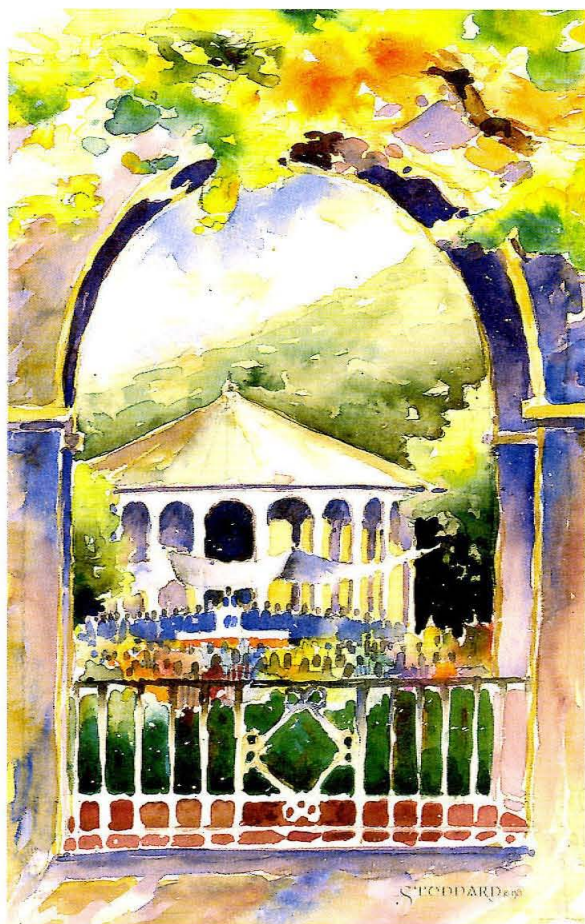




# CALIFORNIA INSTITUTE of TECHNOLOGY

*One Hundred and Sixth Annual Commencement*  
*June 9, 2000*



Cover: Caltech's commencement ceremony,  
by Joseph Stoddard.  
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CALIFORNIA INSTITUTE  
*of* TECHNOLOGY

*One Hundred and Sixth  
Annual Commencement*

Friday Morning at Ten O'Clock  
June Ninth, Two Thousand

**I**N 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; about 280 professorial faculty members, including four Nobel laureates and four Crafoord laureates; and more than 200 research faculty members. Today, Caltech will award 202 students the B.S. degree; 112 students the M.S. degree; 1 scholar the Engineer's degree; and 127 doctoral candidates the Ph.D. degree, for a total of 442 graduates—quite a leap from the one man and one woman who constituted the first collegiate graduating class of Throop Polytechnic Institute.

*Please note:*

*Video footage of Commencement may be viewed on the Caltech Web site at <http://www.caltech.edu/commencement/>. Broadcast is scheduled to begin after 2:30 p.m. and will be available throughout the year.*

WIDELY REGARDED AS A KEY FIGURE in the development of science fiction as a literary genre, Ray Bradbury is the author of more than 500 short stories, novels, plays, screenplays, television scripts, and poems. His writings grapple with some of the thorniest issues of our age—racism, censorship, environmental pollution, nuclear war—while celebrating the senses, the emotions, and the imagination.

Bradbury was born in Waukegan, Illinois, on August 22, 1920. At age 11 he began writing stories on butcher paper. In 1934 his family relocated to Los Angeles, where he graduated from high school in 1938. Although finished with his formal schooling, Bradbury continued to educate himself by spending his evenings in the library and his days at the typewriter. That same year, while working as a sidewalk newspaper vendor, Bradbury published his first story, “Hollerbochen's Dilemma,” in *Imagination!* magazine. His first paid publication, “Pendulum,” followed in 1941. By 1943, he had given up selling newspapers and was writing full time. Two years later, “The Big Black and White Game” was selected for inclusion in *Best American Short Stories*. The appearance of *The Martian Chronicles* in 1950 confirmed his growing reputation as an important science fiction author. Many other works followed, including such classics of the genre as *The Illustrated Man*, *Fahrenheit 451*, and *Something Wicked This Way Comes*.

Since 1985, Bradbury has adapted 42 of his short stories for “The Ray Bradbury Television Theater” on the USA cable television channel. His nonliterary pursuits have included acting as creative consultant for various architectural

design projects, including the Spaceship Earth exhibition at Epcot Center, the Orbitron space ride at EuroDisney, and the Glendale Galleria, Westside Pavilion, and Horton Plaza shopping malls. Bradbury is the recipient of numerous awards and honors, including the O. Henry Memorial Award, the Benjamin Franklin Award, the World Fantasy Award for Lifetime Achievement, and the Grand Master Award from the Science Fiction Writers of America. Perhaps his most unusual accolade is the moon's Dandelion Crater, named in honor of his novel *Dandelion Wine*.

Of himself, Bradbury says he "writes every day with joy." If there is a theme to his life, it is this: "Don't criticize; offer alternatives; build up, don't tear down."

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 super magisterial 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

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### *Chief Marshal*

Gary A. Lorden, Ph.D.

### *Marshals*

Arden L. Albee, Ph.D.

Melany L. Hunt, Ph.D.

Christoph Koch, Ph.D.

Rudolph A. Marcus, Ph.D.

Jean-Paul Revel, Ph.D.

Alison Winter, Ph.D.

### *Faculty Officers*

Kim C. Border, Ph.D.

Paul H. Patterson, Ph.D.

Ward Whaling, 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 Speaker

The President

The Chair of the Board of Trustees

## PROGRAM

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|   |  |
|---|--|
| <i>Organ Prelude</i>  | Leslie J. Deutsch, Ph.D.   |
| PROCESSIONAL  | The Caltech Convocations Brass<br>and Percussion Ensemble<br><i>William Bing, M.M., Conductor</i>            |
| PRESIDING   | Gordon E. Moore, Ph.D.<br><i>Chair of the Board of Trustees</i><br><i>California Institute of Technology</i> |
| COMMENCEMENT SPEAKER<br><i>"The Great Years Ahead"</i>                              | Ray Bradbury, <i>Futurist and</i><br><i>Science Fiction Author</i>   |
| CHORAL SELECTION<br><br><i>"Hallelujah," from Messiah</i><br>George Frideric Handel | The Caltech Glee Clubs<br><i>Donald G. Caldwell, D.M.A.,</i><br><i>Conductor</i>                             |
| CONFERRING OF DEGREES   | David Baltimore, Ph.D.<br><i>President</i><br><i>California Institute of Technology</i>                      |
| PRESENTATION OF CANDIDATES FOR DEGREES  |  |
| For the Degree of Bachelor of Science   | Jean-Paul Revel, Ph.D.<br><i>Dean of Students</i>  |
| For the Degree of Master of Science   | Christopher E. Brennen, Ph.D.<br><i>Vice President for Student Affairs</i>                                   |
| For the Degree of Engineer  | Arden L. Albee, Ph.D.<br><i>Dean of Graduate Studies</i>   |
| For the Degree of Doctor of Philosophy  | Dr. Albee  |
| Biology   | Paul H. Patterson, Ph.D.<br><i>Professor of Biology</i>  |
| Chemistry and Chemical Engineering  | David A. Tirrell, Ph.D.<br><i>Division Chair</i>   |

|                                    |   |
|------------------------------------|---|
| Engineering and Applied Science    | Richard M. Murray, Ph.D.<br><i>Division Chair</i>   |
| Geological and Planetary Sciences  | Edward M. Stolper, Ph.D.<br><i>Division Chair</i>   |
| The Humanities and Social Sciences | John O. Ledyard, Ph.D.<br><i>Division Chair</i>     |
| Physics, Mathematics and Astronomy | Thomas A. Tombrello, Ph.D.<br><i>Division Chair</i> |

#### ANNOUNCEMENT OF AWARDS AND CONCLUDING REMARKS

President Baltimore

#### ALMA MATER

The Caltech Glee Clubs,  
The Caltech Convocations Brass and  
Percussion Ensemble, and Organ

“Caltech Alma Mater”  
By Manton Barnes, BS ’21 EE  
(*The audience may join in;  
lyrics are found on page 43.*)

#### RECESSIONAL

The Caltech Convocations Brass  
and Percussion Ensemble

*Organ Postlude*

*Dr. Deutsch*

You are invited to attend a reception on the  
Athenaeum West Lawn following the program.

## CANDIDATES FOR DEGREES

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### *Bachelor Of Science*

Daniel Michael Abrams\* *Houston, Texas* Applied Physics  
Viktor Yuryevich Alekseyev\* *Santa Monica, California* Chemistry  
Rafed Amin Al-Huq *Farwaniza, Kuwait* Engineering and Applied Science  
Michelle Elle Armond\* *Redondo Beach, California* Electrical Engineering and History  
Gabriel Kanile'a Au *Honolulu, Hawaii* Electrical Engineering  
Matthew Paul Bachmann *Spokane, Washington* Geochemistry  
Xiaoyan Robert Bao\* *Atlanta, Georgia* Biology  
Amy Courtright Barr *Palo Alto, California* Planetary Science  
Tobias Keith Bartels *Lincoln, Nebraska* Mathematics  
Margaret Elizabeth Belska *Oakdale, California* Geology  
Vidya M. Bhalodia *East Hanover, New Jersey* Biology  
Amanda Lynn Blasius\* *Boca Raton, Florida* Biology  
Kevin Blake Bradley *Ventura, California* Engineering and Applied Science  
Benjamin David Brantley *Columbia, South Carolina* Engineering and Applied Science  
Nicholas Fraser Breen *Webster Groves, Missouri* Chemistry  
James Alexis Bresson\* *Yakima, Washington* Chemical Engineering  
Christopher Allen Brooks\* *Media, Pennsylvania* Engineering and Applied Science  
(Mechanical Engineering)  
Christopher Jay Brown *Lincoln, Nebraska* Chemistry  
Gina Marie Buccolo *Columbus, Nebraska* Planetary Science  
Damian Nathaniel Burch\* *Missouri City, Texas* Engineering and Applied Science and  
Mathematics  
Corey Edward Burke *West Palm Beach, Florida* Engineering and Applied Science  
John Russell Burke\* *Spartanburg, South Carolina* Physics  
Kurt Andrew Campbell *Tenino, Washington* Electrical Engineering  
Steven Andrew Cashion *Winchester, Tennessee* Engineering and Applied Science  
(Mechanical Engineering)  
Andrew Manning Casteel *Los Angeles, California* Economics  
Richard Agustin Castro *Garland, Texas* Electrical Engineering  
Juancarlos Nakamura Chan *Chatsworth, California* Engineering and Applied Science  
(Mechanical Engineering)  
Candace C. Chang\* *La Cañada, California* Chemistry  
Ming Ming Chen\* *Reisterstown, Maryland* Chemistry  
Andrew MacGregor Childs\* *Chagrin Falls, Ohio* Physics

