted or represented by individuals of his or her choice at his or her own expense, including an attorney. The decision of the vice president or designee will be in writing, will be rendered within a reasonable time after the conclusion of the hearing, and will be final. This decision will be based solely upon the evidence presented at the hearing and will include a summary of the evidence and of the reasons for the decision. If, as a result of the hearing, the Institute decides that the information is inaccurate, misleading, or otherwise in violation of the privacy rights of the student, the Institute shall amend the records accordingly, and so inform the student in writing. However, if, as a result of the hearing, the Institute decides that the information is not inaccurate, misleading, or otherwise in violation of the privacy rights of a student, it shall inform the student of the right to place in the educational records a statement commenting on the information in the records and/or setting forth any reasons for disagreeing with the decision of the Institute.

3. The Institute considers the following to be directory information: a student's name, UID, addresses (permanent, campus and local/off-campus, and e-mail), associated telephone listings, ID photograph, date and place of birth, major field of study, year in school, current enrollment status, expected date of graduation, name of academic adviser, participation in officially recognized activities and sports, weight and height if a member of an athletic team, dates of attendance, degrees and awards received, thesis title, home town, and most recently attended educational agency or institution. Directory information may be made available to requestors at the Institute's discretion. Any student may, however, have part or all of this information withheld by notifying the registrar in writing no later than 30 days after the commencement of classes in the academic year. That information will then be withheld for the balance of that academic year. If the information is to be withheld in subsequent years, new requests must be filed.
4. A student will not be required to waive any rights regarding access to educational records. However, a student may voluntarily waive right of access to confidential statements made by third parties respecting admission to educational agencies or institutions, applications for employment, or the receipt of an honor or honorary recognition. In case of waiver, the confidential statements will be used solely for the purposes for which they were specifically intended, and the student will, upon request, be notified of the names of all persons making such confidential statements. If a student

- should desire to so waive right of access, so as to facilitate the obtaining of a confidential statement of this nature, he or she should contact the registrar for the necessary form.
5. The Institute reserves the right to destroy from time to time any and all educational records that it maintains on a student, except to the extent that the law requires their maintenance for a longer period of time. However, where access to records has been requested, no destruction of those records will be allowed to take place until such access has been granted or denied.
  6. Students who believe their rights under FERPA may have been violated may file a complaint with the Family Policy Compliance Office, U.S. Department of Education, 400 Maryland Avenue SW, Washington D.C. 20202-4605.

### *Transcripts of Records*

A student, or former student, may request that official transcripts of his or her records be forwarded to designated institutions or individuals. Requests should be filed at the Registrar's Office at least five days before the date on which the transcripts are to be mailed.

### **Accreditations and Authorizations**

The California Institute of Technology is accredited by the Accrediting Commission for Senior Colleges and Universities of the Western Association of Schools and Colleges, 985 Atlantic Ave., Ste. 100, Alameda, CA 94501; (510) 748-9001. In addition, the Institute is authorized by the California State Department of Education, Office of Private Postsecondary Education, to operate as a private postsecondary educational institution and, by the same agency, to train veterans in the programs of the Veterans Administration.

The Engineering Accreditation Commission of ABET, Inc. (111 Market Place, Suite 1050, Baltimore, MD 21202-4012; 410-347-7700), has accredited Caltech's B.S. programs in chemical engineering, in electrical engineering, and in mechanical engineering. Further, the Committee on Professional Training of the American Chemical Society has approved Caltech's B.S. program in chemistry.

The documents describing these accreditations and authorizations are on file and may be inspected in the Registrar's Office and the Provost's Office; the office of the Division of Engineering and Applied Science also has the documentation for ABET.

### **Student Problem Resolution Process**

Caltech provides a variety of routes, most of them informal, by which students may bring complaints to consideration and resolution. For example, in academic matters, students may begin with faculty-student conversations that may extend to the deans, the

option representatives, the division chairs, the registrar, or to various committees having faculty and student members. Non-academic matters can be dealt with informally by student leaders, resident associates, the residence life coordinators, the deans, and other student affairs offices. The Graduate Student Council (GSC) and the Associated Students of the California Institute of Technology (ASCIT) may become involved in some complaints, and sometimes ad hoc groups are formed to make recommendations.

The Problem-Resolution Process (Process) is intended to deal with complaints by currently enrolled students for which reasonable efforts by the available informal routes have not lead to an acceptable resolution and which do not fall within the jurisdiction of other Policies or the Honor System.

The first step in this Process is for the student to consult with the appropriate deans. One of the deans will then determine if this issue falls under this Process and, if appropriate, will appoint a mediator to help resolve the issue. If the student's issue involves a decision or action of a dean, the vice president of student affairs will appoint a mediator to help resolve the issue.

The mediator will assist the student in trying to work out the problem. If the student is not satisfied with the results, the student may file a written notice of appeal to the vice president for student affairs. The decision of the vice president is final.

If the student has a complaint about Caltech's compliance with academic program quality and accrediting standards that they believe warrants further attention after exhausting the steps outlined above, they may contact the Western Association of Schools and Colleges (WASC) at <http://www.wascsenior.org/comments>. WASC is the academic accrediting body for Caltech. If the student believes the complaint warrants further consideration after review by WASC, they may submit a complaint to the Attorney General of the State of California (Attorney General) at <http://oag.ca.gov> or (916) 322-3360 or (800) 952-5225. Prospective students may contact WASC or the Attorney General with complaints as well.

### **Student Patent and Computer Software Agreement**

The California Institute of Technology (Caltech) has the responsibility to see that inventions made and computer software developed at Caltech, including the Jet Propulsion Laboratory (JPL) and other facilities owned or managed by Caltech, be used for the public benefit, be administered in such a way as to avoid cause for criticism of Caltech, and meet Caltech's contractual obligations to others. It is Caltech's policy to share profits made from its licensing of inventions and computer software with the inventors and authors of such inventions and computer software.

In order to clarify this situation and to protect the rights of both the student and Caltech, each student at Caltech is asked to sign this agreement. In view of the patent and copyright policies of Caltech in force at this date and as may from time to time be amended, and in consideration for my use of Institute facilities and equipment, and the other advantages accruing under this agreement, I hereby agree as follows:

1. Caltech retains all rights in inventions and computer software generated by me while a student at Caltech, including the Jet Propulsion Laboratory (JPL) and other facilities owned or managed by Caltech, subject to the following exceptions.
2. When I generate computer software or written work at Caltech in connection with the educational program of Caltech, such as in course work, homework, theses, and publications, I retain ownership of copyright rights, but hereby grant to Caltech an irrevocable royalty-free nonexclusive license, with the right to grant sublicenses, for educational and research purposes, and when generated at JPL or any Caltech managed facility that so requires, I hereby grant the US Government a royalty-free nonexclusive license to use for purposes for or on behalf of the US Government.
3. In addition, when I conceive inventions or write computer software entirely on my own time without using Caltech's equipment, facilities (other than such incidental use as is permitted under Caltech policy) or proprietary information, and without the use of any Caltech funds (regardless of the origin of such funds, whether internal, industry, Government or other), I shall retain all rights to such inventions or computer software, except for those inventions or computer software that relate to Caltech's actual or demonstrably anticipated research or development.
4. I agree to assign, and hereby do assign, to Caltech all rights to and interest in inventions and computer software made or written as described in paragraphs 1 through 3, apart from those retained by me, and all copyrights, patent applications and patents relating thereto; to execute all papers required to apply for, obtain, maintain, issue and enforce such copyright registrations, patents and applications; and to provide reasonable assistance regarding such copyrights, patents and patent applications, including testifying in any interference proceeding or litigation relating thereto. Expenses for the copyright and patent application assistance shall be borne entirely by Caltech.
5. I agree to notify my advisor and Caltech's Office of Technology Transfer promptly of any discovery, innovation or invention that I conceived or first actually reduced to practice, or computer software I write, which are assignable

as described in paragraph 4 above. For work done at JPL, or any Caltech managed facility that so requires, I agree to have all scientific and technical publications reviewed prior to public release to ensure compliance with U.S. export control laws and to protect intellectual property rights.

6. I understand that if Caltech receives funds from the licensing of computer software, patent applications or patents assigned to it by me pursuant to this agreement, in excess of unreimbursed expenses associated with obtaining, maintaining and enforcing such copyrights and patents, I shall share in these funds according to the established Institute policy, procedures and practice in effect on the date that the patent application is filed or the computer software is completed in the same manner as a member of the academic staff and other employees.
7. I understand that Caltech relies on the foregoing agreement when it enters into contracts with others and obligates itself with respect to inventions or computer software made or written in the course of research conducted at Caltech.
8. Notwithstanding the above, nothing in this agreement is to be interpreted as abridging any rights I may have as an employee for inventions developed in my own time under Section 2870 of the California Labor Code.

*Revised 04-04-2013*

### **Student Retention and Persistence Rates**

Most undergraduates enter Caltech at the freshman level. Of the 244 freshmen enrolled during the 2011–12 academic year, 233 reenrolled in the first term of the 2012–13 academic year and are progressing, yielding a persistence rate of 96 percent after all allowable exclusions. Of the 214 freshmen enrolled during the 2006–07 academic year, 193 graduated by June 2012, yielding a graduation rate for this group of 92 percent after allowable exclusions.

At the graduate level, most students enter Caltech to pursue either the degree of Master of Science or Doctor of Philosophy or, occasionally, both. Of the 244 entering graduate students enrolled in a Ph.D. program during the 2011–12 academic year, 235 reenrolled in the first term of the 2012–13 academic year and are making satisfactory academic progress, resulting in a persistence rate of 96 percent. Of the 13 entering graduate students enrolled in M.S. programs during the 2011–12 academic year, 9 completed requirements for a terminal M.S. degree within one year.

### **Undergraduate Student Events**

Caltech is committed to providing its students, faculty and staff with an environment that promotes safe and responsible social interaction. Caltech recognizes that student parties and activities

are an important part of campus life. Students are required to follow Event Planning Procedures set forth on the Deans Office website: <http://deans.caltech.edu/Services/PartyPlan>

## **INSTITUTE POLICIES**

### **Acceptable Use of Electronic Information Resources**

Caltech provides electronic information resources (including, but not limited to, computers, computer accounts and services, networks, software, electronic mail services, electronic information sources, video and voice services, servers, web pages, and related services) to assist members of the Institute community in the pursuit of education and research. This policy, in conjunction with other applicable Caltech policies, sets forth the acceptable use of all Caltech electronic information resources owned or managed by Caltech, and describes the rights and responsibilities of the Institute and of faculty, staff, students, and other members of the Institute community with respect to use of these resources.

Electronic information resources are intended to be used to carry out the legitimate business of the Institute, although some incidental personal use is permitted. Faculty, staff, students, and other members of the Institute community (“users”) who use campus electronic information resources should be guided by the Institute’s Honor System, which prohibits any member of the Institute community from taking unfair advantage of any other member of the Caltech community. In addition, users who use the Institute’s electronic information resources assume responsibility for their appropriate use and agree to comply with all relevant Institute policies and all applicable local, state, and federal laws.

Users of Institute electronic information resources may not use these resources for inappropriate or unauthorized purposes. Some examples of inappropriate use are: sending a communication or using electronic information resources, including web pages, that discriminate against or illegally harass, defame, offend, or threaten individuals or organizations, or to engage in other illegal conduct or conduct that violates Institute policy; destruction of or damage to equipment, software, or data belonging to others; disruption or unauthorized monitoring of electronic communications; interference with use of Institute systems; violations of computer security systems; unauthorized use of accounts, access codes, or identification numbers; use of facilities in ways that intentionally impede the legitimate computing activities of others; use of facilities for commercial purposes; use for political or lobbying activities that jeopardize the Institute’s tax exempt status and, therefore, violate Institute policy; violation of copyrights, software license agreements, patent protections and authorizations, or protections on proprietary or confidential information; unauthorized use of

Caltech's trademarks; violating copyright laws by downloading and sharing files; violations of privacy; academic dishonesty; sending chain mail; spamming; downloading, viewing, and/or sharing of materials in violation of the Institute's harassment policies, including sexual violence (<http://cit.hr.caltech.edu/policies/policies-main.html>); intrusion into computer systems to alter or destroy data or computer programs (e.g., hacking or cracking); or sending communications that attempt to hide the identity of the sender or represent the sender as someone else.

