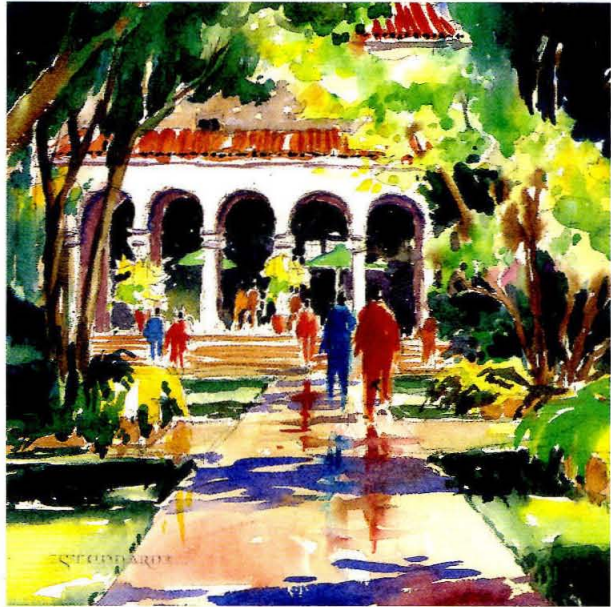


CALIFORNIA INSTITUTE *of* TECHNOLOGY



*One Hundred and Second  
Annual Commencement*

*June 14, 1996*

Cover illustration of Caltech's Olive Walk  
by Joseph Stoddard

CALIFORNIA INSTITUTE OF TECHNOLOGY

*One Hundred and Second*  
*Annual*  
*Commencement*

FRIDAY MORNING AT TEN O'CLOCK  
JUNE FOURTEENTH, NINETEEN NINETY-SIX

# About Caltech

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

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

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

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

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



# *About the Speaker*

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

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

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

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



# The Commencement Ceremony

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

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

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

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

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

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

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

David C. Elliot  
Professor of History, Emeritus

# *Academic Procession*

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

*Marshals*

Arden L. Albee, Ph.D.

Noel Robert Corngold, Ph.D.

Joel N. Franklin, Ph.D.

D. Roderick Kiewiet, Ph.D.

David Wales, Ph.D.

Ward Whaling, Ph.D.

*Faculty Officer*

Robert H. Grubbs, Ph.D.

## MARCHING ORDER

CANDIDATES FOR THE DEGREE OF BACHELOR OF SCIENCE

CANDIDATES FOR THE DEGREE OF MASTER OF SCIENCE

CANDIDATES FOR THE DEGREE OF ENGINEER

CANDIDATES FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

FACULTY OFFICERS

THE FACULTY

THE CHAIRS OF THE DIVISIONS

THE DEANS

THE PROVOST

THE TRUSTEES

THE COMMENCEMENT CHAPLAIN

THE COMMENCEMENT SPEAKER

THE PRESIDENT

THE CHAIR OF THE BOARD OF TRUSTEES

# Program

- ORGAN PRELUDE . . . . . Leslie J. Deutsch, Ph.D.
- PROCESSIONAL . . . . . The Caltech Convocations Brass  
and Percussion Ensemble  
*William Bing, M.M., Conductor*
- PRESIDING . . . . . Gordon E. Moore, Ph.D.  
*Chair of the Board of Trustees  
California Institute of Technology*
- INVOCATION . . . . . The Reverend Dr. Eric Michael Smith  
*Pastor  
Holliston United Methodist Church*
- "PUSHING THE FRONTIERS OF A  
RAPIDLY CHANGING WORLD" . . . . . Bobby Ray Inman  
*Admiral, U.S. Navy (retired)*
- CHORAL SELECTION . . . . . The Caltech Glee Clubs  
*Donald G. Caldwell, D.M.A., Conductor*
- "Hallelujah" from *Messiah*  
George Frederick Handel  
*(The audience will please rise during the singing of the "Hallelujah" chorus.)*
- CONFERRING OF DEGREES . . . . . Thomas E. Everhart, Ph.D.  
*President  
California Institute of Technology*

## PRESENTATION OF CANDIDATES FOR DEGREES

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

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

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

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

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

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

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

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

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

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

## ANNOUNCEMENT OF AWARDS AND

CONCLUDING REMARKS . . . . . President Everhart

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

BENEDICTION . . . . . The Reverend Dr. Smith

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

ORGAN POSTLUDE . . . . . Dr. Deutsch

# Candidates for Degrees

## BACHELOR OF SCIENCE

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

*Students whose names are followed by an asterisk are being graduated with honor in accordance with a vote of the faculty.*

BACHELOR OF SCIENCE — *Continued*

Amalavoyal Narasimha Chari\* *Calcutta, India* Mathematics and Economics  
David Emilio Chavez\* *Ranchos de Taos, New Mexico* Chemistry  
Anand Chelian *Seal Beach, California* Engineering and Applied Science  
Christine Hsiao-ch'ing Chen *Irvine, California* Physics  
Li-Shing Lyndon Chen *College Station, Texas* Engineering and Applied Science  
Richard Wei-Heng Chin *Bethesda, Maryland* Engineering and Applied Science  
David Sunbo Choi *Los Angeles, California* Economics  
Soon Ghee Chua\* *Republic of Singapore* Electrical Engineering and Economics  
Rudi Langston Cilibrasi *Sacramento, California* Engineering and Applied Science  
Matthew Allen Clapp *Bloomington, Minnesota* Electrical Engineering  
Andrew Brian Clarke\* *Hollywood, Florida* Engineering and Applied Science and Literature  
Keith Mansfield Counsell *Baltimore, Maryland* Engineering and Applied Science  
David Allen Cuthbert *Escondido, California* Engineering and Applied Science  
Jeremiah Kane Darling\* *Albuquerque, New Mexico* Physics  
Michael Craig Deierling *Des Moines, Iowa* History  
Jeffrey T. Denniston *Prospect, Pennsylvania* Mathematics  
Scott McKinley DeWinter\* *Anchorage, Alaska* Engineering and Applied Science  
Jeffrey M. Dickert *Seattle, Washington* Applied Physics  
Eric Scott Dickson\* *Long Beach, California* Physics  
Thomas Louis Dmukauskas\* *Cicero, Illinois* Engineering and Applied Science  
Kevin Lee Du\* *Greenwich, Connecticut* Biology and Literature  
Brendan Patrick Keegan Dunn *Minneapolis, Minnesota* Engineering and Applied Science  
Leonard Dvorson\* *Newton, Massachusetts* Physics  
Donna Michelle Ebenstein\* *Concord, California* Engineering and Applied Science and Biology  
Christopher Robert Echols *Olathe, Kansas* Engineering and Applied Science  
Daniel Trawick Egnor *Penn Yan, New York* Engineering and Applied Science  
Dariush Edward Ehsani\* *Creve Coeur, Missouri* Mathematics  
Bryce Mildon Engelbrecht\* *Sapulpa, Oklahoma* Engineering and Applied Science  
Blair Richard Essy\* *Portland, Oregon* Chemistry  
Mintao Fan\* *Pugi, China* Biology and Mathematics  
Arsalan Farooq *Nairobi, Kenya* Engineering and Applied Science  
Ghene Erwin Faulcon *Raleigh, North Carolina* Mathematics  
Anatole Faykin *Philadelphia, Pennsylvania* Biology and Engineering and Applied Science  
Christopher Lawrence Foley *Carpinteria, California* Engineering and Applied Science  
Venkataraman Vishnampet Ganesan\* *Coimbatore, India* Engineering and Applied Science

