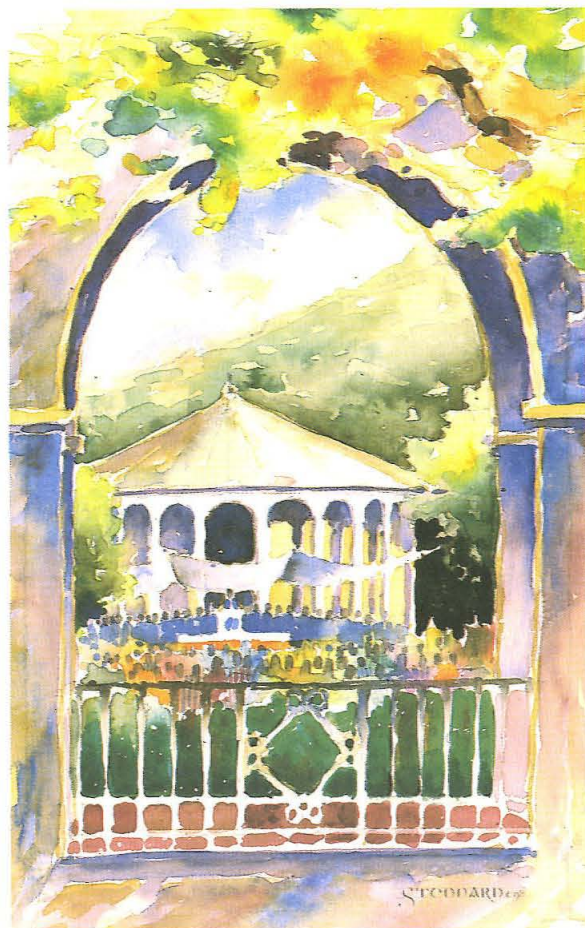




CALIFORNIA INSTITUTE *of* TECHNOLOGY

One Hundred and Fourth Annual Commencement
June 12, 1998



Cover: Caltech's commencement ceremony,
by Joseph Stoddard.

This program is produced by the Public Relations Office.

CALIFORNIA INSTITUTE
of TECHNOLOGY

*One Hundred and Fourth
Annual Commencement*

Friday Morning at Ten O'Clock
June Twelfth, Nineteen Ninety-Eight

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; about 280 professorial faculty members, including three Nobel laureates and three Crafoord laureates; and more than 200 research faculty members. Today, Caltech will award 218 students the B.S. degree; 120 students the M.S. degree; 1 scholar the Engineer's degree; and 191 doctoral candidates the Ph.D. degree, for a total of 530 graduates—quite a leap from the one man and one woman who constituted the first collegiate graduating class of Throop Polytechnic Institute. Today also marks another first: President David Baltimore's first Caltech commencement; he assumed office on October 15, 1997.

BILL NYE IS HOST AND HEAD WRITER of the popular, Emmy Award-winning kids' science television show, *Disney Presents Bill Nye the Science Guy*. Commonly referred to as a modern-day *Watch Mr. Wizard*, Nye's show employs MTV-style cuts, short comedy skits, mock TV-shows, short films, and music videos to illustrate a wide range of scientific topics.

Nye was chosen as commencement speaker by Caltech students, many of whom watch the show. "We know it's aimed at kids," says Sara Beaber, a Caltech graduating senior in chemistry and history, "but it's fun for me to be reminded of the fun and wonder of science, especially when I'm bogged down in the grunge and equations of my homework." Although Nye's show—which attempts to put science in an easily digestible format—is geared toward elementary-school kids, Nye also has a stable of adult viewers. "His wacky sense of humor appeals to science nerds of all ages," says Libby Mosier, a senior graduating in biology.

A native of Washington, D.C., Nye graduated from Cornell with a mechanical engineering degree. He then started work as an engineer for Boeing, in Seattle, where some friends got him to enter a Steve Martin look-alike contest. He won, and the professional comedian was born. Engineer by day, comedian by night, Nye hooked up with and became part of a television comedy ensemble, *Almost Live!*, a local version of *Saturday Night Live*. Three years later, he introduced the "Science Guy" character, which became an instant hit.

Early in 1993, with support from the National Science Foundation and the Department of Energy, Nye created a *Science Guy* pilot for the local PBS station. Today *Disney Presents Bill Nye the Science Guy* is on seven days a week, running on PBS Monday through Friday, while various local cable affiliates broadcast the weekend shows. Nye's was the first television show to run concurrently on public television and syndicated television. Although Nye Labs—the headquarters for the show—is based in Seattle, Nye and his crew have filmed episodes in such locations as the Florida Everglades and Hawaiian Islands.

Nye is also active in other areas of science education. His official web site, "Nye Labs On-Line," includes links to such sites as Chicago's Field Museum of Natural History and the Smithsonian Institution, and a section that discusses the Mars Pathfinder missions. Nye attends science teacher conferences, gives demonstrations, and recently testified before a congressional panel in support of national standardized science tests. He has tutored inner-city preteens and teens as part of the "I Have a Dream" program, aimed at keeping kids on track toward college and university studies. And Nye's first patented invention—a collapsible, water-filled magnifying glass—may someday help kids see science a little differently.

But, no matter what Nye chooses to do, it usually has something to do with science. Because, as he says, and almost 4.5 million weekly viewers will attest to, "Science rules!"

—Adapted from an article by Ryan Poquette in *On Campus*, Caltech's monthly faculty-staff newspaper

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

Chief Marshal

J. Morgan Kousser, Ph.D.

Marshals

Arden L. Albee, Ph.D.

Jacqueline K. Barton, Ph.D.

Christof Koch, Ph.D.

Rudolph A. Marcus, Ph.D.

Jean-Paul Revel, Ph.D.

Alison Winter, Ph.D.

Faculty Officers

David J. Stevenson, Ph.D.

John E. Bercaw, 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

<i>Organ Prelude</i>	Leslie J. Deutsch, Ph.D.
PROCESSIONAL	The Caltech Convocations Brass and Percussion Ensemble <i>William Bing, M.M., Conductor</i>
PRESIDING	Gordon E. Moore, Ph.D. <i>Chair of the Board of Trustees</i> <i>California Institute of Technology</i>
INTRODUCTION OF SPEAKER	Sara A. Beaber <i>BS '98, Chemistry and History</i>
COMMENCEMENT SPEAKER	Mr. Bill Nye <i>"Hold On to Your Passion; Keep Your Head"</i>
CHORAL SELECTION	The 1998 Commencement Chorus <i>Elizabeth A. Neroda, M.S. '98</i> <i>President, Women's Glee Club, 1997-98</i> <i>Conductor</i>
"Hallelujah," from <i>Messiah</i> George Frideric Handel	
CONFERRING OF DEGREES	David Baltimore, Ph.D. <i>President</i> <i>California Institute of Technology</i>
PRESENTATION OF CANDIDATES FOR DEGREES	
For the Degree of Bachelor of Science	Jean-Paul Revel, Ph.D. <i>Dean of Students</i>
For the Degree of Master of Science	Christopher E. Brennen, Ph.D. <i>Vice President for Student Affairs</i>
For the Degree of Engineer	Arden L. Albee, Ph.D. <i>Dean of Graduate Studies</i>

For the Degree of Doctor of Philosophy	Dr. Albee
Biology	Melvin I. Simon, Ph.D. <i>Division Chair</i>
Chemistry and Chemical Engineering	Peter B. Dervan, Ph.D. <i>Division Chair</i>
Engineering and Applied Science	John H. Seinfeld, Ph.D. <i>Division Chair</i>
Geological and Planetary Sciences	Edward M. Stolper, Ph.D. <i>Division Chair</i>
The Humanities and Social Sciences	John O. Ledyard, Ph.D. <i>Division Chair</i>
Physics, Mathematics and Astronomy	Charles W. Peck, Ph.D. <i>Division Chair</i>
ANNOUNCEMENT OF AWARDS AND CONCLUDING REMARKS	President Baltimore
ALMA MATER	The 1998 Commencement Chorus, The Caltech Convocations Brass and Percussion Ensemble, and Organ
“Caltech Alma Mater” By Manton Barnes, BS '21 EE <i>(The audience may join in; lyrics are found on page 48.)</i>	
RECESSIONAL	The Caltech Convocations Brass and Percussion Ensemble
<i>Organ Postlude</i>	Dr. Deutsch

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

CANDIDATES FOR DEGREES

Bachelor Of Science

Jon Paul Allen *Dekalb, Illinois* Engineering and Applied Science
Megan Yori Andrews *Flagstaff, Arizona* Biology
Dan-Eugen Angelescu* *Bucharest, Romania* Physics
Kristie Lee Armentrout *Anaheim, California* Engineering and Applied Science
Bryan Hobson Atwood* *Ennis, Texas* Electrical Engineering
Sudipta Bardhan* *Sewell, New Jersey* Biology
Jason Wayne Barnes *Chesterfield, Missouri* Astronomy
Brian Joseph Barris *San Antonio, Texas* Physics
Sara Alexandra Beaber* *Lawrenceville, New Jersey* Chemistry and History
Umesh Bhandary *Kathmandu, Nepal* Engineering and Applied Science
(Mechanical Engineering)
Ronak Jayant Bhatt* *Kelseyville, California* Physics
Christopher Bisbee *Aliquippa, Pennsylvania* Chemistry
David Elliot Blau *Oak Ridge, Tennessee* Mathematics and Engineering and Applied
Science
Karen Mercedes Bletzer* *East Lansing, Michigan* Engineering and Applied Science
Liubomir Borissov *Rousse, Bulgaria* Physics and Mathematics
Elizabeth Anne Callaghan *St. Anthony, Minnesota* Electrical Engineering
Michaelleen Bell Callahan* *Leesburg, Virginia* Biology
Myfanwy Galadriel Truth Callahan *Glenview, Illinois* Engineering and Applied Science
Thuan Duy Cao* *Saigon, Vietnam* Engineering and Applied Science
Kevin Thomas Carle *Lilburn, Georgia* Engineering and Applied Science
Kin Chan *Queens, New York* Biology
Dazhi Chen* *San Jose, California* Electrical Engineering and Economics
Mark Chen *Arcadia, California* Engineering and Applied Science
Yeng-long Chen *Eugene, Oregon* Chemical Engineering
Tak Gee Cheung* *Yorba Linda, California* Engineering and Applied Science
(Mechanical Engineering)
Albert Chiu *East Brunswick, New Jersey* Chemical Engineering
Nicholas Isaac Choly* *San Jose, California* Applied Physics
John Francis Christensen* *Corbett, Oregon* Chemical Engineering
Ryan Patrick Clancey *Santa Clara, California* Applied Physics
Zane Alexander Crawford *Sanger, California* Engineering and Applied Science