This policy will not be construed or applied in a manner that improperly interferes with employees' rights under the National Labor Relations Act.

Password capabilities and other safeguards are provided to members of the Caltech community in order to safeguard electronic messages, data, files, and other records (including computer files and records, electronic mail, and voice mail) from unauthorized use. In addition, the Institute will routinely follow up on systems and/or accounts that appear to be compromised or are in the process of being compromised. However, these safeguards are not intended to provide confidentiality from the Institute with respect to personal messages or files stored on Institute systems. Electronic information resources are Institute property. Users should not have an expectation of privacy with respect to their use of Institute electronic information resources or data, files, or other records generated, stored, or maintained on Institute resources.

The Institute may routinely examine network transmission patterns such as source/destination, address/port, flags, packet size, packet rate, and other indicia of traffic on the servers. While the Institute will not, as a routine matter, review the content of electronic messages or other data, files, or records generated, stored, or maintained on Institute electronic information systems, the Institute retains the right, within its discretion, to inspect, review, or retain the content of electronic messages and other data, files, or records generated, stored, or maintained by users at any time without prior notification, for legitimate Institute reasons. These legitimate reasons include, but are not limited to, responding to lawful subpoenas or court orders, investigating misconduct and determining compliance with Institute policies, and locating electronic messages, data, files, or other records. Users should also understand that electronic messages, data, files, and other records generated, stored, or maintained on Institute electronic information systems may be electronically accessed, reconstructed, or retrieved even after they have been deleted. Institute access to the content of electronic mail, data, files, or other records generated, stored, or maintained by any member of the Caltech community may only be requested 1) by the provost for faculty; 2) by the associate vice president for human resources for employees; and 3) by the vice president for student affairs for students and 4) the Office of General Council for purposes of comply-

ing with legal process and requirements. In all cases, Institute access requires prior consultation with the Office of the General Counsel.

The use of Institute electronic information resources is a privilege, not a right, and the Institute may revoke this privilege, or decline to extend this privilege, at any time. Inappropriate use of Institute resources may result in administrative discipline up to and including separation from the Institute. Suspected illegal acts involving Institute electronic information services may be reported to state and federal authorities, and may result in prosecution by those authorities. Any questions concerning the appropriate use of any of the Institute's electronic information resources or relevant Institute policies should be directed to the provost, the chief information officer, the associate vice president for human resources, the dean of students, or the dean of graduate studies.

### **Compliance with Export Laws & Regulations**

*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.*

Export control laws and regulations as referred to in this Policy include a number of federal laws and regulations that impact an export or import transaction such as those of the Departments of State, Commerce, Treasury, Defense, Energy and U.S. Customs. These laws have existed for many years, however, the events of September 11, 2001 and subsequent events around the world have pushed national security concerns to the forefront. The U.S. government has responded to global security concerns by tightening the export control regulations that govern the transfer of U.S. strategic technology for national security and foreign policy reasons and in furtherance of economic objectives.

The export control laws are intended to control the transfer of sensitive information or goods to individuals, entities or countries of concern and, under certain conditions, to foreign persons. The regulations contain a fundamental research exclusion and specific university exemptions that allow most of the research activities being performed at U.S. colleges and universities to be carried out without the need of export licenses or other restrictions, subject to certain conditions.

Caltech is an institution of higher learning conducting fundamental research in science and engineering. The fundamental research exclusion, however, does not fully relieve us of our responsibility to comply with the export control regulations. The fundamental research exclusion, as defined in the U.S. export regulations, applies to basic and applied research in science and engineering performed by colleges and universities, so long as that research is carried out openly and without restrictions on publication or access to or dissemination of the research results.

The presidential National Security Decision Directive 189 (NSDD 189) recognizes the important contributions that U.S. universities make in science and engineering that allow our nation to remain innovative and competitive. NSDD 189 provides the framework for the fundamental research exclusion.

The fundamental research exclusion applies only to research conducted in the United States. This exclusion allows most of the activities conducted at Caltech to be performed without the need of an export license. However, there are certain activities and information that are not covered by the fundamental research exclusion and remain subject to the export control laws and regulations. Examples of these are:

- Receipt by the Institute of third-party export controlled information which requires that appropriate measures be taken to ensure that the information is properly safe guarded; Under certain conditions, the disclosure of specific information and the provision of specific types of services to foreign persons (non-U.S. citizens, non-legal permanent residents, or non-U.S. legal entities) inside the United States (“deemed exports”);
- Travel abroad: Engaging in specific activities with persons and entities abroad, even if the information relied upon is publicly available;
- The export of controlled items and information outside the United States including: controlled hardware, software and technology; and
- Financial transactions or other dealings involving prohibited parties or sanctioned countries.

The export control laws and regulations may apply to research activities whether or not they are funded by grants or contracts. Caltech takes its freedom to publish and its commitment to openness in research very seriously. Caltech’s policy, as set forth in the Faculty Handbook, does not allow acceptance of any government contract or grant that requires classified research to be carried out on campus or which impinges upon the Institute’s freedom to publish and otherwise disseminate the results of its research. For that reason, Caltech undergraduate students shall not be given certain export-controlled technology, i.e., ITAR-controlled technical data, software, and items, if such access would jeopardize their ability to publish.

The export control laws are administered by the U.S. Department of Commerce through its Export Administration Regulations (EAR – dual-use items), the U.S. Department of State through its International Traffic in Arms Regulations (ITAR – space and military items), and the U.S. Department of Treasury through its Office of Foreign Assets Control (OFAC – economic and trade sanctions). These laws control the conditions under

which certain information, technologies, and commodities can be transmitted overseas to anyone, including U.S. citizens, or to a foreign person on U.S. soil. Caltech is committed to comply fully with these federal laws and regulations.

To that end, Caltech has established an Export Compliance Office and has appointed a Director of Export Compliance who also functions as Caltech's Empowered Official. The Empowered Official is the person who has legal authority to sign export control license applications and other requests for export approval on behalf of Caltech, and is the person responsible for developing and implementing export compliance programs, campus procedures, awareness programs for faculty and training programs for staff. Caltech expects all faculty and staff to comply fully with all applicable export control laws and regulations. Noncompliance may result in violations that can subject both the individual and the Institute to civil sanctions and criminal penalties.

It is the responsibility of Caltech faculty and staff to ensure the Institute's compliance with this policy.

The following individuals have been designated as contacts regarding export control issues:

Adilia F. Koch, Director of Export Compliance, ext. 4469

Jennifer Wong, Export Compliance Analyst, ext. 2558

### **Conflicts of Interest Policy**

The mission of the California Institute of Technology (Caltech) is to expand human knowledge and benefit society through research integrated with education. In pursuit of this mission, Caltech adheres to the Eleven Principles comprising its code of conduct and strives for the highest level of integrity and public confidence. Caltech's integrity rests on the personal integrity of each of us who is called upon to act on behalf of the Institute. Caltech is committed to ensuring that decisions made on its behalf reflect the highest ethical standards and that its research and instruction remain a rigorous and open inquiry, unencumbered by conflicts of interest, real or perceived, that might affect the sound judgment of the trustees, officers, senior management, faculty, students and staff. Each of us, therefore, is responsible for identifying and resolving conflicts between personal and Institutional interests. We each must act in the best interests of the Institute and refrain from taking part in any transaction where we do not believe in good faith that we can act impartially.

Individual conflicts of interest may affect the Institute's trustees, officers, faculty, or staff. An individual conflict of interest is a situation that may compromise an individual's professional judgment in carrying out Institute business due to an external relationship that directly or indirectly affects the interest of the individual or an immediate family member. Each situation that presents a potential for conflict of interest must be fully disclosed to the Institute, and

managed or eliminated before moving forward. Conflicts of interest also include conflicts of commitment which are situations in which external activities, either paid or unpaid, interfere with an employee's primary obligation and commitment to the Institute.

In academic research, the term conflict of interest refers especially to situations in which financial or other personal considerations may compromise, or may have the appearance of compromising, an investigator's professional judgment in conducting or reporting research. The bias can affect collection, analysis, and interpretation of data, hiring of staff, procurement of materials, sharing of results, choice of protocol, and the use of statistical methods. Conflicts of interest can affect all scholarly fields.

Caltech has established these conflict of interest policies and procedures that apply to all Caltech employees, including faculty, to ensure compliance with Caltech's ethical standards as well as with the laws, rules, and regulations that govern Institute activities, while fostering and sustaining an environment of openness and integrity.

### *Individual Conflicts of Interest*

The broad principles in this policy encompass a variety of situations, many of which do not fall into patterns for which specific guidelines may be established. Conflicts of interest inevitably arise from time to time in everyday business life; some may appear to be inconsequential or may even be advantageous to the Institute. It is important, however, that all employees make timely disclosure of any such conflict of interest. Each employee should apply his or her sense of integrity and common sense to disclose any circumstances that are, may become, or may give the appearance of a possible conflict of interest. Supplementing this broad policy statement are the following rules to be observed on specific matters:

1. Each employee has a duty to act in the best interest of the Institute and avoid actions that would call into question the integrity of the employee or the Institute.
2. An employee who has directly or through family or business connections, a material interest in suppliers of goods or services, or an interest in contractors or potential contractors with the Institute, should not act on behalf of the Institute in any transaction involving that interest. No employee should participate in the selection, award, or administration of a contract with any party with whom he/she is negotiating regarding potential employment or any arrangement concerning potential employment.
3. An employee should avoid outside employment or business activity involving obligations which may conflict or appear to conflict with Institute interests, including its interest in the full- or part-time services of any staff member (i.e. a conflict of commitment). Outside employment, director-

- ships, consulting or similar arrangements, other than with government entities, must be disclosed to the Division Chair for faculty, the staff member's supervisor and the Associate Vice President for Human Resources (HR) for campus staff and the JPL Ethics office and HR office for JPL staff.
4. To avoid the appearance of a conflict of interest, an employee should provide full disclosure of any business or financial enterprise or activity in which he/she is involved which might influence, or might appear to influence, his/her official decisions or actions on Institute matters.
  5. An employee should refrain from personal activities that include, but are not limited to, the purchase or sale of securities, real property, or other goods or services in which he/she could use or might appear to have the opportunity to use, for personal gain, confidential information or special knowledge gained as a result of his/her relationship with the Institute.
  6. An employee should refrain from unauthorized disclosure of non-public information concerning the Institute.
  7. No employee should make unauthorized use of Institute resources for his/her personal benefit or for the benefit of any other person. Incidental personal use of resources is authorized by the Institute.

See Institute Policy on Acceptable Use of Electronic Information Resources, page 53 and JPL Rules!

8. It is sound practice to discourage gifts and favors from people with whom the Institute has a business relationship. Personal gifts of more than nominal value should be tactfully declined or returned to avoid any appearance or suggestion of improper influence. Any employee involved in awarding or administering contracts using federal or other government funds should keep in mind that state and federal law contain prohibitions against soliciting or accepting gratuities, favors or anything of monetary value from contractors or potential contractors.
9. Any employee doing business on behalf of the Institute with specific vendors should refrain from participating on leisure trips with representatives of those vendors. Such trips are not appropriate, even when a staff employee pays a fee to the vendor to participate in such trips.
10. No employee should act in any Institute matter involving a member of his/her immediate family including, but not limited to, matters affecting family members' employment or evaluation or advancement in the Institute, without first making full disclosure. See Policy on Conflict of Interest Disclosure. Such disclosure should include the nature of the

familial relationship and the impact or potential impact of the employee's action on such family member. Immediate family includes spouse or domestic partner and children.

Any employee who believes that his/her conduct or activities may or may appear to conflict with these guidelines or activities or otherwise create a conflict of interest, should make an appropriate disclosure. You may also report possible conflicts of interest by calling the Compliance Hotline at 626-395-8787 or submitting a compliance hotline form (<http://asic.caltech.edu/contact>). JPL employees should consult Laboratory requirements, and seek guidance and/or report possible conflicts of interest by contacting the JPL Ethics Office.