*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*

- George Chung *Memphis, Tennessee* Engineering and Applied Science (Mechanical Engineering)
- Samuel Hue-Kay Chung\* *Wheaton, Illinois* Applied Physics
- Louis Cisnero, Jr. *Jourdanton, Texas* Engineering and Applied Science
- Garth R. Conrad\* *Harrisonburg, Virginia* Engineering and Applied Science
- Andrew Steere Cotter *East Greenwich, Rhode Island* Engineering and Applied Science
- Jeffrey Alan Custer *Corona, California* Engineering and Applied Science
- Keshav Moreshwar Dani\* *Cincinnati, Ohio* Mathematics
- Sandip Prakash Darji *Athens, Alabama* Chemical Engineering
- Heather Lee Dean\* *San Antonio, Texas* Electrical Engineering
- Aaron Jafar Denney *Idyllwild, California* Physics
- Gregory Lee Detweiler *Palatine, Illinois* Engineering and Applied Science (Mechanical Engineering)
- David Jeffers Devault *Tulsa, Oklahoma* Engineering and Applied Science
- Ronald Cabaltica Dollete *Oceanside, California* Electrical Engineering
- Kjerstin Irja Easton *Dana Point, California* Electrical Engineering
- Christopher Mark Eppstein *Visalia, California* Engineering and Applied Science
- Rui Fan\* *Nashua, New Hampshire* Engineering and Applied Science and Mathematics
- Marc Favata\* *Elmwood Park, New Jersey* Physics
- Michael Patrick Fitzgerald *Dallas, Texas* Engineering and Applied Science
- Charles Christopher Fowlkes\* *Bozeman, Montana* Engineering and Applied Science
- E. Marie Fox *Greenwood, Indiana* Chemistry
- Kevin Michael Franklin\* *Brighton, Michigan* Applied Physics and History
- Peter Ian Frazier\* *Rhinebeck, New York* Engineering and Applied Science and Physics
- Gregory Kealoha Fricke *Kahului, Hawaii* Engineering and Applied Science (Mechanical Engineering)
- Carrie Jean Garner *Seattle, Washington* Engineering and Applied Science (Aeronautics)
- Catelyn Murphy Gifford *Waterville, Ohio* Electrical Engineering
- Rachel Florence Gray *Arcadia, California* Biology
- Marc Emil Gustafson *Dallas, Texas* Engineering and Applied Science
- Joseph William Haas *Grand Rapids, Michigan* Physics
- Eric Lawrence Hale\* *Eureka, California* Engineering and Applied Science (Mechanical Engineering) and Economics
- Mark Isaac Hammond *Federal Way, Washington* Engineering and Applied Science
- Angela Han *Southfield, Michigan* Physics
- Hou-En Han *Monterey Park, California* Engineering and Applied Science
- Kimberly Kelly Harle *Baltimore, Maryland* Economics
- John William Hatfield\* *Festus, Montana* Mathematics and Physics
- John Lewis Henderson, Jr. *Atlanta, Georgia* Engineering and Applied Science (Mechanical Engineering)

## *Bachelor of Science continued*

- Clifford William Hicks\* *Yorba Linda, California* Physics  
William Eliot Hiestand\* *Kenmore, Washington* Engineering and Applied Science  
(Mechanical Engineering)  
David Andrew Hiller *Mattapoissett, Massachusetts* Chemistry  
Anthony Wei-Cheun Ho *Rochester, Minnesota* Applied Physics  
Russel Howe *Hayden, Colorado* Applied Mathematics  
Albert Hsiao\* *Poway, California* Biology and Engineering and Applied Science  
Sue Ju-Shan Hsieh *Walnut, California* Engineering and Applied Science  
(Mechanical Engineering)  
Zhao Huang\* *Palo Alto, California* Physics  
Lisa Litun Hung *Edison, New Jersey* Engineering and Applied Science  
Adrianne Marie Hyldahl *Brandon, Florida* Engineering and Applied Science  
Tanim Shahriar Islam\* *Richmond, Virginia* Physics  
Anna Iwaniec\* *Princeton Junction, New Jersey* Engineering and Applied Science  
(Mechanical Engineering)  
Eike Hans Jens\* *Neuss, Germany* Engineering and Applied Science  
Alan Wesley Jones *Sunnyvale, Texas* Physics  
Nathan Mark Russell Jones *Lafayette, California* Applied Physics  
Moo Kwang Joung *Bethesda, Maryland* Physics  
Kanwarpal Singh Kahlon *Azusa, California* Biology  
Stefan Georgiev Kazachki *Sofia, Bulgaria* Mathematics and Economics  
Elizabeth Christine Kelley *Hollis, New Hampshire* Engineering and Applied Science  
(Mechanical Engineering)  
Matthew Brennan Kennedy\* *Kingwood, Texas* Engineering and Applied Science  
(Mechanical Engineering)  
Hanna Kim *La Crescenta, California* Biology  
Jessie Yeon Ji Kim\* *Upland, California* Chemistry  
Brent Michael Kious\* *Kerrville, Texas* Biology and Science, Ethics, and Society  
Juna Ariele Kollmeier\* *Huntington, New York* Physics  
Hosein Kouros-Mehr\* *Hacienda Heights, California* Biology  
Amit Ghanashyam Kshatriya\* *Katy, Texas* Mathematics  
Michael Kuhlen\* *Konstanz, Germany* Physics  
Max Peter Kullberg *Anchorage, Alaska* Physics  
Christopher Eric Kurtz\* *Idaho Falls, Idaho* Chemistry  
Aaron Austen Kuzin\* *Sheridan, Wyoming* Biology  
Jacob Paul Lacouture *Newington, Connecticut* Electrical Engineering  
Christopher Ian Leapley *Bakersfield, California* Biology  
Ja-Chen Audrey Lee *West Covina, California* Applied Physics  
Jui-Ting Patty Lee\* *Ithaca, New York* Physics

## *Bachelor of Science continued*

- Renee Guiyon Lee\* *La Cañada, California* Engineering and Applied Science  
Sueanne Lee\* *Los Angeles, California* Engineering and Applied Science (Mechanical Engineering)  
Troy Jeffrey Lee\* *Makawao, Hawaii* Mathematics  
Melvin Boon-Tiong Leok\* *Singapore, Singapore* Mathematics  
Daniel Leon Levy\* *Los Gatos, California* Biology and Chemistry  
Huimou Li\* *Fairbanks, Alaska* Electrical Engineering  
Caroline Lim\* *Alhambra, California* Biology  
Xin Liu\* *Tian Jin, P.R. China* Electrical Engineering  
Yi-Ping Liu\* *Thornton, Colorado* Engineering and Applied Science  
Corydon Murray Loomis III *Columbus, Georgia* Engineering and Applied Science  
Nicklaus Frederick Lorenzen *Arvada, Colorado* Chemical Engineering  
Dominic George Lucchetti *Ypsilanti, Michigan* Engineering and Applied Science  
Chiyan Luo\* *Changsha, P.R. China* Physics  
Sam Mandegaran\* *Tehran, Iran* Electrical Engineering and Economics  
Peter Henry Maresh *Farmington, Connecticut* Electrical Engineering  
Damian Scott Martinez *Pasco, Washington* Engineering and Applied Science  
Jaime Francisco Martinez *Burbank, California* Electrical and Computer Engineering  
Vivek C. Mathrani *Flushing, New York* Chemistry  
Kevin Bryce McCarty\* *Indiana, Pennsylvania* Physics  
Jason Stuart McIlhaney *Albuquerque, New Mexico* Engineering and Applied Science  
(Mechanical Engineering)  
John William Meacham *Westminster, California* Engineering and Applied Science  
Pankaj Mehta\* *Miami, Florida* Mathematics  
James Madison Melnyk *Laguna Hills, California* Science, Ethics, and Society  
Aron Jeffrey Meltzner\* *Santa Monica, California* Geology  
Arjun Mendiratta *Oak Brook, Illinois* Chemistry  
Sarah Mary Milkovich *Ithaca, New York* Planetary Science  
Christopher Terrell Miller *Fairfax, Virginia* Physics  
Svjetlana Miocinovic\* *Zagreb, Croatia* Biology and Engineering and Applied Science  
Adam Mocarski *Garfield, New Jersey* Engineering and Applied Science  
Benjamin Mok *Claremont, California* Economics  
Ivan Andriyovych Mokhnal *Velyky Berezny, Ukraine* Mathematics  
Wren Bowlan Montgomery *Washington, D.C.* Physics and Geophysics  
Kudah Christopher Mushambi *Harare, Zimbabwe* Engineering and Applied Science  
(Mechanical Engineering)  
Matthew Allen Musick *Houston, Texas* Engineering and Applied Science  
Max Narovlyansky *Swampscott, Massachusetts* Chemistry  
Kwong Man Ng\* *Hong Kong* Biology  
Martin Anh Nguyen\* *Houston, Texas* Engineering and Applied Science  
Kristine Elizabeth Nielson *Salt Lake City, Utah* Geology