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*

Robert Howard Cresswell *Charlotte, North Carolina* Engineering and Applied Science
Brian R. D'Urso* *Portsmouth, Rhode Island* Physics
Vito Dai* *Cupertino, California* Electrical Engineering
Michael Ivor Davies *Redding, California* Engineering and Applied Science
Eric Dennis* *San Diego, California* Physics
Roopesh Ramesh Doshi *Simi Valley, California* Electrical Engineering
Timothy Michael Doyle *Wasilla, Alaska* Engineering and Applied Science
Alexander Robert Dunn* *Colorado Springs, Colorado* Chemistry
Armando Durazo, Jr. *Tucson, Arizona* Chemistry
Christina Marie Edwards *Fort Myers, Florida* Engineering and Applied Science
Kelly Kyoung Yoon Eom *Downey, California* Biology
Lael Lona Erskine *El Cerrito, California* Chemistry
Jennifer Catherine Fang *Charlottesville, Virginia* Electrical Engineering
Derek Lyle Farmer *White Bear Lake, Minnesota* Mathematics
David Wayne Farnham* *Carmichael, California* Physics
Leah Diane Foechterle *Vienna, Virginia* Engineering and Applied Science
Samantha Foster *Burbank, California* Engineering and Applied Science
Jeremy Luke Gawle *Webster, Massachusetts* Applied Mathematics
Roman Gelman *Los Angeles, California* Engineering and Applied Science
Kulvinder Singh Gill *Sherman, Mississippi* Physics
Steven Harris Ginzburg* *Aptos, California* Engineering and Applied Science
William C. Glenn, Jr. *Pittsburgh, Pennsylvania* Engineering and Applied Science
Steven Edward Glista *Kalamazoo, Michigan* Biology
James Ernest Glore *Indianapolis, Indiana* Electrical Engineering
Alexander Goretsky* *Scranton, Pennsylvania* Chemical Engineering
Dustin Lyle Green* *Timonium, Maryland* Engineering and Applied Science
Judith Michelle Green *Woodland Hills, California* Engineering and Applied Science
John Henry Grossman IV *Fairfax, Virginia* Engineering and Applied Science
Yuanshan Guo* *Fuzhou, P.R. China* Engineering and Applied Science
Jordan Alexander Hague *Haledon, New Jersey* Physics
Dragos Antonio Harabor* *Bucharest, Romania* Engineering and Applied Science
James Gerard Heaney, Jr. *Smithtown, New York* Engineering and Applied Science
Daniel Christopher Hennessy *Palm Harbor, Florida* Physics
Timothy Donald Henson* *Phoenix, Arizona* Engineering and Applied Science
Michael James Herrera *Los Angeles, California* Mathematics
David Andrew Hilvert *Houston, Texas* Engineering and Applied Science
Emily Tze Chong Ho *Alhambra, California* Engineering and Applied Science
Jeffrey Li-chieh Ho* *Scottsboro, Alabama* Engineering and Applied Science

BACHELOR OF SCIENCE, *continued*

- Lori Chu-yun Hsu *Mission Viejo, California* Engineering and Applied Science
(Mechanical Engineering)
- Chih-wei Maria Huang* *Fremont, California* Electrical Engineering
- Jerry Shen-ming Huang *Dallas, Texas* Biology
- Kerwyn Casey Huang* *Little Rock, Arkansas* Physics and Mathematics
- Wei-Hwa Huang *North Potomac, Maryland* Engineering and Applied Science
- Jae Ho Hur* *Seoul, Korea* Biology
- Evan Harris Hurowitz* *Torrance, California* Biology and Chemistry
- Jeffrey Thu Huynh* *Milpitas, California* Physics
- Alexander Thomas Ihler* *College Station, Texas* Electrical Engineering and Mathematics
- Hiroshi Ishii* *Tokyo, Japan* Engineering and Applied Science
- Eric Cheng-Feng Jan* *Louisville, Kentucky* Engineering and Applied Science
- Jason Christopher Jenkins* *Lawrenceville, Georgia* Chemistry
- Patrick Donald Jewell *Kapolei, Hawaii* Applied Physics
- Hui Jin* *Shanghai, P.R. China* Electrical Engineering
- Alexis Maria Cavanagh Johnson *La Cañada Flintridge, California* Engineering and
Applied Science
- Robert Carlton Johnson* *Norman, Oklahoma* Engineering and Applied Science
(Mechanical Engineering)
- Robert Joseph Johnson* *San Bernardino, California* Engineering and Applied Science
- Blake Alan Jones *Stillwater, Minnesota* Engineering and Applied Science
- Yevgeniy Kaganovich *Los Angeles, California* Engineering and Applied Science
- Natsuko Kagawa *Hyogo, Japan* Engineering and Applied Science
(Mechanical Engineering)
- Emil Paskalev Kartalov *Plovdiv, Bulgaria* Physics
- Robert Kurtis Keeney *Federal Way, Washington* Engineering and Applied Science
(Mechanical Engineering)
- Zee Yen Khoo* *Petaling Jaya, Malaysia* Engineering and Applied Science (Mechanical
Engineering)
- Thanh Vinh Khuu *Los Angeles, California* Engineering and Applied Science
- Diana Dawn King *Kerrville, Texas* Chemistry
- Daniel Michael Kleiman* *Wilmette, Illinois* Mathematics and Economics
- Ilya Koshkin *Woodland Hills, California* Engineering and Applied Science
- Harmesh K. Lad *Chatsworth, California* Electrical Engineering
- Tai Anh Lam* *Seattle, Washington* Physics
- Gary Ka Leong Lee* *Stockton, California* Chemical Engineering
- Wei-Chung Allen Lee *Edina, Minnesota* Chemical Engineering
- Sam Sen Li* *Santa Cruz, California* Electrical Engineering
- Yi Li* *Changsha, Hunan, P.R. China* Physics

BACHELOR OF SCIENCE, *continued*

Brian Nguyen Limketkai* *Arcata, California* Electrical Engineering
Jonathan James Little* *Kingwood, Texas* Electrical Engineering
Rowena Lohman *Half Moon Bay, California* Geology
Tao Long* *Beijing, China* Electrical Engineering
Erin Margaret Lynch *Arlington, Virginia* Mathematics
Scott Michael Mandelsohn *Granada Hills, California* Engineering and Applied Science
Jacob L. Mandelson *Portland, Oregon* Engineering and Applied Science
Vuk Mandić* *Podgorica, Yugoslavia* Physics and Mathematics
Jeremiah Michael Mans* *Omaha, Nebraska* Applied Physics
Bradley Jon Marker *Mendham, New Jersey* Engineering and Applied Science
Michael Joseph Medaglia *Queens, New York* Engineering and Applied Science
Steven Samir Michael *Katy, Texas* Physics
Michael Herman Michrowski *Tarzana, California* Engineering and Applied Science and
Economics
Benjamin David Miller* *Oberlin, Ohio* Mathematics
Michelle Marie Miller *Webster Groves, Missouri* Biology
Dusan Misevic *Belgrade, Yugoslavia* Mathematics and Biology
Christina Molodowitch* *Orange, California* Chemistry
Brian Matthew Monroe *Encino, California* Astronomy
Terence R. Moran *Woodland Hills, California* Biology
Mary Elizabeth Mosier *Newport Beach, California* Biology
Tatsuya Murase *Westminster, California* Physics
Vale Murthy *Morristown, New Jersey* Chemical Engineering
Tatiana Vladimirovna Myagkova *Moscow, Russia* Biology
Kazunori Nakada *San Francisco, California* Engineering and Applied Science
Bradley James Nakatani* *Bellevue, Washington* Biology and Chemistry
Bradley Duane Nelson* *Seattle, Washington* Engineering and Applied Science
Lisa S. Ngo *Los Angeles, California* Biology
Barbara Anna Novak *Glenshaw, Pennsylvania* Biology
Peter Allen Oakley *Mill Creek, Washington* Engineering and Applied Science
Siddhartha Padmanabha *Anaheim, California* Biology
Payam Pakzad* *Tehran, Iran* Electrical Engineering and Applied Mathematics
Linda Ji Won Park *South Barrington, Illinois* Chemical Engineering
Fay Fei Peng* *Media, Pennsylvania* Chemical Engineering
William Charles Penn *Hollidaysburg, Pennsylvania* Astronomy
Maria Pilar Pérez González de Apodoca *Madrid, Spain* Biology
Adam George Petrie* *Mercer Island, Washington* Astronomy
Khai Nhu Pham *Arlington, Texas* Engineering and Applied Science
James Richard Pierce *Danville, Pennsylvania* Biology

BACHELOR OF SCIENCE, *continued*

Donald Harvey Pinkston III* *Altadena, California* Engineering and Applied Science
Mason Alexander Porter* *Beverly Hills, California* Applied Mathematics
Maura Anne Raburn* *Santa Rosa, California* Applied Physics
Ravi Ramamoorthi* *Mumbai, India* Engineering and Applied Science
Colin Alexander Reed *Dover, Massachusetts* Electrical Engineering
Evan John Reed* *Rochester, Minnesota* Applied Physics
John T. Reese *Anchorage, Alaska* Engineering and Applied Science
Phillip Charles Rodriguez III *San Antonio, Texas* Engineering and Applied Science
Jesse Matthew Rosenstock* *Madison, Wisconsin* Engineering and Applied Science
Shane David Ross* *Anaheim, California* Physics
Brian Marc Rothstein* *McLean, Virginia* Engineering and Applied Science
Lee Gabriel Rumsey* *Long Beach, California* Electrical Engineering
Heather Kelin Ryan *Columbia, Missouri* Engineering and Applied Science
Keri Lynn Ryan* *Boise, Idaho* Engineering and Applied Science
Joshua Jacob Sacks* *Savannah, Georgia* Engineering and Applied Science
Melissa Zamarripa Sáenz *San Antonio, Texas* Biology
Conrado Salas Cano* *Zaragoza, Spain* Physics
Antonio Jose Salazar-Escobar *Caracas, Venezuela* Electrical Engineering
Wesley Thomas Salzillo *Florence, Oregon* Applied Physics
Sarah Elizabeth Sanders *Fort Collins, Colorado* Engineering and Applied Science
S. Jason Sekanina* *La Cañada Flintridge, California* Applied Mathematics and
Engineering and Applied Science
Barry Shapira *Acton, California* Chemistry
Hilla Shaviv* *Hajfa, Israel* Engineering and Applied Science
Kiran Shekar *Silver Spring, Maryland* Applied Physics
Changchun Shi* *Kifeng City, Henan Province, P.R. China* Mathematics and Physics
Michael David Shumway* *The Woodlands, Texas* Applied Physics
Robert John McKay Sides *Marblehead, Massachusetts* Physics
Andrew Craig Silberfarb *Irvine, California* Physics
Frances Mei-Lin Siu *Thousand Oaks, California* Electrical Engineering
Geoffrey Robert Smith* *Pasadena, California* Engineering and Applied Science
and History
Michal W. Smulski* *Tarnow, Poland* Electrical Engineering
Kyle Brian Stickle* *Everett, Washington* Electrical Engineering
Kathryn Anne Stofer *Lake Jackson, Texas* Biology
Paul Olaf Storaasli *Hampton, Virginia* Electrical Engineering
Advoquita Pajunar Stude* *Phoenix, Arizona* Engineering and Applied Science
Julius Tsu-li Su* *Boca Raton, Florida* Biology
Sean Andrew Suchter* *Arcadia, California* Engineering and Applied Science