BACHELOR OF SCIENCE — *Continued*

- Christopher Lowell Gerardy *Louisville, Colorado* Astronomy  
Matthew James Goff\* *Chicopee, Massachusetts* Chemical Engineering  
Alex Golovitser *New York, New York* Physics  
Robert Anton Granat\* *Brooklyn, New York* Engineering and Applied Science  
Eugene Grayver *Los Angeles, California* Electrical Engineering  
Michael Christopher Greene *El Toro, California* Engineering and Applied Science  
Francisco Javier Gutiérrez *Cuauhtémoc, Mexico* Engineering and Applied  
Science and Economics  
Christopher Dale Hance\* *Puyallup, Washington* Engineering and Applied Science  
Daniel Jeffrey Hanish *Omaha, Nebraska* Physics  
Stephanie D. Haussmann *Torrance, California* Biology  
Eric S. Hill *Houghton Lake, Michigan* Engineering and Applied Science  
Heidi Jean Hofer *Glassboro, New Jersey* Physics  
Justin Howard Howell *Sunnyvale, California* Astronomy  
Jason Chung-Shiang Hsu\* *Brea, California* Applied Mathematics and Economics  
Victor Yu-Ching Hsu\* *Alhambra, California* Biology  
John Michael Hubenschmidt *Sugar Land, Texas* Mathematics  
Colin James Humphries *Albuquerque, New Mexico* Biology  
Chou Po Hung *Chico, California* Biology  
Christopher John Hunter\* *Anchorage, Alaska* Engineering and Applied Science  
Rachel Olivia Hunter *Modesto, California* Biology  
José Miguel Hurtado, Jr.\* *Fairfield, California* Geology  
Xinh Xinh Huynh\* *San Francisco, California* Physics  
Michael Edwin Ichiri *Honolulu, Hawaii* Biology  
Roman Jarosiewicz\* *Tremont, Illinois* Engineering and Applied Science  
Walter Curtis Jones III *Bloomfield Hills, Michigan* Economics  
Adil Mahmood Karim\* *San Diego, California* Applied Physics  
Mihoko Kato *Los Angeles, California* Chemistry  
Brian Lee Katon *Deadwood, South Dakota* Engineering and Applied Science and  
Economics  
Clifton Hiroichi Kayano\* *Kaneohe, Hawaii* Electrical Engineering  
Stacy Ann Kerkela *Athens, Georgia* Geophysics  
Jay-Steven Yap Kho *Walnut, California* Electrical Engineering  
Brian Sanghoon Kim\* *Upland, California* Biology  
Paul Choi Kim *Houston, Texas* Engineering and Applied Science  
Seong-Youn Brenda Kim *Los Angeles, California* Engineering and Applied Science and  
Biology  
Tae Hyung Kim\* *Seoul, Korea* Engineering and Applied Science  
John David Heaton King *San Diego, California* Engineering and Applied Science



BACHELOR OF SCIENCE — *Continued*

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

BACHELOR OF SCIENCE — *Continued*

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

BACHELOR OF SCIENCE — *Continued*

Devabhaktuni Srikrishna\* *Tenali, India* Mathematics  
Divya Srinivasan\* *Eden Prairie, Minnesota* Independent Studies Program  
Gregory Joseph Steiert *Portland, Oregon* Electrical Engineering  
David E. Stephenson *Torrance, California* Engineering and Applied Science  
Donovan Aaron Stevens *Porterville, California* Geology  
Vivek Anand Sujar\* *Bombay, India* Engineering and Applied Science  
Marc Allen Sulfridge\* *Boise, Idaho* Engineering and Applied Science  
David Alan Tahmoush\* *Haddon Township, New Jersey* Physics  
Renny Sandra Talianchich *Houston, Texas* Engineering and Applied Science  
Craig Shigeru Tanaka\* *Gardena, California* Engineering and Applied Science and Economics  
Haiyun Tang\* *Shanghai, China* Applied Physics  
Kathryn Chuan Tao *Rancho Santa Fe, California* Engineering and Applied Science  
Andrew Chanan Tong\* *Beaumont, Texas* Physics  
Thanh Nga Trinh Tran\* *Las Vegas, Nevada* Chemical Engineering  
Steve Fu-Min Tsai\* *Alhambra, California* Biology  
Doris Ying Tsao\* *Silver Spring, Maryland* Biology  
Helen Wan-Chu Tsao *Oxnard, California* Engineering and Applied Science  
Jian-Jin Tuan\* *Kirkland, Washington* Electrical Engineering  
Tamara Lynne Tulou *McLean, Virginia* Electrical Engineering  
Eric Joseph Uhrhane *Morristown, New Jersey* Engineering and Applied Science  
Paul Robert Upchurch *Houston, Texas* Engineering and Applied Science  
Sean Alan Upchurch *Houston, Texas* Chemistry  
Hatice Sertac Uysal *Istanbul, Turkey* Economics  
David R. Vaughn *Lake Jackson, Texas* Economics  
Sean Michael Vellucci\* *Lawrence, Kansas* Biology  
Laura Elizabeth Verhoff *Sarasota, Florida* Engineering and Applied Science  
Adam Neil Maximilian Villani *Long Beach, California* Geology  
Michael James Vogel *Beavercreek, Ohio* Engineering and Applied Science  
Kenneth Antrim Walsh *San Diego, California* Electrical Engineering  
David Wang\* *Houston, Texas* Biology  
Shultz Hsu Shih Wang *Elmhurst, New York* Electrical Engineering  
Samuel Michael Webb\* *Kalamazoo, Michigan* Geochemistry  
Nathan Andrew Weller *Elko, Nevada* Electrical Engineering  
Jon Robert Wesselmann\* *Woodstock, Georgia* Applied Physics  
Lyndie Ruth Williamson *Palo Alto, California* Applied Physics  
Stephen Wong\* *Los Angeles, California* Biology  
Joy Kaoru Yamamoto\* *San Mateo, California* Chemistry  
Hunyue Yau *Chicago, Illinois* Electrical Engineering

BACHELOR OF SCIENCE — *Continued*

Wayne Hiroshi Yoshida *Monterey Park, California* Chemical Engineering

Nam Chul Yu\* *Huntington Beach, California* Biology

Inn Huam Yuk\* *Singapore* Chemistry

Kenneth Michealovitch Zenfeldmann *Lake Oswego, Oregon* Engineering and Applied Science

Jian Zhang\* *Santa Ana, California* Biology

Ning Zhang\* *Tainjin, China* Applied Physics

Xinlan Zhou\* *Beijing, China* Physics

Daniel Marc Zimmerman\* *Randolph, New Jersey* Engineering and Applied Science and Science, Ethics, and Society

Saiful Azrin Zulkifli *Kuala Lumpur, Malaysia* Electrical Engineering

## MASTER OF SCIENCE

- Mark Joseph Abolins (*Geology*) A.B., University of California, Berkeley 1992.
- Keri Ann Aivazis (*Mechanical Engineering*) B.S., Southern Methodist University 1994.
- Khaled H. A. E. Al-Khaldi (*Chemical Engineering*) B.Sc., Kuwait University 1992.
- YanJun An (*Chemical Engineering*) B.E., Tsinghua University 1990; M.S., 1992.
- Alyssa Beth Apsel (*Electrical Engineering*) B.S., Swarthmore College 1995.
- Brian Michael Balchunas (*Chemical Engineering*) B.S.E., The University of Michigan 1994.
- Elizabeth Anne Boer (*Applied Physics*) B.Sc., McGill University 1994.
- Paul Martin Bridger (*Applied Physics*) B.Sc., University of Waterloo 1994.
- Susan Kanper Brookhart (*Chemistry*) B.A., Amherst College 1992.
- Brian Christopher Broom (*Materials Science*) B.S., North Carolina State University 1994.
- Paul Whitton Carter (*Physics*) B.A. (*Mathematics*), B.A. (*Physics*), Rice University 1993.
- Hou-Pu Chou (*Electrical Engineering*) B.S., National Taiwan University 1993.
- Kenneth Thor Christensen (*Mechanical Engineering*) B.S., The University of New Mexico 1995.
- Thomas Franklin Clymer (*Aeronautics*) B.S., Michigan State University 1995.
- Amish Suresh Desai (*Electrical Engineering*) B.S., University of California, Los Angeles 1993.
- Matthew Anthony Dilligan (*Mechanical Engineering*) B.S., Yale College 1995.
- Mark Edward Duttweiler (*Mechanical Engineering*) B.S., Rice University 1995.
- Tyler Allen Erickson (*Civil Engineering*) B.S., Colorado State University 1993.
- Chenggong Charles Fan (*Electrical Engineering*) B.E., The Cooper Union 1995.
- Xiaolin Feng (*Electrical Engineering*) B.E., Tsinghua University 1994.
- Mikhail Georgievich Filippov (*Social Science*) Diploma, Moscow State University 1989; M.A., University of California, Riverside 1993.
- Simone Francis (*Mechanical Engineering*) A.S., Borough of Manhattan Community College 1992; B.E., The City College of New York 1995.
- Alfonso García Portilla (*Aeronautics*) B.S., Instituto Tecnológico de Veracruz 1994.
- Laura Elizabeth Grego (*Physics*) B.S., The University of Michigan 1992.
- Freddy Hansen (*Applied Physics*) M.Sc., Chalmers University of Technology 1993.
- Bryce William Harrington (*Aeronautics*) B.S., University of Southern California 1994.
- Alexa Welsh Harter (*Physics*) Sc.B., Brown University 1991.
- Gavin Bernard Horn (*Electrical Engineering*) B.A.Sc., University of Toronto 1995.
- Ying Huang (*Applied Mechanics*) B.E., Tsinghua University 1995.
- Lara Shane Hughes (*Environmental Engineering Science*) B.S., Washington University 1994.
- José Miguel Hurtado, Jr. (*Geology*) B.S., California Institute of Technology 1996.
- Dan Istrate (*Mechanical Engineering*) Engineer, Polytechnic Institute of Bucharest 1992.
- Yong-Nam Jun (*Physics*) A.B., Princeton University 1994.

