Cover illustration of Caltech's Olive Walk
by Joseph Stoddard
One Hundred and Second
Annual
Commencement

Friday morning at ten o'clock
June fourteenth, nineteen ninety-six
About Caltech

In his diary entry of September 1, 1891, Pasadena philanthropist Amos Throop wrote, "Planted potatoes, cleaned a water pipe, husked the corn... In afternoon, saw Mr. Wooster and rented his block for five years... and hope I have made no mistake." Were he here today, Throop could rest assured in his decision. For the building of which he wrote, the Wooster Block, was rented for the purpose of establishing Throop University—the forerunner of Caltech.

In November of that year, Throop opened its doors to 31 students and a six-member faculty. Could anyone have imagined then that the school would become a world center for science and engineering research and education? Perhaps... for in the first year, the board of trustees began to reconsider the mission of the school. In 1892, they decided to emphasize industrial training, and in 1893, reflecting this new focus, renamed the school Throop Polytechnic Institute.

Throop might have remained just a good local school had it not been for the arrival in Pasadena of George Ellery Hale. A faculty member at the University of Chicago and a noted astronomer, Hale settled here in 1903. From that time until his death in 1938, he made significant contributions to Pasadena and Southern California: he established the Mount Wilson Observatory, raised funds for Palomar Observatory and its 200-inch telescope, participated in the creation of the Huntington Library and Art Gallery, helped design the Civic Center in downtown Pasadena, and—perhaps his single greatest achievement—set the course for the development of Throop into the California Institute of Technology, a school he envisioned as a scientific institution of the highest rank.

In 1913, Hale convinced Arthur Amos Noyes, professor of chemistry and former president of the Massachusetts Institute of Technology, to join him in Pasadena. With the arrival in 1917 of Robert Andrews Millikan, professor of physics at the University of Chicago, Hale had assembled the founders of the new institution. The world center of scientific and engineering research and education he had imagined soon took shape under a new name, the California Institute of Technology, administered by Millikan and enriched with the scientific talents of Noyes and his faculty colleagues.

Caltech today has a 124-acre campus and operates seven off-campus astronomical, seismological, and marine biological facilities, and administers NASA's Jet Propulsion Laboratory as well. At present, the Institute has an enrollment of some 2,000 students, more than half of whom are in graduate studies, and a faculty of about 275 professorial members and more than 370 research members, including two Nobel laureates and two Crafoord laureates. Today, Caltech will award 226 students the B.S. degree; 105 students the M.S. degree; 1 scholar the Engineer's degree; and 164 doctoral candidates the Ph.D. degree, for a total of 496 graduates—quite a leap from the one man and one woman who constituted the first collegiate graduating class of Throop University.
About the Speaker

The Institute is honored to have Admiral Bobby Ray Inman as the speaker at its 102nd annual commencement. Born in Texas in 1931, Bobby Inman graduated from the University of Texas in 1950. He joined the Naval Reserve the following year and was commissioned as an ensign in 1952. Over the next 19 years he served on an aircraft carrier, two cruisers, and a destroyer, as well as carrying out numerous assignments in naval intelligence.

Following his graduation from the National War College in 1972, Inman was selected for promotion to rear admiral in 1974 and was promoted to vice admiral in 1976. In 1981, he was promoted to admiral, becoming the first naval intelligence specialist to achieve the four-star rank. Between 1974 and 1982, Inman served in tours as director of Naval Intelligence, vice director of the Defense Intelligence Agency, director of the National Security Agency, and deputy director of the Central Intelligence Agency. He retired from the service with the permanent rank of admiral in 1982.

From 1983 to 1986, Inman served as chairman and CEO of the Microelectronics and Computer Technology Corporation (MCC) in Austin, Texas, and from 1986 to 1989, he was chairman, president, and CEO of Westmark Systems, Inc., a privately owned electronics industry holding company. From 1987 through 1990, he was chairman of the Reserve Bank of Dallas, and he is currently adjunct professor with both the LBJ School of Public Affairs and the Graduate School of Business at the University of Texas at Austin.

In addition to his membership on Caltech's board of trustees, Inman is a trustee of Southwestern University and a member of the board of directors of Fluor, Science Applications International, Southwestern Bell, Temple Inland, and Xerox. He serves in a volunteer status as a trustee of the American Assembly and the Center for Excellence in Education. He serves on the Board of Directors of the Public Agenda Foundation and is a member of the National Academy of Public Administration.
The Commencement Ceremony

These tribal rites have a very long history. They go back to the ceremony of initiation for new university teachers in mediaeval Europe. It was then customary for students, after an appropriate apprenticeship to learning and the presentation of a thesis as their masterpiece, to be admitted to the Guild of Masters of Arts and granted the license to teach. In the ancient University of Bologna this right was granted by authority of the Pope and in the name of the Holy Trinity. We do not this day claim such high authority.

As in any other guild, whether craft or merchant, the master’s status was crucial. In theory at least, it separated the men from the boys, the competent from the incompetent. On the way to his master’s degree, a student might collect a bachelor’s degree in recognition of the fact that he was half-trained, or partially equipped. The doctor’s degree was somewhat different. Originally indistinguishable from the master’s, the doctor’s gradually emerged by a process of escalation into a supermagisterial role—first of all in the higher faculties of theology, law, and medicine. It will come as no surprise that the lawyers had a particular and early yen for this special distinction.

These graduations and distinctions are reflected in the quaint and colorful niceties of academic dress.

Of particular interest is the cap or mortarboard. In the form of the biretta it was the peculiar sign of the master. Its use has now spread far beyond that highly select group to school girls and choir boys and even to the nursery school. Sic transit . . .

The gown, of course, is the basic livery of the scholar, with its clear marks of rank and status—the pointed sleeves of the bachelor, the oblong sleeves of the master, the full sleeves and velvet trimmings of the doctor. The doctors, too, may depart from basic black and break out into many colors—Harvard crimson or Yale blue or the scarlet splash of Oxford.

Color is the very essence of the hood: color in the main body to identify the university; color perhaps in the binding to proclaim the subject of the degree—orange for engineering, gold for science, the baser copper for economics, white for arts and letters, green for medicine, purple for law, scarlet for theology, and so on. Size is a further variable, as the hoods tend to lengthen from the three feet of the bachelor to the four of the doctor. So the birds are known by their plumage.

With this color and symbolism, which is mediaeval though mutated, we stage our brief moment of pageantry, paying homage to that ancient community of scholars in whose shadow we stand, and acknowledging our debt to the university as one of the great institutional constructs of the Middle Ages. While looking back, however, we also celebrate the achievements of this present generation of students and look forward to the future of these our younger colleagues, whom we now welcome to our midst.

David C. Elliot
Professor of History, Emeritus
Academic Procession

Chief Marshal, J. Morgan Kousser, Ph.D.

Marshals
Arden L. Albee, Ph.D.
Noel Robert Corngold, Ph.D.
Joel N. Franklin, Ph.D.
D. Roderick Kiewiet, Ph.D.
David Wales, Ph.D.
Ward Whaling, Ph.D.

Faculty Officer
Robert H. Grubbs, Ph.D.

MARCHING ORDER
CANDIDATES FOR THE DEGREE OF BACHELOR OF SCIENCE
CANDIDATES FOR THE DEGREE OF MASTER OF SCIENCE
CANDIDATES FOR THE DEGREE OF ENGINEER
CANDIDATES FOR THE DEGREE OF DOCTOR OF PHILOSOPHY
FACULTY OFFICERS
THE FACULTY
THE CHAIRS OF THE DIVISIONS
THE DEANS
THE PROVOST
THE TRUSTEES
THE COMMENCEMENT CHAPLAIN
THE COMMENCEMENT SPEAKER
THE PRESIDENT
THE CHAIR OF THE BOARD OF TRUSTEES
Program

ORGAN PRELUDE ........................................ Leslie J. Deutsch, Ph.D.