BACHELOR OF SCIENCE, *continued*

Leonard Sung* *Washingtonville, New York* Chemistry and Biology
Kai-hsu Tai* *Taipei, Taiwan* Chemistry
Taison Tan* *Glendora, California* Chemical Engineering
Victoria M. Tanusheva* *Northridge, California* Mathematics
Louis Kelly Thomas* *Orangevale, California* Engineering and Applied Science
Yingzhong Tian* *Princeton, New Jersey* Biology
Matthew Steven Tiscareno *Costa Mesa, California* Planetary Science
Kim T. Tran* *Los Angeles, California* Biology
Tony Viet Tran *Bellingham, Washington* Chemical Engineering
Robert Christian Tryon *St. Louis, Missouri* Biology
Helen Yii-Ling Tsai* *Salem, Oregon* Chemistry
Benjamin Edward Turk *Nashville, Tennessee* Engineering and Applied Science
(Mechanical Engineering)
James McKay Turner* *Allamuchy, New Jersey* Chemistry
Stephen David Van Hooser *Toledo, Ohio* Engineering and Applied Science
Patricio Antonio Vela* *Potomac, Maryland* Engineering and Applied Science
Daniel Velez *New York, New York* Chemical Engineering
Kwanchanok Viravaidya* *Bangkok, Thailand* Chemical Engineering
Anna Nesterova Vlasak* *Almaty, Kazakhstan* Biology
Christopher Ian Walker *Palo Alto, California* Applied Physics
Jennifer Jarhua Wang* *Agoura, California* Biology
Niniane Xin Wang* *Las Vegas, Nevada* Engineering and Applied Science
Peter Tuan-Ping Wang *Cerritos, California* Mathematics
Yale Re Wang *Hammond, Louisiana* Engineering and Applied Science and Economics
Sindy Hsin-Pen Wei* *Poway, California* Biology
Eileen Rose Wexler *Sugar Land, Texas* Engineering and Applied Science
Jeanne Marie Wilson *Upper Darby, Pennsylvania* Biology
James Edwin Wing *Longmont, Colorado* Engineering and Applied Science
David Vaughn Winkler* *Oxford, Ohio* Engineering and Applied Science
Irene Chi-Sun Wong *Enfield, Connecticut* Chemical Engineering
Carol Chia-Chia Wu* *Sugar Land, Texas* Biology
Gary I-Lun Wu* *Poway, California* Engineering and Applied Science
Kejian Wu* *New Haven, Connecticut* Chemical Engineering
Jing Xu* *Anhui, China* Physics
Grace Yang *New York, New York* Chemistry
Johanna Alicia Yao* *Sugar Land, Texas* Chemistry
Timothy Matlock Yarnall *Port Charlotte, Florida* Applied Physics
Richard C. Yeh *Thousand Oaks, California* Physics
Jennie Yoder* *Los Angeles, California* Engineering and Applied Science

BACHELOR OF SCIENCE, *continued*

Liang Edward Yu* *South San Francisco, California* Engineering and Applied Science

Alan Hiu-Yeung Yue* *Glendale, California* Physics

Amy May Zheng* *San Diego, California* Biology and History

Daniel Zilberman* *Staten Island, New York* Biology

Master of Science

- Christopher Marc Adams (*Aeronautics*) B.S., University of California, Santa Barbara 1997.
- Peter Jonathan Adams (*Chemical Engineering*) B.S., Cornell University 1996.
- Hendra Adiwidjaja (*Control and Dynamical Systems*) B.Sc., University of Toronto 1995.
- Dennis P. Anderson (*Chemistry*) B.S. (*Chemistry*), B.S. (*Chemical Engineering*), Purdue University 1991.
- Marco Arienti (*Aeronautics*) Dottore in Ingegneria Aeronautica, Politecnico di Milano 1994.
- Stephen Peter Arvedson (*Chemistry*) B.S., University of Wisconsin–Madison 1991.
- Joanna M. Austin (*Aeronautics*) B.E., B.Sc., University of Queensland 1996.
- Alejandro Backer (*Computation and Neural Systems*) S.B., Massachusetts Institute of Technology 1995.
- Cynthia R. Ball (*Computer Science*) B.S., California State University, Los Angeles 1990.
- Kenneth Raymond Banas (*Astronomy*) S.B. (*Astronomy*), S.B. (*Physics*), The University of Michigan 1996.
- Neena Bashir (*Geochemistry*) B.A., Amherst College 1989.
- Christophe Jean-Michel Basset (*Electrical Engineering*) Diplôme d'Ingénieur, École Supérieure d'Ingénieurs en Electrotechnique et Electronique 1998.
- Bjarne Bergheim (*Mechanical Engineering*) B.S., University of California, Irvine 1997.
- Ashish Ishwar Singh Bhardwaj (*Applied Physics*) B.Sc., Indian Institute of Technology, Kharagpur 1994; M.Sc., 1996.
- Magali I. Billen (*Geophysics*) B.S., University of Puget Sound 1995.
- William H. Buckner (*Chemistry*) A.B., Harvard College 1995.
- Brian Dale Burkholder (*Materials Science*) B.A., Texas A&M University 1995.
- Ming Cai (*Electrical Engineering*) B.S., Tsinghua University 1995; M.S., 1997.
- Marco Casari (*Social Science*) D.E.S., Università Commerciale "Luigi Bocconi" 1996.
- Ioannis Chasiotis (*Aeronautics*) Diploma, Aristotle University of Thessaloniki 1996.
- Chun-Tung Cheung (*Electrical Engineering*) B.E., The University of Hong Kong 1997.
- Benjamin Bin Chow (*Aeronautics*) B.S., University of California, Los Angeles 1995; M.S., 1996.
- John Francis Clinton (*Civil Engineering*) B.E., University College Dublin 1997.
- David Rea Cocker III (*Environmental Engineering Science*) B.S. (*Chemistry*), B.S. (*Environmental Engineering*), University of California, Riverside 1996.
- Catherine J. G. Cornu (*Environmental Engineering Science*) Kandidaat Burgerlijk Ingenieur, Vrije Universiteit Brussel 1992; Burgerlijk Scheikundig Ingenieur, 1995.
- Marie Elizabeth Csete, M.D. (*Biology*) A.B., Princeton University 1975; M.D., Columbia University 1979.
- Christine Elizabeth DeMartini (*Social Science*) B.A., B.S., University of Kansas 1996.
- Romain Julien Doyotte (*Aeronautics*) B.S., Metz University 1994; M.S., 1996.

MASTER OF SCIENCE, *continued*

- Yael Dubowski (*Environmental Engineering Science*) B.Sc., The Hebrew University of Jerusalem 1993; M.Sc., 1996.
- Steven James Dutton (*Environmental Engineering Science*) B.A., University of Colorado 1994; M.S., 1996.
- Hanying Feng (*Electrical Engineering*) B.E., Tsinghua University 1997.
- Edward Huggins Fine (*Control and Dynamical Systems*) B.A., Wesleyan University 1995.
- Kevin Edward Foltz (*Electrical Engineering*) B.A., B.S., Rice University 1997.
- Robert Eliot Freeman (*Electrical Engineering*) B.A., B.S., University of California, Berkeley 1993.
- Chu-Chen Fu (*Physics*) B.A., Northwestern University 1993.
- Todd Matthew Fuelberth (*Chemistry*) B.S., University of Nebraska 1996.
- Siddhartha Madhav Gadgil (*Mathematics*) B.S., Indian Statistical Institute 1996.
- Ali Reza Ghaneh (*Electrical Engineering*) B.S., California State Polytechnic University, Pomona 1991.
- Daniel Edward Giammar (*Environmental Engineering Science*) B.S., Carnegie Mellon University 1996.
- Robert Michael Gingrich (*Physics*) B.A., B.S., University of California, Santa Cruz 1995.
- Stephen Clarke Glade (*Materials Science*) B.S., Georgia Institute of Technology 1994.
- Garrett Edwin Glasgow (*Social Science*) B.A., University of California, Los Angeles 1995.
- Luis Gonzalez Liñero (*Aeronautics*) Ingeniero Mecanico Electricista, Universidad Panamericana 1995.
- Nathan Ray Good (*Applied Physics*) B.S., University of Alabama 1996.
- Leah Sarah Gordon (*Environmental Engineering Science*) S.B., Massachusetts Institute of Technology 1993; S.M., 1994.
- Michael Joseph Gordon (*Applied Physics*) B.S., Colorado School of Mines 1994; M.S., 1995.
- Aimie Mitsuko Goto (*Biology*) B.S., University of California, Los Angeles 1994.
- Andrew Charles Guyader (*Civil Engineering*) B.S., California Polytechnic State University, San Luis Obispo 1997.
- Zhigang Han (*Electrical Engineering*) B.E., Tsinghua University 1995.
- Kristen Tavis Hatto (*Civil Engineering*) B.Eng., McGill University 1997.
- Adrian Hightower (*Materials Science*) B.S., California Institute of Technology 1995.
- Cory James Hill (*Applied Physics*) B.A., B.S., University of Southern California 1996.
- Bac Hoa Hoang (*Chemistry*) B.S., University of Minnesota 1996.
- Man Ching Maria Ita Hui (*Electrical Engineering*) B.Eng., The Chinese University of Hong Kong 1997.
- Angela A. Hung (*Social Science*) B.A., Rice University 1995; M.A., University of Virginia 1997.
- Patrick Hin Fun Hung (*Mechanical Engineering*) B.S., The University of Waterloo 1997.
- Gyeong Soon Hwang (*Applied Physics*) B.S., Seoul National University 1991; M.S., 1993.

MASTER OF SCIENCE, *continued*

- Suzie Jean Hwang (*Chemical Engineering*) B.S., Stanford University 1996.
- Eric Cheng-Feng Jan (*Mechanical Engineering*) B.S., California Institute of Technology 1998.
- Gustavo Joseph (*Mechanical Engineering*) Ingeniero Mecánico Electricista, Universidad Nacional Autónoma de México 1997.
- Joseph Roland Kiniry (*Computer Science*) B.S., Florida State University 1992; M.S., University of Massachusetts, Amherst 1995.
- Paul Samuel Krueger (*Aeronautics*) B.S., University of California, Berkeley 1997.
- Chao Ku (*Mathematics*) B.S., Peking University 1994.
- Grzegorz Maciej Labedzki (*Mathematics*) Magister Matematyki, Wrocław University 1993.
- Yue Lei (*Mathematics*) B.S., Peking University 1992.
- Guillaume Lessard (*Electrical Engineering*) B.Sc.A., Université Laval 1996.
- Fok-Yan Thomas Leung (*Environmental Engineering Science*) B.S., Queen's University 1997.
- Hao Li (*Materials Science*) B.E., Tsinghua University 1996.
- Lifang Li (*Electrical Engineering*) B.S. Tsinghua University 1993; M.S., 1996.
- Eugene Lipovetsky (*Applied Mechanics*) Diploma, Kishinev Polytechnical Institute 1977; M.A., The Claremont Graduate School 1989.
- Qingdi Liu (*Electrical Engineering*) B.E., Tsinghua University 1995; M.S., 1997.
- Yingying Liu (*Mechanical Engineering*) B.E., Tsinghua University 1996.
- Marko Lončar (*Electrical Engineering*) B.S.E.E., University of Belgrade 1997.
- Joseph Peter John Manca (*Electrical Engineering*) B.S., California Institute of Technology 1997.
- Michael Edward Manley (*Materials Science*) B.S.M.E., University of Massachusetts, Lowell 1994.
- Ellis Fan-Chuin Meng (*Electrical Engineering*) B.S., California Institute of Technology 1997.
- Benjamin David Miller (*Mathematics*) B.S., California Institute of Technology 1998.
- José Mumbrú (*Electrical Engineering*) Engineer (*Communication*), Universitat Politècnica de Catalunya 1995; Engineer (*Electronics*), 1996.
- Brian Keenan Muzas (*Aeronautics*) B.S.E., Princeton University 1996.
- Danny Hilman Natawidjaja (*Geology*) B.Sc., Bandung Institute of Technology 1984; M.S., University of Auckland 1992.
- Mark Lee Neidengard (*Computer Science*) B.S., California Institute of Technology 1997.
- Elizabeth Ann Neroda (*Geochemistry*) A.B., Occidental College 1996.
- Olivier Nguyen (*Aeronautics*) Diplôme d'Ingénieur, Université de Liege 1996.
- Sidao Ni (*Geophysics*) B.S., University of Science and Technology of China 1993; M.S., 1996.
- Michele Louisa Ostraat (*Chemical Engineering*) B.S., Trinity University 1996.
- Georgios Panotopoulos (*Electrical Engineering*) Diploma, National Technical University of Athens 1997.