MASTER OF SCIENCE — Continued

- Rolf William Kaiser (*Mechanical Engineering*) B.S., Stanford University 1995.
- Hunsuk Kim (*Applied Physics*) B.S., Seoul National University 1989; M.S., 1991.
- Ninfa Cynthia Korf (*Electrical Engineering*) B.S., New Mexico State University 1994.
- Roger Gerard Matthias Paul Koumans (*Electrical Engineering*) B.S., Eindhoven University of Technology 1994; M.S., 1994.
- Olga Kuchner (*Chemical Engineering*) A.B., Harvard College 1994.
- Guruswamy Kumaraswamy (*Chemical Engineering*) B.Tech., Indian Institute of Technology, Bombay 1994.
- Doris L. Lee (*Chemical Engineering*) S.B., Massachusetts Institute of Technology 1994.
- Maurice Yao-Tze Lee (*Computation and Neural Systems*) B.S., Wheaton College 1987.
- Reginald Kai Ming Lee (*Applied Physics*) B.A.Sc., University of Toronto 1994.
- Paul Scott LeMahieu (*Electrical Engineering*) B.S., University of Wisconsin-Madison 1994.
- Ying Li (*Mechanical Engineering*) B.S., Tsinghua University 1994.
- Hong Liao (*Environmental Engineering Science*) B.S., Peking University 1986; M.S., 1989.
- Rong Lu (*Physics*) B.A., Middlebury College 1993.
- Dragan Stanislav Marić (*Electrical Engineering*) B.S.E.E., The University of Belgrade 1994.
- Jason L. Maron (*Physics*) B.S. (*Mathematics*), B.S. (*Physics*), University of Wisconsin-Madison 1993.
- Kyu Sung Min (*Materials Science*) B.S., University of California, Los Angeles 1994.
- Erica Stacy Mintzer (*Social Science*) B.A., Tufts University 1990; J.D., University of Pennsylvania 1993.
- Nathan Alan Niemi (*Geology*) B.A., Cornell University 1994.
- Muriel Andre Noca (*Mechanical Engineering*) Ingénieur, École Polytechnique Feminine 1993.
- Julie Jeannine Norris (*Geophysics*) B.S., University of California, Los Angeles 1993.
- Sumit Pandey (*Chemical Engineering*) B.Tech., Institute of Technology, Banaras Hindu University 1994.
- Eric Charles Piquette (*Applied Physics*) B.S., Colorado School of Mines 1993.
- Dan Raymond Provenzano (*Applied Physics*) B.S., University of California, Santa Barbara 1994.
- Christina Michelle Ramirez (*Social Science*) B.A., The University of Texas at Austin 1994.
- Hongyu Ran (*Mechanical Engineering*) B.S., University of Science and Technology of China 1995.
- Rajan Ranga (*Electrical Engineering*) B.S., California Institute of Technology 1995.
- Mike Anthony Reddig (*Chemical Engineering*) B.S., Northwestern University 1994.
- Marc Alexis Rieffel (*Computer Science*) B.A., B.S., Swarthmore College 1994.
- Wayne Michael Ringelberg (*Aeronautics*) B.S., United States Air Force Academy 1987.

MASTER OF SCIENCE — *Continued*

- Clarence Worth Rowley III (*Mechanical Engineering*) B.S.E., Princeton University 1995.
- Fintan Danh Ryan (*Physics*) S.B. (*Electrical Engineering*), S.B. (*Physics*), Massachusetts Institute of Technology 1992.
- Sandeep Bhalchandra Sane (*Aeronautics*) B.Tech., Indian Institute of Technology, Bombay 1995.
- Jason Charles Schense (*Chemical Engineering*) S.B., Massachusetts Institute of Technology 1994.
- Stefan Schlamp (*Aeronautics*) B.S., Stuttgart University 1994.
- Eve Meryl Schooler (*Computer Science*) B.S., Yale College 1983; M.S., University of California, Los Angeles 1988.
- Armin Schwartzman (*Electrical Engineering*) B.Sc., Technion — Israel Institute of Technology 1995.
- Peter Robert Seidel (*Chemical Engineering*) B.S.E., Princeton University 1994.
- Fred Serricchio (*Mechanical Engineering*) B.S., Rensselaer Polytechnic Institute 1994.
- Claude N. L. Seywert (*Aeronautics*) Diplom, Eidgenossische Technische Hochschule Zurich 1991; Schlussdiplom, 1995.
- Nirao Mahesh Shah (*Biology*) M.B., B.S., Seth G. S. Medical College 1992.
- Jerry Wei-Jen Shan (*Aeronautics*) B.S., California Institute of Technology 1995.
- Amy Shaw (*Chemistry*) A.B., Bryn Mawr College 1991.
- Wanwimol Siriawatwechakul (*Chemical Engineering*) B.S., Chulalongkorn University 1994.
- Aimée Louise Smith (*Applied Physics*) B.S., California Institute of Technology 1993.
- Jan Karsten Speth (*Applied Physics*) B.A., Cornell University 1991.
- Theron Jay Stanford (*Electrical Engineering*) B.S., Cornell University 1995.
- Atsushi Sugitatsu (*Electrical Engineering*) B.S., Kyoto University 1988.
- Lixin Tang (*Biology*) B.S., University of Science and Technology of China 1989; M.S., 1992.
- Dhirajlal Dayalji Thakkar (*Astronomy*) B.Tech., Indian Institute of Technology, Bombay 1987.
- Steven Ronald Tsitas (*Planetary Science*) B.S., The University of Melbourne 1988; M.S., California State University, Fresno 1991.
- Sergey Dmitrievich Tsyplakov (*Social Science*) Diploma, Moscow Institute of Physics and Technology 1990.
- Charles Anthony Vanelli (*Mechanical Engineering*) B.S.E.E., The University of Texas at Austin 1993.
- Tobias Voelkl (*Aeronautics*) Vordiplom, Technische Universität München 1993.
- Marijana Vukićević (*Electrical Engineering*) B.S., University of Belgrade 1994.
- Fang Wang (*Social Science*) B.A., Institute of International Relations 1991.
- Xuanqi Wang (*Electrical Engineering*) B.S., Tsinghua University 1989.
- Jerrell Richard Watts (*Computer Science*) B.S., The University of Texas at Austin 1994.
- Samuel Michael Webb (*Environmental Engineering Science*) B.S., California Institute of Technology 1996.

## MASTER OF SCIENCE — *Continued*

- Roberto Antonio Weber (*Social Science*) B.A., Texas A&M University 1994.
- Lianxing Wen (*Geophysics*) B.S., University of Science and Technology of China 1988.
- Joyce Yuen-Wah Wong (*Electrical Engineering*) B.S., California Institute of Technology 1995.
- Timothy Chang-Wei Wu (*Chemical Engineering*) B.S., University of Illinois at Urbana-Champaign 1988.
- Tao Xiang (*Electrical Engineering*) B.E., Southeast University 1992; M.S., 1995.
- Lihao Xu (*Electrical Engineering*) B.S., Shanghai Jiao Tong University 1988; M.S., 1991.
- Chung-hei Yeung (*Chemical Engineering*) B.S., Case Western Reserve University 1993.
- Su Yin (*Mechanical Engineering*) B.S., University of Science and Technology of China 1992; M.S., Shanghai Institute of Optics and Fine Mechanics 1995.
- Jin Yu (*Social Science*) B.A., Institute of International Relations 1991; M.A., University of Arkansas 1994.
- Yair Zadik (*Computer Science*) B.S., California Institute of Technology 1993.
- Mark Donald Zeleznock (*Aeronautics*) B.S., University of California, Berkeley 1995.
- Hui Zhang (*Planetary Science*) B.S., Peking University 1992.
- Mei Zhu (*Chemistry*) B.S., Fudan University 1988; M.A., Rice University 1993.
- Denis N. Zorin (*Computer Science*) B.S., Moscow Institute of Physics and Technology 1991; M.S., Ohio State University 1993.

## ENGINEER

- Bahadır Erimli (*Electrical Engineering*) B.S., Middle East Technical University 1992; M.S., California Institute of Technology 1993.