#### *Additional Faculty Responsibilities*

It is acknowledged that, in their wider roles as academicians and professionals, the faculty may be subject to conflicts of interest that are not necessarily financial and that are not within the scope of a policy that is designed to address conflicts of interest in the employer-employee setting. For example, this policy is not designed to address conflicts that may be encountered in service to a professional society. Academic and professional activities not covered by this policy are best handled within the ethical guidelines established by the Faculty Handbook. Faculty members must be aware of potential conflicts to ensure an open and productive environment for research and teaching. Conflicts of interest may arise when faculty members have the opportunity to influence the Institute's business decisions or when outside relationships may or may appear to compromise the integrity of decisions made as teachers and researchers. A faculty member's general commitment to the Institute requires that the member perform his/her responsibilities to the Institute and appropriately use his/her own judgment in deciding whether to engage in a variety of extramural activities, within the confines set forth in the Faculty Handbook. As a result, the Institute relies on its faculty to be alert to the possible effect of outside activities on the integrity of his/her decisions and on his/her ability to fulfill his/her obligations to the Institute. Accordingly, in addition to the conflict rules set forth above, the following guidance is provided for faculty:

1. Some activities and interests are unlikely to lead to serious conflicts of interest and do not require disclosure. An example is a faculty member's entitlement to royalties or honoraria for published scholarly works and other writings or occasional lectures. Likewise, no serious conflicts arise when a faculty member serves as a consultant to a government agency, receives royalties under Institute royalty-sharing policies or owns equity in a business solely for the faculty member's consulting activities.
2. Disclosure to the Division Chair is mandatory if the faculty

member directs students into a research area and, as a result, the faculty member intends to realize financial gain. An example is a research area within the ambit of a business in which the faculty member has a significant ownership interest or which employs the faculty member as a consultant. Any involvement of undergraduates, graduate students or post-doctoral scholars in the outside professional activities of the faculty member directing the student's research must be specifically approved in advance by the Division Chair. The student must also sign the written disclosure to signify understanding of the issues involved.

3. Disclosure to the Division Chair is mandatory if the faculty member has a significant interest in a business under circumstances that link the fortunes of the business to the faculty member's research.
4. Disclosure to the Division Chair is required if the faculty member is to receive sponsored support for research from a business for which the faculty member is a consultant, or in which the faculty member has a significant financial interest.

#### *Conflict of Interest Requirements Imposed by Federal Sponsors*

The National Science Foundation (NSF) and Public Health Services (PHS) have issued specific rules regarding the disclosure of significant financial interests and the management of financial conflicts of interest as a condition for submitting proposals and accepting awards of financial support from these agencies. Members of the Caltech Community proposing or working on any activity funded by NSF or PHS (including the National Institutes of Health) are required to comply with Caltech's Policy and Procedures for Managing Conflict of Interest Requirements Imposed by Federal Sponsors: (<http://researchcompliance.caltech.edu/documents/40-fedaward-coi.pdf>)

#### *Institutional Conflicts of Interest Policy*

Institutional conflicts of interest differ from individual conflicts of interest. An institutional conflict of interest is a situation in which the research, teaching, outreach, or other activities of the Institute may be compromised because of an external financial or business relationship held by the Institute that may bring financial gain to the Institute.

#### *Institutional Conflicts of Interest*

The Institute has many legitimate interests that may at times conflict. Management of institutional conflicts of interest is by its very nature more complex than that of individual conflicts of interest. External relationships to sponsors and supporters of the institution, the local community's acceptance of economic development activities, the institution's obligations as a charitable organization receiv-

ing preferential tax treatment, and the institution's perception of its teaching, research, and academic missions all impact how potential conflicts of interest are managed. The examples and issues presented below do not necessarily constitute inappropriate conflicts of interest. Each situation must be judged on the facts and merits of the relationship with an eye to what reasonable individuals outside the Institute might consider to be appropriate. Any activity, financial and/or operational, that may bring into question the Institute's reputation, integrity, and objectivity should be considered for possible conflicts of interest. The following are examples of potential situations that may give rise to institutional conflicts of interest:

1. Significant gifts to the Institute from a commercial sponsor of research may raise questions about the influence of the company on Caltech's research programs and how they are managed. Similar concerns arise when individual companies sponsor research or provide significant consulting income to a significant number of faculty members within a single academic division. Gifts or promise of gifts, in exchange for favorable terms on a technology license or a first look at intellectual property may also pose a problem.
2. The acquisition of goods and services for the Institute represents a large portion of Caltech's expenditures. Purchasing goods and services from companies that sponsor research at the Institute, or who are licensees of Institute technology, may raise issues similar to those raised by large gifts from commercial sponsors.
3. A potential institutional conflict of interest exists simply by the Institute having a license agreement with, or an equity position in, a company sponsoring a faculty member's research. In these situations, there may be, or may appear to be, a bias to accept terms and conditions that would facilitate the company's success.

#### *Reporting Institutional Conflicts of Interest*

If you identify a situation that appears to be an Institutional Conflict of Interest, you should report the situation to either the Vice President for Business & Finance or to the Provost on campus or to the Associate Director for Business at JPL. You may also make a report by calling the campus Compliance Hotline at 626-395-8787 or the JPL Ethics Office at 818-354-6338 or submitting a compliance hotline form (<http://asic.caltech.edu/contact>).

favors or anything of monetary value from contractors or potential contractors.

9. Any employee doing business on behalf of the Institute with specific vendors should refrain from participating on leisure trips with representatives of those vendors. Such trips are not appropriate, even when a staff employee pays a fee to the vendor to participate in such trips.

10. No employee should act in any Institute matter involving a member of his/her immediate family including, but not limited to, matters affecting family members' employment or evaluation or advancement in the Institute, without first making full disclosure. See Policy on Conflict of Interest Disclosure. Such disclosure should include the nature of the familial relationship and the impact or potential impact of the employee's action on such family member. Immediate family includes spouse or domestic partner and children.

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2. Disclosure to the Division Chair is mandatory if the faculty member directs students into a research area and, as a result, the faculty member intends to realize financial gain. An example is a research area within the ambit of a business in which the faculty member has a significant ownership interest or which employs the faculty member as a consultant. Any involvement of undergraduates, graduate students or post-doctoral scholars in the outside professional activities of the faculty member directing the student's research must be specifically approved in advance by the Division Chair. The student must also sign the written disclosure to signify understanding of the issues involved.
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1. Significant gifts to the Institute from a commercial sponsor of research may raise questions about the influence of the company on Caltech's research programs and how they are managed. Similar concerns arise when individual companies sponsor research or provide significant consulting income to a significant number of faculty members within a single academic division. Gifts or promise of gifts, in exchange for favorable terms on a technology license or a first look at intellectual property may also pose a problem.
2. The acquisition of goods and services for the Institute represents a large portion of Caltech's expenditures. Purchasing goods and services from companies that sponsor research at the Institute, or who are licensees of Institute technology, may raise issues similar to those raised by large gifts from commercial sponsors.
3. A potential institutional conflict of interest exists simply by the Institute having a license agreement with, or an equity position in, a company sponsoring a faculty member's research. In these situations, there may be, or may appear to be, a bias to accept terms and conditions that would facilitate the company's success.

### *Reporting Institutional Conflicts of Interest*

If you identify a situation that appears to be an Institutional Conflict of Interest, you should report the situation to either the Vice President for Business & Finance or to the Provost on campus or to the Associate Director for Business at JPL. You may also make a report by calling the campus Compliance Hotline at 626-395-8787 or the JPL Ethics Office at 818-354-6338 or submitting a compliance hotline form (<http://asic.caltech.edu/contact>).

## **Disability and Reasonable Accommodation Policy**

It is the Institute's policy to comply fully with the Americans with Disabilities Act, the Rehabilitation Act (Section 504), and other applicable federal and state laws to ensure equal opportunity for qualified persons with disabilities. The Institute does not discriminate based on physical or mental disability, and is committed to ensuring that there is no unlawful discrimination in any of its academic or employment programs, services, activities, and terms and conditions of employment.

As required by law, the Institute will provide reasonable accommodations to qualified individuals with known disabilities including students, faculty, postdoctoral scholars, staff, and job applicants, so long as such accommodation does not create an undue hardship for the Institute. The Institute also will provide reasonable accommodations to employees with pregnancy-related conditions consistent with federal and state law.

The following individuals have been designated as contacts for disability related issues, and as coordinators under Section 504 of the Rehabilitation Act. Individuals who wish to request an accommodation should contact the appropriate Institute representative.

### *Students:*

Barbara Green, 626-395-6351  
Associate Dean of Students

### *Faculty:*

Stacey Scoville, 626-395-6320  
Administrator to the Provost

### *Staff and Postdoctoral Scholars:*

Campus  
Tracey Saruwatari, 626-395-5740  
Disability and Leave Manager

### *JPL*

Arlene Cass, 818-354-9750  
Human Resources Consultant

As part of the Caltech's commitment to make reasonable accommodations, the Institute will participate in a timely, good faith, interactive process with the individual and the appropriate Institute representative to determine effective accommodations, if any, that can be made in response to a request for accommodation. The Institute has the right to request documentation of the individual's disability. By working together in good faith, the Institute will attempt to implement reasonable accommodations that are appropriate and consistent with its legal requirements.

After engaging in the interactive process, and after the Institute has determined if a reasonable accommodation is available, an individual with a disability who disagrees with the Institute's determination, may file an appeal. Appeal procedures may be obtained from the above campus/JPL coordinators.

### **Fire Safety**

It is the policy of the California Institute of Technology to comply with all applicable laws, regulations, codes, and standards in regard to fires, fire safety, and fire protection. The Institute recognizes that campus fire safety is vitally important to the Institute community, and thus is committed to maintaining a safe environment for faculty, staff, students, and other members of the Institute community.

The purpose of the Institute policy on fire safety is to provide guidelines for establishing and maintaining fire safety procedures with respect to the undergraduate and graduate student houses and dormitories (student living areas or student housing) at the Institute.

Please refer to <http://www.studaff.caltech.edu/policies.htm> for the complete text of the policy.

### **Mural Policy**

Murals or anything that goes on walls or ceilings in the shared spaces of Caltech's resident houses should not involve offensive material, which includes language or images that reasonable persons would find offensive, that would reasonably interfere with other residents' enjoyment of the facility, and/or that violate Caltech's nondiscrimination or unlawful harassment policies or other Caltech policies. Examples of offensive material include language or images that are racist or sexist or that are derogatory on the basis of national origin, disability, age, religion, or sexual orientation. Graffiti or anything else that makes the houses look deteriorated or degraded is also not acceptable. Students must notify the Housing Office in advance of the intention to put up a mural and of its proposed location. Neither the Housing Office nor Student Activities and Programs (Student Life) will bear the cost of removal if a mural is put up without consultation or differs from the submitted design in ways that make it inappropriate. All murals must comply with the mural policy and be approved following the guidelines stated in the mural policy. For full mural policy text, see [http://www.housing.caltech.edu/undergrad/mural\\_policy.asp](http://www.housing.caltech.edu/undergrad/mural_policy.asp).

### **Missing Students**

Missing student policy and procedure have been established to assist in locating Caltech students living in on-campus housing who, based on the facts and circumstances known to Caltech, the Institute has determined to be missing. Please refer to <http://www.studaff.caltech.edu/policies.htm> for the complete text of the policy.

## **Nondiscrimination and Equal Employment Opportunity**

Caltech is committed to equal opportunity for all persons without regard to sex, race, color, religion, national origin, citizenship, ancestry, age, marital status, physical or mental disability, medical condition (cancer-related or genetic characteristics), genetic information, pregnancy or perceived pregnancy, gender, gender identity or expression, sexual orientation, status as disabled veteran, or other eligible veteran status or any other characteristic or condition protected by the state and federal law. It is the policy of Caltech to provide a work and academic environment free of discrimination as required by federal and state law, including Title IX which prohibits discrimination based on sex in Caltech's educational programs and activities. Discrimination is an act or communication that interferes with an individual's or a group's ability to participate fully in the Caltech community on the basis of any protected condition or characteristic. Consistent with this policy and federal and state law, sex discrimination, including sexual harassment and sexual violence will not be tolerated at Caltech. Caltech will take all reasonable steps to eliminate discrimination, harassment, and sexual violence in its work and academic environment.