- Piboon Pantu (*Chemical Engineering*) B.S., Kasetsart University 1996.
- Yao-chun Peng (*Biology*) B.S., National Tsing Hua University 1996.
- Eva Peral (*Electrical Engineering*) Ingeniero Superior de Telecomunicaciones, Universidad Politecnica de Valencia 1995.
- Siegfried Pfandler (*Environmental Engineering Science*) B.S., Technical University of Vienna 1992; M.S., 1997.
- Steven Edmund Pracko (*Applied Physics*) B.A., Northwestern University 1995.
- Prashant Kishore Purohit (*Applied Mechanics*) B.Tech., Indian Institute of Technology, Delhi 1997.
- Yue Qi (*Materials Science*) B.E. (*Materials Science and Engineering*), B.E. (*Computer Science*), Tsinghua University 1996.
- Wei Qin (*Electrical Engineering*) B.S., California Institute of Technology 1997.
- Amy Linn Raab (*Chemical Engineering*) B.S., Case Western Reserve University 1995; M.S., 1996.
- Regina Ragan (*Applied Physics*) B.S., University of California, Los Angeles 1996.
- Ravi Ramamoorthi (*Computer Science and Physics*) B.S., California Institute of Technology 1998.
- Adam Rasheed (*Aeronautics*) B.E., Carleton University 1995.
- Shelly Elese Sakiyama (*Chemical Engineering*) S.B. (*Biology*), S.B. (*Chemical Engineering*), Massachusetts Institute of Technology 1996.
- Tina Megerdichian Salmassi (*Environmental Engineering Science*) B.S., University of California, Los Angeles 1996.
- Alexandra Mary Sarkozy (*Materials Science*) B.S., University of California, Santa Barbara 1996.
- Jason Lee Scanlin (*Astronomy*) B.A., Columbia University 1996.
- Ren Ruan Shi (*Chemical Engineering*) B.S., University of California, Berkeley 1995.
- Wenyng Shou (*Biology*) B.A., Pomona College 1993.
- Yang Song (*Electrical Engineering*) B.Eng., Tsinghua University 1993; M.S., 1996.
- Jennie Catherine Stephens (*Environmental Engineering Science*) A.B., Harvard College 1997.
- Kea-Tiong Tang (*Electrical Engineering*) B.S., National Taiwan University 1996.
- Chun Ping Teoh (*Aeronautics*) B.A., Cambridge University 1997.
- Leslie Rachel Title (*Social Science*) B.A., Wesleyan University 1994.
- Ted S. Tuttle (*Aeronautics*) B.S., University of Wisconsin-Madison 1996.
- Jeffrey Gilbert Varnes (*Chemistry*) B.A., Franklin and Marshall College 1996.
- Jian Wang (*Chemical Engineering*) B.S., University of Science and Technology of China 1996.
- Wei Wang (*Electrical Engineering*) B.S., Tsinghua University 1997.
- Xiaou Wang (*Mechanical Engineering*) B.Eng., Tsinghua University 1994.
- Theodore Andrew Waniuk (*Materials Science*) B.S., Harvey Mudd College 1996.

MASTER OF SCIENCE, *continued*

Yong Xu (*Electrical Engineering*) B.S., Tsinghua University 1997.

Yunping Yang (*Electrical Engineering*) B.S., B.Eng., Tsinghua University 1991; M.S., 1997.

Tze-Jung Yao (*Electrical Engineering*) B.S., National Taiwan University 1995.

Weijun Zhou (*Chemical Engineering*) B.S., University of Science and Technology of China 1993.

Daniel Marc Zimmerman (*Computer Science*) B.S., California Institute of Technology 1996.

E n g i n e e r

Bibhuti Bhusan Patel (*Aeronautics*) B.Tech., Indian Institute of Technology, Madras 1994; M.S., California Institute of Technology 1995.

Doctor of Philosophy

DIVISION OF BIOLOGY

Christopher Charles Byrd (*Biology*) B.A., B.S., The University of Texas at Austin 1990.

Thesis: Regulation of Peptide Import by Components of the N-End Rule Pathway.

Thomas Robert Clandinin (*Biology*) B.Sc., University of Alberta 1990; M.Sc., The University of Calgary 1992.

Thesis: Genetic Analysis of LET-23 Mediated Receptor Tyrosine Kinase Signaling in *Caenorhabditis elegans*.

Dawn Denise Waterman Cornelison (*Biology*) B.A., University of Colorado at Boulder 1990; M.S., California Institute of Technology 1995.

Thesis: Gene Expression in Wild-Type and MyoD-null Satellite Cells: Regulation of Activation, Proliferation, and Myogenesis.

Jian Hua (*Biology*) B.S., Fudan University 1989; M.S., Shanghai Institute of Plant Physiology 1992.

Thesis: Mechanisms of Ethylene Perception in *Arabidopsis thaliana*.

Richard M. Jeo (*Biology*) B.S., University of Oregon 1990.

Thesis: Representation of Three-Dimensional Space in Primate Visual Cortex.

Cynthia N. Kiser (*Biology*) B.A., Williams College 1987.

Thesis: Biological Electron Transfer in Copper Proteins.

Te-Yi Kung (*Cellular and Molecular Neurobiology*) B.S., National Taiwan University 1989.

Thesis: Cell Fate Determination at the Insect CNS Midline.

Giovanni M. Lesa (*Molecular Biology and Biochemistry*) B.S., M.S., University of Bologna 1988.

Thesis: Signaling by LET-23, A *Caenorhabditis elegans* Epidermal Growth Factor Receptor Homolog.

Jun Li (*Biology*) B.S., Peking University 1989.

Thesis: Molecular Identity and Mechanism of Cyclic Nucleotide-Gated Channels.

Jing Liu (*Biology*) B.S., Beijing University 1989.

Thesis: Epidermal Growth Factor Signaling and Its Regulation in *Caenorhabditis elegans*.

Marsha A. Maxwell (*Biology*) B.S. (*Chemistry*), B.S. (*Physics*), Spelman College 1993; M.S., California Institute of Technology 1995.

Thesis: The Role of MSTd Neurons in Visually Guided Navigation.

Alexander D. Protopapas (*Biology*) B.A., Columbia University 1990.

Thesis: Pyramidal Cell Responses to Temporally Structured Stimuli: Experiments and Computer Simulations.

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

Brian M. Sullivan (*Biology*) B.S., Allegheny College 1992.

Thesis: Studies of Nitric Oxide Signal Transduction.

Daniel E. Vaughn (*Biology*) B.S., Union College 1987.

Thesis: Molecular Mechanism of pH Dependent Antibody Binding:

Structure/Function Studies on the Neonatal Fc Receptor.

Robert Wayne Williams (*Biology*) B.A., University of California, Santa Cruz 1992.

Thesis: Molecular Genetics of Meristem Development in *Arabidopsis thaliana*.

Charles Hyung-Suk Yoon (*Biology*) A.B., University of California, Berkeley 1991.

Thesis: Characterization of SLI-1, A Negative Regulator of LET-23-Mediated Signal Transduction in *Caenorhabditis elegans*.

DIVISION OF CHEMISTRY AND CHEMICAL ENGINEERING

Michael Benjamin Abrams (*Chemistry*) B.S., University of Wisconsin–Madison 1991.

Thesis: Design, Synthesis, Characterization, and Reactivity of Group III *ansa*-Metallocenes Containing Bulky Alkyl and Silyl Substituents.

Michael Paul Belmares (*Chemistry*) B.S., Sonoma State University 1992.

Thesis: Molecular Origins of the Thermophysical Properties of Polymers and Modeling of Polymer Permeation by Large Molecules.

Ruth Ann Bertsch (*Chemistry*) A.B., Princeton University 1991.

Thesis: The Early Events of Protein Folding: Simulations of Polyalanine Folding into an Alpha-Helix.

Zhong-Ren Chen (*Chemical Engineering and Chemistry*) B.S., Zhejiang University 1984; M.S., 1987; M.S., California Institute of Technology 1995.

Thesis: I. Dynamics of Block Copolymer Nanostructures. II. Polymerizability of Cyclic Olefins and Ring-Closing Metathesis.

Richard Ping Cheng (*Chemistry*) B.S., National Taiwan University 1992.

Thesis: Design and Synthesis of Metallopeptides: Incorporation of Unnatural Alpha-Amino Acids and Construction of a Structural Template.

Basil Ismail Dahiyat (*Chemistry*) B.S., The Johns Hopkins University 1990; M.S.E., 1992.

Thesis: Protein Design Automation: Principles and Practice.

Eric Lee Kuiokalani Dias (*Chemistry*) S.B., Massachusetts Institute of Technology 1992.

Thesis: Ruthenium-Based Olefin Metathesis Catalysts: Synthesis, Mechanism, and Activity.

Francesco Faglioni (*Chemistry*) Laurea in Chimica, Università degli Studi di Modena 1991.

Thesis: Quantum Chemical Computations of Heterogeneous Selective Oxidation, STM Images, and Multiple Bond Reactions.

Doctor of Philosophy continued

Salem Faham (*Chemistry*) B.S., University of Maryland 1991.

Thesis: Crystallographic Studies on the Fibroblast Growth Factors Protein Family and Cys 112 Asp azurin from *Pseudomonas aeruginosa*.

Marilena Fitzsimons (*Chemistry*) D.E.C., John Abbott College 1989; B.Sc., McGill University 1992.

Thesis: Design of a Rhodium-Peptide Complex as a Synthetic DNA Nuclease.

William Anthony Greenberg (*Chemistry*) B.S., State University of New York at Stony Brook 1992.

Thesis: Design and Synthesis of Ligands for Recognition of the Major and Minor Grooves of DNA.

Daniel Benjamin Hall (*Chemistry*) B.S., Yale College 1991.

Thesis: Oxidative DNA Damage through Long Range Electron Transfer.

Curtis Asa Hastings (*Chemistry*) B.S., Yale College 1992.

Thesis: Part A: Studies Directed Toward the Total Synthesis of Chebulagic Acid.

Part B: DNA Recognition by Metallointercalator-Peptide Conjugates.