## *Bachelor of Science continued*

Nik Haliza Nik Hassan *Kota Bharu, Malaysia* Electrical Engineering  
Katherine Triplett Noyes *Sunland, California* Biology  
William Leonard Ofstad *Portland, Oregon* Chemical Engineering  
Satoshi Ohtake *La Jolla, California* Chemical Engineering  
Alejandro Antonio Ortega, Jr. *Aurora, Colorado* Mathematics  
Melissa Claire Parish *Glendale, Arizona* Electrical Engineering  
Eleanor Jeesung Park\* *Skokie, Illinois* Chemical Engineering  
Dale Alan Parkes *Loveland, Colorado* Engineering and Applied Science (Mechanical Engineering)  
Ryan Benton Patterson\* *Picayune, Mississippi* Physics  
Brian R. Patton\* *St. Louis, Missouri* Physics  
Matthew Russell Paul *Newbury Park, California* Engineering and Applied Science  
Keith Alexander Peters *Hampton Bays, New York* Engineering and Applied Science  
Anh D. Pham\* *San Jose, California* Electrical Engineering and Economics  
Karen Lynn Rantamaki *Mason, New Hampshire* Engineering and Applied Science  
Timothy S. Reed *La Crescenta, California* Engineering and Applied Science  
Kevin Patrick Richberg\* *Memphis, New York* Chemistry  
Mohammed Husain Rizvi *Lahore, Pakistan* Engineering and Applied Science  
Daniel Kenneth Rogstad *Monrovia, California* Biology  
Alan Miller Rosenwinkel *Philadelphia, Pennsylvania* Engineering and Applied Science (Mechanical Engineering)  
Baldeep Singh Sadhal *Yorba Linda, California* Electrical Engineering  
Robert Michael Saliba *Camarillo, California* Economics  
Veronica Savu\* *Bucharest, Romania* Physics  
Rory Abbott Sayres\* *Bogota, New Jersey* Biology  
Amanda Marie Schaffer *Luthersburg, Pennsylvania* Engineering and Applied Science  
Nathan Jon Schara *Fresno, California* Engineering and Applied Science (Mechanical Engineering)  
Selwyn Sean Scharnhorst\* *Singapore, Singapore* Physics  
Kevin Matthew Schulz *Talent, Oregon* Physics  
Adrian Provost Seymour\* *Tuolumne, California* Planetary Science  
Devang Ashok Shah *Missouri City, Texas* Engineering and Applied Science and Economics  
Ian Ross Shapiro\* *San Francisco, California* Chemistry  
William Edward Sharp *Mission Viejo, California* Engineering and Applied Science  
Kacie Elise Shelton *Corvallis, Oregon* Physics  
Stephen Vincent Shepherd *Morgan Hill, California* Biology  
Angela J. L. Shum *Arcadia, California* Electrical Engineering  
Jaideep Singh *San Diego, California* Physics  
Aleksandrs Lev Slivkins\* *Riga, Latvia* Mathematics  
Jeremiah James Smith\* *Battle Creek, Michigan* Electrical Engineering

## *Bachelor of Science continued*

Daniel Song\* *Torrance, California* Biology  
Kartik Srinivasan\* *El Paso, Texas* Applied Physics  
Joshua Matthew Strahan *Denver, Colorado* Physics  
Eric Robert Strom\* *Thousand Oaks, California* Physics  
Zhendi Su\* *Beijing, P.R. China* Chemical Engineering  
Matthew Thomas Sullivan\* *Baton Rouge, Louisiana* Physics  
Erika Ray Swanson\* *Salem, Missouri* Chemistry  
Ian Douglas Swett\* *Bangor, Maine* Economics and Engineering and Applied Science  
John Russel Teifel\* *Aloha, Oregon* Electrical Engineering  
Ricky Tong\* *Spring, Texas* Chemical Engineering  
Kamran Vakili\* *Laguna Niguel, California* Physics  
Francisco Eduardo Valles *Lakeview Terrace, California* Chemical Engineering  
Phuong Kim Vu *Sugar Land, Texas* Biology  
Sam Lewis Wilcke\* *Bellevue, Idaho* Chemical Engineering  
Matthew Frederic Wilhelm *Palos Verdes, California* Engineering and Applied Science  
Steven Ryan Wolf *Salem, Oregon* Engineering and Applied Science  
Jim Yuk-Fai Wong\* *San Gabriel, California* Biology  
Sophia Sy-Hann Xiang\* *Cerritos, California* Biology  
Xiaolin Xie\* *Shanghai, P.R. China* Physics  
Kaiwen Xu\* *Nanjing, P.R. China* Physics and Engineering and Applied Science  
Jennifer Chuen-Hsien Yang *Davenport, Iowa* Chemistry  
Yifan Yang *Baltimore, Maryland* Engineering and Applied Science (Aeronautics)  
(Mechanical Engineering)  
Haitao Yu\* *Xi-An, P.R. China* Physics  
Jingyi Yu\* *Shanghai, P.R. China* Applied Mathematics and Engineering and Applied Science  
Hanhui Yuan\* *Guangdong Province, P.R. China* Engineering and Applied Science  
Ke-Jia Carl Zha *Carmel, Indiana* Electrical Engineering  
Hao Zhang\* *Shanghai, P.R. China* Engineering and Applied Science  
Jianhui Zhang\* *Changchun, P.R. China* Engineering and Applied Science

## *Master of Science*

Mark Lee Adams (*Electrical Engineering*) B.S.E.E., Auburn University 1997.  
Ricardo Alvarez-Miranda (*Electrical Engineering*) B.S., University of Massachusetts 1998.  
Elena Nikolaeva Asparouhova (*Social Science*) B.Sc., Sofia University 1994; M.Sc., 1996;  
B.B.A., 1998.  
John King-Tai Au (*Applied Physics*) B.Sc., Queen's University 1999.

## *Master of Science continued*

- Matthew Allen Barton (*Applied Physics*) B.S., Hope College 1997.
- David Eugene Beckman (*Physics*) B.S., (*Electrical Engineering*), B.S. (*Engineering Physics*), University of Illinois at Urbana-Champaign 1992.
- Emily Kirsten Bell (*Materials Science*) A.B., Bryn Mawr College 1998.
- Gwendolyn Rae Bell (*Astronomy*) B.S., Harvey Mudd College 1998.
- Jeffrey Myles Bergthorson (*Aeronautics*) B.Sc., University of Manitoba 1999.
- Samuel Case Bradford V (*Civil Engineering*) B.S., University of California, Berkeley 1999.
- Rhett Ty Brewer (*Applied Physics*) B.S., Brigham Young University 1997.
- Eliot Christen Bush (*Biology*) A.B., Harvard College 1997.
- Philippe Chatelain (*Aeronautics*) Ingénieur Civil Mécanicien, Université Catholique de Louvain 1999.
- Zie Wei Susan Chen (*Biology*) B.S., The University of Texas at Austin 1998.
- Wonchae Choe (*Biology*) B.S., Kyung Hee University 1992; M.S., 1994.
- John Myun Choi (*Electrical Engineering*) B.S., State University of New York at Buffalo 1999.
- Marcia Ann Cooper (*Mechanical Engineering*) B.S., Purdue University 1999.
- John Anthony Cortese (*Physics*) B.S., Worcester Polytechnic Institute 1982; M.S. (*Electrical Engineering*), 1985; M.S. (*Applied Mathematics*), California Institute of Technology 1990; Ph.D. (*Electrical Engineering*), 1995.
- Lars Brör Cremean (*Mechanical Engineering*) B.S., Cornell University 1999.
- Georgia Pauline Buenaventura Cua (*Civil Engineering*) B.S., Harvey Mudd College 1998.
- Michael Ivor Davies (*Electrical Engineering*) B.S., California Institute of Technology 1998.
- Jason Patrick Davis (*Computation and Neural Systems*) S.B., Massachusetts Institute of Technology 1998.
- Heather Lee Dean (*Computation and Neural Systems*) B.S., California Institute of Technology 2000.
- Luca R. Diaconescu (*Physics*) B.Eng., Carleton University 1995; B.Sc., 1996; M.Eng., 1997.
- Sébastien Laurent Bruno Fabre (*Aeronautics*) Diplôme d'Ingénieur, École Polytechnique 1999.
- Tao Feng (*Materials Science*) B.E., Tsinghua University 1998.
- Michael Ian James Fleming (*Electrical Engineering*) B.S., University of Auckland 1996; M.S., 1998.
- Matthew Brian Gardner (*Physics*) B.A., University of California, Berkeley 1995.
- Pedro Gonzalez (*Aeronautics*) Ingeniero Tecnico Aeronautico, Universidad Politecnica de Madrid; B.S., Embry-Riddle Aeronautical University 1996.
- Jason Allan Graetz (*Materials Science*) A.B., Occidental College 1998.
- William Michael John Green (*Electrical Engineering*) B.Sc., University of Alberta 1999.