Caltech is an equal employment opportunity and affirmative action employer and will, whenever possible, actively recruit and include for employment members of underrepresented minority groups, females, disabled veterans, other eligible veterans, and otherwise qualified persons with disabilities. Caltech will hire, transfer, and promote based on the qualifications of the individual to ensure equal consideration and fair treatment of all. All other employment actions, such as work assignments, appointments, compensation, evaluations, training, benefits, layoffs, and terminations are governed by this policy. Personnel actions will be reviewed to ensure adherence to this policy.

The Provost has been designated as the Equal Employment Opportunity Coordinator for faculty, the Director of Employee & Organizational Development for campus staff, the Associate Deans of Students for undergraduate students, the Dean of Graduate Studies for graduate students, and the Director for Human Resources at the Jet Propulsion Laboratory for employees assigned there. The Associate Dean of Graduate Studies has been designated as Caltech's Title IX Coordinator. She can be reached at (626) 395-3132, email: [TitleIXCoordinator@caltech.edu](mailto:TitleIXCoordinator@caltech.edu), or at her office 230 Center for Student Services. Inquiries concerning the interpretation and application of this policy should be referred to the appropriate designated individual. Management is responsible for monitoring decisions regarding personnel actions to ensure that these decisions are based solely on the individual's merit, and on legitimate, nondiscriminatory job requirements for the position in question and the reasonableness of any necessary accommodations for persons with a disability.

Anyone who witnesses or experiences conduct he/she believes to be in violation of this policy is urged to contact any of the above mentioned coordinators, the individuals identified in Caltech's harassment policy, the Caltech Employee & Organization Development office or JPL Employee Relations Group immediately. Complaints, including complaints under Title IX, will be investigated promptly using the Procedures Regarding Unlawful Harassment, including Sexual Violence. Individuals who violate this policy may be subject to disciplinary action up to and including termination or expulsion.

In addition, an employee who believes he/she has been subject to harassment or discrimination has the right to file a complaint with the Federal Equal Employment Opportunity Commission or the California Department of Fair Employment and Housing, which have the authority to remedy violations. Employees, students and others participating in Caltech's educational programs and activities may file complaints with the U.S. Department of Education Office for Civil Rights at (415) 486-5555 (or [ocr.sanfrancisco@ed.gov](mailto:ocr.sanfrancisco@ed.gov)) or (800) 421-3481 (or [OCR@ed.gov](mailto:OCR@ed.gov)).

To ensure equal employment opportunity and nondiscrimination, each member of the Caltech community must understand the importance of this policy and his/her responsibilities to contribute to its success.

Related Policies and Procedures:

- Unlawful Harassment
- Procedures Regarding Unlawful Harassment

### **Sexual Violence**

All members of the Caltech community have the right to be treated, and the responsibility to treat others, with dignity and respect. These principles are fundamental to the educational and intellectual mission of Caltech. Consistent with these principles, it is the policy of Caltech to provide a work and academic environmental free of sexual violence. This applies to all students, faculty, staff, postdoctoral scholars, and others participating in Caltech's educational programs and activities, whether those take place in Caltech facilities, at an event sponsored by Caltech at another location, or elsewhere. Sexual violence is a form of sexual harassment and is prohibited by Title IX of the Education Code.

Caltech will not tolerate sexual violence, and is committed to educating the community in ways to prevent sexual violence. All forms of sexual violence are considered to be serious offenses. Caltech actively encourages reporting of violations of this policy, and is committed to responding promptly to, and thoroughly investigating, all complaints of sexual violence. Caltech will take reasonable steps to remedy the effects and prevent recurrence of the behavior. Overt or covert acts of retaliation, reprisal, interference, discrimination, intimidation or harassment against an individual or group for exercising its rights under this policy will be

subject to prompt and appropriate corrective action. Individuals who violate this policy may be subject to disciplinary action up to and including termination or expulsion.

A broad range of behaviors can be classified as sexual violence. Sexual violence can be committed by individuals of any gender, and can occur between individuals of the same gender or different genders, strangers or acquaintances, and people involved in intimate or sexual relationships. Sexual violence is defined as physical sexual acts perpetrated forcibly and/or against a person's will, or where the person is incapable of giving consent. Sexual violence includes sexual assault (rape), forced sodomy, forced oral contact, statutory rape, sexual assault with an object, sexual battery, domestic partner violence, sexual coercion, sexual intimidation, stalking, dating violence, exploitation and threat of sexual assault.

The Provost has been designated as the coordinator for complaints against faculty, the Director of Employee & Organizational Development (EOD) for campus staff and postdoctoral scholars, the Dean of Undergraduate Studies for undergraduate students, the Dean of Graduate Studies for graduate students, and the Director for Human Resources at the Jet Propulsion Laboratory (JPL) for employees assigned there. The Associate Dean of Graduate Studies has been designated as Caltech's Title IX Coordinator. She can be reached at (626) 395-3132, E-mail: TitleIXCoordinator@caltech.edu, or at her office, 230 Center for Student Services.

Any Member of the Caltech community who has experienced sexual violence is strongly encouraged to immediately report the incident to Caltech as well as local enforcement. All complaints will be investigated promptly using the Procedures Regarding Sexual Violence.

### *Consent*

Consent is a crucial component of the Caltech policy. Consent is the voluntary, informed, uncoerced agreement through words and/or actions, which a reasonable person would interpret as a willingness to participate in mutually agreed upon sexual activity. Sexual activity should only occur when all participants willingly and affirmatively choose to engage in particular acts.

Consent once given may be withdrawn at any time. Consent cannot be inferred from silence, passivity or lack of active resistance. Consent cannot be inferred from consent to a prior or different activity. If consent is withdrawn, the other party must immediately stop whatever sexual activity is occurring. Being intoxicated or otherwise impaired does not diminish one's responsibility to obtain consent.

Indications that consent is not present include, but are not limited to:

- A verbal "no" (no matter how indecisive) or resistance (no matter how passive).

- When physical force is used, or when there is a reasonable belief of the threat of physical force.
- When any kind of coercion is present.
- When a person is legally incapable of making an intentional decision to participate in a sexual activity, including being unconscious, asleep, incapacitated by drugs or alcohol or due to an intellectual or other disability.

*What to Do if Sexual Violence Has Occurred*

If you are the victim of sexual violence, you are encouraged to seek immediate medical, psychological, and support/advocacy services provided by campus and/or community services. If emergency response is required and you are on campus, please call campus security at (626) 395-5000 or The Rape Treatment Center at Santa Monica-UCLA Medical Center (“The Rape Treatment Center”) at (310) 319-4000. The Rape Treatment Center can be reached 24 hours a day, 7 days a week. There is no cost to use their services, and transportation will be provided by the center if it is needed. If emergency response is required and you are off campus, please call the Pasadena Police Department at (626) 744-4241 or other appropriate police department, or The Rape Treatment Center.

Because sexual violence may involve physical trauma and is a crime, the person assaulted is urged to seek medical treatment as soon as possible. Medical treatment is available at the Student Health Center, Huntington Memorial Hospital emergency room, The Rape Treatment Center, a private physician, or through other community resources.

Preserve all physical evidence of the assault. Do not shower, bathe, douche, eat, drink, wash your hands, or brush your teeth until after you have had a medical examination. Save all of the clothing you were wearing at the time of the assault. Place each item of clothing in a separate paper bag. Do not use plastic bags. Do not clean or disturb anything in the area where the assault occurred.

*Resources*

*Title IX Coordinator:*

(626) 395-3132

E-mail: [TitleIXCoordinator@caltech.edu](mailto:TitleIXCoordinator@caltech.edu)

Office: 230 Center for Student Services

*Campus:*

Provost

Vice Provosts

Deans

Associate Deans

Student Affairs Directors

Master of Student Housing

Director of Employee &amp; Organization Development

Employee Relations Consultants

Associate Vice President of Human Resources

Division Chairs

Division Administrators

*JPL:*

Director for Human Resources

Deputy Director for Human Resources

Employee Relations Manager

Employee Relations Consultants

Other JPL Managers

*Anonymous Reporting:*

Campus Hotline at (626) 395-8787 or (888) 395-8787

JPL Ethics Hotline at (818) 354-9999 or (866) G0JPLEO

For either Campus or JPL by submitting a compliance Hotline

Contact Form

*Confidential Resources:*

Sexual violence can be a traumatic experience. Therefore, members of the Caltech community may access the following offices for confidential support. Caltech staff and postdoctoral scholars may contact the Staff and Faculty Consultation Center (SFCC), while undergraduate and graduate students may access the Student Counseling Center or the Caltech Center for Diversity, and JPL employees, the Employee Assistance Program. Professionals in these offices and The Rape Treatment Center will listen and help identify options and next steps. They can also help you decide what plan of action feels most comfortable. Talking to any of these individuals does not constitute reporting an incident to Caltech. Although they are not involved in Caltech's formal response to an incident, or possible legal action, staff members in each of these offices are available to provide support to the complainant and/or the respondent as he or she moves through the steps related to either or both of these processes. Staff in these offices may be able to help you develop a clear statement that contains all of the relevant information regarding your complaint, or may recommend that you speak with another campus office for additional specialized services or resources, including how to obtain a protective order.

*Campus:*

Student Counseling Center	(626) 395-8331 (students)
Caltech Center for Diversity	(626) 395-3221, (626) 395-5772 (626) 395-8108 (students)
SFCC	(626) 395-8360 (faculty, staff, and postdoctoral scholars)

*JPL:*

Employee Assistance Program	(818) 354-3680 (employees)
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Please note that hospital and certain health-care providers have an obligation to inform the police about suspected sexual violence. You can choose whether or not to disclose information to the police or to file a civil or criminal complaint. If you desire further information concerning this procedure, please contact the Student Counseling Center, the Caltech Center for Diversity, the SFCC or the Employee Assistance Program.

*Emergency Support – Available 24 Hours a day, 7 Days a week:*

Campus Security	(626) 395-5000
JPL Security	(818) 393-3333
The Rape Treatment Center at Santa Monica-UCLA Medical Center	(310) 319-4000

*Outside Resources:*

Pasadena Police Department	(626) 744-4241
Huntington Hospital ER	(626) 397-5111

In addition, employees have the right to file a complaint with the Federal Equal Employment Opportunity Commission or the California Department of Fair Employment and Housing, which have the authority to remedy violations. Employees, students and others participating in Caltech's educational programs and activities may file complaints with the U.S. Department of Education Office for Civil Rights, (415) 486-5555, ocr.sanfrancisco@ed.gov or (800) 421-3481, OCR@ed.gov.

No member of the Caltech community will be retaliated against for making a good-faith report of alleged harassment or for participating in an investigation, proceeding, or hearing conducted by Caltech, or by a state or federal agency.

*Informational Resources:*

Information on harassment and sexual violence is also available in the offices of Caltech's Title IX Coordinator, and from the Caltech Center for Diversity, Staff and Faculty Consultation Center, Student Affairs, Resident Associates, and Employee &

Organization Development at campus, and from Employee Relations and the Employee Assistance Program at JPL.

### *Procedures Regarding Sexual Violence*

A student, faculty, staff member, postdoctoral scholar, or other individual participating in any Caltech educational program or activity who has experienced sexual violence is strongly encouraged to immediately report the incident to Caltech as well as local law enforcement. If you would like support and guidance in filing a complaint, please contact the Title IX Coordinator, the Caltech Center for Diversity, the Staff and Faculty Consultation Center (SFCC), one of the undergraduate or graduate Deans, Employee & Organization Development (EOD) in Human Resources, the Chief of Campus Security, the Director of Security Operations, or the Director for Human Resources at the Jet Propulsion Laboratory (JPL).

Copies of Caltech's sexual violence, nondiscrimination, unlawful harassment, and other policies are available on campus from Caltech's Title IX Coordinator, the Human Resources Office, any Student Affairs office, Dean's offices, the Caltech Center for Diversity, the Staff and Faculty Consultation Center, and the Provost's Office and from Human Resources at JPL. Policies are also published in the Caltech Catalog and on the Caltech Human Resources website, the Student Affairs website, the Title IX website, and the JPL Human Resources website.