PROCESSIONAL .......................... The Caltech Convocations Brass and Percussion Ensemble
                                      William Bing, M.M., Conductor

PRESIDING ........................................ Gordon E. Moore, Ph.D.
                                      Chair of the Board of Trustees
                                      California Institute of Technology

INVOCATION ........................................ The Reverend Dr. Eric Michael Smith
                                      Pastor
                                      Holliston United Methodist Church

“PUSHING THE FRONTIERS OF A
RAPIDLY CHANGING WORLD” ............. Bobby Ray Inman
                                      Admiral, U.S. Navy (retired)

CHORAL SELECTION ......................... The Caltech Glee Clubs
                                      Donald G. Caldwell, D.M.A., Conductor

    “Hallelujah” from Messiah
    George Frederick Handel
    (The audience will please rise during the singing of the “Hallelujah” chorus.)

CONFERRING OF DEGREES .................. Thomas E. Everhart, Ph.D.
                                      President
                                      California Institute of Technology
PRESENTATION OF CANDIDATES FOR DEGREES

For the Degree of Bachelor of Science . . . . D. Roderick Kiewiet, Ph.D.  
Dean of Students

For the Degree of Master of Science ........ Gary A. Lorden, Ph.D.  
Vice President for Student Affairs

For the Degree of Engineer .................... Arden L. Albee, Ph.D.  
Dean of Graduate Studies

For the Degree of Doctor of Philosophy .......... Dr. Albee

Biology ............................................ Melvin I. Simon, Ph.D.  
Division Chair

Chemistry and Chemical Engineering ........ Peter B. Dervan, Ph.D.  
Division Chair

Engineering and Applied Science ............... John H. Seinfeld, Ph.D.  
Division Chair

Geological and Planetary Sciences ............. Edward M. Stolper, Ph.D.  
Division Chair

Humanities and Social Sciences ................. John O. Ledyard, Ph.D.  
Division Chair

Physics, Mathematics and Astronomy ........... Charles Peck, Ph.D.  
Division Chair

ANNOUNCEMENT OF AWARDS AND CONCLUDING REMARKS ............. President Everhart

ALMA MATER ......................................... The Caltech Glee Clubs,  
The Caltech Convocations Brass and Percussion Ensemble, and Organ  
(The audience may join in; lyrics are found on page 40.)

BENEDICTION ................................. The Reverend Dr. Smith

RECESSIONAL ................................. The Caltech Convocations Brass  
and Percussion Ensemble

ORGAN POSTLUDE ................................. Dr. Deutsch
Candidates for Degrees

BACHELOR OF SCIENCE

Dorina Akemi Akutagawa* San Jose, California Biology
Amir Ghasem Alagheband* Vancouver, Canada Engineering and Applied Science
Carlos Horacio Aldana* Miami, Florida Electrical Engineering
Eve Astrid Andersson* Seattle, Washington Engineering and Applied Science
Shruthi Bajaj Cerritos, California Engineering and Applied Science
David Andrew Barksdale Fullerton, California Engineering and Applied Science
John Anthony Barrera Suisun, California Engineering and Applied Science
Angie Marie Bealko Clarkston, Michigan Engineering and Applied Science
Michael Drew Benedetti Vienna, West Virginia Physics
Robert Michael Bergeron* Nashua, New Hampshire Engineering and Applied Science
Marcel Peter Benedetti Bethlehem, Pennsylvania Astronomy
Abhijit Bhalla Bikaner, India Engineering and Applied Science
Sooketo Bhuta* Pomona, California Engineering and Applied Science and Economics
Rebecca Leanne Blankenburg* Carmichael, California Biology
Alexandria Bianca Boehm* Kailua, Hawaii Engineering and Applied Science
Walter Frank Brisken* Fremont, California Physics and Astronomy
Jane Ruth Brock* Falls Church, Virginia Chemistry
Suzanne Margaret Bruch* Durham, North Carolina Biology
West Matthew Burghardt Bradenton, Florida Engineering and Applied Science
Barry Mark Caceres* Las Vegas, Nevada Engineering and Applied Science
Frederic Caldwell El Paso, Texas Engineering and Applied Science
Causenge Capellus Cangin* New York, New York Electrical Engineering
Matthew Thomas Carle Advance, North Carolina Physics
Guillermo Gregorio Castillo Neperland, Texas Engineering and Applied Science
Pratap Chakravarthy Bangalore, India Chemical Engineering
Hope Hong-Mei Chang Honolulu, Hawaii Engineering and Applied Science
Janis Leslie Chang* Cleveland, Ohio Physics
Jessica Chang Fullerton, California Chemistry and Biology
Lily Chang Sherman Oaks, California Engineering and Applied Science
Patty Pei-Ling Chang-Chien Temple City, California Electrical Engineering
Robert William Chapman* Huntington Beach, California Electrical Engineering

Students whose names are followed by an asterisk are being graduated with honor in accordance with a vote of the faculty.
BACHELOR OF SCIENCE — Continued

Amalavoyal Narasimha Chari* Calcutta, India Mathematics and Economics
David Emilio Chavez* Ranchos de Taos, New Mexico Chemistry
Anand Chelian Seal Beach, California Engineering and Applied Science
Christine Hsiao-ch’ing Chen Irvine, California Physics
Li-Shing Lyndon Chen College Station, Texas Engineering and Applied Science
Richard Wei-Heng Chin Bethesda, Maryland Engineering and Applied Science
David Sunbo Choi Los Angeles, California Economics
Soon Ghee Chua* Republic of Singapore Electrical Engineering and Economics
Rudi Langston Cilibrasi Sacramento, California Engineering and Applied Science
Matthew Allen Clapp Bloomington, Minnesota Electrical Engineering
Andrew Brian Clarke* Hollywood, Florida Engineering and Applied Science and Literature
Keith Mansfield Counsell Baltimore, Maryland Engineering and Applied Science
David Allen Cuthbert Escondido, California Engineering and Applied Science
Jeremiah Kane Darling* Albuquerque, New Mexico Physics
Michael Craig Deierling Des Moines, Iowa History
Jeffrey T. Denniston Prospect, Pennsylvania Mathematics
Scott McKinley DeWinter* Anchorage, Alaska Engineering and Applied Science
Jeffrey M. Dickert Seattle, Washington Applied Physics
Eric Scott Dickson* Long Beach, California Physics
Thomas Louis Dmukauskasz Cicero, Illinois Engineering and Applied Science
Kevin Lee Du* Greenwich, Connecticut Biology and Literature
Brendan Patrick Keegan Dunn Minneapolis, Minnesota Engineering and Applied Science
Leonard Dvorson* Newton, Massachusetts Physics
Donna Michelle Ebenstein* Concord, California Engineering and Applied Science and Biology
Christopher Robert Echols Olathe, Kansas Engineering and Applied Science
Daniel Trawick Egnor Penn Yan, New York Engineering and Applied Science
Darush Edward Ehsani* Creve Coeur, Missouri Mathematics
Bryce Mildon Engelbrecht* Sapulpa, Oklahoma Engineering and Applied Science
Blair Richard Essy* Portland, Oregon Chemistry
Mintao Fan* Pugi, China Biology and Mathematics
Arsalan Farooq Nairobi, Kenya Engineering and Applied Science
Ghene Erwin Faulcon Raleigh, North Carolina Mathematics
Anatole Faykin Philadelphia, Pennsylvania Biology and Engineering and Applied Science
Christopher Lawrence Foley Carpinteria, California Engineering and Applied Science
Venkataraman Vishnampet Ganesan* Coimbatore, India Engineering and Applied Science
Christopher Lowell Gerardy  Louisville, Colorado  Astronomy
Matthew James Goff*  Chicopee, Massachusetts  Chemical Engineering
Alex Golovitsin  New York, New York  Physics
Robert Anton Granat*  Brooklyn, New York  Engineering and Applied Science
Eugene Grayver  Los Angeles, California  Electrical Engineering
Michael Christopher Greene  El Toro, California  Engineering and Applied Science
Francisco Javier Gutiérrez  Cuautémoc, Mexico  Engineering and Applied Science
Christopher Dale Hance*  Puyallup, Washington  Engineering and Applied Science
Daniel Jeffrey Hanish  Omaha, Nebraska  Physics
Stephanie D. Haussmann  Torrance, California  Biology
Eric S. Hill  Houghton Lake, Michigan  Engineering and Applied Science
Heidi Jean Hofer  Glassboro, New Jersey  Physics
Justin Howard Howell  Sunnyvale, California  Astronomy
Jason Chung-Shiang Hsu*  Brea, California  Applied Mathematics and Economics
Victor Yu-Ching Hsu*  Alhambra, California  Biology
John Michael Hubenschmidt  Sugar Land, Texas  Mathematics
Colin James Humphries  Albuquerque, New Mexico  Biology
Chou Po Hung  Chico, California  Biology
Christopher John Hunter*  Anchorage, Alaska  Engineering and Applied Science
Rachel Olivia Hunter  Modesto, California  Biology
José Miguel Hurtado, Jr.*  Fairfield, California  Geology
Xinh Xinh Huynh*  San Francisco, California  Physics
Michael Edwin Ichiru  Honolulu, Hawaii  Biology
Roman Jarosiewicz*  Tremont, Illinois  Engineering and Applied Science
Walter Curtis Jones III  Bloomfield Hills, Michigan  Economics
Adil Mahmood Karim*  San Diego, California  Applied Physics
Mihoko Kato  Los Angeles, California  Chemistry
Brian Lee Katon  Deadwood, South Dakota  Engineering and Applied Science and Economics
Clifton Hiroichi Kayano*  Kaneohe, Hawaii  Electrical Engineering
Stacy Ann Kerkela  Athens, Georgia  Geophysics
Jay-Steven Yap Kho  Walnut, California  Electrical Engineering
Brian Sanghoon Kim*  Upland, California  Biology
Paul Choi Kim  Houston, Texas  Engineering and Applied Science
Seong-Youn Brenda Kim  Los Angeles, California  Engineering and Applied Science and Biology
Tae Hyung Kim*  Seoul, Korea  Engineering and Applied Science
John David Heaton King  San Diego, California  Engineering and Applied Science
BACHELOR OF SCIENCE — Continued