R. Erik Holmlin (*Chemistry*) A.B., Occidental College 1993.

Thesis: Metallointercalator-DNA Conjugates: Synthesis and Application in Investigations of DNA-Mediated Electron and Energy Transfer.

Chao-Ping Hsu (*Chemistry*) B.S., National Taiwan University 1990; M.Sc., 1992.

Thesis: On the Theory of Electron Transfer Reactions: Superexchange Coupling and Polar Solvation Dynamics.

Brian P. Hudson (*Chemistry*) B.S., Purdue University 1992.

Thesis: Structure of a Metallointercalator Bound to DNA.

Iftikhar Huq (*Chemical Engineering*) B.Sc., The University of Calgary 1991; M.S., California Institute of Technology 1994.

Thesis: Design and Control Studies on the Fluid Catalytic Cracking Process.

Isamu Kusaka (*Chemical Engineering*) B.E., University of Tokushima 1988; M.E., 1990.

Thesis: Molecular Theory of Vapor Phase Nucleation.

Keith Tadao Kuwata (*Chemistry*) B.S., Harvey Mudd College 1991.

Thesis: Spectroscopic and Computational Studies of Ionic Clusters as Models of Solvation and Atmospheric Reactions.

Brian Edward Ledford (*Chemistry*) B.S., The University of North Carolina at Chapel Hill 1992.

Thesis: Part I. The Total Synthesis of (+)-Trehazolin: Optically Active

Spiroheptadienes as Useful Precursors for the Synthesis of Aminocyclopentitols.

Part II. An Inexpensive, Nonbasic Alternative to the Horner-Emmons Olefination Reaction.

David Alan Liberles (*Chemistry*) B.A., Oberlin College 1991; M.S., California Institute of Technology 1995.

Thesis: Sequence Specific DNA Recognition and Bending.

Doctor of Philosophy continued

- Ai Ching Lim (*Chemistry*) B.A., Haverford College 1991.
Thesis: Investigation of RNA Tertiary Structure and Function by Transition Metal Complexes.
- Jeremy Isaac Martin (*Chemistry and Chemical Engineering*) B.A., Haverford College 1990.
Thesis: Statistical Mechanics of End-Attached Polymer Interfaces.
- Bob Robinson Maughon, Jr. (*Chemistry*) B.A., Rice University 1993.
Thesis: Synthesis of Functionalized Polymers by Ring-Opening Metathesis Polymerization (ROMP).
- Teresa Anne Moore (*Chemistry*) B.S., Montana State University 1990.
Thesis: Molecular Beam Studies of Stratospheric Photochemistry.
- Sarah Mutumi Ngola (*Chemistry*) B.A., Smith College 1993.
Thesis: Molecular Recognition and Catalysis in Aqueous Media: Electrostatic and Polarization Effects.
- Katherine Elizabeth Pomykal (*Chemistry*) B.S., University of California, San Diego 1993.
Thesis: Studies of Charge Transfer at Semiconductor/Liquid Junctions.
- Benjamin E. Ramirez (*Chemistry*) B.S., University of Illinois at Urbana-Champaign 1992.
Thesis: The CUA Center of Cytochrome Oxidase: Electronic Structure and Electron-Tunneling Pathways.
- Carl Anthony Rhodes Jr. (*Chemical Engineering and Control and Dynamical Systems*) B.S., Stanford University 1992; M.S., California Institute of Technology 1995.
Thesis: Nonlinear Modeling and Identification for Process Control.
- Mary S. Shepard (*Chemistry*) B.S., Bowling Green State University 1992.
Thesis: Asymmetric Induction in Enone-Allene [2+2] Photocycloaddition Reactions: Application Toward the Enantioselective Synthesis of (+)-Chebuleic Acid.
- Scott Korey Silverman (*Chemistry*) B.S., University of California, Los Angeles 1991.
Thesis: I. Conformational and Charge Effects on High-Spin Organic Polyradicals.
II. Studies on the Chemical-Scale Origin of Ion Selectivity in Potassium Channels.
- James Michael Spotts (*Chemistry*) B.A., Dartmouth College 1990.
Thesis: Multiphoton Ionization Studies of Metal Atom-Solvent Interactions from the van der Waals Dimer to the Mesoscopic Scale.
- Susanne Evelyn Swalley (*Chemistry*) B.A., Amherst College 1993.
Thesis: Specific Recognition of G,C-Rich Sequences in the Minor Groove of DNA by Synthetic Ligands.
- Norma J. Tom (*Chemistry*) B.S., University of California, Berkeley 1992.
Thesis: Synthesis of (+)-Dynemicin A. Synthesis and DNA Cleavage Studies of Dynemicin Analogs.
- Pablo Umaña (*Chemical Engineering and Biology*) Licenciatura, Universidad de Costa Rica 1991; M.S., California Institute of Technology 1994.
Thesis: Engineering of Protein Glycosylation in Chinese Hamster Ovary Cells.

Doctor of Philosophy continued

Michael Wayne Wagaman (*Chemistry*) B.S., University of Delaware 1993.

Thesis: Conjugated Electroluminescent Polymers Synthesized by a Ring-Opening Metathesis Polymerization Precursor Route.

Grant Kingsley Walkup (*Chemistry*) B.S., University of California, San Diego 1993.

Thesis: Fluorescent Peptidyl Chemosensors for the Measurement of Divalent Metal Cation Concentrations.

Anthony Paul West, Jr. (*Chemistry and Physics*) A.B., Princeton University 1991.

Thesis: Theoretical Studies of Molecular Magnetism and Molecular Recognition, and Experimental Studies of the Extracellular Domain of the Nicotinic Acetylcholine Receptor.

J. Charles Williamson (*Chemistry*) B.S., Harvey Mudd College 1990.

Thesis: Ultrafast Gas-Phase Electron Diffraction.

Yevgeny Yurkovetsky (*Chemical Engineering*) Diploma, Odessa Technological Institute of Refrigeration Industry 1989; M.S., California Institute of Technology 1994.

Thesis: I. Statistical Mechanics of Bubbly Liquids. II. Behavior of Sheared Suspensions of Non-Brownian Particles.

Huimin Zhao (*Chemistry*) B.S., University of Science and Technology of China 1992.

Thesis: Enzyme Design by Directed Evolution.

Wenge Zhong (*Chemistry*) B.S., Peking University 1987; M.S., 1990; M.S., Rutgers, The State University of New Jersey 1992.

Thesis: Physical Organic Chemistry on the Nicotinic Acetylcholine Receptor.

William John Zuercher (*Chemistry*) B.A., Grinnell College 1993.

Thesis: Ruthenium-Catalyzed Polycyclization Reactions.

DIVISION OF ENGINEERING AND APPLIED SCIENCE

Mohamed-Slim Alouini (*Electrical Engineering*) Diplôme d'Ingénieur, École Nationale Supérieure des Telecommunications 1993; M.S.E.E., Georgia Institute of Technology 1995.

Thesis: Adaptive and Diversity Techniques for Wireless Digital Communications Over Fading Channels.

Xin An (*Electrical Engineering*) B.E., Tsinghua University 1991.

Thesis: Long-Term Large-Scale Holographic Storage in $\text{LiNbO}_3:\text{Fe}$.

David Alan Bachman (*Applied Physics*) B.S., University of California, Berkeley 1992; M.S., California Institute of Technology 1994.

Thesis: Nonlinear Phenomena in a Pure Electron Plasma Studied with a 2-D Fluid Code.

George Barbastathis (*Electrical Engineering*) Diploma, National Technical University of Athens 1993; M.S., California Institute of Technology 1994.

Thesis: Intelligent Holographic Databases.

Doctor of Philosophy continued

Eric Bax (*Computer Science*) B.S., Furman University 1990; M.S., California Institute of Technology 1995.

Thesis: Finite-Difference Algorithms for Counting Problems.

Veronica Ruth Blackwell (*Environmental Engineering Science and Geochemistry*) B.Eng., McGill University 1992; M.S., California Institute of Technology 1994.

Thesis: Formation Processes of Clathrate Hydrates of Carbon Dioxide and Methane.

Vasken Z. Bohossian (*Computation and Neural Systems*) B.Eng., McGill University 1993; M.S., California Institute of Technology 1994.

Thesis: Neural Logic: Theory and Implementation.

Carlos D. Brody (*Computation and Neural Systems*) B.A., Oxford University 1988; M.Sc., Edinburgh University 1990.

Thesis: Analysis and Modeling of Spike Train Correlations in the Lateral Geniculate Nucleus.

Renato Penha Camata (*Applied Physics*) B.S., University of São Paulo 1990; M.S., 1992; M.S., California Institute of Technology 1995.

Thesis: Aerosol Synthesis and Characterization of Silicon Nanocrystals.

Zehra Cataltepe (*Computer Science*) B.Sc., Bilkent University 1991; M.S., California Institute of Technology 1994.

Thesis: Incorporating Input Information into Learning and Augmented Objective Functions.

Chuan-cheng Cheng (*Electrical Engineering*) B.S., National Taiwan University 1991; M.S., California Institute of Technology 1994.

Thesis: Nanofabrication and Characterization of Photonic Crystals.

Ernest Yee-Wei Chuang (*Electrical Engineering*) B.S., University of California, Berkeley 1992; M.S., California Institute of Technology 1993.

Thesis: Methods and Architecture for Rewritable Holographic Memories.

Robert Dale Conner (*Materials Science*) B.S., California State Polytechnic University, Pomona 1989; M.S., California Institute of Technology 1994.

Thesis: Mechanical Properties of Bulk Metallic Glass Matrix Composites.

Darren G. Crowdy (*Applied Mathematics*) B.A., Queens' College, University of Cambridge 1992.

Thesis: Exact Solutions for Two-dimensional Stokes Flow.

Richard Bruce Dandliker (*Materials Science*) B.S., Stanford University 1992; M.S., California Institute of Technology 1994.

Thesis: Bulk Metallic Glass Matrix Composites: Processing, Microstructure, and Application as a Kinetic Energy Penetrator.

Doruk Engin (*Applied Physics*) B.S., California Institute of Technology 1992; M.S., 1993.

Thesis: Part I. Wave Mixing in Photorefractive Crystals. Part II. Photopolymerization Dynamics.

Doctor of Philosophy continued

Selena Mae Forman (*Environmental Engineering Science and Geochemistry*) B.S., California Institute of Technology 1989; B.A., Reed College 1990; M.S., California Institute of Technology 1994.

Thesis: The Transport of Nonlinearly Adsorbing Compounds Between Stream Water and Sediment Bed in a Laboratory Flume.

Timothy S. Frank (*Applied Physics*) B.S., Baylor University 1990; M.S., California Institute of Technology 1992.

Thesis: Computing with Spiking Neurons.

Heather Nicol Frase (*Materials Science*) B.S., Miami University 1992; M.S., California Institute of Technology 1995.

Thesis: Vibrational and Magnetic Properties of Mechanically Attrited Ni₃Fe Nanocrystals.

Matthew Paul Fraser (*Environmental Engineering Science and Geology*) B.S., Carnegie Mellon University 1991; M.S., California Institute of Technology 1993.

Thesis: Measuring and Modeling the Concentrations of Individual Organic Compounds in the Urban Atmosphere.