## *Master of Science continued*

- Martin Griffiths (*Geophysics*) B.Sc., University College London 1997.
- Eitan R. Grinspun (*Computer Science*) B.A.Sc., University of Toronto 1997.
- Matthew Strentzel Hanna (*Computer Science*) B.S., University of Washington 1997.
- Sarah Christine Heilshorn (*Chemical Engineering*) B.S., Georgia Institute of Technology 1998.
- Olivier Philippe Henry (*Electrical Engineering*) Diplôme d'Ingénieur, École Supérieure d'Ingénieurs en Électrotechnique et Électronique 2000.
- Anil Nirmal Hirani (*Computer Science*) M.Sc., Birla Institute of Technology and Science 1986; M.S., Stanford University 1988.
- Nien-Show Ho (*Electrical Engineering*) B.S., National Taiwan University 1995; M.S., 1997.
- Lan Hu (*Electrical Engineering*) B.E., Tsinghua University 1998; M.S., Princeton University 1998.
- Xianglei Huang (*Planetary Science*) B.S., University of Science and Technology of China 1997.
- Cynthia Lee Hunt (*Materials Science*) A.B., The University of Chicago 1998.
- Scott Irving Jackson (*Aeronautics*) Sc.B., Brown University 1999.
- Anxiao Jiang (*Electrical Engineering*) B.E., Tsinghua University 1999.
- Yindi Jing (*Electrical Engineering*) B.E., University of Science and Technology of China 1996; M.E., 1999.
- Michael Bernard Johnson (*Aeronautics*) B.Sc., Queen's University 1999.
- Melinda Jane Kellogg (*Physics*) B.S., University of California, Santa Barbara 1993; M.S. (*Astronomy*), California Institute of Technology 1999.
- David Thomas Kewley (*Computation and Neural Systems*) B.S., University of Rochester 1990.
- Tobias Jan August Kippenberg (*Applied Physics*) Vordiplom Physik, Rheinisch-Westfälische Technische Hochschule Aachen 1998.
- Martha Kirouac (*Biology*) B.S., Union College 1996.
- Brett Matthew Kornfeld (*Physics*) B.A., Columbia University 1998.
- Savvas Koudounas (*Electrical Engineering*) B.Eng., Imperial College of Science, Technology, and Medicine, University of London 1999.
- Milan Kovacevic (*Electrical Engineering*) Dipl. Ing., University of Belgrade 1999.
- Christopher J. Lacenere (*Biology*) B.S., Carnegie Mellon University 1994.
- Andrew John Landahl (*Physics*) B.S., (*Mathematics*), B. S. (*Physics*), Virginia Polytechnic Institute and State University 1996.
- Patrick Shawn Lang (*Chemistry*) B.S., University of California, Davis 1988; B.S., University of California, Irvine 1992.
- Franck Christian Laumonier (*Aeronautics*) Diploma, École Polytechnique 1998.
- Peter Byungho Lee (*Physics*) B.S., University of California, Berkeley 1998.
- Melvin Boon-Tiong Leok (*Mathematics*) B.S., California Institute of Technology 2000.
- Yi Li (*Applied Physics*) B.S., California Institute of Technology 1998.

## *Master of Science continued*

- Carolina Becker Livi (*Biology*) B.Sc., Universidade Federal do Rio Grande do Sul 1996.
- Dai Lu (*Electrical Engineering*) B.Eng., Zhejiang University 1996.
- Jun Lu (*Mechanical Engineering*) B.S., Tsinghua University 1992; M.S., 1995.
- Miao-Ling Lu (*Environmental Engineering Science*) B.S., National Taiwan University 1996; M.S., 1998.
- Mehrdad Mahmoudi Zarandi (*Chemical Engineering*) B.Sc., Isfahan University of Technology 1985.
- Stefan Alexander Maier (*Applied Physics*) Vordiplom, Technische Universität München 1998.
- Irena Maravic (*Electrical Engineering*) B.Sc., University of Belgrade 1997.
- Kimberly Anne Mertz (*Environmental Engineering Science*) B.S., Northwestern University 1998.
- Mark Meyer (*Computer Science*) B.S. (*Computer Engineering*), B.S. (*Computer Science*), Northwestern University 1997.
- Alexander Marshall Nicholson (*Computer Science*) B.A.Sc., University of Toronto 1996.
- Mark O'Dell (*Computation and Neural Systems*) B.S. (*Electrical Engineering*), B.S. (*Physics*), Rutgers University 1989.
- Tina Pavlin (*Physics*) A.B., Princeton University 1997.
- Byron Jacob Philhour (*Physics*) B.A., University of California, Berkeley 1995.
- Matthew Earl Pritchard (*Geophysics*) A.B., The University of Chicago 1997.
- Matthew James Ringuette (*Aeronautics*) B.S., Rensselaer Polytechnic Institute 1999.
- Frederick William Romberg (*Electrical Engineering*) A.A., Montgomery College 1992; B.S., Virginia Polytechnic Institute and State University 1995.
- Carlos Alejandro Romero Talamás (*Aeronautics*) Industrial Physics Engineering, Instituto Tecnológico y de Estudios Superiores de Monterrey 1995; M.S., International Space University 1998.
- Ian Robert Sammis (*Physics*) B.S. (*Computer Science*), B.S. (*Mathematics*), B.S. (*Creative Studies*), University of California, Santa Barbara 1995.
- Marcus Christopher Sarofim (*Chemistry*) S.B., Massachusetts Institute of Technology 1996.
- Brian Kirk Savage (*Geophysics*) B.A., University of California, Berkeley 1998.
- Kevin Anthony Scaldeferri (*Physics*) B.S. (*Mathematics*), B.S. (*Physics*), University of Maryland at College Park 1997.
- Jeffrey Thomas Scruggs (*Applied Mechanics*) B.S., Virginia Polytechnic Institute and State University 1997; M.S., 1999.
- Huazhang Shen (*Biology*) B.S., University of Science and Technology of China 1994.
- Paul Michael Skerritt (*Physics*) B.Sc., University College Dublin 1997; M.Sc., 1998.
- William Bryan Smith (*Biology*) B.S., University of Southern California 1995.
- Robert Gregory Southworth (*Computer Science*) B.S., California Institute of Technology 1992.

## *Master of Science continued*

- Ann Marie Stimmiller (*Electrical Engineering*) B.S., California Institute of Technology 1999.
- Han Wui Then (*Electrical Engineering*) B.Sc., University of Illinois at Urbana-Champaign 1999.
- Amber Lynn Thweatt (*Control and Dynamical Systems*) B.S., The University of Michigan 1997.
- Thomas Davison Tubman (*Biology*) B.A., University of Arizona 1993.
- David James Vakil (*Astronomy*) B.S., University of Arizona 1997.
- Scott Jeffrey Van Essen (*Applied Physics*) B.S., California Institute of Technology 1995.
- Marion Walter Vance (*Mechanical Engineering*) B.S.E., Arizona State University 1998.
- Luis Enrique Vázquez (*Biology*) B.A., University of Puerto Rico, Mayagüez 1998.
- Stephanie Yeager Vernooy (*Biology*) B.A., Pomona College 1994.
- Jean Zhiyuan Wang (*Electrical Engineering*) Diplôme d'Ingénieur, École Supérieure d'Ingénieurs en Électrotechnique et Électronique 2000.
- Murphy Wang (*Aeronautics*) B.S.E., The University of Michigan 1999.
- Pin Wang (*Chemical Engineering*) B.S., University of Science and Technology of China 1997.
- Nathan El Ray Whitlock (*Chemical Engineering*) B.S., University of Wyoming 1998.
- Eric Wintenberger (*Aeronautics*) Diplôme d'Ingénieur, École Centrale Paris 1998.
- Julie Anne Wolf (*Civil Engineering*) B.S., University of California, San Diego 1999.
- Catherine Grace Wong (*Computer Science*) B.A.Sc., University of Toronto 1998.
- Zoë Justine Wood (*Computer Science*) B.S., University of California, Santa Cruz 1997.
- Xinkai Wu (*Physics*) B.S., Peking University 1998.
- Kaiwen Xia (*Geophysics*) B.S., University of Science and Technology of China 1995; M.E., 1998.
- Jun Xie (*Electrical Engineering*) B.Eng., Zhejiang University 1996.
- Lan Yang (*Materials Science*) B.S., University of Science and Technology of China 1996.
- Richard Ming-Chun Yang (*Aeronautics*) B.S., California State Polytechnic University Pomona 1997.
- Ya-Tang Yang (*Applied Physics*) B.S., National Taiwan University 1996.
- Tomoyuki Yoshie (*Electrical Engineering*) B.Eng., Kyoto University 1990; M.Eng., 1992.
- Hanhui Yuan (*Mathematics*) B.S., California Institute of Technology 2000.
- Junhua Yuan (*Physics*) B.S., University of Science and Technology of China 1998.
- Kathryn Marie Zeiler (*Social Science*) B.S., Indiana University 1991; M.S., Golden Gate University 1995.
- Lingsen Zeng (*Geology*) B.S., Nanjing University 1987; M.S., Chinese Academy of Geological Sciences 1994.
- Qingsong Zhang (*Materials Science*) B.E., Tsinghua University 1996.

## *Engineer*

Keith Scott Haberman (*Aeronautics*) B.S., New Mexico State University 1991; M.S., 1993.

## Doctor of Philosophy

### DIVISION OF BIOLOGY

Tara Lynn Chapman (*Biochemistry*) B.S. (*Chemistry*), B.A. (*French*), Arizona State University 1994.

Thesis: Biochemical Characterization of Two Cytomegalovirus MHC Class I Homologs.

Christine Wai Jun Chee-Ruiter (*Computation and Neural Systems*) B.S., Harvey Mudd College 1985.

Thesis: The Biological Sense of Smell: Olfactory Search Behavior and a Metabolic View for Olfactory Perception.

Wen Chen (*Biology*) B.S., University of Science and Technology of China 1994.

Thesis: Extragenic Suppressors of Heat Shock Activated Go $\alpha$ .

Chiou-Fen Chuang (*Biology*) B.S., Chung Shan Medical and Dental College 1990; M.S., National Yang-Ming Medical College 1992.

Thesis: Molecular Genetics of Floral Patterning in *Arabidopsis thaliana*.

Marie Elizabeth Csete (*Biology*) A.B., Princeton University 1975; M.D., Columbia University 1979; M.S., California Institute of Technology 1998.

Thesis: Less is More: Oxygen and Stem Cell Regeneration.

Susan Elizabeth Roian Egnor (*Integrative Neurobiology*) A.B., Bryn Mawr College 1990.

Thesis: The Role of Spectral Cues in Sound Localization by the Barn Owl.

Reid Martin Renny Feldman (*Biology*) A.B., Harvard College 1993.

Thesis: Life is Degrading: SCF Ubiquitin Ligases—Their Components and Functions.

Aidyl Sofia Gonzalez-Serricchio (*Biology*) B.S., Rensselaer Polytechnic Institute 1993.

Thesis: Negative Regulation of Cell Fate Specification by the *lin-15* Locus during Vulva Induction in *Caenorhabditis elegans*.