Mitsuo Kobayashi West Orange, New Jersey Chemistry
Kimberly Lynn Komisarek* Naperville, Illinois Chemistry and Literature
Kurt Donald Kramer Anchorage, Alaska Applied Physics
Arvindh Krishnaswamy Silver Spring, Maryland Physics and Engineering and Applied Science
Jason H. Kuang* Buena Park, California Engineering and Applied Science
Roshan Moti Nihalaney Kumar Glendale, California Biology and Chemistry
Karen Kustedjo Waldwick, New Jersey Chemistry
Kelvin Y. Kwan* Claremont, California Biology
Eileen EE Ling Lau* Kuala Lumpur, Malaysia Electrical Engineering
Albert Taijin Lee Simsbury, Connecticut Engineering and Applied Science
Charles Chulsoo Lee Flagstaff, Arizona Biology and Chemistry
Jason Chen-Shan Lee* Cerritos, California Biology
Tiffany Pei-ling Lee* Tainan, Taiwan Engineering and Applied Science
Heide Roth Li Honolulu, Hawaii Engineering and Applied Science
Steven Philip Lieske* Delavan, Wisconsin Biology and Electrical Engineering
Hansel Lo Corcoran, Minnesota Chemical Engineering
Jeffrey Chih-Hou Lowe* Dallas, Texas Chemical Engineering
Adriana Elizabeth Lozano Houston, Texas Literature
Anh Quoc Ly Tustin, California Electrical Engineering
Thomas Joseph MacCarone Swampscott, Massachusetts Physics
Jeffrey Jacob Mach Oroville, California Engineering and Applied Science
Linda Ntepane Maepa Overland Park, Kansas Geology
Rahul Malhotra* Bombay, India Physics
Tal Margalith San Diego, California Applied Physics
Christopher Ryan Marsh San Angelo, Texas Engineering and Applied Science
Andrew Nathan Mart* Stuart, Florida Physics
Nathan John Mates Seattle, Washington Engineering and Applied Science
Sean Patrick Mauch* Ekalaka, Montana Applied Mathematics
Jonathan Edward McDunn Alexandria, Virginia Chemistry
Lydia Esther McKay Spring Valley, California Engineering and Applied Science
Jeffrey Robert McMillan* St. Louis, Missouri Electrical Engineering
Thomas Oliver Meyer* South Elgin, Illinois Physics
Jennifer Ann Miller Moreno Valley, California Chemistry
Reza Mohsin Lahore, Pakistan Engineering and Applied Science
Anthony Frank Molinaro Denver, Colorado Engineering and Applied Science
John Anderson Monroe, Jr.* Naperville, Illinois Applied Mathematics
Roman Muchnik* Los Angeles, California Mathematics
Penny Lee Muir Leyden, Illinois Engineering and Applied Science
BACHELOR OF SCIENCE — Continued

John Douglas Naud* Rochester, New York Physics
Esmeralda Nava San Diego, California Engineering and Applied Science
Kevin Richard Neville* Pullman, Washington Chemistry
Suzanne Pham Nguyen Tacoma, Washington Biology
Robert Marshall Nostrant* Orangevale, California Engineering and Applied Science
Nestor Andrés Ocampo El Paso, Texas Engineering and Applied Science
Miyabi Grace Ota Los Angeles, California Engineering and Applied Science
Boris Hyle Park Arcadia, California Physics
Cecilia Soojee Park* Irvine, California Chemistry and Biology
Egon Clive Pasztor* Peoria, Arizona Engineering and Applied Science
Mitesh Patel Katy, Texas Physics
Pál Ivan Pénzes* Sighet, Romania Engineering and Applied Science
Ann Plotkin Belmont, California Engineering and Applied Science
David Arthur Plurad Dix Hills, New York Chemical Engineering
Elizabeth Marian Price Chicago, Illinois Engineering and Applied Science
Aimee Lai Quan* Cincinnati, Ohio Biology
Anandi Raman Pittsburgh, Pennsylvania Biology and Chemistry
Daniel David Richard III* New Orleans, Louisiana Engineering and Applied Science
Brian S. Riley Elmira, Oregon Engineering and Applied Science
Josef David Ringgenberg Lombard, Illinois Chemistry
Michael Tzu Ru* Alhambra, California Chemical Engineering
Sara Ann Russell Indianapolis, Indiana Geophysics
Anton Vladimirovich Ryzhov* Moscow, Russia Physics
Atul Arvind Salvekar* Cleveland, Ohio Electrical Engineering
Nathan Scandella* Gaithersburg, Maryland Engineering and Applied Science
Dean James Schaefer Kenilworth, New Jersey Economics
Andrew Louis Schoen Sandy, Utah Mathematics
Frederick Shic Orlando, Florida Engineering and Applied Science
Robin King-Hang Sik* Hong Kong Engineering and Applied Science
Alexander Libra Simon* Pasadena, California Biology
David Malcolm Simpson Cardiff-by-the-Sea, California Engineering and Applied Science
Steven Michael Skovran Glastonbury, Connecticut Engineering and Applied Science
Alison Elaine Slemp* Tulsa, Oklahoma Biology and History
David A. Smith Charlottesville, Virginia Mathematics
Glenn Carlyle Smith South Pasadena, California Engineering and Applied Science
Zoltan Somogyi Santa Monica, California Applied Mathematics
Alison Lyn Sopher* Tallahassee, Florida Mathematics
Mark Clemens Sorensen* Cupertino, California Engineering and Applied Science
BACHELOR OF SCIENCE — Continued