Sonja Glavaški (*Electrical Engineering*) Diploma, University of Belgrade 1988; M.S., 1991; M.S., California Institute of Technology 1992.

Thesis: Robust System Analysis and Nonlinear System Model Reduction.

John William Goodwine, Jr. (*Applied Mechanics*) B.S., University of Notre Dame 1988; J.D., Harvard University 1991; M.S., California Institute of Technology 1993.

Thesis: Control of Stratified Systems with Robotic Applications.

Alan Bryant Heirich (*Computer Science*) A.B., The University of Michigan 1987; M.S., University of California, San Diego 1989; M.S., California Institute of Technology 1992.

Thesis: Analysis of Scalable Algorithms for Dynamic Load Balancing and Mapping with Application to Photo-realistic Rendering.

David Joseph Hill (*Applied Mathematics*) B.A., Reed College 1991.

Thesis: Part I. Vortex Dynamics in Wake Models. Part II. Wave Generation.

Gary Roger Holt (*Computation and Neural Systems*) B.S., California Institute of Technology 1991.

Thesis: A Critical Reexamination of Some Assumptions and Implications of Cable Theory in Neurobiology.

Guido H. Hunziker (*Applied Physics*) Baccalaureat, College St. Michel 1988; Diploma, Swiss Federal Institute of Technology 1993.

Thesis: Spectroscopy and Wavelength Conversion by Four-Wave Mixing in Semiconductor Optical Amplifiers.

Fukang Jiang (*Electrical Engineering*) B.S., Hangzhou University 1984; M.S., 1987; M.S., California Institute of Technology 1992.

Thesis: Silicon-Micromachined Flow Sensors.

Doctor of Philosophy continued

John Kao (*Engineering Science*) B.S., Polytechnic Institute of New York 1982; M.S., California Institute of Technology 1983.

Thesis: Two-Dimensional Steady Bow Waves in Water of Finite Depth.

Scott David Kelly (*Mechanical Engineering*) B.S., Cornell University 1991; M.S. California Institute of Technology 1992.

Thesis: The Mechanics and Control of Robotic Locomotion with Applications to Aquatic Automata.

Sangwook Lee (*Aeronautics*) B.S., Seoul National University 1987; M.S., 1989.

Thesis: Failure of Laminated Composites at Thickness Discontinuities Under Complex Loading and Elevated Temperatures.

Michael John Levene (*Computation and Neural Systems*) B.S., University of Rochester 1992.

Thesis: Optics in Neural Computation.

Qiao Lin (*Mechanical Engineering*) B.S., Tsinghua University 1985; M.S., 1988.

Thesis: Mechanics and Planning of Workpiece Fixturing and Robotic Grasping.

Wenshan Liu (*Applied Physics*) B.S., Fudan University 1992; M.S., California Institute of Technology 1994.

Thesis: Formation and Characterization of Mg-based Bulk Metallic Glasses and Nanocrystalline Materials.

Malik Magdon-Ismael (*Electrical Engineering and Physics*) B.S., Yale College 1993; M.S., California Institute of Technology 1995.

Thesis: Supervised Learning in Probabilistic Environments.

Berna Linda Massingill (*Computer Science*) B.A., B.S., The University of Texas at Austin 1977; M.S., California Institute of Technology 1993.

Thesis: A Structured Approach to Parallel Programming.

Bennett Scott May (*Civil Engineering*) B.S., The Johns Hopkins University 1991; M.S., 1992.

Thesis: Probabilistic Robust Control: Theory and Applications.

Mark Robert Meloon (*Applied Mathematics*) B.S., University of Wisconsin—Madison 1992.

Thesis: Models of Richtmyer-Meshkov Instability in Continuously Stratified Fluids.

Ashish Misra (*Mechanical Engineering*) B.Sc., SIES College, Bombay University 1988; M.E., Indian Institute of Science 1992.

Thesis: Large-Eddy Simulation Using a Vortex-Based Subgrid Stress Model.

Karina Luciel Montilla Edmonds (*Aeronautics and Materials Science*) B.S., University of Rhode Island 1992; M.S., California Institute of Technology 1993.

Thesis: Shock Wave Processing of Transitional Metal Silicides.

Bruce James Nairn (*Environmental Engineering Science*) B.A.Sc., University of Toronto 1992; M.S., California Institute of Technology 1993.

Thesis: Incipient Transport of Silt-Sized Sediments.

Jay Russell Odum (*Environmental Engineering Science*) A.B., The University of North Carolina at Chapel Hill 1992; M.S., 1993.

Thesis: Secondary Organic Aerosol Formation and Gas/Aerosol Partitioning.

Doctor of Philosophy continued

- Han G. Park (*Aeronautics and Electrical Engineering*) B.S., University of California, Berkeley 1991; S.M., Massachusetts Institute of Technology 1994.
Thesis: A Study of Heat Transport Processes in the Wake of a Stationary and Oscillating Circular Cylinder Using Digital Particle Image Velocimetry/Thermometry.
- David Charles Polidori (*Applied Mechanics*) B.S., University of Wisconsin—Madison 1992; M.S., California Institute of Technology 1993.
Thesis: A Probabilistic Treatment of Uncertainty in Nonlinear Dynamical Systems.
- William Alan Press (*Computation and Neural Systems*) Sc.B., Brown University 1990.
Thesis: Effects of Spatial Attention on Macaque Primary Visual Cortex.
- Raúl A. Radovitzky (*Aeronautics*) Ingeniería Civil, Universidad de Buenos Aires 1991; Sc.M., Brown University 1995.
Thesis: Error Estimation and Adaptive Meshing in Strongly Nonlinear Dynamic Problems.
- Eduardo A. Repetto (*Aeronautics*) Ingeniería Civil, Universidad de Buenos Aires 1990; Sc.M., Brown University 1994.
Thesis: On the Fatigue Behavior of Ductile F.C.C. Metals.
- Marc Alexis Rieffel (*Computer Science*) B.A., B.S., Swarthmore College 1994; M.S., California Institute of Technology 1996.
Thesis: Performance Modeling for Concurrent Particle Simulations.
- Mikhail K. Rudnev (*Applied Mathematics*) B.S., Moscow Institute of Physics and Technology 1991.
Thesis: Exponentially Small Splitting of Separatrices and the Arnold's Diffusion Problem.
- Steven Jay Sanders (*Applied Physics*) B.S., University of California, Berkeley 1991; M.S., California Institute of Technology 1993.
Thesis: Plasma Ion Dynamics in Large-Amplitude Drift Waves: Stochasticity, Collisions, Orbit Loss, and Recycling.
- James Jay Schauer (*Environmental Engineering Science*) B.S., Colorado School of Mines 1984; M.S., University of California, Berkeley 1991.
Thesis: Source Contributions to Atmospheric Organic Compound Concentrations: Emissions Measurements and Model Predictions.
- Russina Sgoureva-Philippakos (*Applied Mathematics*) B.S., California Institute of Technology 1994.
Thesis: Nonlinear Effects in Elastic Rayleigh Waves.
- Douglas G. Shiels (*Aeronautics and Computer Science*) B.S., California Institute of Technology 1993; M.S., 1994.
Thesis: Simulation of Controlled Bluff Body Flow with a Viscous Vortex Method.
- Joseph Sill (*Computation and Neural Systems*) B.S., Yale College 1993.
Thesis: Monotonicity and Connectedness in Learning Systems.

Doctor of Philosophy continued

- Paolo Alberto Gregorio Sivilotti (*Computer Science*) B.Sc., Queen's University 1991;
M.S., California Institute of Technology 1993.
Thesis: A Method for the Specification, Composition, and Testing of Distributed Object Systems.
- Michael David Slessor (*Aeronautics and Physics*) B.A.Sc., University of British Columbia 1992; M.S., California Institute of Technology 1993.
Thesis: Aspects of Turbulent-Shear-Layer Dynamics and Mixing.
- Christopher D. Springfield (*Applied Physics*) B.S., Colorado School of Mines 1991;
M.S., California Institute of Technology 1993.
Thesis: Development of an Object-Oriented Infrared Imaging System Simulator and Its Application to Multi-Spectral Infrared Imaging.
- Maggie Elizabeth Taylor (*Materials Science*) B.S., California Institute of Technology 1993; M.S., 1995.
Thesis: Pulsed Laser Deposition: Energetic Growth Effects in Group IV Semiconductor Materials.
- Xiao Lin Tong (*Applied Physics*) B.S., Wuhan University of Technology 1984; M.S., California Institute of Technology 1997.
Thesis: Properties and Applications of Potassium Lithium Tantalate Niobate.
- Thomas Rocco Tsao (*Electrical Engineering*) B.S., University of California, Berkeley 1992; M.S., California Institute of Technology 1993.
Thesis: Silicon Micromachined Magnetic Actuators for Aerodynamic Flow Control Applications.
- Jamal Tuqan (*Electrical Engineering*) B.E., Tsinghua University 1992.
Thesis: Statistical Optimization of Multirate Systems with Applications in Compression and Energy Compaction.
- Robert Vincent Uy (*Mechanical Engineering*) B.S.E., The University of Michigan 1991; M.S., California Institute of Technology 1992.
Thesis: Studies of Rotordynamic Forces Generated by Annular Flows.
- Chun Ming Wang (*Applied Physics and Electrical Engineering*) B.S., National Chiao-Tung University 1990; M.S., California Institute of Technology 1995.
Thesis: Image Enhancement with Two-Photon Laser Scanning Microscopy.
- Jerrell Richard Watts (*Computer Science*) B.S., The University of Texas at Austin 1994; M.S., California Institute of Technology 1996.
Thesis: Dynamic Load Balancing and Granularity Control on Heterogeneous and Hybrid Architectures.
- Linda Kay Weavers (*Environmental Engineering Science*) B.E., University of Minnesota 1992; M.S., California Institute of Technology 1994.
Thesis: Enhancement of Ultrasonic and Ultraviolet Irradiation with Chemical Oxidants.

Doctor of Philosophy continued

- Erik Winfree (*Computation and Neural Systems*) B.S., The University of Chicago 1991.
Thesis: Algorithmic Self-Assembly of DNA.
- Darrell Alan Winner (*Environmental Engineering Science and Planetary Science*) B.S., Carnegie Mellon University 1989; M.S., California Institute of Technology 1990.
Thesis: Long-term Modeling of Regional Ozone Concentrations and Control Strategies.
- Slawomir M. Zaremba (*Applied Mechanics*) M.S., S. Staszic Academy of Mining and Metallurgy 1990.
Thesis: Dynamical Signatures of Gearbox Vibrations.
- José Roberto Zenit-Camacho (*Mechanical Engineering*) Ingeniero, Universidad Nacional Autónoma de México 1992; M.S., California Institute of Technology 1993.
Thesis: Collisional Mechanics in Solid-Liquid Flows.
- Denis N. Zorin (*Computer Science*) B.S., Moscow Institute of Physics and Technology 1991; M.S., The Ohio State University 1993; M.S., California Institute of Technology 1996.
Thesis: Stationary Subdivision and Multiresolution Surface Representations.