### *Protection of the Complainant and Respondent*

For the purpose of this procedure, a complainant is the person filing a complaint; and the respondent is the person responding to the complaint. Caltech will take measures to protect the rights of both the complainant and the respondent as appropriate.

Retaliation against any member of the Caltech community who reports an incident of sexual violence is strictly prohibited.

The designated administrator taking the complaint will ask the complainant questions to assess whether there is a threat to the complainant and/or other members of the community and take appropriate action to protect the complainant and/or others as needed.

If interim safety measures, administrative changes and/or academic changes are needed in order to protect the rights of either party at any stage of the process, they will be made by the appropriate administrators. These changes should be discussed with the appropriate parties: Provost, EOD Director, Dean, Associate Deans, or Director for Human Resources at JPL. Changes might include transfer of supervisory or evaluative responsibility regarding grading, supervision, tenure review, letters of recommendation, changes to office assignments and/or counseling. For students, these changes might include the complainant's option to avoid contact with the respondent, and changes to classes and/or housing. When taking steps to separate a complainant and respondent,

Caltech will endeavor to minimize the burden on the complainant. Care will be taken to protect both parties with the greatest degree of confidentiality. Each party may have an advisor or support person present when reporting, or responding to, sexual violence. However, the proceeding is an internal Caltech function; therefore, the presence of legal counsel is not permitted by anyone during the conduct of these procedures.

### *Filing a Complaint*

A member of the Caltech community who wishes to file a complaint of sexual violence should do so as soon as possible after the assault, although complaints may be filed at any time. Complaints can be made orally or in writing. Complaints should be brought to the attention of one of the following individuals:

#### *Caltech's Title IX Coordinator:*

(626) 395-3132

E-mail: [TitleIXCoordinator@caltech.edu](mailto:TitleIXCoordinator@caltech.edu)

Office: 230 Center for Student Services

#### *Campus:*

Provost

Vice Provosts

Deans

Associate Deans

Student Affairs Directors

Master of Student Houses

Director of Employee & Organizational Development (EOD Director)

Employee Relations Consultants

Associate Vice President for Human Resources

Division Chairs

Division Administrators

#### *JPL:*

Director for Human Resources

Deputy Director for Human Resources

Employee Relations Manager

Employee Relations Consultants

Other JPL Managers

These individuals will ensure that the complaint reaches the appropriate investigating office. If the respondent is a student, the complaint will be forwarded to the Dean of Students or Dean of Graduate Studies, respectively; if a campus staff or a postdoctoral scholar, to the EOD Director; if a faculty member, to the Provost; and if a JPL employee, to the Director for Human Resources at JPL.

Caltech may initiate an investigation about an incident if it becomes aware that inappropriate conduct may have occurred.

Caltech will not delay its investigation of complaints of inappropriate conduct because of a law enforcement investigation.

Concerns about possible harassment may also be reported anonymously by calling the Caltech compliance hotline at (626) 395-8787 or (888) 395-8787, the JPL ethics hotline at (818) 354-9999 or (866) G0JPLEO, or by submitting a compliance Hotline Contact Form.

Complaints under Title IX may be made to the U.S. Department of Education, Office of Civil Rights, which can be reached at (415) 486-5555 or [ocr.sanfrancisco@ed.gov](mailto:ocr.sanfrancisco@ed.gov) or (800) 421-3481 or [ocr@ed.gov](mailto:ocr@ed.gov).

### *Investigative Procedures*

Caltech has put in place the following process to ensure that all investigations of sexual violence are handled promptly, thoroughly and impartially:

- Formal complaints can be made orally or in writing; but if made orally, should in the end be put in writing.
- Complaints should be brought to the attention of one of the following individuals: Caltech's Title IX Coordinator; for Campus: Provost, Vice Provosts, Deans, Associate Deans, Student Affairs Directors, Master of Student Houses, Director of EOD, Employee Relations Consultants, Associate Vice President for Human Resources, Division Chairs, or Division Administrators; for JPL: Director for Human Resources, Deputy Director for Human Resources, Employee Relations Manager, Employee Relations Consultants, or other JPL Managers. They will ensure that complaints reach the Provost, the EOD Director, or the Dean(s) at campus and the Employee Relations Manager at JPL, as appropriate.
- The purpose of the investigation is to determine the facts relating to the complaint.
- All parties involved will receive a fair process and be treated with care and respect.
- The Caltech investigation will occur independently from any legal/criminal proceedings that may take place.
- The individuals involved in the investigation will respect the privacy of the complainant, respondent, and that of all parties involved while conducting a thorough review of the complaint.
- Investigators are trained in issues related to sexual violence, and are trained how to conduct an investigation process that protects the safety of all involved and promotes accountability.
- The investigator should be from the same area as the respondent. For example, if a student makes a complaint against a faculty member, a representative appointed by the

Provost's office will lead the investigation. If a student files a complaint against another student, a representative appointed by the appropriate Student Affairs office will lead the investigation.

- Within a reasonable length of time after the complaint has been filed, the respondent will be notified of the nature of the complaint, and an investigation will begin. If administrative changes are needed to protect the rights of the complainant or respondent during the investigation, the appropriate administrators shall see that they are made.
- Caltech will investigate all complaints consistent with its obligations under applicable law. For complaints solely covered by Title IX of the Education Code, when meeting with the complainant, the investigator(s) will seek consent to proceed with the investigation. If the complainant requests confidentiality or asks that the complaint not be pursued, Caltech still will take all reasonable steps to investigate and respond to the complaint consistent with the request for confidentiality or request not to pursue an investigation. If the complainant refuses to have their name disclosed to the respondent, the investigator(s) will explain that Caltech's ability to respond may be limited. If the complaint includes allegations that may constitute a possible crime, the investigator(s) will notify the complainant of their right to file a criminal complaint.
- The complainant and respondent will be informed of the relevant procedures, and may object to the suitability of the investigator(s) by notifying the appropriate Caltech official in writing.
- Caltech's Sexual Violence, Nondiscrimination and Equal Employment Opportunity (EEO) and Unlawful Harassment policies will be reviewed with both parties and copies will be provided to them.
- The complainant and respondent will be informed that Caltech will not tolerate retaliation, will take steps to prevent retaliation, and will take strong responsive action if retaliation occurs. The complainant and respondent will be advised to notify Caltech immediately of any retaliation that occurs. They should immediately notify any of the individuals to whom a complaint can be made if anyone associated with the matter is under continuing threat or is being subject to retaliation.
- The investigator(s) will summarize for the respondent the evidence in support of the complaint to allow the respondent the opportunity to reply.
- The investigation will remain confidential to the extent possible and all parties will be advised to maintain confidentiality. Caltech administrators will be informed on a need-to-

know basis. Caltech will take reasonable and appropriate efforts to preserve the complainant's and the respondent's privacy and protect the confidentiality of information. However, because of laws relating to reporting and other state and federal laws, Caltech cannot guarantee confidentiality, except where the report is made to a confidential resource.

- The complainant and respondent will be given equal opportunity to present their cases separately to the investigator(s), to suggest others who might be interviewed, and to present other evidence. Subsequently, the investigator(s) can, if appropriate, interview other parties to reach findings and conclusions.
- All parties who participate in investigative interviews may submit written statements. Investigative meetings will not be recorded.
- Both parties will be kept informed of the status of the investigation.
- All formal complaints will be investigated within a reasonable length of time after the complaint has been made, normally within 60 days. An individual, a committee or an outside consultant may conduct the investigation.
- Investigative files are confidential and will be maintained in the appropriate administrator's office.
- Exceptions to or modification of these procedures can be made by the Provost, Dean or Associate Deans, EOD Director, or Director for Human Resources at JPL, if required for fairness or practical necessity. Exceptions must be made in writing and notice provided to both the complainant and respondent. Other administrative issues regarding the conduct of the investigation will be decided by the Provost, Dean (s), EOD director, or Director for Human Resources at JPL, as needed.

#### *Findings and Recommendations*

The investigator(s) will use a preponderance of the evidence standard in making their determination. A preponderance of the evidence means that it is more likely than not that the incident occurred. When the investigator(s) is presented with two different but plausible versions of the incident, credibility determinations may affect the outcome.

The investigator(s) will make a recommendation to the relevant Dean, Provost, EOD Director, or Director for Human Resources at JPL, as appropriate, within 15 days of the completion of the investigation, regarding the charges and the appropriate consequences, including disciplining of the respondent, steps to prevent the reoccurrence of any sexual violence, and to correct any discriminatory effects on the complainant and others, if appropriate.

The conclusions that the investigation might reach include, but are not limited to, the following possibilities. In each case, the investigator(s) should summarize the evidence that supports the conclusion.

1. A violation of Caltech's sexual violence policy occurred.
2. Inappropriate behavior occurred, but did not constitute a violation of Caltech's policy on sexual violence.
3. The charges were not supported by the evidence.
4. The charges were brought without any basis or without a reasonable, good faith belief that a basis existed.

### *Resolution*

As soon as practicable after receiving the findings of the investigator(s), management or administration shall review the findings with the dean(s), manager(s), division chair(s) and others as necessary. Within 7 (seven) days after receiving the recommendation, both the complainant and respondent simultaneously shall be informed in writing of the results, their right to appeal and when the results become final. Both parties are also notified of any change to the results that occurs prior to the time such results become final. Any sanctions imposed against the respondent will be disclosed consistent with applicable law, including FERPA, Title IX of the Education Code, and the Clery Act.

Individuals who have been found to have violated Caltech's policy on sexual violence may be subject to disciplinary action. Discipline can include, but is not limited to, the following:

- Verbal counseling/training
- A formal written warning placed in the respondent's file
- Suspension of the right to accept new graduate students or postdoctoral scholars
- Transfer of advisees and/or removal from positions of administrative responsibility
- Removal from student housing
- Removal from a supervisory position
- Enforced leave of absence/suspension
- Termination of employment or permanent dismissal
- Expulsion

If the respondent was not found to have violated Caltech's policy on sexual violence, but the investigation concludes that he or she violated another Caltech policy, or committed some other wrongful or improper act, appropriate sanctions will be imposed. Effective corrective action may also require remedies for the complainant and/or the broader student population.

### *Appeal*

Appeals must be in writing and submitted within 30 days of notification of the decision. The appeal must be on the grounds of improper procedure, an arbitrary decision based on evidence in the record or new evidence that was unavailable at the time of the investigation. Both the complainant and the respondent will be informed, in writing, of the outcome of the appeal.

The complainant or respondent may appeal the decision to the Provost (for faculty), the Associate VP for Human Resources or designee (for staff and postdoctoral scholars), the Vice President for Student Affairs or designee (for students), or Deputy Director for HR at JPL.

Appeals by a faculty member of decisions or actions by the Provost that affect academic freedom and tenure can be made to the Faculty Committee on Academic Freedom and Tenure, as indicated in Chapter 4 of the *Faculty Handbook*.

### *Further Complaints*

The complainant should immediately notify the Title IX Coordinator, or for campus the Provost or Division Chair, Dean or Associate Deans, EOD Director or for JPL, the Employee Relations Manager, if any retaliatory action occurs. In such cases, the complainant has the right to file another complaint.

Related Policies and Guidelines:

- Nondiscrimination and Equal Employment Opportunity
- Unlawful Harassment

### **Substance Abuse**

The California Institute of Technology (“Caltech”) is committed to providing a safe, healthy, and productive work and academic environment for all its faculty, staff, postdoctoral scholars and students. Consistent with its concern for the well-being of its faculty, staff, postdoctoral scholars and students, it is a Caltech policy to maintain a work and academic environment free from drug and alcohol abuse. Faculty, staff, postdoctoral scholars and students are required to comply with this policy and the related guidelines provided by the academic divisions and student organizations.