Devabhaktuni Srikrishna* Tenali, India Mathematics
Divya Srinivasan* Eden Prairie, Minnesota Independent Studies Program
Gregory Joseph Steiert Portland, Oregon Electrical Engineering
David E. Stephenson Torrance, California Engineering and Applied Science
Donovan Aaron Stevens Porterville, California Geology
Vivek Anand Sujan* Bombay, India Engineering and Applied Science
Marc Allen Sulfridge* Boise, Idaho Engineering and Applied Science
David Alan Tahmoush* Haddon Township, New Jersey Physics
Renny Sandra Talianchich Houston, Texas Engineering and Applied Science
Craig Shigeru Tanaka* Gardena, California Engineering and Applied Science and Economics
Haiyun Tang* Shanghai, China Applied Physics
Kathryn Chuan Tao Rancho Santa Fe, California Engineering and Applied Science
Andrew Chanan Tong* Beaumont, Texas Physics
Thanh Ngia Trinh Tran* Las Vegas, Nevada Chemical Engineering
Steve Fu-Min Tsai* Alhambra, California Biology
Doris Ying Tsao* Silver Spring, Maryland Biology
Helen Wan-Chu Tsao Oxnard, California Engineering and Applied Science
Jian-Jin Tuan* Kirkland, Washington Electrical Engineering
Tamara Lynne Tulou McLean, Virginia Electrical Engineering
Eric Joseph Uhrhane Morristown, New Jersey Engineering and Applied Science
Paul Robert Upchurch Houston, Texas Engineering and Applied Science
Sean Alan Upchurch Houston, Texas Chemistry
Hatice Sertac Uysal Istanbul, Turkey Economics
David R. Vaughn Lake Jackson, Texas Economics
Sean Michael Vellucci* Lawrence, Kansas Biology
Laura Elizabeth Verhoff Sarasota, Florida Engineering and Applied Science
Adam Neil Maximilian Villani Long Beach, California Geology
Michael James Vogel Beaver Creek, Ohio Engineering and Applied Science
Kenneth Antrim Walsh San Diego, California Electrical Engineering
David Wang* Houston, Texas Biology
Shultz Hsu Shih Wang Elmhurst, New York Electrical Engineering
Samuel Michael Webb* Kalamazoo, Michigan Geochemistry
Nathan Andrew Weller Elko, Nevada Electrical Engineering
Jon Robert Wessellmann* Woodstock, Georgia Applied Physics
Lyndie Ruth Williamson Palo Alto, California Applied Physics
Stephen Wong* Los Angeles, California Biology
Joy Kaoru Yamamoto* San Mateo, California Chemistry
Hunyue Yau Chicago, Illinois Electrical Engineering
Wayne Hiroshi Yoshida  Monterey Park, California  Chemical Engineering
Nam Chul Yu*  Huntington Beach, California  Biology
Inn Huam Yuk*  Singapore  Chemistry
Kenneth Michealovitch Zenfeldmann  Lake Oswego, Oregon  Engineering and Applied Science
Jian Zhang*  Santa Ana, California  Biology
Ning Zhang*  Tainjin, China  Applied Physics
Xinlan Zhou*  Beijing, China  Physics
Daniel Marc Zimmerman*  Randolph, New Jersey  Engineering and Applied Science and Science, Ethics, and Society
Saiful Azrin Zulkifli  Kuala Lumpur, Malaysia  Electrical Engineering
MASTER OF SCIENCE

Mark Joseph Abolins (Geology) A.B., University of California, Berkeley 1992.
Khaled H. A. E. Al-Khaldi (Chemical Engineering) B.Sc., Kuwait University 1992.
Yanjun An (Chemical Engineering) B.E., Tsinghua University 1990; M.S., 1992.
Alyssa Beth Apsel (Electrical Engineering) B.S., Swarthmore College 1995.
Brian Michael Balchunas (Chemical Engineering) B.S.E., The University of Michigan 1994.
Brian Christopher Broom (Materials Science) B.S., North Carolina State University 1994.
Hou-Pu Chou (Electrical Engineering) B.S., National Taiwan University 1993.
Kenneth Thor Christensen (Mechanical Engineering) B.S., The University of New Mexico 1995.
Thomas Franklin Clymer (Aeronautics) B.S., Michigan State University 1995.
Amish Suresh Desai (Electrical Engineering) B.S., University of California, Los Angeles 1993.
Matthew Anthony Dilligan (Mechanical Engineering) B.S., Yale College 1995.
Mark Edward Duttweiler (Mechanical Engineering) B.S., Rice University 1993.
Tyler Allen Erickson (Civil Engineering) B.S., Colorado State University 1993.
Xiaolin Feng (Electrical Engineering) B.E., Tsinghua University 1994.
Mikhail Georgievich Filippov (Social Science) Diploma, Moscow State University 1989; M.A., University of California, Riverside 1993.
Gavin Bernard Horn (Electrical Engineering) B.A.Sc., University of Toronto 1995.
José Miguel Hurtado, Jr. (Geology) B.S., California Institute of Technology 1996.
Dan Istrate (Mechanical Engineering) Engineer, Polytechnic Institute of Bucharest 1992.
Yong-Nam Jun (Physics) A.B., Princeton University 1994.
Nina Cynthia Korf (Electrical Engineering) B.S., New Mexico State University 1994.
Doris L. Lee (Chemical Engineering) S.B., Massachusetts Institute of Technology 1994.
Maurice Yao-Tze Lee (Computation and Neural Systems) B.S., Wheaton College 1987.
Ying Li (Mechanical Engineering) B.S., Tsinghua University 1994.
Hong Liao (Environmental Engineering Science) B.S., Peking University 1986; M.S., 1989.
Rong Lu (Physics) B.A., Middlebury College 1993.
Jason L. Maron (Physics) B.S. (Mathematics), B.S. (Physics), University of Wisconsin–Madison 1993.
Kyu Sung Min (Materials Science) B.S., University of California, Los Angeles 1994.
Nathan Alan Niemi (Geology) B.A., Cornell University 1994.
Julie Jeannine Norris (Geophysics) B.S., University of California, Los Angeles 1993.
Sumit Pandey (Chemical Engineering) B.Tech., Institute of Technology, Banaras Hindu University 1994.
Christina Michelle Ramirez (Social Science) B.A., The University of Texas at Austin 1994.
Hongyu Ran (Mechanical Engineering) B.S., University of Science and Technology of China 1995.
Rajan Ranga (Electrical Engineering) B.S., California Institute of Technology 1995.
Mike Anthony Reddig (Chemical Engineering) B.S., Northwestern University 1994.
MASTERC SCIENCE — Continued

Jason Charles Schense (Chemical Engineering) S.B., Massachusetts Institute of Technology 1994.
Eve Meryl Schule (Computer Science) B.S., Yale College 1983; M.S., University of California, Los Angeles 1988.
Armin Schwartzman (Electrical Engineering) B.Sc., Technion — Israel Institute of Technology 1995.
Jerry Wei-jen Shan (Aeronautics) B.S., California Institute of Technology 1995.
Amy Shaw (Chemistry) A.B., Bryn Mawr College 1991.
Wanwimol Siriwatwechakul (Chemical Engineering) B.S., Chulalongkorn University 1994.
Atsushi Sugitatsu (Electrical Engineering) B.S., Kyoto University 1988.
Lixin Tang (Biology) B.S., University of Science and Technology of China 1989; M.S., 1992.
Sergey Dmitrievich Tsyplakov (Social Science) Diploma, Moscow Institute of Physics and Technology 1990.
Charles Anthony Vanelli (Mechanical Engineering) B.S.E.E., The University of Texas at Austin 1993.
Marijana Vukičević (Electrical Engineering) B.S., University of Belgrade 1994.
Samuel Michael Webb (Environmental Engineering Science) B.S., California Institute of Technology 1996.
MASTER OF SCIENCE — Continued

Lianxing Wen (Geophysics) B.S., University of Science and Technology of China 1988.
Timothy Chang-Wei Wu (Chemical Engineering) B.S., University of Illinois at Urbana-Champaign 1988.
Chung-hei Yeung (Chemical Engineering) B.S., Case Western Reserve University 1993.
Su Yin (Mechanical Engineering) B.S., University of Science and Technology of China 1992; M.S., Shanghai Institute of Optics and Fine Mechanics 1995.
Yair Zadik (Computer Science) B.S., California Institute of Technology 1993.
Mark Donald Zeleznock (Aeronautics) B.S., University of California, Berkeley 1995.
Mei Zhu (Chemistry) B.S., Fudan University 1988; M.A., Rice University 1993.
Denis N. Zorin (Computer Science) B.S., Moscow Institute of Physics and Technology 1991; M.S., Ohio State University 1993.