DIVISION OF GEOLOGICAL AND PLANETARY SCIENCES

- Robert John Brady (*Geology*) B.Sc., The University of Calgary 1993; M.S., California Institute of Technology 1995.
Thesis: The Geology of the Gold Butte Breakaway Zone and the Mechanical Evolution of Normal Fault Systems.
- Xiaoming Ding (*Geophysics and Computer Science*) B.S., University of Science and Technology of China 1989; M.S., California Institute of Technology 1995.
Thesis: High Resolution Studies of Deep Earth Structure.
- Mihai Nicolae Duca (*Geology*) Diploma, Bucharest University 1991; M.S., California Institute of Technology 1995.
Thesis: A Petrologic Investigation of Deep-Crustal and Upper-Mantle Xenoliths from the Sierra Nevada, California; Constraints on Lithospheric Composition Beneath Continental Arcs and the Origin of Cordilleran Batholiths.
- David Aspinwall Evans (*Geology*) B.S., Yale College 1992; M.S., California Institute of Technology 1994.
Thesis: I. Neoproterozoic-Paleozoic Supercontinental Tectonics and True Polar Wander. II. Temporal and Spatial Distributions of Proterozoic Glaciations.
- Robert Laird Herman (*Geochemistry*) A.B., The University of Chicago 1991; M.S., California Institute of Technology 1993.
Thesis: In Situ Measurements of Chemical Tracers in the Stratosphere: CO, N₂O, and CH₄.

Doctor of Philosophy continued

- Franklin Perry Mills (*Planetary Science and Physics*) B.S.E., Princeton University 1984; M.S., California Institute of Technology 1986.
Thesis: I. Observations and Photochemical Modeling of the Venus Middle Atmosphere. II. Thermal Infrared Spectroscopy of Europa and Callisto.
- Craig William Scrivner (*Geophysics*) B.S., University of California, San Diego 1989; M.S., California Institute of Technology 1993.
Thesis: Analysis and Modeling of Seismic Ground Motions in Heterogeneous Structures in Southern California.
- Steven Ronald Tsitas (*Planetary Science and Astronomy*) B.S., The University of Melbourne 1988; M.S., California State University, Fresno 1991; M.S., California Institute of Technology 1996.
Thesis: I. The Effect of Volcanic Aerosols on Ultraviolet Radiation in Antarctica. II. A Novel Method for Enhancing Subsurface Radar Imaging Using Radar Interferometry.
- Ashwin Ravindra Vasavada (*Planetary Science and Electrical Engineering*) B.S., University of California, Los Angeles 1992.
Thesis: I. Temperatures of Polar Ice Deposits on Mercury and the Moon. II. Jovian Atmospheric Dynamics from Galileo Imaging.
- Lianxing Wen (*Geophysics*) B.S., University of Science and Technology of China 1988; M.S., California Institute of Technology 1996.
Thesis: Plate Tectonics, Mantle Convection, and D'' Seismic Structures.
- Albert Shih-Yueh Yen (*Planetary Science and Geology*) S.B., Massachusetts Institute of Technology 1986; M.S., Stanford University 1987; M.S., California Institute of Technology 1995.
Thesis: Effects of the Martian Environment on Its Surface Materials: Experimental Studies.
- Judith Ann Zachariasen (*Geology*) A.B., Harvard College 1986; M.A., University of California, Berkeley 1991; M.S., California Institute of Technology 1993.
Thesis: Paleoseismology and Paleogeodesy of the Sumatran Subduction Zone: A Study of Vertical Deformation Using Coral Microatolls.
- Blair J. Zajac, Jr. (*Geophysics*) B.S., University of Washington 1990; M.S., California Institute of Technology 1993.
Thesis: The State of Stress as Inferred from Deviated Boreholes: Constraints on the Tectonics of Offshore Central California and Cook Inlet, Alaska.
- Lupei Zhu (*Geophysics and Computer Science*) B.S., University of Science and Technology of China 1985; M.S., Institute of Geophysics 1988.
Thesis: Broadband Waveform Modeling and Its Application to the Lithospheric Structure of the Tibetan Plateau.

Doctor of Philosophy continued

DIVISION OF THE HUMANITIES AND SOCIAL SCIENCES

Micah Altman (*Social Science*) A.B. (*Computer Science*); A.B. (*Philosophy*), Brown University 1989.

Thesis: Districting Principles and Democratic Representation.

Oleg Bondarenko (*Social Science*) Diploma, Moscow Institute of Physics and Technology 1991.

Thesis: Testing Rationality of Financial Markets.

Mikhail G. Filippov (*Social Science*) Diploma, Moscow State University 1989; M.A., University of California, Riverside 1993; M.S., California Institute of Technology 1996.

Thesis: Political Competition in Federations.

Robin Dale Hanson (*Social Science*) B.S., University of California, Irvine 1981; A.M. (*Conceptional Foundations of Science*), S.M. (*Physics*), The University of Chicago 1984.

Thesis: Four Puzzles in Information and Politics: Product Bans, Informed Voters, Social Insurance, and Persistent Disagreement.

Fang Wang (*Social Science*) B.A., Institute of International Relations 1991; M.S., California Institute of Technology 1996.

Thesis: Nativism in the 1990s.

DIVISION OF PHYSICS, MATHEMATICS AND ASTRONOMY

Shahin Ajoodani-Namini (*Mathematics*) B.Sc., University of Tehran 1988; M.Sc., 1991.

Thesis: Large Sets of t -Designs.

John R. Arrington (*Physics*) B.S., University of Wisconsin-Madison 1990; M.S., California Institute of Technology 1992.

Thesis: Inclusive Electron Scattering from Nuclei at $x > 1$ and High Q^2 .

Rebecca A. Bernstein (*Astronomy*) A.B., Princeton University 1992.

Thesis: The HST/LCO Measurement of the Mean Flux of the Extragalactic Background Light (3000–8000 Å).

Anthony David Blaom (*Mathematics*) B.E., The University of Melbourne 1991; M.S., California Institute of Technology 1992.

Thesis: The Perturbation of Hamiltonian Systems with a Non-Abelian Symmetry.

Bruce Bray (*Physics*) B.Sc., Queen's University 1992.

Thesis: A Determination of the Neutron Spin Structure Function g_1^n with the 1995 HERMES Data.

Mandeepa Chadha (*Physics*) B.S., Panjab University 1988; M.S., 1989; M.Ph., 1990.

Thesis: A Measurement of the Michel Parameters ρ and η in Leptonic Tau Decays.

Doctor of Philosophy continued

- Guangqing Chen (*Physics and Computer Science*) B.S., Peking University 1989; M.S., California Institute of Technology 1991.
Thesis: I. High Pressure Melting of γ -Iron and the Thermal Profile in the Earth's Core. II. High Pressure, High Temperature Equation of State of Fayalite (Fe_2SiO_4).
- Sergey A. Cherkis (*Physics*) B.S., Upsala College 1993.
Thesis: Three-Dimensional Gauge Theories and Gravitational Instantons from String Theory.
- Yanglim Choi (*Mathematics*) B.S., Korea Advanced Institute of Science and Technology 1991.
Thesis: (3,1)-Surfaces via Branched Surfaces.
- Erik Stephen Daniel (*Physics*) B.A., Rice University 1992.
Thesis: Investigations of Quantum Effect Semiconductor Devices—The Tunnel Switch Diode and the Velocity Modulation Transistor.
- Hooman Davoudiasl (*Physics*) S.B., Massachusetts Institute of Technology 1993; M.S., California Institute of Technology 1995.
Thesis: Applications of Chiral Symmetry.
- Guanghua Gao (*Physics*) B.S., University of Science and Technology of China 1989; M.S., California Institute of Technology 1994.
Thesis: Large Scale Molecular Simulations with Application to Polymers and Nano-scale Materials.
- Nikos Photakis Georgiades (*Physics*) B.A., M.S., University of Pennsylvania 1991; M.S., California Institute of Technology 1993.
Thesis: Nonclassical Excitation and Quantum Interference in a Three Level Atom.
- John Evangelos Gizis (*Astronomy*) B.S., Yale College 1992.
Thesis: M Subdwarfs and the Population II Luminosity Function.
- Martin Gremm (*Physics*) Diplom, RWTH-Aachen 1995.
Thesis: Aspects of Heavy Quark Physics.
- David Wardell Hogg (*Physics*) S.B., Massachusetts Institute of Technology 1992.
Thesis: On the Evolution of Field Galaxies.
- Scott Alexander Hughes (*Physics*) B.A., Cornell University 1993; M.S., California Institute of Technology 1995.
Thesis: Gravitational-Wave Astronomy: Aspects of the Theory of Binary Sources and Interferometric Detectors.
- Mihail S. Iotov (*Physics*) Diploma, Sofia University 1991.
Thesis: Diffusion in Amorphous Media.
- Frances Yvonne Jackson (*Mathematics*) B.S., Arizona State University 1992.
Thesis: Sun-Dual Characterizations of the Translation Group of \mathbb{R} .
- Danny Towsian Koh (*Physics*) B.S., Stanford University 1990.
Thesis: Continuous Long Term Observations of Accreting Pulsars.

Doctor of Philosophy continued

Adam Keith Leibovich (*Physics*) B.A., Cornell University 1992.

Thesis: Quarkonia Production in Nonrelativistic Quantum Chromodynamics.

Erik M. Leitch (*Astronomy*) A.B., Princeton University 1992.

Thesis: A Measurement of Anisotropy in the Microwave Background on $7'-22'$ Scales.

Xuhua Li (*Mathematics*) B.Sc., Tsinghua University 1986; M.Sc., Peking University 1988.

Thesis: Some Results on Projective Equivalence Relations.

Wenwen Lu (*Physics*) B.S., Fudan University, 1988.

Thesis: A Study of Bhabha Scattering at the Z Resonance.

Maxim Lyutikov (*Astronomy*) B.S., Moscow Engineering-Physics Institute 1992.

Thesis: Coherent Emission Mechanisms in Radio Pulsars.

Hideo Mabuchi (*Physics*) A.B., Princeton University 1992.

Thesis: Continuous Observation of Quantum Dynamics.

Sanjoy Sondhi Mahajan (*Physics*) B.S., Stanford University 1990; B.A., Oxford University 1992.

Thesis: Order of Magnitude Physics: A Textbook with Applications to the Retinal Rod and the Density of Prime Numbers.

Matthew S. McAdams (*Physics*) B.S., Harvey Mudd College 1992; M.S., University of Illinois at Urbana-Champaign 1993.

Thesis: Semiconductor Laser Signals and Noise in Fiber Grating Systems.

James Stephen Miller III (*Physics*) B.S., Gordon College 1990.

Thesis: Measurement of Hadronic Form Factors in Semileptonic B Meson Decay.

Themistoklis Mitsis (*Mathematics*) B.Sc., University of Athens 1993.

Thesis: On a Problem in Geometric Measure Theory Related to Sphere and Circle Packing.

Ranjan Mukhopadhyay (*Physics*) M.S., Indian Institute of Technology, Kanpur 1991.

Thesis: Quantum Phase Transitions in Disordered Bose Systems.

Patrick Michael Ogle (*Astronomy*) B.S., Harvey Mudd College 1992.

Thesis: Polarization and Structure of Broad Absorption Line Quasi-Stellar Objects.

Benjamin James Owen (*Physics*) B.S., Sonoma State University 1993.

Thesis: Gravitational Waves from Compact Objects.

Michael Andrew Pahre (*Astronomy*) A.B., Harvard College 1989.