The unlawful manufacture, distribution, cultivation, dispensation, possession, sale, offer to sell, purchase, offer to purchase, and/or unlawful use of controlled substances\* or alcohol on the Caltech campus or its offsite locations, including the Jet Propulsion Laboratory (“JPL”), or as any part of its activities, is prohibited. (\*Controlled substances include, but are not limited to, marijuana, heroin, cocaine, LSD, and amphetamines.) In addition, every employee is required to remain free from the influence of controlled substances, alcohol, or any substance that may impair the employee’s ability to perform his/her job duties safely or productively, or that may otherwise impair his/her senses, coordination, or judgment while on duty. Any employee reporting to work

(or otherwise at work) under the influence of, or having present in his/her body, any prescribed drug, alcohol, or other substances or medication that may adversely affect the employee's ability to work in a safe, productive, or efficient manner, must advise his/her supervisor. Caltech may require an employee to submit to drug and alcohol testing consistent with Institute policy and applicable federal and state law.

As a condition of continued admission, every student is required to comply with this policy. As a condition of employment, all Caltech employee (this includes faculty, staff, postdoctoral scholars and student employees), regardless of their location, are required to comply with this policy. A Caltech employee who violates this policy will be subject to disciplinary action up to and including termination of employment. A violation of this policy is likely to result in termination, even for a first offense. Similarly, all students, not just student employees, should understand that disciplinary action including suspension or expulsion may be invoked for violation of this policy and that intoxication is never an excuse for misconduct. Legislation within the last ten years allows institutions of higher education to contact parents when their adult child violates a school's alcohol or drug policy. If a student's behavior with respect to alcohol and drugs presents a danger to himself/herself and/or others, Caltech may inform the parents.

A faculty, staff, postdoctoral scholar or student who is convicted (including a plea of *nolo contendere* [no contest]) of a criminal drug statute violation must, within five (5) calendar days after the conviction, notify Caltech of such conviction. A Campus employee should inform the Senior Director of the Human Resources and students should inform his/her dean. A JPL employee should inform the Human Resources People Services Section Manager.

Persons who are not employees of Caltech, but who perform work at Caltech for its benefit (such as contractors and their employees, temporary employees provided by agencies, visitors engaged in joint projects at Caltech, etc.), are required to comply with this policy. Violation of this policy is likely to result in being barred from the workplace even for a first offense.

### *Health Risks*

The use of any mind-or mood-altering substance, including alcohol, can lead to psychological dependence which is defined as a need or craving for the substance and feelings of restlessness, tension, or anxiety when the substance is not used. In addition, with many substances, use can lead to physical tolerance, characterized by the need for increasing amounts of the substance to achieve the same effect and/or physical dependence, characterized by the onset of unpleasant or painful physiological symptoms when the substance is no longer being used. As tolerance and psychological or physical dependence develop, judgment becomes impaired and the individual often does not realize he/she is losing control over the use of the substance and that he/she needs help.

It is impossible to predict accurately how an individual will react to a specific drug or to alcohol because effects vary depending on the person, environmental variables, the dosage and potency of the substance, the method of taking the substance, the chronicity of use, and whether the substance is taken in conjunction with other substances. Illegal drugs have particularly unpredictable effects due to variability in dosage and purity. Further, the overall potency of street drugs has increased dramatically over the past two decades, making users increasingly susceptible to negative effects.

Alcohol acts as a depressant to the central nervous system and can cause serious short- and long-term damage. Short-term effects include nausea, vomiting, and ulcers; more chronic abuse can lead to brain, liver, kidney, and heart damage, and even to eventual death. Ingesting a large amount of alcohol at one time can lead to alcohol poisoning, coma, and death. Drugs such as LSD, amphetamines, marijuana, and alcohol alter emotion, cognition, perception, physiology, and behavior in a variety of ways. Health risks include but are not limited to depression, apathy, hallucinations, paranoia, and impaired judgment, and all substances have an adverse effect on pregnancy. When two or more substances are combined, the effect is often stronger than their additive sum.

#### *Local, State, and Federal Legal Sanctions*

Local, state, and federal laws establish severe penalties for violations of drug and alcohol statutes. These sanctions, upon conviction, may range from a fine to life imprisonment. In the case of possession and distribution of illegal drugs, these sanctions could include the seizure and summary forfeiture of property, including vehicles. It is especially important to know that federal laws have established penalties for illegally distributing drugs to include life imprisonment and fines in excess of \$1,000,000. Some examples of local or state laws are as follows

- Unlawful possession of a narcotic drug is punishable by imprisonment in the state prison.
- The purchase, possession, or consumption of any alcoholic beverages (including beer and wine) by any person under the age of 21 is prohibited.
- It is illegal to provide alcohol to a person under the age of 21.
- Serving alcohol to an intoxicated person is prohibited.
- Selling any alcoholic beverages, except under the authority of a California Alcoholic Beverage Control License, is prohibited.
- It is a felony to induce another person to take various drugs and “intoxicating agents” with the intent of enabling oneself or the drugged person to commit a felony. The person who induced the other may be regarded as a principal in any crime committed.
- Any person found in a public place to be under the influence of an intoxicating liquor or drug and unable to care for

his/her own safety, or who is interfering with the use of a public way, is guilty of disorderly conduct, which is a misdemeanor.

Examples of local, state and federal laws and regulations may be accessed at the Caltech Security website.

In addition, pursuant to federal law, a student's eligibility for federal financial aid may be suspended if the student is convicted, under federal or state law, of any offense involving the possession or sale of illegal drugs.

*Resources for Staff, Faculty, Postdoctoral Scholars and Students*

Caltech recognizes drug and alcohol abuse and dependency as treatable conditions and offers faculty, staff, postdoctoral scholars and students support programs for individuals with substance use problems. Faculty, staff, and postdoctoral scholars are encouraged to seek assistance for drug- and alcohol-related problems through the Caltech Staff and Faculty Consultation Center ("SFCC") at Campus and the Employee Assistance Program ("EAP") at JPL. Individuals can contact the SFCC by calling (626) 395-8360, and the EAP by calling (818) 354-3680. Students are encouraged to seek assistance from the Student Counseling Center (SCC) at extension 8331. In addition, faculty, staff, postdoctoral scholars, and students can seek confidential referral information through the Center for Diversity at (626) 395-3221.

The staff of the SFCC, the EAP and the SCC will help employees and students to identify appropriate treatment resources and will refer them to counseling, treatment, or rehabilitation programs, as appropriate. Health insurance plans provide varying amounts of coverage for substance-abuse programs to address substance abuse and rehabilitation. Individuals may contact their health providers or Caltech Human Resources Benefits office at Campus at (626) 395-6443, or JPL at (818) 393-3191, for plan details. Information obtained regarding a faculty, staff, postdoctoral scholar or student during voluntary participation in services at the SFCC, EAP, SCC, or any related program will be treated as strictly confidential, and no information, including whether or not an individual is receiving services, will be shared with third parties, except by written consent or as required by law.

*Drug and Alcohol Awareness Program*

Caltech has established and will maintain a drug and alcohol awareness program to educate faculty, staff, postdoctoral scholars and students about

1. Caltech's substance abuse policy;
2. the dangers of drugs and alcohol in a work and academic environment;
3. faculty, staff, postdoctoral scholar and student assistance programs; and

4. disciplinary action that may be imposed on faculty, staff, postdoctoral scholars and students for violations of this policy.

Caltech will distribute to all faculty, staff, postdoctoral scholars and students a copy of this policy on an annual basis.

#### *Supervisor's Responsibilities*

If an employee is suspected of violating this policy, the employee's supervisor should consult with the Director of EOD at Campus and the Human Resources People Services Section Manager at JPL regarding appropriate actions, which may include an investigation, and discipline up to and including termination. If a supervisor believes an employee's behavior raises safety concerns for the employee or others, the supervisor must take immediate action, including calling EOD or the Human Resources People Services Section, to assess and address the situation and removing the employee from the worksite if necessary.

#### *Caltech Sanctions*

Caltech will impose sanctions on individuals and/or organizations that violate this policy. These sanctions will be consistently enforced and penalties will depend on the severity of the offenses. Penalties can include employment termination and student suspension or expulsion from Caltech and referral for prosecution for the most serious violations of the law and this policy. Disciplinary action may be invoked entirely apart from any civil or criminal penalties that the faculty, staff, postdoctoral scholars and students might incur.

### **Title IX**

It is the policy of the California Institute of Technology to provide a work and academic environment free of discrimination, as required by federal and state law, including Title IX which prohibits discrimination based on sex. Title IX is a comprehensive federal law that prohibits discrimination on the basis of sex in any federally funded education program or activity. Caltech will take all reasonable steps to eliminate discrimination, harassment and sexual violence in all of our educational programs and activities. Title IX inquiries or complaints may be made to Felicia Hunt, Caltech's Title IX Coordinator. She can be reached at [TitleIXCoordinator@caltech.edu](mailto:TitleIXCoordinator@caltech.edu) or by calling 626-395-3132. Complaints may also be made to the US Department of Education, Office for Civil Rights, by calling (415) 486-5555 or by emailing [ocr.sanfrancisco@ed.gov](mailto:ocr.sanfrancisco@ed.gov). Additional information on Title IX at Caltech can be found at <http://titleix.caltech.edu>.

### **Unlawful Harassment**

It is the policy of Caltech to provide a work and academic environment free of unlawful harassment ("harassment") and retaliation.

#### *General Information*

Harassment is the creation of a hostile or intimidating environment in which inappropriate conduct, because of its severity and/or persistence, is likely to interfere significantly with an individual's work or education, or affect adversely an individual's living conditions. **Harassment in any form, based on sex, race, color, age, national origin, ethnicity, ancestry, physical or mental disability, medical condition (cancer-related or genetic characteristics), genetic information, pregnancy, marital status, religion, gender, gender expression or identity, sexual orientation, status as a disabled veteran or other eligible veteran status or any other characteristic protected by state or federal laws, is prohibited, as are all forms of sexual intimidation exploitation, and violence.** All faculty, students, staff, postdoctoral scholars and others participating in Caltech's educational programs and activities, whether they take place in Caltech facilities, or elsewhere, should be aware that Caltech does not tolerate any conduct that constitutes unlawful harassment or retaliation. Caltech promptly and thoroughly investigates complaints of harassment, and takes appropriate action, including disciplinary measures, when warranted.

Caltech requires that any employee who is responsible for directing or supervising other Caltech employees or evaluating the work of students, participate in training regarding unlawful harassment, including sexual harassment, at least every two years.

#### *Examples of Unlawful Harassment*

Behavior evidently intended to dishonor such characteristics as race, gender, gender expression or identity, national origin or ethnic group, religious belief, sexual orientation, age, or disability is contrary to the pursuit of inquiry and education and may be discriminatory harassment violative of law. Some examples of incidents that may constitute unlawful harassment are:

- An adviser tells a minority student not to take a certain course because the adviser says that other minority students have had difficulty in the course.
- A disabled individual is not included in an off-site outing because of lack of mobility.
- A supervisor assigns only menial tasks to a minority staff member whose job and qualifications merit more complex work.
- An older employee is disciplined for insubordination when the same conduct is tolerated from younger employees.
- A student tells a racially offensive joke within a study group session with other students.
- A professor makes repeated comments in a class that women are not as good at science and engineering as men.

However, in order to make an accurate judgment as to whether incidents are unlawful, the full context in which the actions were taken or statements made must be considered. Conduct of this type, therefore, will prompt an investigation, since subjecting

someone to harassment or requiring submission to it as a condition of employment, evaluation, compensation, or advancement is a serious offense.

### *Examples of Sexual Harassment*

Sexual harassment is unlawful, violating Title VII of the Civil Rights Act of 1964, as amended, Title IX of the Education Code, and California state law.

Sexual harassment is defined as unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature, when:

1. Submission to such conduct is made either explicitly or implicitly a term or condition of an individual's employment or education.
2. Submission to or rejection of such conduct by an individual is used as the basis for decisions affecting that individual.
3. Such conduct has the purpose or effect of unreasonably interfering with an individual's performance or creating an intimidating, hostile, or offensive environment.

Sexual harassment by peers, coworkers, managers or third parties such as nonemployees, vendors, or contractors is a form of prohibited sex discrimination where the objectionable conduct creates a hostile educational or work environment. All individuals are protected against sexual harassment regardless of gender.