Amy Lynn Greenwood (*Biology*) B.A., Pomona College 1992.

Thesis: The Generation of Peripheral Neuron Diversity from Mammalian Progenitor Cells *in vitro*.

Mitra Jennifer Hartmann (*Integrative Neurobiology*) B.S., Cornell University 1990.

Thesis: The Cerebellum and Active Somatosensation: Recordings from the Granule Cell Layer of Awake, Freely-Behaving Rats.

Ching Elizabeth Ho (*Computation and Neural Systems*) B.Sc., The Chinese University of Hong Kong 1992; M.A., University of Virginia 1994.

Thesis: Multiple Mechanisms of Apparent Motion Perception.

Laurent Itti (*Computation and Neural Systems and Electrical Engineering*) Ingénieur, École Nationale Supérieure des Télécommunications 1994.

Thesis: Models of Bottom-Up and Top-Down Visual Attention.

*When more than one field of study is listed, the first is the major, and the second and others are minors.*



## *Doctor of Philosophy continued*

- Tina Michelle Iverson (*Biochemistry*) B.S., St. John's University 1995.  
Thesis: Crystallographic Investigations of Respiratory Proteins.
- Clara L. Kielkopf (*Biology and Chemistry*) B.S., University of Louisville 1992; B.S., University of Wisconsin-Madison 1994.  
Thesis: Structural Basis of DNA Recognition by Synthetic Ligands.
- Chantal Smith Morgan (*Biochemistry*) A.B., Princeton University 1994.  
Thesis: Full Sequence Design of an Alpha-Helical Protein and Investigation of the Importance of Helix Dipole and Capping Effects in Helical Protein Design.
- Alice Jean Paquette (*Biology*) S.B., Massachusetts Institute of Technology 1989; M.S., University of California, San Diego 1993.  
Thesis: The Role of the Neuron-Restrictive Silencer Factor during Vertebrate Embryogenesis.
- John Stylianos Pezaris (*Computation and Neural Systems*) S.B., Massachusetts Institute of Technology 1984; S.M., 1993.  
Thesis: Responses of Multiple Simultaneously Recorded Macaque Area LIP Neurons in a Memory Saccade Task.
- Micah Seth Siegel (*Computation and Neural Systems*) B.S., Yale University 1992.  
Thesis: Genetically Engineered Sensors of Cell Signaling.
- Qi Sun (*Biology*) B.S., Fudan University 1989; M.S., Shanghai Institute of Plant Physiology, Academia Sinica 1992.  
Thesis: Molecular Genetics of Axon Guidance in *Drosophila melanogaster*.
- Glenn Cameron Turner (*Biology*) B.Sc., University of Alberta 1992.  
Thesis: Functions of the Ubiquitin-Proteasome System in *Saccharomyces cerevisiae*: Cotranslational Protein Degradation and Regulation of the UBR1 Pathway.
- Minqin Wang (*Biology*) B.S., Fudan University 1991; M.S., 1994.  
Thesis: Pattern Formation during *Caenorhabditis elegans* Vulval Development.
- Susan Leishua Wang (*Biology*) B.A., University of California, Berkeley 1992.  
Thesis: Turning on Death in the Fly: Regulation of Apoptosis in *Drosophila melanogaster*.
- Patricia M. White (*Developmental Biology*) B.S., California Institute of Technology 1989.  
Thesis: Cellular and Molecular Mechanisms in Autonomic Neuronal Differentiation.

## *Doctor of Philosophy continued*

### DIVISION OF CHEMISTRY AND CHEMICAL ENGINEERING

- Erika Bellmann (*Chemistry*) Vordiplom, Humboldt University 1992; Diplom, 1995.  
Thesis: Synthesis and Characterization of Hole-Transporting and Electroluminescent Polymers.
- Ryan Elwood Bremer (*Chemistry*) B.A., Grinnell College 1995.  
Thesis: Inhibition of DNA Major Groove Binding Proteins by Hairpin Polyamides.
- Matt Jeffrey Carlson (*Chemistry*) B.S., California Institute of Technology 1992.  
Thesis: BUFF: A Biological Universal Forcefield Derived from Quantum Mechanics.
- Paul James Chirik (*Chemistry*) B.S., Virginia Polytechnic and State University 1995.  
Thesis: Ancillary Ligand Effects on Fundamental Transformations in Metallocene Catalyzed Olefin Polymerization.
- Ivan Julian Dmochowski (*Chemistry*) A.B., Harvard College 1994.  
Thesis: Probing Cytochrome P450 with Sensitizer-linked Substrates.
- Delwin Lerone Elder (*Chemistry*) B.S., University of North Carolina 1994.  
Thesis: The Use of Well-Defined Molybdenum ROMP Initiators in the Synthesis of Fluorescent Poly(arylenevinylene) Homopolymers and Copolymers.
- Sean Joseph Elliott (*Chemistry*) B.A., Amherst College 1994.  
Thesis: The Copper Centers of Particulate Methane Monooxygenase: Differentiation of C- and E-Clusters.
- Kathryn Elizabeth Erkkila (*Chemistry*) A.B., Bryn Mawr College 1992.  
Thesis: Chemical and Structural Characterization of 9,10-phenanthrenequinone Diimine Complexes of Iridium(III) and Rhodium(III) Bound to DNA.
- Justin Patrick Gallivan (*Chemistry*) B.S., University of Illinois at Urbana-Champaign 1994.  
Thesis: Electrostatic Interactions in Chemistry and Biology.
- David Benjamin Gordon (*Chemistry*) S.B., Massachusetts Institute of Technology 1994.  
Thesis: Combinatorial Optimization in Computational Protein Design.
- Robert John Griffin (*Chemical Engineering and Environmental Engineering Science*) B.S., Tufts University 1993; M.S., California Institute of Technology 1997.  
Thesis: Experimental and Computational Studies of Secondary Organic Aerosol Formation.
- Hui-Ming Hung (*Chemistry*) B.S., National Taiwan University 1993; M.S., 1995.  
Thesis: Sonochemistry: The Mechanism and the Application.
- Michael Garrett Johnson (*Chemistry*) B.A., Reed College 1992.  
Thesis: Photorearrangement of Tricyclic 2,5-Cyclohexadienones in a Synthetic Route Toward the Natural Product Resiniferatoxin.
- Thomas Andrew Kirkland (*Chemistry*) B.S., California Polytechnic State University, San Luis Obispo 1993.  
Thesis: Expanding the Applications of Transition Metal Alkylidenes and Alkylidyne to Organic Synthesis.

## *Doctor of Philosophy continued*

- Dmitri Alexandrovich Kossakovski (*Chemistry*) M.S., Moscow Institute of Physics and Technology 1993.  
Thesis: Scanning Probe Chemical and Topographical Microanalysis.
- Guruswamy Kumaraswamy (*Chemical Engineering and Chemistry*) B.Tech., Indian Institute of Technology, Bombay 1994; M.S., California Institute of Technology 1996.  
Thesis: The Effect of Flow History on the Crystallization of Semicrystalline Polymers.
- Sang-Won Lee (*Chemistry*) B.Sc., Korea University 1990; M.Sc., 1992.  
Thesis: Fundamental Studies of the Structures and Reaction Dynamics of Gas Phase Biomolecules and Solvated Ions Using FT-ICR.
- Jennifer Chia-Hung Ma (*Chemistry*) A.B., Harvard College 1993.  
Thesis: Molecular Recognition in Aqueous Media: Studies in Self-Assembly and Enzyme Mimics.
- Mehrdad Mahmoudi Zarandi (*Chemical Engineering*) B.Sc., Isfahan University of Technology 1985. M.S., California Institute of Technology 2000.  
Thesis: Steady and Pulsatile Flow in Curved Vessels.
- Stephen Albert Miller (*Chemistry*) B.S., Stanford University 1994; M.S., 1994.  
Thesis: Metallocene-Mediated Olefin Polymerization: The Effects of Distal Ligand Perturbations on Polymer Stereochemistry.
- Adrian Ponce (*Chemistry*) B.S., Michigan State University 1993.  
Thesis: Electron Tunneling in Proteins and Water.
- Stephanie Monn Rogers (*Chemistry*) B.S., The College of William and Mary 1992.  
Thesis: Reaction Dynamics of the Lowest  $^3A'$  and  $^3A''$  States of  $O(^3P) + H_2$ .
- Shelly Elese Sakiyama-Elbert (*Chemical Engineering*) S.B. (*Biology*), S.B. (*Chemical Engineering*), Massachusetts Institute of Technology 1996; M.S., California Institute of Technology 1998.  
Thesis: Biofunctional Polymers for the Controlled Release of Growth Factors in the Peripheral Nervous System.
- Matthias Scholl (*Chemistry*) S.B., Massachusetts Institute of Technology 1996.  
Thesis: Expanding the Scope of Ruthenium-Based Olefin Metathesis Catalysts.
- Michael Aaron Shogren-Knaak (*Chemistry*) B.S., Stanford University 1994.  
Thesis: Incorporating Function into Beta Beta Alpha-Motif Peptide Scaffolds.
- Michael Ulman (*Chemistry*) B.S., Harvey Mudd College 1995.  
Thesis: Selectivity, Activity and Stability of Ruthenium-Carbene Based Olefin Metathesis Initiators.