ENGINEER

Bahadir Erimli (Electrical Engineering) B.S., Middle East Technical University 1992; M.S., California Institute of Technology 1993.
DOCTOR OF PHILOSOPHY

DIVISION OF BIOLOGY

Thesis: Characterization of the Sea Urchin Homologue of the Replication Factor A 70 kD Subunit and the Novel Interspersed Repeat Family to Which It Binds.


Thesis: Analysis of Temporal Structure in Spike Trains of Visual Cortical Area MT.


Jonathan Christopher Robert Bradley (Biology) B.S., State University of New York at Stony Brook 1988.


Chiang-Shan Ray Li (Computation and Neural Systems) B.S., National Taiwan University 1989.
Thesis: Macaque Lateral Intraparietal Area and Oculomotor Behaviors.

Thesis: Cell Migration Domains in the Chick Telencephalon.

Thesis: Plasticity in Mammalian Somatosensory Cerebellar Maps.

Ardem Patapoutian (Biology) B.Sc., University of California, Los Angeles 1990.
Thesis: The Role of the MyoD Family Genes during Mouse Development.

Christopher John Schoenherr (Biology) B.S., The University of Michigan 1986.

When more than one field of study is listed, in the Division of Biology it indicates a dual major; in other divisions the first is the major and the second and others are minors.
DOCTOR OF PHILOSOPHY — Continued


Jennifer Yun-Man Sun (Biology) B.A., University of California, Berkeley 1991.
Thesis: Three-Dimensional Shape from Shading: Perception and Mechanisms.

DIVISION OF CHEMISTRY AND CHEMICAL ENGINEERING


Max Bachrach (Chemistry) A.B., Columbia University 1990.

Ramesh Baliga (Chemistry and Biology) M.Sc., Indian Institute of Technology, Bombay 1990.
Thesis: Analysis of Nucleoprotein Complexes Formed by E. coli RecA Protein Using Affinity Cleavage.

Thesis: The Synthesis, Characterization and Study of Transition Metal Complexes for the Oxidation and Activation of Hydrocarbons.


Thesis: Transition Metal Complexes as Probes of DNA Sequence-Dependent Structure.

Thesis: Design of Cyclic Polyamides for Sequence-Specific Recognition of the Minor Groove of DNA.

Wonyong Choi (Chemistry) B.S., Seoul National University 1988; M.S., Pohang Institute of Science and Technology 1990.

Thesis: Ring-Opening Metathesis Polymerization with Tungsten Based Catalysts: Kinetics, Thermodynamics and Mechanism.

Thesis: Cooperative Oligonucleotide-Directed Triple Helix Formation at Adjacent DNA Sites.
Continued


Michael W. Day (Chemistry) B.S., California State University, Northridge 1988; M.S., 1990. Thesis: X-Ray Crystallographic Studies on Electron Transfer Proteins; Rubredoxin from Pyrococcus furiosus, Nitrogenase MoFe from Azotobacter vinelandii and Ru(2,2'-bppy)(imd)2His83 Azurin from Pseudomonas aeruginosa.


DOCTOR OF PHILOSOPHY — Continued

Fredrick William Irion (Chemical Engineering and Planetary Science) B.A.Sc.,
Thesis: Analyses of Atmospheric CHF₂Cl, Heavy Ozone, HDO and CH₃D from
ATMOS Spectra.

Yonchu Jenkins (Chemistry) A.B., Occidental College 1990.
Thesis: Dipyridophenazine Complexes of Ruthenium(II) as Luminescent Reporters
of DNA.

Matthew Stanley Johnson (Chemistry) B.A., Macalester College 1989.
Thesis: Spectroscopy of Reactive Molecules and Clusters.

Thesis: Binding Site Size Limitations of Imidazole-Pyrrole Polyamides for
Recognition in the Minor Groove of DNA.

John Edwin Lewis, Jr. (Chemical Engineering) B.S., Texas A&M University 1991; M.S.,
California Institute of Technology 1993.
Thesis: Characterization and Permeation Studies on Oriented Single-Crystal
Ferrierite Membranes.

Thesis: 1. Optical Nuclear Magnetic Resonance Analysis of Epitaxial Gallium
Arsenide Structures. 2. Multiple-Pulse Radio-Frequency-Gradient Nuclear
Magnetic Resonance Imaging of Solids.

Scot Turnbull Martin (Chemistry) B.S., Georgetown University 1991.
Thesis: Photocatalyzed Destruction of Chlorinated Hydrocarbons.

Sherrill Lynn Minch (Chemical Engineering and Biology) S.B. (Chemical
Engineering), S.B. (Life Sciences), Massachusetts Institute of Technology 1990; M.S.,
California Institute of Technology 1993.
Thesis: Engineering Protein Glycosylation in Chinese Hamster Ovary Cells: Genetic
Manipulations, Global Glycoprotein Analysis, and Studies of Environmental
Influences.

Kimberly Ann Mislick (Chemical Engineering) S.B., Massachusetts Institute of
Technology 1991; M.S., California Institute of Technology 1993.
Thesis: The Role of Proteoglycans in the Delivery of Cationic-DNA Complexes and
Enhanced Delivery by Folate Receptor-Mediated Endocytosis.

Thesis: Probing the Role of the Active-Site Cysteine of Azurin by Site-Directed
Mutagenesis.

Jeffrey Charles Moore (Chemical Engineering and Biology) B.S., North Carolina State
University 1989; M.S., California Institute of Technology 1992.

Jeffrey Franklin Morris (Chemical Engineering) B.Ch.E., Georgia Institute of

Siegfried M. Musser (Chemistry) A.B., University of California, Berkeley 1990.
Thesis: The Proton Translocation Mechanisms of the Cytochrome b₅₃-type Ubiquinol
Oxidase Complex and the Mitochondrial Cytochrome c Oxidase Complex.
Michelle E. Parks  (Chemistry)  B.S., Furman University 1991.
Thesis: Sequence-Specific Recognition of DNA by Pyrrole-Imidazole Hairpin Polyamides.

Eldon Scott Priestley  (Chemistry)  B.S., Texas A&M University 1991.
Thesis: Energetics of Triple Helix Formation by Oligonucleotides Containing Nonnatural Bases.

Keith W. Rickert  (Chemistry)  B.S., Yale University 1990.

Susan Felicia Rubin  (Chemical Engineering)  S.B., Massachusetts Institute of Technology 1991; M.S., California Institute of Technology 1993.

Lynn Monica Russell  (Chemical Engineering)  B.S., Stanford University 1991; M.S., California Institute of Technology 1993.

Deborah Rebecca Shnek  (Chemical Engineering and Chemistry)  S.B., Massachusetts Institute of Technology 1989; M.S., California Institute of Technology 1991.
Thesis: Targeting of Proteins and Protein Analogs to Metal-Chelating Lipid Vesicles.


Claire Ellen Slutter  (Chemistry and Chemical Engineering)  B.S., Lehigh University 1988.
Thesis: Overexpression and Characterization of the Copper A Domain from Cytochrome $b_{1/3}$ of Thermus thermophilus.

Xueyu Song  (Chemistry)  B.S., Nankai University 1984; M.S., 1987.

Paul Alan Stockman  (Chemistry)  B.A., B.S., University of Rochester 1989.

Mary Denise Struthers  (Chemistry)  B.S., University of Wisconsin–Madison 1991.
Thesis: Structural Templates for Protein Design: The Assembly of Peptidyl Motifs with Defined Supersecondary Structure.