Moreover, sexual harassment is prohibited regardless of the sex of the harasser, e.g., even where the harasser and the person being harassed are members of the same sex.

Some examples of conduct that may constitute sexual harassment are:

- Unwanted sexual advances.
- Offering employment or research benefits in exchange for sexual favors.
- Making or threatening reprisals after a negative response to sexual advances.
- Making sexual gestures, or displaying sexually suggestive objects, pictures, cartoons, posters, calendars, or computer screens.
- Downloading, viewing, and/or sharing of pornography.
- Making or using derogatory comments, epithets, slurs, or jokes of a sexual nature.
- Verbal sexual advances or propositions.
- Using Caltech resources (including electronic resources) or time to create or obtain sexually explicit materials that are not directly related to legitimate business of Caltech.
- Verbal abuse of a sexual nature, graphic comments about an individual's body, sexually degrading words used to describe an individual, suggestive or obscene letters, notes, electronic mail messages, or invitations.
- Unwelcome, intentional, and/or repeated touching of a sexual nature.

- Stalking.
- Ostracizing individuals from group activities because of their sex or because they objected to harassing behavior.

Even when relationships are consensual, care must be taken to eliminate the potential for harassment or other conflicts. It is not acceptable to treat other employees, who are not in the consensual relationship, less favorably. Caltech practice, as well as more general ethical principles, prohibits individuals from evaluating the work or academic performance of those with whom they have amorous and/or sexual relationships, or from making hiring, salary, or similar decisions.

Upon learning about such a relationship, the supervisor, dean, or division chair has the authority and responsibility to review and remedy any direct administrative or academic relationship between the involved individuals.

When a consensual personal relationship arises and a power differential exists, consent may not be considered a defense in a claim that Caltech's unlawful harassment policy has been violated. The individual in the relationship with greater power will be held responsible.

#### *Resources*

Anyone who witnesses or experiences or is otherwise aware of conduct that he or she believes to be in violation of this policy including retaliation is urged to contact Caltech immediately. For a list of offices to whom violations of this policy can be reported, please see the Procedures attached. Caltech also offers members of the Caltech community the choice of seeking confidential counseling outside Caltech's formal mechanisms for resolving unlawful harassment complaints. These confidential counseling services are intended for the personal benefit of the individual and offer a setting where various courses of action can be explored. For a list of confidential resources, please see the Title IX website or Security website, or for JPL employees, the JPL Employee Assistance Program website.

Individuals also may report harassment anonymously by contacting the Caltech Hotline at (626) 395-8787 or (888) 395-8787 or the JPL Ethics Hotline at (818) 354-9999 or (866) G0JPLEO, or by submitting a compliance hotline form.

In addition, an employee who believes he or she has been harassed has the right to file a complaint with the federal Equal Employment Opportunity Commission or the California Department of Fair Employment and Housing which have the authority to remedy violations. Employees, students and others participating in Caltech's educational programs and activities may file complaints with the U.S. Department of Education Office for Civil Rights (415) 486-5555 or [ocr.sanfrancisco@ed.gov](mailto:ocr.sanfrancisco@ed.gov) or (800) 421-3481 or [OCR@ed.gov](mailto:OCR@ed.gov).

No member of the Caltech community will be retaliated against for making a good-faith report of alleged harassment or for participating in an investigation, proceeding, or hearing conducted by Caltech, or by a state or federal agency.

### *Investigations*

Caltech is firmly committed to resolving allegations of harassment fairly and quickly. To ensure that open and forthright dialog occurs, attorneys are not permitted to accompany individuals during interviews, nor are interview sessions recorded in any manner. Those interviewed are always entitled to submit a written statement if they so choose or to consult with others regarding the interview, keeping in mind that these proceedings must be kept as confidential as possible.

### *Procedures for Investigating and Resolving Unlawful Harassment Complaints at Caltech*

There are several courses of action available to address complaints of harassment, each with different consequences and implications with respect to confidentiality and resultant action. These options are not mutually exclusive. The complainant may choose which course to follow and may submit a formal complaint at any time.

### *Informal Options*

An individual who believes that he or she has been harassed may choose to resolve his or her concerns informally. In general, the goal of the informal options is to quickly end offending behavior without utilizing disciplinary action. Individuals with an official status at Caltech, such as faculty, managers, or supervisors, are expected to follow up with the complainant to make sure that the issue has indeed been resolved. Mutually agreeable administrative changes are sometimes possible to ease an uncomfortable situation. Individuals are not required to try to resolve their concerns informally before making a formal complaint.

Complainants should consider at the outset whether such changes might be desirable. Informal options include:

- Talking personally with the offending individual, or writing a letter asking him or her to stop. This is a personal step taken solely among the relevant parties.
- Speaking to members of the Student Counseling Center, the Staff and Faculty Consultation Center, or the Caltech Center for Diversity on campus and the Employee Assistance Program at JPL. Such conversations are confidential and are not communicated to individuals within or outside Caltech.
- Resolving the complaint informally with the help of a third party who has a faculty, supervisory, or managerial position at Caltech. The goal here is also to allow the parties to resolve complaints without an investigation and without elevating the complaint within Caltech. However, a person in

one of these official positions is obligated to follow up to be sure the situation has been resolved. This action might include referring the complaint to an appropriate individual within Caltech or sharing some of this information with other persons holding positions of responsibility at Caltech.

### *Formal Complaints*

A formal complaint is a request that Caltech take action. The complainant may file a formal complaint by reporting the offending conduct to individuals holding any of the following positions: Caltech's Title IX Coordinator; for campus: Provost, Vice Provost(s), Dean(s), Associate Deans, Student Affairs Directors, Master of Student Houses, Director of Employee & Organizational Development (EOD), Employee Relations Consultants, Associate Vice President of Human Resources, Division Chair, and Division Administrator; for JPL: Director for Human Resources, Deputy Director for Human Resources, Employee Relations Manager and Employee Relations Consultants or other JPL Managers.

The complaint is then taken to the Provost, Director of EOD, or Dean(s) as appropriate (for faculty, postdoctoral scholars and staff, and students, respectively) at campus or the Employee Relations Manager at JPL. This individual initiates an investigation, described more fully below. Formal complaints of harassment can be made orally or in writing.

Caltech may initiate an investigation about an incident if it becomes aware that inappropriate conduct may have occurred. Caltech also will not delay its investigation of complaints of inappropriate conduct because of a law enforcement investigation.

Concerns about possible harassment may also be reported anonymously by calling the Caltech compliance hotline at (626) 395-8787 or (888) 395-8787 or the JPL Ethics Hotline at (818) 354-9999 or (866) G0JPLEO, or by submitting a compliance hotline contact form.

### *Protection of Complainant and Respondent*

For purposes of this procedure, a complainant is the person filing a complaint; and the respondent is the person responding to the complaint. Caltech will take measures to protect the rights of both the complainant and the respondent as appropriate.

Retaliation against any member of the Caltech community who reports an incident of unlawful harassment is strictly prohibited. If interim safety measures, administrative and/or academic changes are needed in order to protect the rights of either party at any stage of the process, they will be made by the appropriate administrators. These changes should be discussed with the appropriate parties: Provost, EOD Director, Dean, Associate Deans or Director for Human Resources at JPL. Changes might include transfer of supervisory or evaluative responsibility regarding grad-

ing, supervision, tenure review, or letters of recommendation, changes to office assignments and/or counseling. For students, changes might include the complainant's option to avoid contact with the respondent, and changes to classes and/or housing. When taking steps to separate a complainant and respondent, Caltech will endeavor to minimize the burden on the complainant. Care will be taken to protect both parties with the greatest degree of confidentiality. Each party may have an advisor or support person present when reporting, or responding to, claims of harassment. However, the proceeding is an internal Caltech function and, therefore, the presence of legal counsel is not permitted by anyone during the conduct of these procedures.

#### *Details of Formal Complaint Process*

Caltech has put in place the following process to ensure that all investigations of harassment are handled promptly, thoroughly, and impartially:

- Formal complaints of harassment can be made orally or in writing; but if made orally should, in the end, be put in writing.
- Complaints should be brought to the attention of one of the following individuals: Caltech's Title IX Coordinator; for campus: Provost, Vice Provosts, Deans, Associate Deans, Student Affairs Directors, Master of Student Houses, Director of EOD, Employee Relations Consultants, Associate Vice President for Human Resources, Division Chairs, or Division Administrators; for JPL: Director for Human Resources, Deputy Director for Human Resources, Employee Relations Manager, Employee Relations Consultants or other JPL Managers. They will ensure that complaints reach the Provost, the EOD Director, or the Dean(s) at campus and the Employee Relations Manager at JPL, as appropriate.
- The purpose of the investigation is to determine the facts relating to the complaint.
- All parties involved will receive a fair process and be treated with care and respect.
- The Caltech investigation will occur independently from any legal/criminal proceedings that may take place.
- The individuals involved in the investigation will respect the privacy of the complainant, respondent, and that of all parties involved while conducting a thorough review of the complaint.
- Investigators are trained in issues related to harassment, and are trained how to conduct an investigation process that protects the safety of all involved and promotes accountability.
- The investigator should be from the same areas as the respondent. For example, if a student makes a complaint

against a faculty member, a representative appointed by the Provost's office will lead the investigation. If a student files a complaint against another student, a representative appointed by the appropriate Student Affairs office will lead the investigation.

- Within a reasonable length of time the respondent will be notified of the nature of the complaint, and an investigation will begin. If administrative changes are needed to protect the rights of the complainant or respondent during the investigation, the appropriate administrators shall see that they are made.
- Caltech will investigate all complaints consistent with its obligations under applicable law. For complaints solely covered by Title IX of the Education Code, when meeting with the complainant, the investigator(s) will seek consent to proceed with the investigation. If the complainant requests confidentiality or asks that the complaint not be pursued, Caltech still will take all reasonable steps to investigate and respond to the complaint consistent with the request for confidentiality or request not to pursue an investigation. If the complainant refuses to have their name disclosed to the respondent, the investigator(s) will explain that Caltech's ability to respond may be limited. If the complaint includes allegations that may constitute a possible crime, the investigator(s) will notify the complainant of their right to file a criminal complaint.
- The complainant and respondent will be informed of the relevant procedures, and may object to the suitability of the investigator(s) by notifying the appropriate Caltech official in writing.
- Caltech's Nondiscrimination and Equal Employment Opportunity (EEO), Unlawful Harassment, and Sexual Violence policies will be reviewed with both parties and copies will be provided to them.
- The complainant and respondent will be informed that Caltech will not tolerate retaliation, will take steps to prevent retaliation, and will take strong responsive action if retaliation occurs. The complainant and respondent will be advised to notify Caltech immediately if any retaliation occurs. They should immediately notify any of the individuals to whom a complaint can be made if anyone associated with the matter is under continuing threat or is being subjected to retaliation.
- The investigator(s) will summarize for the respondent the evidence in support of the complaint to allow the respondent the opportunity to reply.
- The investigation will be treated as confidential to the extent possible and all parties will be advised to maintain confiden-

tiality. Caltech administrators will be informed on a need-to-know basis. Caltech will make reasonable and appropriate efforts to preserve the complainant's and respondent's privacy and protect the confidentiality of information. However, because of laws relating to reporting and other state and federal laws, Caltech cannot guarantee confidentiality, except where the report of harassment is made to a confidential resource.

- The complainant and respondent will be given equal opportunity to present their case separately to the investigator(s), to suggest others who might be interviewed, and to present other evidence. Subsequently, the investigator(s) can, if appropriate, interview other parties to reach findings and conclusions.
- All parties who participate in investigative interviews may submit written statements. Investigatory meetings will not be recorded.
- Both parties will be kept informed of the status of the investigation.
- All formal complaints will be investigated within a reasonable length of time after the complaint has been made, normally within 60 days. An individual, a committee, or an outside consultant may conduct the investigation.
- Investigative files are confidential and will be maintained in the appropriate administrator's office.
- Exceptions to or modification of these procedures can be made by the Provost, Dean or Associate Deans, or Director of EOD at campus or by the Employee Relations Manager at JPL, if required for fairness or practical necessity. Exceptions must be made in writing and notice provided to both the complainant and respondent. Other administrative issues regarding the conduct of the investigation will be decided by the Provost, Dean(s), and Director of EOD at campus or by the Employee Relations Manager at JPL, as needed.