# DOCTOR OF PHILOSOPHY

## DIVISION OF BIOLOGY

- Roger Francis Anderson (*Biology*) A.A., Mount San Antonio College 1984; B.A., University of California, San Diego 1987.  
Thesis: Characterization of the Sea Urchin Homologue of the Replication Factor A 70 kD Subunit and the Novel Interspersed Repeat Family to Which It Binds.
- Thomas Mark Annau (*Computation and Neural Systems*) B.S., Stanford University 1991.  
Thesis: Models of Visual Feature Detection and Spike Coding in the Nervous System.
- Michelle L. Apperson (*Cellular and Molecular Neurobiology*) B.A., University of California, San Diego 1988.  
Thesis: Molecular Analysis of the Postsynaptic Density: Cloning and Characterization of Densin-180, a Novel Postsynaptic Density-Associated Adhesion Molecule.
- Eric Arthur Arn (*Molecular Biology and Biochemistry*) B.S., Worcester Polytechnic Institute 1988.  
Thesis: The 2'-5' RNA Ligase of *Escherichia coli*: Purification, Cloning, and Investigations of *in vivo* Function.
- Wyeth Bair (*Computation and Neural Systems*) B.S., The Pennsylvania State University 1988.  
Thesis: Analysis of Temporal Structure in Spike Trains of Visual Cortical Area MT.
- Cecilie Boysen (*Immunology*) Cand. Scient., University of Copenhagen 1990.  
Thesis: Analysis of the Human T Cell Receptor  $\alpha/\delta$  Locus: New Approaches to Mapping and Sequencing.
- Jonathan Christopher Robert Bradley (*Biology*) B.S., State University of New York at Stony Brook 1988.  
Thesis: Molecular Analysis of Olfactory Signal Transduction.
- Michael Samuel Lewicki (*Computation and Neural Systems*) B.S., Carnegie Mellon University 1989.  
Thesis: Neural Representation of Auditory Temporal Structure.
- Chiang-Shan Ray Li (*Computation and Neural Systems*) B.S., National Taiwan University 1989.  
Thesis: Macaque Lateral Intraparietal Area and Oculomotor Behaviors.
- John Michael Montgomery (*Cellular and Molecular Neurobiology*) B.A., Trinity College, Dublin 1989.  
Thesis: Cell Migration Domains in the Chick Telencephalon.
- Josée Morissette (*Computation and Neural Systems*) B.Sc., McGill University 1988.  
Thesis: Plasticity in Mammalian Somatosensory Cerebellar Maps.
- Ardem Patapoutian (*Biology*) B.Sc., University of California, Los Angeles 1990.  
Thesis: The Role of the MyoD Family Genes during Mouse Development.
- Christopher John Schoenherr (*Biology*) B.S., The University of Michigan 1986.  
Thesis: The Neuron Restrictive Silencer Factor: A Coordinate Repressor of Neuronal Genes.

*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*

Erich Marquard Schwarz (*Molecular Biology and Biochemistry*) B.A., Harvard College 1986.

Thesis: Calx, A Sodium-calcium Exchanger of *Drosophila melanogaster*.

Jennifer Yun-Man Sun (*Biology*) B.A., University of California, Berkeley 1991.

Thesis: Three-Dimensional Shape from Shading: Perception and Mechanisms.

DIVISION OF CHEMISTRY AND CHEMICAL ENGINEERING

Kraig Knute Anderson (*Chemistry*) B.Chem., University of Minnesota 1989.

Thesis: An Improved Model for One-Dimensional Polaronic Ferromagnetism: Poly-*meta*-phenylenefuchsones.

Jean Marie Andino (*Chemical Engineering*) S.B., Harvard College 1988; M.S., California Institute of Technology 1993.

Thesis: Experimental and Theoretical Studies of Reactions Important in Photochemical Smog: Aromatics and Alkanes.

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

Thesis: Electron-Transfer in Covalently Coupled Donor-Acceptor Complexes.

Ramesh Baliga (*Chemistry and Biology*) M.Sc., Indian Institute of Technology, Bombay 1990.

Thesis: Analysis of Nucleoprotein Complexes Formed by *E. coli* RecA Protein Using Affinity Cleavage.

Robert Edward Blake, Jr. (*Chemistry*) B.A., University of California, San Diego 1989.

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

Kara Lynne Bren (*Chemistry*) B.A., Carleton College 1991.

Thesis: Structurally Engineered Cytochromes *c* with Novel Ligand-Binding Properties.

Donna Marie Campisi (*Chemistry*) B.A., New York University 1988; M.A., Columbia University 1989.

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

Junhyeong Cho (*Chemistry*) B.S., Seoul National University 1986; M.S., 1988.

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

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

Thesis: Photooxidative and Photoreductive Degradation of Chlorinated Hydrocarbons on Aqueous Titanium Dioxide Colloids.

Jérôme Clavier (*Chemistry*) D.E.A., École Normale Supérieure de Lyon 1990.

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

Natalia Colocci (*Chemistry*) B.A., Princeton University 1991.

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

DOCTOR OF PHILOSOPHY — Continued

- Donald Dabdub (*Chemical Engineering*) B.S., Lehigh University 1990; M.S., California Institute of Technology 1992.  
Thesis: Mathematical Modeling of Air Pollution Dynamics by Parallel Computation.
- Christopher Bruce Dartt (*Chemical Engineering and Chemistry*) B.S.E., Princeton University 1991; M.S., California Institute of Technology 1993.  
Thesis: Synthesis and Characterization of Titanium-Containing Molecular Sieves.
- Michael W. Day (*Chemistry*) B.S., California State University, Northridge 1988; M.S., 1990.  
Thesis: X-Ray Crystallographic Studies on Electron Transfer Proteins; Rubredoxin from *Pyrococcus furiosus*, Nitrogenase MoFe from *Azotobacter vinelandii* and Ru(2,2'-bipy)<sub>2</sub>(imd)His83 Azurin from *Pseudomonas aeruginosa*.
- Simone Loureiro De Oliveira (*Chemical Engineering*) Chemical Technician, Escola Técnica Federal de Química 1985; M.Sc., Universidade Federal do Rio de Janeiro 1990.  
Thesis: Model Predictive Control (MPC) for Constrained Nonlinear Systems.
- Antonio Figl (*Chemistry and Biology*) B.A., University of California, San Diego 1989.  
Thesis: Structure-Function Analysis of the  $\beta$  Subunit of Neuronal Nicotinic Acetylcholine Receptors.
- Jonathan Eric Forman (*Chemistry*) B.S., California State University, San Bernardino 1990.  
Thesis: Non-Covalent Interactions in Aqueous Media: Molecular Recognition Studies Through Circular Dichroism and Self-Assembly of Discrete Aggregates.
- Hali Janine Lana Forstner (*Chemical Engineering and Environmental Engineering Science*) B.Sc., University of Calgary 1991; M.S., California Institute of Technology 1993.  
Thesis: Aerosol Formation from Atmospheric Hydrocarbon Photooxidation.
- James J. Gerdy (*Chemistry*) B.A., The University of Chicago 1989.  
Thesis: Accurate Interatomic Potentials for Simulations.
- Vinay Kumar Gupta (*Chemical Engineering*) B.Tech., Indian Institute of Technology, Bombay 1990; M.S., California Institute of Technology 1993.  
Thesis: Controlling Molecular and Microstructural Alignment in Anisotropic Polymer Systems.
- Tamara Lynn Hendrickson (*Chemistry*) B.A., Wellesley College 1990.  
Thesis: Insights into the Mechanism of Asparagine-Linked Glycosylation: Kinetic Studies with Substrates and Inhibitors.
- Jennifer Lynn Herek (*Chemistry*) B.A., Lawrence University 1990.  
Thesis: Femtochemistry and Reactive Intermediates: Application to Atmospheric and Organic Chemistry.
- Ralf H. Höchemer (*Chemical Engineering and Environmental Engineering Science*) Vordiplom, Technische Hochschule Darmstadt 1988; Diplom, 1991; M.S., California Institute of Technology 1995.  
Thesis: Degradation of Organic Compounds by Acoustic Cavitation and Pulsed-Power Discharges.