## *Doctor of Philosophy continued*

### DIVISION OF ENGINEERING AND APPLIED SCIENCES

- Brad Thomas Aagaard (*Civil Engineering*) B.S., Harvey Mudd College 1994; M.S., California Institute of Technology 1995.  
Thesis: Finite-Element Simulations of Earthquakes.
- Ali Adibi (*Electrical Engineering*) B.S., Shiraz University 1990; M.S., Georgia Institute of Technology 1993.  
Thesis: Persistent Holographic Storage in Photorefractive Crystals.
- Srinivas Mandayam Aji (*Electrical Engineering and Mathematics*) B.Tech., Indian Institute of Technology, Madras 1995; M.S., California Institute of Technology 1997.  
Thesis: Graphical Models and Iterative Decoding.
- David S. Babcock (*Electrical Engineering*) B.S., The Pennsylvania State University 1992; M.S., California Institute of Technology 1993.  
Thesis: Intelligent Control Using Generalizing Case-Based Reasoning with Neural Networks.
- Zvonimir Z. Bandić (*Applied Physics*) B.S., University of Belgrade 1994; M.S., California Institute of Technology 1995.  
Thesis: Novel Devices Employing Epitaxial Wide Bandgap Semiconductors: Physics, Electronics and Materials Characterization.
- Mark Adrian Brady (*Aeronautics and Computer Science*) B.S., University of California, San Diego 1993.  
Thesis: Regularized Vortex Sheet Evolution in Three Dimensions.
- Goutam Chattopadhyay (*Electrical Engineering*) B.E., University of Calcutta 1987; M.S., University of Virginia 1994.  
Thesis: Dual Polarized and Balanced Receivers at Millimeter and Submillimeter Wavelengths.
- Donald R. Collins (*Environmental Engineering and Planetary Science*) B.S., Virginia Polytechnic Institute 1994.  
Thesis: Characterization of the Physical Properties of Atmospheric Aerosols through Airborne Sampling.
- Cynthia Evors Daniell (*Electrical Engineering*) B.S., University of Southern Alabama 1985; M.S., California Institute of Technology 1988.  
Thesis: Object Recognition in Compressed Imagery.
- John Frank Davis (*Electrical Engineering*) B.S.E., Arizona State University 1993; M.S., California Institute of Technology 1995.  
Thesis: Low-Cost, Industrial Class-E Power Amplifiers with Sine-Wave Drive.
- Blythe Chadwick Deckman (*Electrical Engineering*) B.S., California State Polytechnic University, Pomona 1996; M.S., California Institute of Technology 1997.  
Thesis: Active Quasi-Optics and Measurements.

## *Doctor of Philosophy continued*

Amish S. Desai (*Electrical Engineering*) B.S., University of California, Los Angeles 1993; M.S., California Institute of Technology 1996.

Thesis: Micromachined Devices for an Airborne Bio-Particle Analysis System.

Ognjen Djekić (*Electrical Engineering*) B.S., University of Maryland at College Park 1994; M.S., California Institute of Technology 1995.

Thesis: Optimization and Miniaturization of Microprocessor Power Supplies.

Michael Andrew Gibson (*Computation and Neural Systems*) B.S. (*Computer Science*), B.S. (*Electrical and Computer Engineering*), Carnegie Mellon University 1995.

Thesis: Computational Methods for Stochastic Biological Systems.

Luis Filipe Domingues Gonçalves (*Computation and Neural Systems*) B.A.Sc., University of Waterloo 1991; M.S., California Institute of Technology 1992.

Thesis: Automatic Observation and Synthesis of Human Motion.

Reid R. Harrison (*Computation and Neural Systems and Electrical Engineering*) B.S., University of Florida 1994.

Thesis: An Analog VLSI Motion Sensor Based on the Fly Visual System.

Alexandr Ikriannikov (*Electrical Engineering*) Engineer-Physicist, Moscow Engineering Physics Institute 1992; M.S., California Institute of Technology 1995.

Thesis: New Developments in Single Phase Power Factor Correction.

Ayhan Irfanoglu (*Civil Engineering*) B.S., Middle East Technical University 1993; M.S., California Institute of Technology 1994.

Thesis: Structural Design Under Seismic Risk Using Multiple Performance Objectives.

Michel E. Jabbour (*Applied Mechanics*) Licence de Mécanique, Université Pierre et Marie Curie 1992; Maîtrise de Mécanique, 1993.

Thesis: Modeling Chemical Vapor Deposition of Thin Solid Films.

David S. Jeon (*Aeronautics*) B.S., University of California, Berkeley 1993; M.S., California Institute of Technology 1994.

Thesis: On Cylinders Undergoing One- and Two-Degree of Freedom Forced Vibrations in a Steady Flow.

Anna Karion (*Mechanical Engineering*) B.S., Yale University 1994; M.S., California Institute of Technology 1995.

Thesis: Couette Flows of Granular Materials: Mixing, Rheology, and Energy Dissipation.

Sanza Nkashama Tsilobo Kazadi (*Computation and Neural Systems*) B.S., California Institute of Technology 1995.

Thesis: Swarm Engineering.

Penelope E. Kneebone (*Environmental Engineering Science and Chemistry*) B.Sc., University of Otago 1995.

Thesis: Arsenic Geochemistry in a Geothermally Impacted System: The Los Angeles Aqueduct.

## *Doctor of Philosophy continued*

- Reginald Kai Ming Lee (*Applied Physics*) B.A.Sc., University of Toronto 1994; M.S., California Institute of Technology 1996.  
Thesis: Lasing and Modified Spontaneous Emission in Photonic Crystal Structures and Microcavities.
- Lifang Li (*Electrical Engineering*) B.S., Tsinghua University 1993; M.S., 1996; M.S., California Institute of Technology 1998.  
Thesis: Adaptive Receiver Design and Optimal Resource Allocation Strategies for Fading Channels.
- Ying Li (*Mechanical Engineering*) B.S., Tsinghua University 1994; M.S., California Institute of Technology 1996.  
Thesis: Tsunamis: Non-Breaking and Breaking Solitary Wave Run-Up.
- Daqi Lu (*Applied Physics*) B.S., University of Science and Technology of China 1991.  
Thesis: Theoretical Studies of the Nonlinear Optical Properties of Organic Materials.
- Amit Manwani (*Computation and Neural Systems and Electrical Engineering*) B.Tech., Indian Institute of Technology, Bombay 1994.  
Thesis: Information-theoretic Analysis of Neuronal Communication.
- Kyu Sung Min (*Materials Science*) B.S., University of California, Los Angeles 1994; M.S., California Institute of Technology 1996.  
Thesis: Synthesis and Properties of Light-Emitting Si-Based Nanostructures.
- Petrus Joannes Joseph Moeleker (*Aeronautics and Physics*) Econometrics, Erasmus Universiteit Rotterdam 1995; Engineer, Technische Universiteit Delft 1996.  
Thesis: The Filtered Advection-Diffusion Equation: Lagrangian Methods and Modeling.
- Kamran Mohseni (*Mechanical Engineering*) B.S., Imperial College of Science, Technology, and Medicine 1993.  
Thesis: A: Universality in Vortex Formation. B: Evaluation of Mach Wave Radiation Mechanisms in a Supersonic Jet.
- Mario Enrique Munich (*Electrical Engineering*) Ingeniero Electricista, Universidad Nacional de Rosario 1991; M.S., California Institute of Technology 1994.  
Thesis: Visual Input for Pen-Based Computers.
- Kenji Oguni (*Applied Mechanics*) B.Eng., University of Tokyo 1994; M.Eng., 1996.  
Thesis: Micromechanical Aspects of Failure in Unidirectional Fiber Reinforced Composites.
- Peter Jungsoo Park (*Applied Mathematics*) A.B., Harvard College 1994; S.M., 1994.  
Thesis: Multiscale Numerical Methods for the Singularly Perturbed Convection-Diffusion Equation.
- Pablo A. Parrilo (*Control and Dynamical Systems*) Ingeniero Electronico, Universidad de Buenos Aires 1994.  
Thesis: Structured Semidefinite Programs and Semialgebraic Geometry Methods in Robustness and Optimization.

## *Doctor of Philosophy continued*

- Sergey Pekarsky (*Control and Dynamical Systems*) B.Sc., Tomsk State University 1992;  
M.Sc., Weizmann Institute of Science 1996.  
Thesis: Discrete Reduction of Mechanical Systems and Multisymplectic Geometry of Continuum Mechanics.
- Eva Maria Peral Sanchez (*Electrical Engineering*) Ingeniero Superior de Telecomunicaciones, Universidad Politecnica de Valencia 1995; M.S., California Institute of Technology 1998.  
Thesis: Some Issues Relevant to Affecting Propagation of Lightwave Signals in Optical Fibers.
- Wendong Qu (*Engineering Science*) B.S., Ocean University of Qingdao; M.S., 1995; M.S., California Institute of Technology 1997.  
Thesis: Studies on Nonlinear Dispersive Water Waves.
- Stefan Schlamp (*Aeronautics and Computation and Neural Systems*) B.S., Stuttgart University 1994; M.S., California Institute of Technology 1996.  
Thesis: Laser-Induced Thermal Acoustic Velocimetry.
- Eric Schultz (*Aeronautics and Planetary Science*) B.S., Pennsylvania State University 1995; M.S., University of Washington 1997.  
Thesis: Detonation Diffraction through an Abrupt Area Expansion.
- Hui (Helen) Si (*Applied Mathematics*) B.S., Tsinghua University 1994.  
Thesis: Numerical Study of Interfacial Flow with Surface Tension in Two and Three Dimensions.
- James Norman Smith (*Environmental Engineering Science and Chemistry*) B.S., Harvey Mudd College 1984.  
Thesis: A. Computational Chemistry Applied to the Analysis of Air Pollution Reaction Mechanisms. B. Fundamental Studies of Droplet Evaporation and Discharge Dynamics in Electrospray Ionization.
- Grant Douglas Swenson (*Aeronautics and Chemistry*) B.S., University of Southern California 1993; M.S., California Institute of Technology 1994.  
Thesis: Numerical Simulations of Combustion Instabilities in Gas Turbine Combustors, with Applications.
- Tobias Voelkl (*Aeronautics and Applied Mathematics*) Vordiplom, Technische Universität München 1993; M.S., California Institute of Technology 1996.  
Thesis: A Physical-Space Version of the Stretched-Vortex Subgrid-Stress Model for Large-Eddy Simulation of Incompressible Flow.