Sakae Suzuki  (Chemistry)  B.A., Reed College 1989.

Toshihiko Takeuchi  (Chemistry)  B.S., The Ohio State University 1990.
Thesis: The Electronic Structure of Distorted Porphyrins and Cobalt Schiff Base Derivatives as Novel Enzyme Inhibitors.

DOCTOR OF PHILOSOPHY — Continued

Robert Henry Terbrueggen (Chemistry) B.S. (Cellular and Molecular Biology), B.S. (Chemistry), The University of Michigan 1990.
Thesis: Exploring the Direct and Indirect Readout of DNA with Phenathrenequinone Diimine Complexes of Rhodium(III).
Ebrahim Zandi (Chemistry) Diploma, Universität Zurich 1990.

DIVISION OF ENGINEERING AND APPLIED SCIENCES

Thesis: Compressible Vortex Arrays.
Olga Berson (Environmental Engineering Science and Chemistry) B.S., Moscow Mendeleev Institute of Chemical Technology 1989; M.S., California Institute of Technology 1992.
Thesis: The Study of Copper Bioavailability and Mechanism of Uptake in the Type I Methanotroph Methylococcus albus BG8.
Thesis: Nonlinear Combustion Instabilities and Stochastic Sources.
Jung-Chih Chiao (Electrical Engineering) B.S., National Taiwan University 1988; M.S., California Institute of Technology 1991.
Howard Marc Choset (Mechanical Engineering) B.S., B.S.E., University of Pennsylvania 1990; M.S., California Institute of Technology 1991.
Thesis: Hybrid and Monolithic Active Quasi-Optical Grids.
DOCTOR OF PHILOSOPHY — Continued


Kate Elizabeth Fey (Applied Mechanics) B.S., California Institute of Technology 1990; M.S., Cornell University 1992.


The thesis: Response Control of Structural Systems Using Semi-Actively Controlled Interactions.

The thesis: Ultrafast Molecular Dynamics in Complexed Trans-Stilbene.

Liubo Hong (Materials Science and Physics) B.S., Peking University 1990; M.S., California Institute of Technology 1993.
The thesis: Structures and Stabilities of Nanocrystalline Materials Synthesized by Mechanical Allloying and Modeled as Driven Alloys.

Danny Dwayne Howard (Aeronautics and Electrical Engineering) B.S., Mississippi State University 1990; M.S., California Institute of Technology 1991.

The thesis: The Sonochemistry of Aqueous Solutions.


J. Kenneth Klewicki (Environmental Engineering Science and Geology) B.S., Clarkson University 1990.
The thesis: The Kinetics of Redox Reactions of Mn(II) and Mn(III) in Aqueous Systems: Homogenous Autoxidation of Mn(II) and the Formation and Disappearance of Mn(III) Complexes.
DOCTOR OF PHILOSOPHY — Continued


Thesis: An Experimental Study of the Turbulent Transverse Jet.


Donald Yu-Chun Lie (Electrical Engineering and Applied Physics) B.S., National Taiwan University 1987; M.S., California Institute of Technology 1990.
Thesis: Ion Implantation in Epitaxial Ge_xSi_1-x on Si(100).

Duo-min Lin (Engineering Science) B.S., University of Science and Technology of China 1986; M.E., 1988; M.S., California Institute of Technology 1991.
Thesis: Run-up and Nonlinear Propagation of Oceanic Internal Waves and Their Interactions.


Cheh-Ming Jeff Liu (Electrical Engineering) B.S., National Chiao Tung University 1986; M.S., 1988; M.S., California Institute of Technology 1994.
Thesis: Monolithic Grid Amplifiers.

Victor Manuel Lubecke (Electrical Engineering) B.S., California State Polytechnic University, Pomona 1986; M.S., California Institute of Technology 1990.

Jiafu Luo (Electrical Engineering) B.S., University of Science and Technology of China 1987; M.S., California Institute of Technology 1992.
Thesis: Monolithic GaAs VLSI Optoelectronic Neuron Arrays.


Kevin Christopher Moore (Aeronautics and Chemistry) B.S., Harvey Mudd College 1987.

John Christopher Morris (Electrical Engineering) B.S., California Polytechnic State University, San Luis Obispo 1988; M.S., California Institute of Technology 1990.
Thesis: Experimental Control and Model Validation: A Helicopter Case Study.
DOCTOR OF PHILOSOPHY — Continued

Matthew Philip Newlin (Mechanical Engineering) B.S.M.E., University of Washington 1982; M.S., California Institute of Technology 1983.
Thesis: Model Validation, Control, and Computation.


Thesis: Silicon Heterojunctions.

See-May Phoong (Electrical Engineering) B.S., National Taiwan University 1991; M.S., California Institute of Technology 1992.


Thesis: Chemical Vapor Deposition of Diamond in Flames and Fluidized Beds.


Stefano Soatto (Control and Dynamical Systems) Laurea in Ingegneria Elettronica, Università degli Studi di Padova 1992; M.S., California Institute of Technology 1993.
Thesis: Chemical Environment Selectivity in Mössbauer Diffraction.

Thesis: A Parallel Programming Model with Sequential Semantics.


Thesis: Optoelectronic Structure Fabrication by Organometallic Vapor-Phase Epitaxy and Selective Epitaxy.


Yi-Chun Wang (Mechanical Engineering) B.S., National Taiwan University 1986; M.S., 1988.

Chi-Ming Yang (Civil Engineering) B.S., National Taiwan University 1985; M.S., Carnegie Mellon University 1988.


DOCTOR OF PHILOSOPHY — Continued

DIVISION OF GEOLOGICAL AND PLANETARY SCIENCES

Ariel David Anbar (Geochemistry and Chemistry) A.B., Harvard College 1986; M.S., California Institute of Technology 1991.
Thesis: I. Rhenium and Iridium in Natural Waters. II. Methyl Bromide: Ocean Sources, Ocean Sinks, and Climate Sensitivity. III. CO₂ Stability and Heterogeneous Chemistry in the Atmosphere of Mars.


Sharon Kedar (Geophysics) B.Sc., Tel-Aviv University 1988.

Woh-jer Lee (Geology) B.S., National Taiwan University 1986.
Thesis: Experimental Study on Liquid Immiscibility in Silicate-Carbonate Systems with Applications to Carbonatites.

Thesis: Atmospheric Chemistry in the Outer Solar System: from 40 K to 4000 K.


Hong Kie Thio (Geophysics) B.Sc., State University of Utrecht 1984; M.Sc., 1988.


DIVISION OF THE HUMANITIES AND SOCIAL SCIENCES

DOCTOR OF PHILOSOPHY — Continued

Szilvia Pápai (Social Science) Diploma, University of Economics, Budapest 1989; M.S., California Institute of Technology 1993.

Jason Lee Saving (Social Science) B.A., Rice University 1991; M.S., California Institute of Technology 1993.

DIVISION OF PHYSICS, MATHEMATICS AND ASTRONOMY

Radha Pillapakkam Bahukutumbi (Physics) B.S., St. Xavier's College 1988; M.S., Indian Institute of Technology, Bombay 1990.

Ruth Amy Brain (Physics) B.S., Iowa State University 1990; M.S., California Institute of Technology 1992.


Pei-Long Chen (Physics) B.M.E., National Taiwan University 1986; M.S., National Central University 1988.
Thesis: Coherent Vortex States in Two Dimensional Ideal Fluids.

Brian Cook (Physics) B.S., Yale University 1991; M.S., California Institute of Technology 1993.
Thesis: Development and Testing of a Detector to Study Neutrino Oscillations at Palo Verde.


Erotokritos Charalambous Katsavounidis (Physics) B.S., Aristotle University of Thessaloniki 1988; M.S., California Institute of Technology 1990.
Thesis: Search for GUT Magnetic Monopoles with the MACRO Detector.