DOCTOR OF PHILOSOPHY — *Continued*

- Fredrick William Irion (*Chemical Engineering and Planetary Science*) B.A.Sc., University of Ottawa 1989; M.S., California Institute of Technology 1992.  
Thesis: Analyses of Atmospheric  $\text{CHF}_2\text{Cl}$ , Heavy Ozone, HDO and  $\text{CH}_3\text{D}$  from ATMOS Spectra.
- Yonchu Jenkins (*Chemistry*) A.B., Occidental College 1990.  
Thesis: Dipyrrophenazine Complexes of Ruthenium(II) as Luminescent Reporters of DNA.
- Matthew Stanley Johnson (*Chemistry*) B.A., Macalester College 1989.  
Thesis: Spectroscopy of Reactive Molecules and Clusters.
- James J. Kelly (*Chemistry*) A.B., Cornell University 1991.  
Thesis: Binding Site Size Limitations of Imidazole-Pyrrole Polyamides for Recognition in the Minor Groove of DNA.
- John Edwin Lewis, Jr. (*Chemical Engineering*) B.S., Texas A&M University 1991; M.S., California Institute of Technology 1993.  
Thesis: Characterization and Permeation Studies on Oriented Single-Crystal Ferrierite Membranes.
- John Aaron Marohn (*Chemistry*) B.A., B.S., University of Rochester 1989.  
Thesis: 1. Optical Nuclear Magnetic Resonance Analysis of Epitaxial Gallium Arsenide Structures. 2. Multiple-Pulse Radio-Frequency-Gradient Nuclear Magnetic Resonance Imaging of Solids.
- Scot Turnbull Martin (*Chemistry*) B.S., Georgetown University 1991.  
Thesis: Photocatalyzed Destruction of Chlorinated Hydrocarbons.
- Sherrill Lynn Minch (*Chemical Engineering and Biology*) S.B. (*Chemical Engineering*), S.B. (*Life Sciences*), Massachusetts Institute of Technology 1990; M.S., California Institute of Technology 1993.  
Thesis: Engineering Protein Glycosylation in Chinese Hamster Ovary Cells: Genetic Manipulations, Global Glycoprotein Analysis, and Studies of Environmental Influences.
- Kimberly Ann Mislick (*Chemical Engineering*) S.B., Massachusetts Institute of Technology 1991; M.S., California Institute of Technology 1993.  
Thesis: The Role of Proteoglycans in the Delivery of Cationic-DNA Complexes and Enhanced Delivery by Folate Receptor-Mediated Endocytosis.
- Tadashi Jack Mizoguchi (*Chemistry*) A.B., Harvard College 1990.  
Thesis: Probing the Role of the Active-Site Cysteine of Azurin by Site-Directed Mutagenesis.
- Jeffrey Charles Moore (*Chemical Engineering and Biology*) B.S., North Carolina State University 1989; M.S., California Institute of Technology 1992.  
Thesis: Tailoring Enzyme Catalysts by Directed Evolution.
- Jeffrey Franklin Morris (*Chemical Engineering*) B.Ch.E., Georgia Institute of Technology 1989; M.S., California Institute of Technology 1991.  
Thesis: Suspensions: Microstructure, Diffusion, and Inhomogeneous Flow.
- Siegfried M. Musser (*Chemistry*) A.B., University of California, Berkeley 1990.  
Thesis: The Proton Translocation Mechanisms of the Cytochrome  $b_0$ -type Ubiquinol Oxidase Complex and the Mitochondrial Cytochrome  $c$  Oxidase Complex.

DOCTOR OF PHILOSOPHY — *Continued*

- Michelle E. Parks (*Chemistry*) B.S., Furman University 1991.  
Thesis: Sequence-Specific Recognition of DNA by Pyrrole-Imidazole Hairpin Polyamides.
- Eldon Scott Priestley (*Chemistry*) B.S., Texas A&M University 1991.  
Thesis: Energetics of Triple Helix Formation by Oligonucleotides Containing Nonnatural Bases.
- Keith W. Rickert (*Chemistry*) B.S., Yale University 1990.  
Thesis: Protein Glycosylation: Substrate Selectivity and Conformational Consequences.
- Susan Felicia Rubin (*Chemical Engineering*) S.B., Massachusetts Institute of Technology 1991; M.S., California Institute of Technology 1993.  
Thesis: Viscoelasticity and Dynamics of Alignment in Side-Group Liquid-Crystalline Polymers.
- Lynn Monica Russell (*Chemical Engineering*) B.S., Stanford University 1991; M.S., California Institute of Technology 1993.  
Thesis: The Physics and Chemistry of Marine Aerosols.
- Deborah Rebecca Shnek (*Chemical Engineering and Chemistry*) S.B., Massachusetts Institute of Technology 1989; M.S., California Institute of Technology 1991.  
Thesis: Targeting of Proteins and Protein Analogs to Metal-Chelating Lipid Vesicles.
- Ranabir Sinha Roy (*Chemistry*) M.Sc., Indian Institute of Technology, Bombay 1991.  
Thesis: Coenzyme-Amino Acid Chimeras: New Residues for the Design of Functional Proteins.
- Claire Ellen Slutter (*Chemistry and Chemical Engineering*) B.S., Lehigh University 1988.  
Thesis: Overexpression and Characterization of the Copper A Domain from Cytochrome *ba<sub>3</sub>* of *Thermus thermophilus*.
- Xueyu Song (*Chemistry*) B.S., Nankai University 1984; M.S., 1987.  
Thesis: Quantum Effects in Electron Transfer Reactions and Solvation Dynamics.
- Paul Alan Stockman (*Chemistry*) B.A., B.S., University of Rochester 1989.  
Thesis: Microwave and Far-infrared Spectroscopy of Water-containing, Hydrogen-bonded Dimers: Vibrational, Rotational, and Tunneling Dynamics.
- Mary Denise Struthers (*Chemistry*) B.S., University of Wisconsin-Madison 1991.  
Thesis: Structural Templates for Protein Design: The Assembly of Peptidyl Motifs with Defined Supersecondary Structure.
- Sakae Suzuki (*Chemistry*) B.A., Reed College 1989.  
Thesis: Towards a More Quantitative Understanding of Intermolecular Interactions: Biologically Significant Intermolecular Clusters.
- Toshihiko Takeuchi (*Chemistry*) B.S., The Ohio State University 1990.  
Thesis: The Electronic Structure of Distorted Porphyrins and Cobalt Schiff Base Derivatives as Novel Enzyme Inhibitors.
- Matthew Jabez Taylor (*Chemistry*) A.S., Olympic College 1988; B.S., University of Washington 1990.  
Thesis: Oligonucleotide-Directed Alkylation of Double Stranded DNA: A Product and Kinetic Analysis.

DOCTOR OF PHILOSOPHY — *Continued*

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

DIVISION OF ENGINEERING AND APPLIED SCIENCES

- Barry E. Ambrose (*Electrical Engineering*) B.E., University College Cork 1986; M.Sc., Trinity College, Dublin 1990; M.S., California Institute of Technology 1991.  
Thesis: Dynamic Routing of Telephone Traffic Using Network Management Tools.
- Kayvan Ardalan (*Applied Mathematics*) B.S.M.E., University of Akron 1988; M.S.A.A.E., The Ohio State University 1990.  
Thesis: Compressible Vortex Arrays.
- Olga Berson (*Environmental Engineering Science and Chemistry*) B.S., Moscow Mendeleev Institute of Chemical Technology 1989; M.S., California Institute of Technology 1992.  
Thesis: The Study of Copper Bioavailability and Mechanism of Uptake in the Type I Methanotroph *Methylobaculum albus* BG8.
- Victor Scott Burnley (*Aeronautics*) A.A., Gordon Junior College 1986; B.A.E., Georgia Institute of Technology 1988; M.S.A.E., 1989.  
Thesis: Nonlinear Combustion Instabilities and Stochastic Sources.
- Geoffrey W. Burr (*Electrical Engineering*) B.A., B.S., State University of New York at Buffalo 1991; M.S., California Institute of Technology 1993.  
Thesis: Volume Holographic Storage Using the 90° Geometry.
- Joseph E. Cates (*Aeronautics*) B.S., University of Alabama 1990; M.S., California Institute of Technology 1991.  
Thesis: Studies of Shock Wave Focusing Using Geometrical Shock Dynamics.
- Haris J. Catrakis (*Aeronautics*) B.S., California Institute of Technology 1991; M.S., 1991.  
Thesis: Mixing and the Geometry of Isosurfaces in Turbulent Jets.
- Jung-Chih Chiao (*Electrical Engineering*) B.S., National Taiwan University 1988; M.S., California Institute of Technology 1991.  
Thesis: Quasi-Optical Components for Millimeter and Submillimeter Waves.
- Howard Marc Choset (*Mechanical Engineering*) B.S., B.S.E., University of Pennsylvania 1990; M.S., California Institute of Technology 1991.  
Thesis: Sensor Based Motion Planning: The Hierarchical Generalized Voronoi Graph.
- Michael Peter DeLisio, Jr. (*Electrical Engineering*) B.S.E., The University of Michigan 1990; M.S., California Institute of Technology 1991.  
Thesis: Hybrid and Monolithic Active Quasi-Optical Grids.
- Ersan Demiralp (*Applied Physics*) B.Sc., Middle East Technical University 1987.  
Thesis: Prediction of Structures and Properties for Organic Superconductors.