## *Doctor of Philosophy continued*

- Xu Wang (*Electrical Engineering*) B.S., Zhejiang University 1990; M.S., Tsinghua University 1993; M.S., Syracuse University 1995; M.S., California Institute of Technology 1997.  
Thesis: Optoelectronic Devices for Optical Memory Systems.
- Xuan-Qi Wang (*Electrical Engineering*) B.S., Tsinghua University 1989; M.S., California Institute of Technology 1996.  
Thesis: Integrated Parylene Micro Electro Mechanical Systems (MEMS).
- Yong Wang (*Control and Dynamical Systems*) B.S., Peking University 1991; M.S., 1994.  
Thesis: Effects of Actuator Limits in Bifurcation Control with Applications to Active Control of Fluid Instabilities in Turbomachinery.
- Rolf Markus Weber (*Computation and Neural Systems*) Vordiplom, Rheinisch-Westfälische Technische Hochschule Aachen 1991; Magistère d'Informatique, École Normale Supérieure de Lyon Lyon 1995.  
Thesis: Unsupervised Learning of Models for Object Recognition.
- Jiajun Wen (*Computation and Neural Systems*) B.S., University of Science and Technology of China 1993.  
Thesis: What You Can See Outside the Focus of Attention.
- Charles Kincaid Witham (*Materials Science*) M.S., Duke University 1993; M.S., California Institute of Technology 1995.  
Thesis: The Effects of Alloy Chemistry on the Electrochemical and Hydriding Properties of Ni-Substituted  $\text{LaNi}_5$ .
- Joyce Yuen-Wah Wong (*Electrical Engineering*) B.S., California Institute of Technology 1995; M.S., 1996.  
Thesis: Perpendicular Patterned Media for High Density Magnetic Storage.
- Shuyun Wu (*Electrical Engineering*) B.S., Shanghai Jiao Tong University 1987; M.S., California Institute of Technology 1995.  
Thesis: Integrated Polysilicon Thermistors for Microfluidic Sensing.
- Jimmy Yee (*Applied Physics*) B.S., Cornell University 1991; M.S., California Institute of Technology 1993.  
Thesis: Experimental Investigations in Spheromaks: Injection into a Tokamak and Formation in an Unbounded Environment.
- Xiaoyun Zhu (*Electrical Engineering*) B.S., Tsinghua University 1994; M.S., California Institute of Technology 1995.  
Thesis: Hard vs. Soft Bounds in Probabilistic Robustness Analysis and Generalized Source Coding and Optimal Web Layout Design.



## *Doctor of Philosophy continued*

### DIVISION OF GEOLOGICAL AND PLANETARY SCIENCES

Elizabeth Warner Holt (*Geochemistry*) B.S., California Institute of Technology 1991; M.S., Stanford University 1993.

Thesis:  $^{18}\text{O}/^{16}\text{O}$  Studies of Short-Lived (10–25 year), Fumarolic ( $>500^\circ\text{C}$ ) Meteoric-Hydrothermal Events in the Outflow Sheets of Ash-Flow Tuffs.

Anton Borisovich Ivanov (*Planetary Science and Computer Science*) Engineer, Moscow Engineering Physics Institute 1994.

Thesis: Some Aspects of the Martian Climate in the Mars Orbiter Laser Altimeter (MOLA) Investigation.

Mark Stephen Roulston (*Planetary Science*) B.A., Cambridge University 1994.

Thesis: Construction of Low Dimensional Models of El Niño-Southern Oscillation Using Empirical Orthogonal Functions.

### DIVISION OF HUMANITIES AND SOCIAL SCIENCES

Frederick Jason Boehmke (*Social Science*) B.A., Washington University 1995.

Thesis: Beyond the Ballot: The Influence of Direct Democracy on Interest Group Behavior.

Alvaro S. González Staffa (*Social Science*) B.A., University of Washington 1988; M.C.P., Massachusetts Institute of Technology 1991; M.S., California Institute of Technology 1997.

Thesis: Essays on the Industrial Organization of Telecommunications and Network Industries.

Anthony Mark Kwasnica (*Social Science*) B.A., University of Arizona 1994; M.S., California Institute of Technology 1997.

Thesis: Asymmetric Information and Cooperation.

Roberto Antonio Weber (*Social Science*) B.A., Texas A&M University 1994; M.S., California Institute of Technology 1996.

Thesis: Interdependence in Laboratory Groups and Organizations.

### DIVISION OF PHYSICS, MATHEMATICS AND ASTRONOMY

Tihomir Zlatev Asparouhov (*Mathematics*) M.S., University of Sofia 1995.

Thesis: Sequential Fixed Width Confidence Intervals.

Andrew Jordan Baker (*Astronomy*) B.A., Harvard College 1994.

Thesis: Molecular Gas in Nearby Active Galactic Nuclei.

Bradford B. Behr (*Astronomy*) B.A., Williams College 1992.

Thesis: A New Spin on Horizontal-Branch Stars: Anomalous Abundances and Rapid Rotation Rates.

## *Doctor of Philosophy continued*

- Eugene Chiang (*Astronomy*) S.B., Massachusetts Institute of Technology 1995.  
Thesis: Circumstellar and Circumplanetary Disks.
- Teviet David Creighton (*Physics*) B.S., University of Calgary 1994.  
Thesis: From the Big Bang to Tumbleweeds: Analysis of Signals from Relic Gravitons, Neutron Stars, and Terrestrial Gravitational Noise in Gravitational Wave Detectors.
- Andrea Paulina Dvoredsky (*Physics*) B.S., University of Maryland at College Park 1993.  
Thesis: Investigations of Novel Effects in Semi-inclusive Deep Inelastic Scattering.
- Christina J. Hood (*Physics*) B.Sc., University of Otago 1993.  
Thesis: Real-time Measurement and Trapping of Single Atoms by Single Photons.
- Oleg Kovrijkine (*Mathematics*) B.S., Moscow Institute of Physics and Technology 1993; M.A., 1995.  
Thesis: Some Estimates of Fourier Transforms.
- Ruben Krasnopolsky (*Physics*) Licenciado, Universidad de Buenos Aires 1991.  
Thesis: Hydromagnetic Astrophysical Outflows.
- Ushma Kriplani (*Physics*) B.Sc., St. Xavier's College 1986; M.Sc., Indian Institute of Technology, Bombay 1988; M.S., California Institute of Technology 1991.  
Thesis: Kinematical Mössbauer Diffraction in  $^{57}\text{Fe}$ .
- Tao Li (*Mathematics*) B.S., Peking University 1995.  
Thesis: Immersed Surfaces, Dehn Surgery and Essential Laminations.
- Thomas Williams Murphy, Jr. (*Physics*) B.S., Georgia Institute of Technology 1993; M.S., California Institute of Technology 1997.  
Thesis: Ultraluminous Infrared Galaxies: Power Sources and Ages Along the Merger Sequence.
- Malik Rakhmanov (*Physics*) M.S., Moscow State University 1989.  
Thesis: Dynamics of Laser Interferometric Gravitational Wave Detectors.
- Arthur George Street (*Physics*) B.S., University of Sydney 1994; M.S., California Institute of Technology 1997.  
Thesis: Understanding and Designing Protein Beta-Sheets.
- David William Vernooy (*Physics*) B.Sc., Queen's University 1994.  
Thesis: Cold Atoms in Cavity QED for Quantum Information Processing.
- William Joseph Weber, IV (*Physics*) B.S., Stanford University 1992.  
Thesis: Thermodynamic Study of Coadsorption:  $\text{Kr}/\text{CCl}_4$  and  $\text{CH}_4/\text{CCl}_4$  on Graphite.

## PRIZES AND AWARDS

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*Prizes and awards are listed primarily for those students receiving degrees in 2000, and include prizes and awards received by them in previous years.*

### 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 seniors who, in the opinion of the undergraduate Deans, have made the greatest undergraduate contribution to the welfare of the student body and whose qualities of leadership, character, and responsibility have been outstanding.

2000     *Alan Miller Rosenwinkel, Jaideep Singh*

### 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.

2000     *Eleanor Jeesung Park*

ROSALIND W. ALCOTT MERIT SCHOLARSHIP, CALTECH PRIZE  
SCHOLARSHIP, CARNATION SCHOLARSHIP, AND JOHN STAUFFER  
MERIT SCHOLARSHIP

Each year Caltech awards these prizes for academic excellence to undergraduates. 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.

|      |                                 |                                |
|------|---------------------------------|--------------------------------|
| 1999 | <i>Candace C. Chang</i>         | <i>Daniel Leon Levy</i>        |
|      | <i>Ming Ming Chen</i>           | <i>Kartik Srinivasan</i>       |
|      | <i>Andrew MacGregor Childs</i>  | <i>Ricky Tong</i>              |
|      | <i>Kevin Michael Franklin</i>   | <i>Kamran Vakil</i>            |
|      | <i>Clifford William Hicks</i>   | <i>Jim Yuk-Fai Wong</i>        |
|      | <i>Albert Hsiao</i>             | <i>Haitao Yu</i>               |
|      | <i>Eike Hans Jens</i>           | <i>Hanhui Yuan</i>             |
|      | <i>Juna Ariele Kollmeier</i>    | <i>Hao Zhang</i>               |
|      | <i>Michael Kühlen</i>           |                                |
|      | <i>Christopher Eric Kurtz</i>   |                                |
|      | <i>Aaron Austen Kuzin</i>       |                                |
|      | <i>Melvin Boon-Tiong Leok</i>   |                                |
| 2000 | <i>Xiaoyan Robert Bao</i>       | <i>Daniel Leon Levy</i>        |
|      | <i>Amanda Lynn Blasius</i>      | <i>Chiyan Luo</i>              |
|      | <i>James Alexis Bresson</i>     | <i>Selwyn Sean Scharnhorst</i> |
|      | <i>Christopher Allen Brooks</i> | <i>Kartik Srinivasan</i>       |
|      | <i>Corey Edward Burke</i>       | <i>Ian Douglas Swett</i>       |
|      | <i>Candace C. Chang</i>         | <i>Ricky Tong</i>              |
|      | <i>Ming Ming Chen</i>           | <i>Jim Yuk-Fai Wong</i>        |
|      | <i>Andrew MacGregor Childs</i>  | <i>Sophia Sy-Hann Xiang</i>    |
|      | <i>Albert Hsiao</i>             | <i>Xiaolin Xie</i>             |
|      | <i>Tanim Shahriar Islam</i>     | <i>Kaiwen Xu</i>               |
|      | <i>Eike Hans Jens</i>           | <i>Haitao Yu</i>               |
|      | <i>Aaron Austen Kuzin</i>       | <i>Jingyi Yu</i>               |
|      | <i>Renee Guiyon Lee</i>         | <i>Hao Zhang</i>               |
|      | <i>Melvin Boon-Tiong Leok</i>   |                                |

#### WILLIAM F. BALLHAUS PRIZE

Awarded to aeronautics students for outstanding doctoral dissertations.