#### *Findings and Recommendations*

The investigator(s) will use the preponderance of evidence standard in determining whether prohibited harassment occurred. A preponderance of the evidence means that it is more likely than not that the incident occurred. When the investigator(s) is presented with two different but plausible versions of the incident, credibility determinations may affect the outcome.

The investigator(s) will make a recommendation to the relevant Dean, Provost, EOD Director, or Director for Human Resources at JPL, as appropriate, within 15 days of the completion of the investigation, regarding the charges and the appropriate consequences, including disciplinary action against the respondent, and steps to prevent the reoccurrence of any harassment and to correct any discriminatory effects on the complainant and others, if appropriate.

#### *General Information*

The conclusions that the investigation might reach include, but are not limited to, the following possibilities. In each case the investigator(s) should summarize the evidence that supports the conclusion.

1. A violation of Caltech's Nondiscrimination and EEO, Unlawful Harassment or Sexual Violence Policies occurred.
2. Inappropriate behavior occurred, but did not constitute a violation of Caltech's policies on discrimination, harassment, and/or sexual violence. For example, the respondent improperly used the power of his or her position, used poor judgment, or violated applicable standards of ethical behavior.
3. The charges were not supported by the evidence.
4. The charges were brought without any basis or without a reasonable, good faith belief that a basis existed.

### *Resolution*

As soon as practicable after receiving the findings of the investigator(s), management or administration shall review the findings with the dean(s), manager(s), division chair(s) and others as necessary. Within 7 (seven) days after receiving the recommendation, both the complainant and respondent shall be informed in writing, concurrently, of the results and their right to appeal. Any sanctions imposed against the respondent will be disclosed consistent with applicable law, including FERPA, Title IX of the Education Code, and the Clery Act.

If a violation of Caltech's Nondiscrimination and EEO, harassment or sexual violence policies has occurred, appropriate sanctions will be imposed if possible. Depending on the severity of the case and role at Caltech, possible sanctions include, but are not limited to:

- Verbal counseling/training
- A formal written warning placed in the respondent's file
- Suspension of the right to accept new graduate students or postdoctoral scholars
- Transfer of advisees and/or removal from positions of administrative responsibility
- Removal from student housing
- Removal from a supervisory position
- Enforced leave of absence/suspension
- Termination of employment or permanent dismissal
- Expulsion

If the respondent was not found to have violated Caltech policy on harassment, but the investigation concludes that he or she violated another Caltech policy, or committed some other wrongful or improper act, appropriate sanctions will be imposed. Effective corrective action may also require remedies for the complainant and/or the broader student population.

### *Appeals*

Appeals must be in writing and submitted within 30 days of notification of the decision. The appeal must be on the grounds of improper procedure, an arbitrary decision based on evidence in the records or new evidence that was unavailable at the time of the investigation. Both the complainant and respondent will be informed, in writing, of the outcome of the appeal.

Faculty appeals can be made to the Provost. Appeals by a faculty member of decisions or actions by the Provost that affect academic freedom and tenure can be made to the Faculty Committee on Academic Freedom and Tenure, as indicated in Chapter 4 of the Faculty Handbook.

Student appeals can be made to the Vice President for Student Affairs or his or her designee.

Staff and postdoctoral scholar appeals can be made to the Associate Vice President for Human Resources or his or her designee at campus or to the Deputy Director for HR at JPL.

### *Further Complaints*

The complainant should immediately notify the Title IX Coordinator, or for campus, the Provost or Division Chair, Dean or Associate Deans, or Director of EOD or for JPL, the Employee Relations Manager, if the corrective action does not end the harassment, or if any retaliatory action occurs. In such cases, the complainant has the right to file another complaint.

### *Related Policies and Procedures:*

- Nondiscrimination and Equal Employment Opportunity
- Sexual Violence Policy

## **Violence Prevention**

It is the policy of the Institute to provide a safe and secure environment for all members of the Institute community, comprising employees including faculty, students, postdoctoral scholars, and third parties by maintaining an environment of respect, providing conflict resolution processes, and by establishing preventative measures as well as providing assistance and support to victims. This policy specifically addresses the Institute's position on the prevention, reduction, and management of violence to provide a safe working and learning environment for its students, employees including faculty, postdoctoral scholars, and third parties engaged in any Institute activity.

All members of the Institute community shall cooperate to maintain a safe environment.

The Institute does not tolerate violence or threats of violence committed by or against employees including faculty, students, postdoctoral scholars, or third parties on its campus, at JPL or at any Institute locations or Institute activities. All weapons are

banned from Institute premises and activities unless written permission is given by Campus Security or Jet Propulsion Laboratory (JPL) Division of Protective Services. Employees and students who violate this policy will be subject to corrective action, up to and including termination, expulsion/dismissal, or denial of access to Institute locations. Individuals who intentionally bring false accusations about a violation of this Policy against another also will be subject to corrective action, including termination or expulsion/dismissal. Other violations of the policy will be handled in accordance with Institute policies and applicable laws.

Caltech has established and will maintain a violence prevention program to educate employees including faculty, postdoctoral scholars and students about violence prevention and public safety awareness.

### *Definitions*

- Acts of violence include any physical action, whether intentional or reckless, that harms or threatens the safety of another individual at the Institute.
- A threat of violence includes any behavior that by its very nature could be interpreted by a reasonable person as intent to cause physical harm to another individual.
- Institute or Facilities include all Institute locations and off-campus locations where employees including faculty, postdoctoral scholars or students are engaged in Institute activities.
- An At-Risk Individual is an employee, student, or other person who is a potential target or victim of violence. An At-Risk Individual also may be a threat to self or others.
- Intimidation is engaging in actions that include, but are not limited to, stalking or behavior intended to frighten, coerce or induce duress.
- Persons include Institute employees including faculty, students, postdoctoral scholars and third parties.
- Third Parties are individuals who are not Institute employees or students, such as relatives, acquaintances, guests, contractual personnel, consultants, vendors, visitors, volunteers, customers, clients, others engaging in sponsored activities, external affiliates, or others.
- Victim is an individual who has experienced or witnessed an act or acts of violence or threats of violence or intimidation as outlined in this Policy.
- Weapon is any instrument or substance capable of producing bodily harm, in any manner, under any circumstances, and at a time and place that manifests intent to harm or intimidate another person or that warrants alarm for the safety of another person.

*Examples of actions or activities that violate the Institute's Policy include, but are not limited to:*

- Physical violence or the threat of physical violence against persons or property.
- Any verbal or physical conduct and/or harassing or intimidating behavior that causes a person to reasonably fear for his or her safety, or the safety of others including the safety of friends or family.
- Possessing, brandishing, or using a weapon in a manner that is not required by the individual's position while involved in any Institute activity on or off premises.
- Threatening or intimidating communications including notes, voice messages, telephone calls, electronic communications such as emails, texts and social media, and intra-office or regular mail directed towards a person(s) or Facilities.
- Intimidation, including stalking a person.
- Intentional destruction or threat of destruction to property owned or controlled by the Institute or NASA.
- Acts of violence or threats of violence, on or off Institute premises, if the threats or acts affect the legitimate interests of the Institute.

*Reporting Violence*

- Any individual who experiences or observes a threat, an act of violence, or an unauthorized Weapon must immediately notify Campus Security or JPL Protective Services Division, or law enforcement.

Campus Security	626 395-5000
JPL Protective Services Division	818-354-3530

An individual at a non-campus or non-JPL location must immediately notify local law enforcement.

- If an individual becomes aware of behavior that might violate this Policy, the individual must immediately notify one of the following managers or offices.

Employee's supervisor/management	
Campus Human Resources – Employee Relations	626-395-8039
Dean of Students	626-395-6351
Dean of Graduate Studies	626-395-6346
Provost Office	626-395-6320
Title IX Coordinator	626-395-3132
Campus Security	626 395-5000
Caltech Ethics Help Line	626-395-8787
JPL Human Resources	818-354-7506
JPL Protective Services Division	818-354-3530

*General Information*

- The Institute will handle all reports of violence in a confidential manner, with information released as determined to be appropriate by the Institute.
- Managers are required to immediately report any known incidents of violent, threatening, or intimidating behavior to Security, JPL Division of Protective Services, Human Resources, the Deans or the Provost, whether that behavior is observed on or off Institute premises when any Institute activity is involved.
- Caltech policy prohibits retaliation against any employee, student, or third party who, in good faith, reports a violation or suspected violation of this Policy.

### *Investigating Violence*

- All reports of inappropriate behavior or conduct that violates or appears to violate any aspect of this Policy will be taken seriously, properly investigated and dealt with accordingly. Separate from any criminal investigation that the police may conduct, Campus Security or JPL Division of Protective Services, Human Resources, the Deans, the Provost, or the Title IX Coordinator will conduct an independent investigation of the alleged threat or incident.
- Based on the findings of the investigation, individuals who violate any aspect of this Policy may be subject to corrective action up to and including any of the following: termination of employment, expulsion/dismissal, removal from the premises, or being restricted from access to Institute facilities.
- Additionally, the commission of such acts that may violate California or federal laws may be referred to law enforcement agencies for investigation.

### *Possession and Use of Firearms and Weapons*

No unauthorized firearms or other weapons shall be brought onto Institute or NASA property or to Institute activities, with the exception of weapons authorized by the Chief of Security on campus or the Division Manager of the Protective Services Division at JPL.

### *Resources*

- The Staff and Faculty Consultation Center and the Student Counseling Center at campus or the Employee Assistance Program at JPL may provide resources such as intervention, consultation or referral for clinical evaluation or treatment, including arranging for counselors to work with at-risk individuals, and victims and observers of an incident.

Campus Security	626-395-5000
Staff and Faculty	626-395-8360
Consultation Center	
Human Resources	626-395-8039
Dean of Students	626-395-6351
Dean of Graduate Studies	626-395-6346
Student Counseling Center	626-395-8331
Provost	626-395-6320
Title IX Coordinator	626-395-3132
Caltech Center for Diversity	626-395-6207
Caltech Ethics Help Line	626-395-8787

### *JPL*

Protective Services Division	818-354-3530
Human Resources	818-354-7506
Employee Assistance Program	818-354-3680
Ethics	818-354-6338
Ethics Help Line	818-354-9999
Workplace Violence Hotline	818-393-2851

### *Exceptions*

- Any exception to this policy requires the approval of the Chief of Security for campus, or the Division Manager for the Division of Protective Services for JPL.

### *Related Policies*

- Termination
- Unlawful Harassment
- Sexual Violence

## **Whistleblower**

It is important to the Institute that employees disclose violations or potential violations of law or serious breaches of conduct without the fear of retaliation. Caltech policy prohibits retaliation against an individual who makes a good-faith disclosure of suspected wrongful conduct. Any individual who engages in retaliation in violation of this policy will be subject to disciplinary action up to and including termination or expulsion.

As employees of the Institute, each of us is responsible for making sure his/her conduct fully complies with all laws and regulations as well as Institute policies. The Institute expects employees with knowledge of specific acts that he/she reasonably believes violate the law or Institute policy to disclose those acts to an appropriate Institute official.

If an employee believes he/she has been the subject of retaliation for making a good-faith disclosure, he/she is encouraged to contact his/her supervisor or one of the following offices:

Human Resources, JPL Ethics Office, Audit Services and Institute Compliance, or the Office of General Counsel. Anyone with questions or concerns regarding inappropriate or improper activities within the Institute may use one of the anonymous reporting mechanisms outlined below:

Web Hotline: <http://asic.caltech.edu/hotline.htm>

Telephone Hotline: (626) 395-8787 or toll free (888) 395-8787

Interoffice Mail: Audit Services and Institute Compliance  
MC 250-64

U.S. Mail: Audit Services and Institute Compliance  
565 S. Wilson Avenue, Pasadena, CA 91106

JPL Ethics Line: (818) 354-9999 or toll free (866) G0-JPLEO