DOCTOR OF PHILOSOPHY — *Continued*

- Edward E. Deng (*Electrical Engineering*) B.S., Tsinghua University 1986; M.S., 1989; M.S., California Institute of Technology 1992.  
Thesis: I. Negative Incremental Impedance of Fluorescent Lamps. II. Simple High Power Factor Lamp Ballasts.
- Kate Elizabeth Fey (*Applied Mechanics*) B.S., California Institute of Technology 1990; M.S., Cornell University 1992.  
Thesis: Experimental and Theoretical Aspects of Dynamic Crack Growth Along Bimaterial Interfaces.
- Kelly Dee Goodwin (*Environmental Engineering Science and Oceanography*) B.S., University of Florida 1988; M.S., California Institute of Technology 1991.  
Thesis: Natural Cycles of Brominated Methanes: Macroalgal Production and Marine Microbial Degradation of Bromoform and Dibromomethane.
- Jeffrey Clyde Hayen (*Applied Mechanics and Physics*) A.S., Grossmont Community College 1981; B.S., San Diego State University 1984; M.S., 1986.  
Thesis: Response Control of Structural Systems Using Semi-Actively Controlled Interactions.
- Ahmed Abdou Heikal (*Applied Physics*) B.Sc., Tanta University 1980; M.Sc., 1986.  
Thesis: Ultrafast Molecular Dynamics in Complexed *Trans*-Stilbene.
- Liubo Hong (*Materials Science and Physics*) B.S., Peking University 1990; M.S., California Institute of Technology 1993.  
Thesis: Structures and Stabilities of Nanocrystalline Materials Synthesized by Mechanical Alloying and Modeled as Driven Alloys.
- Danny Dwayne Howard (*Aeronautics and Electrical Engineering*) B.S., Mississippi State University 1990; M.S., California Institute of Technology 1991.  
Thesis: I. Mechanisms of Injury Associated with Extracorporeal Shock Wave Lithotripsy. II. Exsolution of Volatiles.
- Inez Hua (*Environmental Engineering Science*) B.A., University of California, Berkeley 1990; M.S., California Institute of Technology 1992.  
Thesis: The Sonochemistry of Aqueous Solutions.
- Xinlei Hua (*Applied Physics*) B.S., Peking University 1985.  
Thesis: First Principles Simulations: Development of New Density Functionals and Pseudopotential and Formation Mechanism of Fullerenes.
- Ching-Tung Huang (*Civil Engineering*) B.S., National Chiao Tung University 1985; M.E., Carnegie Mellon University 1991; M.S., California Institute of Technology 1992.  
Thesis: On the Dynamic Response of Nonlinear Uncertain Systems.
- Lyatt Jaeglé (*Environmental Engineering Science and Planetary Science*) Diplôme d'Ingénieur, Institut Industriel du Nord 1992.  
Thesis: Stratospheric Chlorine and Nitrogen Chemistry: Observations and Modeling.
- J. Kenneth Klewicki (*Environmental Engineering Science and Geology*) B.S., Clarkson University 1990.  
Thesis: The Kinetics of Redox Reactions of Mn(II) and Mn(III) in Aqueous Systems: Homogenous Autoxidation of Mn(II) and the Formation and Disappearance of Mn(III) Complexes.

DOCTOR OF PHILOSOPHY — *Continued*

F. Christopher Kolb (*Computation and Neural Systems*) B.A., University of Oxford, Oriel College 1992.

Thesis: Two Themes in Perceptual Ecology: Visual Attention and Awareness.

David Matthew Kuzo (*Aeronautics and Chemistry*) B.S., Lehigh University 1977; M.S., 1979.

Thesis: An Experimental Study of the Turbulent Transverse Jet.

William Sauway Law (*Mechanical Engineering*) B.A., Oxford University 1991; M.S., California Institute of Technology 1993.

Thesis: Evaluating Imprecision in Engineering Design.

Donald Yu-Chun Lie (*Electrical Engineering and Applied Physics*) B.S., National Taiwan University 1987; M.S., California Institute of Technology 1990.

Thesis: Ion Implantation in Epitaxial  $\text{Ge}_x\text{Si}_{1-x}$  on Si(100).

Duo-min Lin (*Engineering Science*) B.S., University of Science and Technology of China 1986; M.E., 1988; M.S., California Institute of Technology 1991.

Thesis: Run-up and Nonlinear Propagation of Oceanic Internal Waves and Their Interactions.

Chang Liu (*Electrical Engineering*) B.E., Tsinghua University 1990; M.S., California Institute of Technology 1991.

Thesis: Silicon Micromachined Sensors and Actuators for Fluid Mechanics Applications.

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

Thesis: Monolithic Grid Amplifiers.

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

Thesis: Micromechanical Tuning Elements for Submillimeter Wave Integrated Circuits.

Jiafu Luo (*Electrical Engineering*) B.S., University of Science and Technology of China 1987; M.S., California Institute of Technology 1992.

Thesis: Monolithic GaAs VLSI Optoelectronic Neuron Arrays.

David Solomon Marx (*Electrical Engineering*) B.S.E., University of Pennsylvania 1986; M.S., California Institute of Technology 1991.

Thesis: Subwavelength Structures, Optical Diffraction, and Optical Disc Memories.

Cyrille Dennis Moore (*Aeronautics*) B.S., Princeton University 1987; M.S., 1988.

Thesis: Experiments in Axisymmetric Supersonic Jets.

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

Thesis: Experiments on the Interaction of a Coflowing Light Gas Jet with a Weak Oblique Shock Wave.

John Christopher Morris (*Electrical Engineering*) B.S., California Polytechnic State University, San Luis Obispo 1989; M.S., California Institute of Technology 1990.

Thesis: Experimental Control and Model Validation: A Helicopter Case Study.



DOCTOR OF PHILOSOPHY — *Continued*

- Matthew Philip Newlin (*Mechanical Engineering*) B.S.M.E., University of Washington 1982; M.S., California Institute of Technology 1983.  
Thesis: Model Validation, Control, and Computation.
- John David O'Brien (*Applied Physics*) B.S., Iowa State University 1991; M.S., California Institute of Technology 1993.  
Thesis: Design, Growth, and Characterization of Vertical Cavity Surface Emitting Lasers.
- Sergei S. Orlov (*Electrical Engineering*) Diploma, Moscow Institute of Physics and Technology 1991; M.S., California Institute of Technology 1993.  
Thesis: Holographic Storage Dynamics, Phase Conjugation, and Nonlinear Optics in Photorefractive Materials.
- James Patrick Ostrowski (*Mechanical Engineering*) Sc.B., Brown University 1990; M.S., California Institute of Technology 1991.  
Thesis: The Mechanics and Control of Undulatory Robotic Locomotion.
- Fernando Paganini Herrera (*Electrical Engineering*) Ingeniero Electricista, Licenciado en Matemáticas, Universidad de la República 1990; M.S., California Institute of Technology 1992.  
Thesis: Sets and Constraints in the Analysis of Uncertain Systems.
- Per-Olov Pettersson (*Applied Physics*) B.A., Swarthmore College 1991; M.S., California Institute of Technology 1993.  
Thesis: Silicon Heterojunctions.
- See-Young Phoon (*Electrical Engineering*) B.S., National Taiwan University 1991; M.S., California Institute of Technology 1992.  
Thesis: Time-varying and Finite Field Filter Banks.
- Randal Anthony Salvatore (*Electrical Engineering*) B.S.E., The University of Michigan 1990; M.S., California Institute of Technology 1991.  
Thesis: Ultrashort and Ultrahigh-Repetition-Rate Pulses from Passively Mode-Locked Semiconductor Lasers.
- Ali Shakouri (*Electrical Engineering*) Maîtrise de Physique, University of Paris VII 1989; Ingénieur, École Nationale Supérieure des Télécommunications 1990; M.S., California Institute of Technology 1990.  
Thesis: Electron Transport in Quantum Well Infrared Photodetectors.
- Ho Seon Shin (*Mechanical Engineering*) B.S., Seoul National University 1987; M.S., 1989.  
Thesis: Chemical Vapor Deposition of Diamond in Flames and Fluidized Beds.
- Kelly S. Smith (*Environmental Engineering Science*) B.S., Michigan State University 1989; M.S., California Institute of Technology 1991.  
Thesis: Enrichment of a Marine Methanotrophic Population and Its Kinetics of Methane and TCE Oxidation.
- Stefano Soatto (*Control and Dynamical Systems*) Laurea in Ingegneria Elettronica, Università degli Studi di Padova 1992; M.S., California Institute of Technology 1993.  
Thesis: A Geometric Framework for Dynamic Vision.