Julia Dusk Kennefick (Physics) B.S., University of Arkansas 1989; M.S., California Institute of Technology 1991.
Thesis: The Luminosity Function of Quasars at Redshifts Greater Than Four.

David P. Kirkby (Physics) B.Sc., University of Toronto 1989.
DOCTOR OF PHILOSOPHY — Continued

Axel Wolf Hendrik Kratel (Physics) B.S., University of California, Irvine 1988; M.S., California Institute of Technology 1990.

James Edwin Larkin (Physics) B.S., California State University, Hayward 1990; M.S., California Institute of Technology 1992.

Hoi Ming Leung (Mathematics) B.Sc., The Chinese University of Hong Kong 1990; M.S., California Institute of Technology 1993.
Thesis: Conformal Laminations on the Circle.

Patrick Neal McGraw (Physics) B.S., Harvey Mudd College 1990.
Thesis: Dynamics of Non-Abelian Aharonov-Bohm Systems.

Thomas E. Norwood (Mathematics) B.S., California Polytechnic State University, San Luis Obispo 1991.
Thesis: Codes and Polynomials in the Study of Cyclic Difference Sets.


Angela Putney (Astronomy) S.B., Massachusetts Institute of Technology 1990.

Wilhelm Schlag (Mathematics) Diplom, Technical University of Vienna 1991; M.S., University of California, Berkeley 1994.

Todd Andrew Small (Astronomy) B.S., Yale University 1990.

Stanislav K. Smirnov (Mathematics) M.S., St. Petersburg State University 1992; M.S., California Institute of Technology 1995.

Patricia K. Ure (Mathematics) B.A., Reed College 1985; M.S., California Polytechnic State University, San Luis Obispo 1991.


Selmer Siu Man Wong (Physics) B.S., University of California, Los Angeles 1990; M.S., California Institute of Technology 1992.
Lin Yan (Astronomy) B.Sc., University of Science and Technology of China 1986; M.Sc., 1989. 
Thesis: Binary Stars in Globular Clusters.

Yunfeng Zhu (Mathematics) B.S., Hangzhou University 1988; M.S., University of Science and Technology of China 1991.
Prizes and Awards

MILTON AND FRANCIS CLAUSER DOCTORAL PRIZE
Awarded to the Ph.D. candidate whose research is judged to exhibit the greatest degree of originality as evidenced by its potential for opening up new avenues of human thought and endeavor as well as by the ingenuity with which it has been carried out.

Recipient to be announced at Commencement.

FREDERIC W. HINRICHS, JR., MEMORIAL AWARD
Awarded to the senior who, in the opinion of the undergraduate Deans, has made the greatest undergraduate contribution to the welfare of the student body and whose qualities of leadership, character, and responsibility have been outstanding.

1996 Esmeralda Nava
   Alison Elaine Slemp

MABEL BECKMAN PRIZE
Awarded to an undergraduate woman upon completion of her junior or senior year in recognition of demonstrated academic and personal excellence, contributions to the Institute community, and outstanding qualities of character and leadership.

1992 Aimee Louise Smith
1996 Rebecca Leanne Blankenburg

WILLIAM F. BALLHAUS PRIZE
Awarded to aeronautics students for outstanding doctoral dissertations.

1996 Mark Eugene Walter

ROLF D. BUHLER MEMORIAL AWARD IN AERONAUTICS
Awarded to an aeronautics student for outstanding academic achievement in the Master's program.

1991 Haris J. Catrakis
1996 Tobias Voelkl

FRITZ B. BURNS PRIZE IN GEOLOGY
Awarded to an undergraduate who has demonstrated both academic excellence and great promise of future contributions in the fields represented by the Division of Geological and Planetary Sciences.

1991 Linda Ntepane Maepa
1995 José Miguel Hurtado, Jr.

Prizes and awards are listed only for those students awarded degrees in 1996, and include prizes and awards received by them in previous years.
CALTECH PRIZE SCHOLARSHIPS AND CARNATION SCHOLARSHIPS

Each year Caltech awards these prizes for academic excellence. They are based solely on merit (selection is made on the basis of grades, faculty recommendations, and demonstrated research productivity) with no consideration given to need or any other nonacademic criteria. Listed below are graduating students who have been recipients of these prizes.

Donna Akemi Akutagawa
Walter Frank Brisken
Haris J. Catrakis
Analavoyal Narasimha Chari
David Emilio Chavez
Soon Ghee Chua
Jeremiah Kane Darling
Eric Scott Dickson
Donna Michelle Ebenstein
Mintao Fan
Kate Elizabeth Fey
Jason Chung-Shiang Hsu
José Miguel Hurtado, Jr.
Brian Sanghoon Kim
Kelvin Y. Kwan
Jason Chen-Shan Lee
Steven Philip Lieske

Thomas Oliver Meyer
Roman Muchnik
John Douglas Naud
Pál Ivan Pénzes
Michael Tzu Ru
Anton Vladimirovich Ryzhov
Alexander Libra Simon
Alison Elaine Slemp
Haiyun Tang
Thanh Nga Trinh Tran
Charles Su-Chang Tsai
Jon Robert Wesselmann
Stephen Wong
Nam Chul Yu
Inn Huan Yuk
Jian Zhang
Ning Zhang

THE W. P. CAREY & CO., INC., PRIZES IN MATHEMATICS

Awarded to a student receiving a Doctor of Philosophy degree, for an outstanding doctoral dissertation in applied mathematics or pure math.

1996 Wilhelm Schlag
Stanislav K. Smirnov

RICHARD BRUCE CHAPMAN MEMORIAL AWARD

Awarded to a graduate student in hydrodynamics who has distinguished himself or herself in research in the Division of Engineering and Applied Science.

1996 Yi-Chun Wang
Jin E. Zhang
PRIZES AND AWARDS — Continued

DONALD S. CLARK MEMORIAL AWARDS

May be awarded to two juniors in recognition of service to the campus community and academic excellence. Preference is given to students in the Division of Engineering and Applied Science and to those in Chemical Engineering.

1989 Kate Elizabeth Fey
1995 Thanh Nga Trinh Tran

DEANS’ CUP AND DIRECTOR OF RESIDENCE LIFE AND MASTER’S AWARD

Two awards, selected by the Deans, the Director of Residence Life, and the Master of Student Houses, presented to undergraduates whose concern for their fellow students has been demonstrated by persistent efforts to improve the quality of undergraduate life and by effective communication with members of the faculty and administration.

1995 Jonathan Edward McDunn, Deans’ Cup
1996 Angie Marie Bealko, Deans’ Cup
  Donna Michelle Ebenstein, Deans’ Cup
  Jonathan Edward McDunn, Residence Life and Master’s Award

CONSTANTIN G. ECONOMOU MEMORIAL PRIZE

Awarded to a chemical engineering graduate student distinguished by outstanding research accomplishments and exemplary attitude while fulfilling candidacy requirements for the Ph.D. degree.

1991 Jeffrey Franklin Morris

LAWRENCE L. AND AUDREY W. FERGUSON PRIZE

Awarded to the graduating Ph.D. candidate in biology who has produced the outstanding Ph.D. thesis for the past year.

1996 Christopher John Schoenherr

HAREN LEE FISHER MEMORIAL AWARD IN JUNIOR PHYSICS

Awarded to a junior physics major who demonstrates the greatest promise of future contributions in physics. (Awarded in June, and published the following year)

1995 John Douglas Naud

HENRY FORD II SCHOLAR AWARD

Awarded either to the engineering student with the best academic record at the end of the third year of undergraduate study, or to the engineering student with the best first-year record in the graduate program.