2000     *Eric Schultz*

#### ERIC TEMPLE BELL UNDERGRADUATE

#### MATHEMATICS RESEARCH PRIZE

Awarded to one or more juniors or seniors for outstanding original research in mathematics.

1999     *Melvin Boon-Tiong Leok*

2000     *Keshav Moreshwar Dani*

#### ROLF D. BUHLER MEMORIAL AWARD IN AERONAUTICS

Awarded to an aeronautics student for outstanding academic achievement in the Master's program.

1996     *Tobias Voelkl*

2000     *Philippe Chatelain*

#### 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.

1999     *Aron Jeffrey Meltzner, Adrian Provost Seymour*

2000     *Amy Courtright Barr*

#### THE W. P. CAREY & CO., INC., PRIZE IN MATHEMATICS

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

2000     *Philip Christopher Love (graduated June 1999)*

#### 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.

2000     *Ying Li, Kamran Mohseni*

## 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.

1998 *Heather Lee Dean*

1999 *Jeremiah James Smith, Ricky Tong*

## 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.

1998 *Heather Lee Dean, Deans' Cup*

1999 *Katherine Triplett Noyes and Jaideep Singh, Residence Life and Master's Award*

2000 *Kevin Blake Bradley and Aron Jeffrey Meltzner, Deans' Cup*

## EVERHART DISTINGUISHED GRADUATE STUDENT LECTURER AWARD

Awarded to a graduate student who has demonstrated exemplary presentation ability and graduate research.

1996 *Mitra Jennifer Hartmann*

1999 *Marie Elizabeth Csete, Kamran Mohseni*

## DORIS EVERHART SERVICE AWARD

Awarded annually to an undergraduate who has actively supported and willingly worked for organizations that enrich not only student life, but also the campus and/or community as a whole, and who has, in addition, exhibited care and concern for the welfare of students on a personal basis. The award was established in 1999 by Martin and Sally Ridge in honor of Doris Everhart.

1999 *Alan Miller Rosenwinkel*

2000 *Kevin Blake Bradley*

#### 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.

2000     *Glenn Cameron Turner*

#### RICHARD P. FEYNMAN PRIZE IN THEORETICAL PHYSICS

Awarded to a senior on the basis of excellence in theoretical physics.

2000     *Andrew MacGregor Childs*

#### HAREN LEE FISHER MEMORIAL AWARD IN JUNIOR PHYSICS

Awarded to a junior physics major who demonstrates the greatest promise of future contributions in physics.

1999     *Andrew MacGregor Childs*

#### 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.

1999     *Eike Hans Jens*

#### 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.

1999     *Melvin Boon-Tiong Leok, Daniel Leon Levy*

#### GRADUATE DEANS' 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.

2000     *Petrus Joannes Joseph Moeleker, Chantal Smith Morgan*

#### 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.

1999     *Andrew MacGregor Childs*

#### 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.

1999     *Ming Ming Chen*

#### 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.

2000     *Ian Douglas Swett*

#### D. S. KOTHARI PRIZE IN PHYSICS

Awarded to a graduating senior in physics who has produced an outstanding research project during the year.

2000     *Zhao Huang*

#### MARGIE LAURITSEN LEIGHTON PRIZE

Awarded to one or two undergraduate women who are majoring in physics, astrophysics, or astronomy, and who have demonstrated academic excellence.

1997     *Kledja Adnan Bega and Emma Elizabeth Goldberg (graduated June 1999)*

1998     *Juna Ariele Kollmeier*

#### DOROTHY B. AND HARRISON C. LINGLE SCHOLARSHIP

Awarded to an incoming freshman in recognition of interest in a career in science or engineering, outstanding academic record, demonstrated fair-mindedness, and unquestioned integrity.

1996     *Amanda Marie Schaffer*



#### THE HERBERT NEWBY McCOY AWARD

Awarded to chemistry doctoral students for outstanding contributions to the science of chemistry.

2000 *Paul James Chirik, Ivan Julian Dmochowski,  
Matthias Scholl, James N. Smith*

#### MARY A. EARL McKINNEY PRIZE IN LITERATURE

1998 *Eleanor Jeessung Park*  
2000 *Stephen Vincent Shepherd*

#### ROBERT L. NOLAND LEADERSHIP SCHOLARSHIP

Awarded to undergraduate 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.

2000 *Candace C. Chang, Matthew Allen Musick, Katherine Triplett Noyes,  
Baldeep Singh Sadhal*

#### RODMAN W. PAUL HISTORY PRIZE

Awarded to a junior or senior who has displayed an unusual interest in and talent for history.

1999 *Michelle Elle Armond*  
2000 *Brent Michael Kiouss*

#### HERBERT J. RYSER MEMORIAL SCHOLARSHIPS

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

1999 *Damian Nathaniel Burch, Melvin Boon-Tiong Leok*

#### 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.

2000 *Ming Ming Chen*

#### ELEANOR SEARLE PRIZE IN LAW, POLITICS, AND INSTITUTIONS

The Eleanor Searle Prize was established in 1999 by friends and colleagues to honor Eleanor Searle. The prize is awarded annually to an undergraduate or graduate student whose work in history or the social sciences exemplifies Eleanor Searle's interests in the use of power, government, and law.

2000    *Michelle Elle Armond, Sarah Mary Milkovich*

#### 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.

1999    *Tobias Voelkl*

#### 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.

1994    *Hou-En Han*

1997    *Angela Han*

1998    *Michelle Elle Armond, Gina Marie Buccolo,  
Catelyn Murphy Gifford, Max Peter Kullberg, Huimou Li*

2000    *Michael Kuhlen*

#### SIGMA XI AWARD

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

2000    *Andrew MacGregor Childs*

#### HALLETT SMITH PRIZE

Established in 1997 to commemorate Professor Smith's long career as one of the 20th century's most distinguished Renaissance scholars. The cash prize is given annually by the literature faculty to the undergraduate student who writes the finest essay on Shakespeare.

2000     *Jim Yuk-Fai Wong*

#### PAUL STUDENSKI MEMORIAL FUND PRIZE

A travel grant awarded to a Caltech undergraduate who would benefit from a period away from the academic community in order to obtain a better understanding of self and his or her plans for the future.

1999     *Jessie Yeon Ji Kim, Amit Ghanashyam Kshatriya*

#### ALAN R. SWEET PRIZE IN ECONOMICS

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

2000     *John Williams Hatfield*

#### FRANK TERUGGI MEMORIAL AWARD

Awarded to an undergraduate student who honors the spirit of Frank Teruggi's life through participation "in the areas of Latin American Studies, radical politics, creative radio programming, and other activities aimed at improving the living conditions of the less fortunate."

2000     *Kevin Michael Franklin*

#### CHARLES WILTS PRIZE

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

2000     *Ali Adibi*

# FREDRICK J. ZEIGLER MEMORIAL AWARD

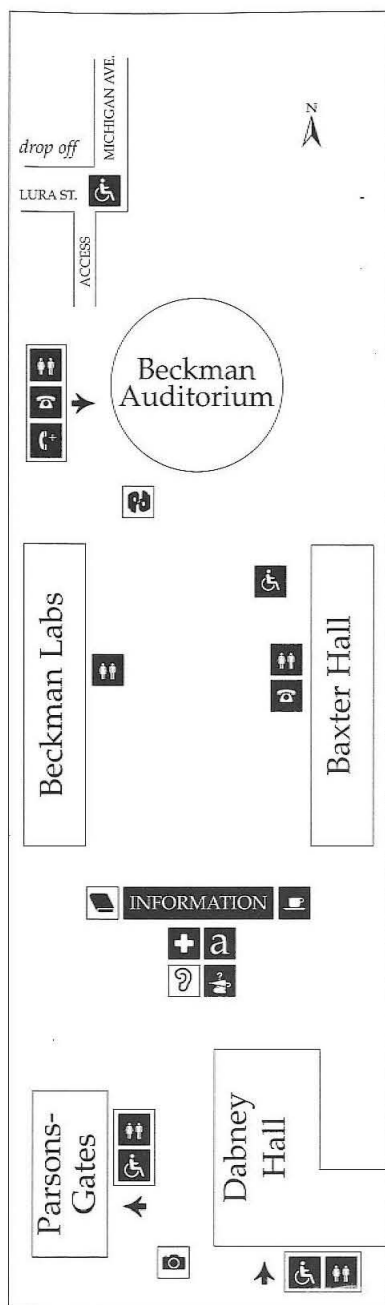
Awarded to an outstanding sophomore or junior in pure or applied mathematics, for excellence in scholarship as demonstrated in class activities or in the preparation of an original paper or essay in any subject area.

1999     *Jingyi Yu*








## *Caltech 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.

CALIFORNIA INSTITUTE OF TECHNOLOGY  
One-Hundredth and Sixth Annual Commencement  
June 9, 2000

ADDITION TO DOCTOR OF PHILOSOPHY LIST, DIVISION OF ENGINEERING AND  
APPLIED SCIENCE:

Hou-Pu Chou (*Electrical Engineering*) B.S., National Taiwan University 1993;  
M.S., California Institute of Technology 1996.  
Thesis: Microfabricated Devices for Rapid DNA Diagnostics