DOCTOR OF PHILOSOPHY — *Continued*

- Tab Allen Stephens (*Materials Science*) B.S., Texas A&M University 1990; M.S., California Institute of Technology 1991.  
Thesis: Chemical Environment Selectivity in Mössbauer Diffraction.
- John William Thornley (*Computer Science*) B.Sc., University of Auckland 1982; M.Sc., 1985; M.S., California Institute of Technology 1993.  
Thesis: A Parallel Programming Model with Sequential Semantics.
- Jorge E. Tierno (*Electrical Engineering*) Ingeniero Electricista, Universidad de la República 1989; M.S., California Institute of Technology 1991.  
Thesis: A Computational Approach to Nonlinear System Analysis.
- Charles Su-Chang Tsai (*Applied Physics*) B.S., California Institute of Technology 1989; M.S., 1990.  
Thesis: Optoelectronic Structure Fabrication by Organometallic Vapor-Phase Epitaxy and Selective Epitaxy.
- Siddhartha Valluri (*Aeronautics and Electrical Engineering*) B.Tech., Indian Institute of Technology, Kanpur 1990; M.S., California Institute of Technology 1991.  
Thesis: Bluff Body Flows in the Presence of a Free Surface.
- Mark Eugene Walter (*Applied Mechanics and Materials Science*) Sc.B., Brown University 1990; M.S., California Institute of Technology 1991.  
Thesis: The Evolution of Damage in Ceramic Matrix Composites.
- Yi-Chun Wang (*Mechanical Engineering*) B.S., National Taiwan University 1986; M.S., 1988.  
Thesis: Shock Waves in Bubbly Cavitating Flows.
- Chi-Ming Yang (*Civil Engineering*) B.S., National Taiwan University 1985; M.S., Carnegie Mellon University 1988.  
Thesis: Statistical System Identification and Applications to Seismic Response of Structures.
- Jin E. Zhang (*Engineering Science*) B.S.E., Tsinghua University 1981; M.S.E., 1985.  
Thesis: I. Run-up of Ocean Waves on Beaches II. Nonlinear Waves in a Fluid-filled Elastic Tube.
- Dongyan Zhou (*Electrical Engineering*) B.S., Zhejiang University 1989; M.S., California Institute of Technology 1992.  
Thesis: Synthesis of PWM Dc-to-Dc Power Converters.

DOCTOR OF PHILOSOPHY — *Continued*

DIVISION OF GEOLOGICAL AND PLANETARY SCIENCES

Ariel David Anbar (*Geochemistry and Chemistry*) A.B., Harvard College 1989; M.S., California Institute of Technology 1991.

Thesis: I. Rhenium and Iridium in Natural Waters. II. Methyl Bromide: Ocean Sources, Ocean Sinks, and Climate Sensitivity. III. CO<sub>2</sub> Stability and Heterogeneous Chemistry in the Atmosphere of Mars.

Mark Andrew Gurwell (*Planetary Science and Astronomy*) B.S., University of Washington 1990; M.S., California Institute of Technology 1992.

Thesis: Planetary Atmospheres: Probing Structure through Millimeterwave Observations of Carbon Monoxide.

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

Thesis: The Origin of Harmonic Tremor at Old Faithful Geyser.

Woh-jeer Lee (*Geology*) B.S., National Taiwan University 1986.

Thesis: Experimental Study on Liquid Immiscibility in Silicate-Carbonate Systems with Applications to Carbonatites.

James Richard Lyons (*Planetary Science and Environmental Engineering Science*) B.S., Rensselaer Polytechnic Institute 1983; M.S., The Ohio State University 1987.

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

Hari Nair (*Planetary Science and Chemistry*) B.S., Gannon University 1990; M.S., California Institute of Technology 1992.

Thesis: Photochemical Processes in the Atmospheres of Earth and Mars.

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

Thesis: 1. Using Short-period Surface Waves to Study Seismic Source and Structure.  
2. Source Complexity of Large Strike-slip Earthquakes.

Eric Wolfgang Weisstein (*Planetary Science and Physics*) B.A., Cornell University 1990; M.S., California Institute of Technology 1993.

Thesis: Millimeter/Submillimeter Fourier Transform Spectroscopy of Jovian Planet Atmospheres.

Wenbo Yang (*Geophysics*) B.E., Beijing Institute of Technology 1983; M.E., 1986; M.S., California Institute of Technology 1992.

Thesis: Impact Volatilization of Calcite and Anhydrite and the Effect on Global Climate From K/T Impact Crater at Chicxulub.

John Douglas Yule (*Geology*) B.A., Pomona College 1983; M.S., University of Wyoming 1988.

Thesis: Geologic and Tectonic Evolution of Jurassic Marginal Ocean Basin Lithosphere, Klamath Mountains, Oregon.

DIVISION OF THE HUMANITIES AND SOCIAL SCIENCES

Kaoru Kato (*Social Science*) A.A., San Bernardino Valley College 1983; B.A., University of Arizona 1989; B.S., 1990; M.S., California Institute of Technology 1993.

Thesis: Stochastic Bargaining Theory and Order Flow.

DOCTOR OF PHILOSOPHY — *Continued*

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

Thesis: Dominant Strategy Implementation on Private Goods Domains with Indivisibilities.

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

Thesis: Welfare Magnets, the Labor-Leisure Decision and Economic Efficiency.

DIVISION OF PHYSICS, MATHEMATICS AND ASTRONOMY

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

Thesis: Shell Model Monte Carlo for Gamow-Teller Strengths and Two-Neutrino Double Beta Decay.

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

Thesis: Capillary-Driven Reflow of Thin Cu Films with Submicron, High Aspect Ratio Features.

Deepto Chakrabarty (*Physics*) S.B., Massachusetts Institute of Technology 1988; M.S., California Institute of Technology 1992.

Thesis: Hard X-Ray Detection and Timing of Accretion-Powered Pulsars with BATSE.

Pei-Long Chen (*Physics*) B.M.E., National Taiwan University 1986; M.S., National Central University 1988.

Thesis: Coherent Vortex States in Two Dimensional Ideal Fluids.

Brian Cook (*Physics*) B.S., Yale University 1991; M.S., California Institute of Technology 1993.

Thesis: Development and Testing of a Detector to Study Neutrino Oscillations at Palo Verde.

Bradley Miles Stougaard Hansen (*Astronomy*) B.S., University of Natal, Durban 1989; M.S., 1992.

Thesis: The Ages, Speeds and Offspring of Pulsars.

Erotokritos Charalambous Katsavounidis (*Physics*) B.S., Aristotle University of Thessaloniki 1988; M.S., California Institute of Technology 1990.

Thesis: Search for GUT Magnetic Monopoles with the MACRO Detector.

Michael Henderson Kelsey (*Physics*) B.S., University of California, Los Angeles 1988.

Thesis: Measurement of the Leptonic Branching Fraction of the  $D_s$  Meson and Determination of Its Decay Constant.

Julia Dusk Kennefick (*Physics*) B.S., University of Arkansas 1989; M.S., California Institute of Technology 1991.

Thesis: The Luminosity Function of Quasars at Redshifts Greater Than Four.

David P. Kirkby (*Physics*) B.Sc., University of Toronto 1989.

Thesis: A Study of Final-State Radiation in Hadronic Z Decays.

DOCTOR OF PHILOSOPHY — *Continued*

- Axel Wolf Hendrik Kratel (*Physics*) B.S., University of California, Irvine 1988; M.S., California Institute of Technology 1990.  
Thesis: Pulsed Power Discharges in Water.
- James Edwin Larkin (*Physics*) B.S., California State University, Hayward 1990; M.S., California Institute of Technology 1992.  
Thesis: Near Infrared Spectroscopy of LINER Galaxies.
- Hoi Ming Leung (*Mathematics*) B.Sc., The Chinese University of Hong Kong 1990; M.S., California Institute of Technology 1993.  
Thesis: Conformal Laminations on the Circle.
- Patrick Neal McGraw (*Physics*) B.S., Harvey Mudd College 1990.  
Thesis: Dynamics of Non-Abelian Aharonov-Bohm Systems.
- Thomas E. Norwood (*Mathematics*) B.S., California Polytechnic State University, San Luis Obispo 1991.  
Thesis: Codes and Polynomials in the Study of Cyclic Difference Sets.
- Søren Pedersen (*Physics*) B.Sc., University College Cork 1990; M.S., California Institute of Technology 1994.  
Thesis: Development and Applications of Techniques in Laser Femtochemistry.
- Angela Putney (*Astronomy*) S.B., Massachusetts Institute of Technology 1990.  
Thesis: Magnetic White Dwarf Stars.
- Wilhelm Schlag (*Mathematics*) Diplom, Technical University of Vienna 1991; M.S., University of California, Berkeley 1994.  
Thesis:  $L^p \rightarrow L^q$  Estimates for the Circular Maximal Function.
- Todd Andrew Small (*Astronomy*) B.S., Yale University 1990.  
Thesis: The Norris Survey of the Corona Borealis Supercluster.
- Stanislav K. Smirnov (*Mathematics*) M.S., St. Petersburg State University 1992; M.S., California Institute of Technology 1995.  
Thesis: Spectral Analysis of Julia Sets.
- Patricia K. Ure (*Mathematics*) B.A., Reed College 1985; M.S., California Polytechnic State University, San Luis Obispo 1991.  
Thesis: A Study of  $(O, n, n+1)$ -Sets and Other Solutions of the Isoperimetric Problem in Finite Projective Planes.
- Gautam Vasisht (*Astronomy*) B.Tech., Indian Institute of Technology, Kanpur 1990.  
Thesis: Many Faces of Young Neutron Stars.
- Barbara Helen Wang (*Physics*) B.A., The University of Chicago 1990; M.S., California Institute of Technology 1993.  
Thesis: Rheo-optical Investigation of the Dynamics of Miscible Polymers: Blends and Diblock Copolymers.
- Selmer Siu Man Wong (*Physics*) B.S., University of California, Los Angeles 1990; M.S., California Institute of Technology 1992.  
Thesis: Surface Chemical Analysis Using Reflection Electron Energy Loss Spectrometry During Molecular Beam Epitaxy.