1990 Haris J. Catrakis
1995 Michael Tzu Ru
PRIZES AND AWARDS — Continued

JACK E. FROEHLICH MEMORIAL AWARD
Awarded to a junior in the upper five percent of his or her class who shows outstanding promise for a creative professional career.
1995 Roman Muchnik
Nam Chul Yu

GRADUATE DEAN’S AWARD FOR OUTSTANDING COMMUNITY SERVICE
Awarded to a Ph.D. candidate who, throughout his or her graduate years at the Institute, has made great contributions to graduate life and whose qualities of leadership and responsibility have been outstanding.
1996 Jean Marie Andino

GEORGE W. GREEN MEMORIAL PRIZE
Awarded to the undergraduate student who, in the opinion of the division chairs, has shown outstanding ability and achievement in creative scholarship.
1995 Jerry Wei-Jen Shian
1996 José Miguel Hurtado, Jr.

ARIE J. HAAGEN-SMIT MEMORIAL AWARD
Awarded to a sophomore or junior in biology or chemistry who has shown academic promise and who has made recognized contributions to Caltech.
1995 Thanh Nga Trinh Tran

BIBI JENTOFT-NILSEN MEMORIAL AWARD
Awarded to an upperclass student who exhibits outstanding qualities of leadership and who actively contributes to the quality of student life at Caltech.
1995 Angie Marie Bealko
1996 Eric S. Hill

ARTUR MAGER PRIZE IN ENGINEERING
Awarded to a senior in Engineering who has shown excellence in scholarship and the promise of an outstanding professional career.
1991 Haris J. Catrakis
1996 Donna Michelle Ebenstein
PRIZES AND AWARDS — Continued

HERBERT NEWBY McCoy AWARD
Awarded to chemistry doctoral students for outstanding contributions to the science of chemistry.
1996 Jennifer Lynn Herek
Ranabir Sinha Roy
Xueyu Song

MARY A. EARL McKinney Prize in Literature
The purpose of this prize is to cultivate proficiency in writing. It may be awarded for essays submitted in connection with regular literature classes or awarded on the basis of a special essay contest.
1994 Andrew Brian Clarke

MILLIKAN SCHOLARSHIP
Awarded to selected freshmen whose record of personal and academic accomplishment is judged outstanding among the remarkable group of incoming freshmen.
1991
Heide Roth Li
Esmeralda Nava
Michael Edwin Ichiri

1992
Rebecca Leanne Blankenburg
Causenge Capellus Cangin
Amalovayal Narasimha Chari
Jeremiah Kane Darling
Eric Scott Dickson
Donna Michelle Ebenstein
Xinh Xinh Huynh
Adil Mahmood Karim
Robert Marshall Nostant
Thanh Nga Trinh Tran
Lyndie Ruth Williamson

ROBERT L. NOLAND LEADERSHIP SCHOLARSHIP
Awarded to students who exhibit qualities of outstanding leadership, which are most often expressed as personal actions that have helped other people and that have inspired others to fulfill their capabilities.
1995 Alison Elaine Slemp
1996 Carlos Horacio Aldana
Laura Elizabeth Verhoff
Jian Zhang
PRIZES AND AWARDS — Continued

RODMAN W. PAUL HISTORY PRIZE

Awarded to a graduating senior who has displayed unusual interest in and talent for history.

1995 Alison Elaine Slemp

HOWARD REYNOLDS MEMORIAL PRIZE IN GEOLOGY

Awarded to a sophomore or junior who demonstrates the potential to excel in the field of geology and who actively contributes to the quality of student life at Caltech.

1993 Linda Ntepane Maepa
1995 José Miguel Hurtado, Jr.

HERBERT J. RYSER MEMORIAL SCHOLARSHIPS

Awarded to undergraduate students for academic excellence, preferably in mathematics.

1994 Roman Muchnik
1995 Amalavoyal Narasimha Chari
Devabhaktuni Srikrishna

RICHARD P. SCHUSTER MEMORIAL PRIZE

Awarded to one or more juniors or seniors in chemistry or chemical engineering on the basis of financial need and academic promise.

1994 David R. Vaughn
1995 David Emilio Chavez
Michael Tzu Ru

ERNEST E. SECHLER MEMORIAL AWARD IN AERONAUTICS

Awarded to an aeronautics student who has made the most significant contribution to the teaching and research efforts of GALCIT (Graduate Aeronautical Laboratories of the California Institute of Technology). Preference is given to students working in structural mechanics.

1995 Mark Eugene Walter
PRIZES AND AWARDS — Continued

DON SHEPARD AWARD

Awarded to students who would find it difficult, without additional financial help, to engage in extracurricular and cultural activities. The recipients are selected on the basis of their capacity to take advantage of and to profit from these activities rather than on the basis of their scholastic standing.

1993
Eve Astrid Andersson
David Alan Tahmoush

1994
Jerry Wei-Jen Shan

1995
Eve Astrid Andersson
Jessica Chang
Michael Christopher Greene
Karen Kustedjo
Eileen EE Ling Lau
Renny Sandra Talianchich
Wayne Hiroshi Yoshida
Inn Huam Yuk
Daniel Marc Zimmerman

SIGMA XI AWARD

Awarded to a senior selected for an outstanding piece of original scientific research.

1996 John Douglas Naud

JOHN STAGER STEMPEL MEMORIAL PRIZE IN PHYSICS

Awarded to a graduate student in physics for outstanding progress in research as demonstrated by an excellent performance on the oral Ph.D. candidacy examination.

1994 James Edwin Larkin
Søren Pedersen

ALAN R. SWEEZY PRIZE IN ECONOMICS

Awarded to a graduating senior who has shown unusual interest in and talent for economics.

1996 Jason Chung-Shiang Hsu

MORGAN WARD PRIZE

Awarded for the best problems and solutions in mathematics submitted by a freshman or sophomore.

1993 Mitesh Patel
PRIZES AND AWARDS — Continued

CHARLES WILTS PRIZE

Awarded to a graduate student for outstanding independent research in electrical engineering leading to a Ph.D.

1996 Fernando Paganini Herrera

FREDERICK J. ZEIGLER MEMORIAL AWARD

Awarded to an outstanding sophomore or junior in pure or applied mathematics, for excellence in scholarship as demonstrated in class activities or in the preparation of an original paper or essay in any subject area.

1994 Amalavoyal Narasimha Chari
1995 Roman Muchnik

CIT ALMA MATER

by Manton Barnes (BS ’21 EE)

In Southern California with grace and splendor bound,
Where the lofty mountain peaks look out to lands beyond,
Proudly stands our Alma Mater, glorious to see;
We raise our voices proudly, hailing, hailing thee.
Echoes ringing while we’re singing over land and sea,
The halls of fame resound thy name, noble CIT.
SERVICES FOR COMMENCEMENT GUESTS

- **PUBLIC TELEPHONES** are available in Baxter Hall and Beckman Auditorium.
- **RESTROOMS** are available in Baxter Hall, Beckman Labs, Dabney Hall, Parsons-Gates Hall of Administration, and Beckman Auditorium.
- **FIRST AID SERVICES** are available at the Information Center.
- **LOST AND FOUND** items may be reported and/or claimed at the Information Center.
- Complimentary **COFFEE** and **PUNCH** (beginning at 8:30 a.m.)
- Informal cap and gown photographs 8:30 a.m.-9:30 a.m.
- **CALTECH BOOKSTORE** sells souvenirs, film, and other items.
- **ATHENAEUM** luncheon tickets on sale 8 a.m.-10 a.m.

SPECIAL SERVICES FOR PERSONS WITH DISABILITIES

- **ASSISTIVE LISTENING DEVICES** are available at the Information Center. A driver's license or state-issued ID card is required.
- **LARGE-TYPE PROGRAMS** (abridged) are available at the Information Center.
- **AMERICAN SIGN LANGUAGE** (ASL) interpreters are stationed at the west front of the Ceremony seating area.
- **PEOPLE WHO USE WHEELCHAIRS**, and their guests, will find a special section near the east front of the Ceremony seating area.
- **RESTROOMS ACCESSIBLE TO PEOPLE WHO USE WHEELCHAIRS** are located on the first floor of Dabney Hall and in the Parsons-Gates Hall of Administration.
- **AMPLIFIED TELEPHONE** is available in Beckman Auditorium.