Thesis: Elliptical Galaxies: Structure, Stellar Content, and Evolution.

Shuyan Qi (*Physics*) B.S., University of Science and Technology of China 1992.

Thesis: Anisotropic Fluctuations and Kinetics of Order-Order and Order-Disorder Phase Transitions of Diblock Copolymers.

Patricia M. Schwarz (*Physics*) B.A., San Francisco State University 1985.

Thesis: Black Holes, Gravity Waves and String Theory.

Doctor of Philosophy continued

Sima Setayeshgar (*Physics*) S.B. (*Mathematics*), S.B. (*Physics*), Massachusetts Institute of Technology 1990; M.S., California Institute of Technology 1992.

Thesis: Turing Pattern Formation in the Chlorine Dioxide-Iodine-Malonic Acid Reaction-Diffusion System.

Yaoying (Alyce) Su (*Physics*) B.S., National Taiwan University 1992.

Thesis: Backbone Flexibility in Protein Design—Theory and Experiment.

Alycia Jeannette Weinberger (*Physics*) B.A., University of Pennsylvania 1991; M.S., California Institute of Technology 1993.

Thesis: Speckle Imaging of the Nuclei of Six Seyfert Galaxies at Wavelengths of 2.2 μm and 1.6 μm .

Eric Rodney Westphal (*Physics*) M.A., Reed College 1993.

Thesis: Electroweak Baryogenesis via Scalar Baryon Number Transport.

Jody Ann White (*Physics*) S.B., Massachusetts Institute of Technology 1991.

Thesis: Shell Model Monte Carlo Investigation of Nuclear Structure in Rare Earth Nuclei.

Daniel LeRoy Williams (*Physics*) B.S., Louisiana State University 1991; M.S., California Institute of Technology 1993.

Thesis: Measurements of the Isotopic Composition of Solar Energetic Particles Measured with the MAST Instrument Aboard the SAMPEX Spacecraft.

Patricia Rose Wrean (*Physics*) B.Sc., Simon Fraser University 1989.

Thesis: $^{19}\text{F}(\alpha, n)^{22}\text{Na}$, $^{22}\text{Ne}(p, n)^{22}\text{Na}$, and the Role of Their Inverses in the Destruction of ^{22}Na .

Yanqin Wu (*Astronomy*)

Thesis: Excitation and Saturation of White Dwarf Pulsations.

PRIZES AND AWARDS

Prizes and awards are listed only for those students receiving degrees in 1998, 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.

1998 *Alexander Thomas Ihler, Michael David Shumway*

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.

1998 *Melissa Zamarripa Sáenz*

CHARLES D. BABCOCK AWARD

Awarded, by vote of the aeronautics faculty, to a student whose achievements in teaching or other assistance to students have made a significant contribution to the aeronautics department.

1994 *Michael David Slessor*

1998 *Raúl A. Radovitzky*

WILLIAM F. BALLHAUS PRIZE

Awarded to aeronautics students for outstanding doctoral dissertations.

1998 *Eduardo A. Repetto*

ERIC TEMPLE BELL UNDERGRADUATE MATHEMATICS RESEARCH PRIZE

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

1997 *Mason Alexander Porter*

ROLF D. BUHLER MEMORIAL AWARD IN AERONAUTICS

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

1998 *Paul Samuel Krueger*

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.

1998 *Rowena Lohman*

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.

1996	<i>Liubomir Borissov</i> <i>Eric Dennis</i>	<i>Alexander Robert Dunn</i>
1997	<i>Dan-Eugen Angelescu</i> <i>John Francis Christiansen</i> <i>Alexander Robert Dunn</i> <i>Brian R. D'Urso</i> <i>Kerwyn Casey Huang</i> <i>Hui Jin</i> <i>Robert Joseph Johnson</i> <i>Yi Li</i> <i>Tao Long</i>	<i>Mason Alexander Porter</i> <i>Ravi Ramamoorthi</i> <i>Changchun Shi</i> <i>Michael David Shumway</i> <i>Julius Tsu-li Su</i> <i>Sean Andrew Suchter</i> <i>Victoria M. Tanusheva</i> <i>James McKay Turner</i> <i>Johanna Alicia Yao</i>
1998	<i>Dan-Eugen Angelescu</i> <i>Sudipta Bardhan</i> <i>Liubomir Borissov</i> <i>Tak Gee Cheung</i> <i>Nicholas Isaac Choly</i> <i>John Francis Christiansen</i> <i>Eric Dennis</i> <i>Alexander Robert Dunn</i> <i>Brian R. D'Urso</i> <i>Yuanshan Guo</i> <i>Dragos Antonio Harabor</i> <i>Kerwyn Casey Huang</i> <i>Evan Harris Hurowitz</i> <i>Eric Cheng-Feng Jan</i> <i>Hui Jin</i> <i>Yi Li</i> <i>Jonathan James Little</i>	<i>Rowena Lohman</i> <i>Tao Long</i> <i>Vuk Mandic</i> <i>Jeremiah Michael Mans</i> <i>Benjamin David Miller</i> <i>Bradley James Nakatani</i> <i>Payam Pakzad</i> <i>Adam George Petrie</i> <i>Mason Alexander Porter</i> <i>Ravi Ramamoorthi</i> <i>Evan John Reed</i> <i>Michael David Shumway</i> <i>Julius Tsu-li Su</i> <i>Leonard Sung</i> <i>Victoria M. Tanusheva</i> <i>James McKay Turner</i> <i>Johanna Alicia Yao</i>

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.

1998 *José Roberto Zenit-Camacho*

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.

1997 *Donald Harvey Pinkston III, Keri Lynn Ryan*

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.

1997 *Michael James Herrera, Deans' Cup*

Richard C. Yeh, Residence Life and Master's Award

1998 *Kulvinder Singh Gill, Deans' Cup*

Samantha Foster, 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.

1997 *Gyeong Soon Hwang*

1998 *Michael Joseph Gordon*

EVERHART DISTINGUISHED GRADUATE STUDENT LECTURER AWARD

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

1995 *David Wardell Hogg*

1996 *Hideo Mabuchi*

1997 *Bassil Ismail Dahiyat, Matthew Paul Fraser, Steven Jay Sanders*

1998 *David Aspinwall Evans*

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.

1998 *Thomas Robert Clandinin, Robert Wayne Williams*

RICHARD P. FEYNMAN PRIZE IN THEORETICAL PHYSICS

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

1998 *Victoria M. Tanusheva*

HAREN LEE FISHER MEMORIAL AWARD IN JUNIOR PHYSICS

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

1997 *Brian R. D'Urso*

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.

1997 *Brian Marc Rothstein*

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.

1997 *Brian R. D'Urso, Adam George Petrie*

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.

1998 *Selena Mae Forman*

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.

1997 *Alexander Robert Dunn, Ravi Ramamoorthi*

1998 *Brian R. D'Urso*

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.

1998 *Jeanne Marie Wilson*

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.

1994 *Julius Tsu-li Su*

THE HERBERT NEWBY McCOY AWARD

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

1997 *Scott Korey Silverman*

1998 *R. Erik Holmlin, Chao-Ping Hsu, Grant Kingsley Walkup*

MARY A. EARL McKINNEY PRIZE IN LITERATURE

Awarded to undergraduate students for excellence in writing in three categories: poetry, prose fiction, and nonfiction essays.

1997 *Alexander Robert Dunn, Siddartha Padmanabha*

MILLIKAN SCHOLARSHIP

Awarded to selected freshmen whose records of personal and academic accomplishment are judged outstanding among the remarkable group of incoming freshmen.

1993 *Wei-Hwa Huang, Jennie Yoder*

1994 *Myfanwy Galadriel Truth Callahan, Jeremiah Michael Mans*

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.

1997 *Phillip Charles Rodriguez III*

1998 *Karen Mercedes Bletzer, Myfanwy Galadriel Truth Callahan*

RODMAN W. PAUL HISTORY PRIZE

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

1997 *Amy Marie Zheng*

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.

1996 *Rowena Lohman*

1997 *Rowena Lohman*

HERBERT J. RYSER MEMORIAL SCHOLARSHIPS

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

1996 *Victoria M. Tanusheva*

1997 *Kerwyn Casey Huang, Benjamin David Miller*

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.

1997 *Alexander Robert Dunn*

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.

1997 *Eduardo A. Repetto*

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.

- 1995 *Robert John McKay Sides*
1996 *Kristie Lee Armentrout*
 Michaelleen Bell Callahan
 Myfanwy Galadriel Truth Callahan
 Zane Alexander Crawford
 Lori Chu-yun Hsu
 Hiroshi Ishii
 Advoquita Pajunar Stude
1997 *Timothy Donald Henson*
 Erin Margaret Lynch
 Jeanne Marie Wilson
 Irene Chi-Sun Wong

SIGMA XI AWARD

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

- 1998 *Victoria M. Tanusheva*

JOHN STAGER STEMPLER 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.

- 1995 *David Wardell Hogg*
1996 *Hideo Mabuchi*

PAUL STUDENSKI MEMORIAL FUND PRIZE

Travel grant awarded to Caltech undergraduates 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.

- 1998 *Sara Alexandra Beaber, David Shane Ross*

ALAN R. SWEEZY PRIZE IN ECONOMICS

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

1998 *Daniel Michael Kleiman*

CHARLES WILTS PRIZE

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

1998 *Malik Magdon-Ismail*

FREDERICK J. ZEIGLER MEMORIAL AWARD

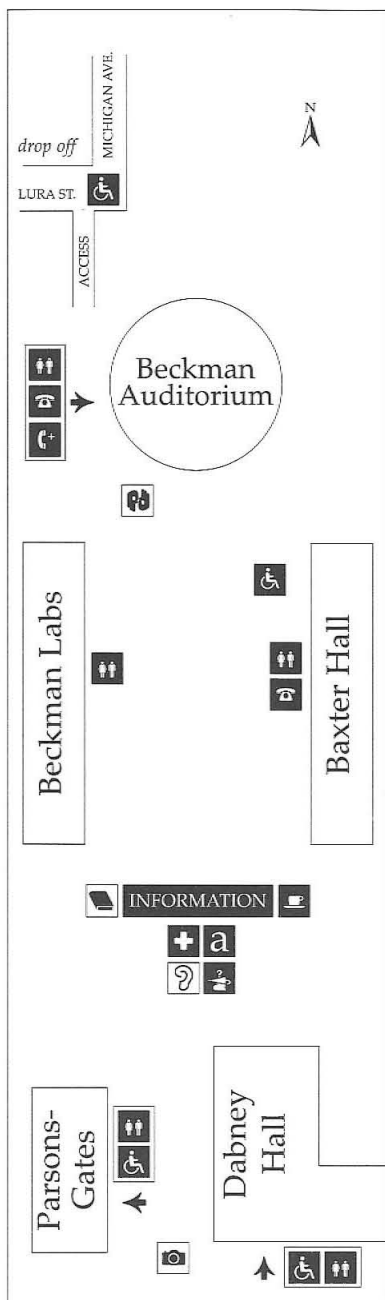
Awarded to an outstanding sophomore or junior in pure or applied mathematics, for excellence in scholarship as demonstrated in class activities or in the preparation of an original paper or essay in any subject area.

1996 *Mason Alexander Porter*








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.