Lin Yan (*Astronomy*) B.Sc., University of Science and Technology of China 1986; M.Sc., 1989.

Thesis: Binary Stars in Globular Clusters.

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

Thesis: The Lyapunov Exponents for Schrödinger Operators and Jacobi Matrices with Slowly Oscillating Potentials.

# Prizes and Awards

## MILTON AND FRANCIS CLAUSER DOCTORAL PRIZE

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

*Recipient to be announced at Commencement.*

## FREDERIC W. HINRICHS, JR., MEMORIAL AWARD

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

1996 *Esmeralda Nava*

*Alison Elaine Slempp*

## MABEL BECKMAN PRIZE

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

1992 *Aimée Louise Smith*

1996 *Rebecca Leanne Blankenburg*

## WILLIAM F. BALLHAUS PRIZE

Awarded to aeronautics students for outstanding doctoral dissertations.

1996 *Mark Eugene Walter*

## ROLF D. BUHLER MEMORIAL AWARD IN AERONAUTICS

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

1991 *Haris J. Catrakis*

1996 *Tobias Voelkl*

## FRITZ B. BURNS PRIZE IN GEOLOGY

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

1991 *Linda Ntepane Maepa*

1995 *José Miguel Hurtado, Jr.*

*Prizes and awards are listed only for those students awarded degrees in 1996, and include prizes and awards received by them in previous years.*

## PRIZES AND AWARDS — *Continued*

### CALTECH PRIZE SCHOLARSHIPS AND CARNATION SCHOLARSHIPS

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

|                                   |                                   |
|-----------------------------------|-----------------------------------|
| <i>Donna Akemi Akutagawa</i>      | <i>Thomas Oliver Meyer</i>        |
| <i>Walter Frank Briskin</i>       | <i>Roman Muchnik</i>              |
| <i>Haris J. Catrakis</i>          | <i>John Douglas Naud</i>          |
| <i>Amalavoyal Narasimha Chari</i> | <i>Pál Ivan Péntzes</i>           |
| <i>David Emilio Chavez</i>        | <i>Michael Tzu Ru</i>             |
| <i>Soon Ghee Chua</i>             | <i>Anton Vladimirovich Ryzhov</i> |
| <i>Jeremiah Kane Darling</i>      | <i>Alexander Libra Simon</i>      |
| <i>Eric Scott Dickson</i>         | <i>Alison Elaine Slempp</i>       |
| <i>Donna Michelle Ebenstein</i>   | <i>Haiyun Tang</i>                |
| <i>Mintao Fan</i>                 | <i>Thanh Nga Trinh Tran</i>       |
| <i>Kate Elizabeth Fey</i>         | <i>Charles Su-Chang Tsai</i>      |
| <i>Jason Chung-Shiang Hsu</i>     | <i>Jon Robert Wesselmann</i>      |
| <i>José Miguel Hurtado, Jr.</i>   | <i>Stephen Wong</i>               |
| <i>Brian Sanghoon Kim</i>         | <i>Nam Chul Yu</i>                |
| <i>Kelvin Y. Kwan</i>             | <i>Inn Huam Yuk</i>               |
| <i>Jason Chen-Shan Lee</i>        | <i>Jian Zhang</i>                 |
| <i>Steven Philip Lieske</i>       | <i>Ning Zhang</i>                 |

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

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

1996 *Wilhelm Schlag*  
*Stanislav K. Smirnov*

### RICHARD BRUCE CHAPMAN MEMORIAL AWARD

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

1996 *Yi-Chun Wang*  
*Jin E. Zhang*



## PRIZES AND AWARDS — *Continued*

### DONALD S. CLARK MEMORIAL AWARDS

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

1989 *Kate Elizabeth Fey*

1995 *Thanh Nga Trinh Tran*

### DEANS' CUP AND DIRECTOR OF RESIDENCE LIFE AND MASTER'S AWARD

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

1995 *Jonathan Edward McDunn, Deans' Cup*

1996 *Angie Marie Bealko, Deans' Cup*

*Donna Michelle Ebenstein, Deans' Cup*

*Jonathan Edward McDunn, Residence Life and Master's Award*

### CONSTANTIN G. ECONOMOU MEMORIAL PRIZE

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

1991 *Jeffrey Franklin Morris*

### LAWRENCE L. AND AUDREY W. FERGUSON PRIZE

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

1996 *Christopher John Schoenherr*

### HAREN LEE FISHER MEMORIAL AWARD IN JUNIOR PHYSICS

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

1995 *John Douglas Naud*

### HENRY FORD II SCHOLAR AWARD

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

1990 *Haris J. Catrakis*

1995 *Michael Tzu Ru*

PRIZES AND AWARDS — *Continued*

JACK E. FROEHLICH MEMORIAL AWARD

Awarded to a junior in the upper five percent of his or her class who shows outstanding promise for a creative professional career.

1995 *Roman Muchnik*

*Nam Chul Yu*

GRADUATE DEAN'S AWARD FOR OUTSTANDING COMMUNITY SERVICE

Awarded to a Ph.D. candidate who, throughout his or her graduate years at the Institute, has made great contributions to graduate life and whose qualities of leadership and responsibility have been outstanding.

1996 *Jean Marie Andino*

GEORGE W. GREEN MEMORIAL PRIZE

Awarded to the undergraduate student who, in the opinion of the division chairs, has shown outstanding ability and achievement in creative scholarship.

1995 *Jerry Wei-Jen Shan*

1996 *José Miguel Hurtado, Jr.*

ARIE J. HAAGEN-SMIT MEMORIAL AWARD

Awarded to a sophomore or junior in biology or chemistry who has shown academic promise and who has made recognized contributions to Caltech.

1995 *Thanh Nga Trinh Tran*

BIBI JENTOFT-NILSEN MEMORIAL AWARD

Awarded to an upperclass student who exhibits outstanding qualities of leadership and who actively contributes to the quality of student life at Caltech.

1995 *Angie Marie Bealko*

1996 *Eric S. Hill*

ARTUR MAGER PRIZE IN ENGINEERING

Awarded to a senior in Engineering who has shown excellence in scholarship and the promise of an outstanding professional career.

1991 *Haris J. Catrakis*

1996 *Donna Michelle Ebenstein*

## PRIZES AND AWARDS — *Continued*

### HERBERT NEWBY McCOY AWARD

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

1996 *Jennifer Lynn Herek*

*Ranabir Sinha Roy*

*Xueyu Song*

### MARY A. EARL McKINNEY PRIZE IN LITERATURE

The purpose of this prize is to cultivate proficiency in writing. It may be awarded for essays submitted in connection with regular literature classes or awarded on the basis of a special essay contest.

1994 *Andrew Brian Clarke*

### MILLIKAN SCHOLARSHIP

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

1991

*Heide Roth Li*

*Esmeralda Nava*

*Michael Edwin Ichiriu*

1992

*Rebecca Leanne Blankenburg*

*Causenge Capellus Cangin*

*Amalavoyal Narasimha Chari*

*Jeremiah Kane Darling*

*Eric Scott Dickson*

*Donna Michelle Ebenstein*

*Xinh Xinh Huynh*

*Adil Mahmood Karim*

*Robert Marshall Nostrant*

*Thanh Nga Trinh Tran*

*Lyndie Ruth Williamson*

### ROBERT L. NOLAND LEADERSHIP SCHOLARSHIP

Awarded to students who exhibit qualities of outstanding leadership, which are most often expressed as personal actions that have helped other people and that have inspired others to fulfill their capabilities.

1995 *Alison Elaine Slemp*

1996 *Carlos Horacio Aldana*

*Laura Elizabeth Verhoff*

*Jian Zhang*

PRIZES AND AWARDS — *Continued*

RODMAN W. PAUL HISTORY PRIZE

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

1995 *Alison Elaine Slem*

HOWARD REYNOLDS MEMORIAL PRIZE IN GEOLOGY

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

1993 *Linda Ntepane Maepa*

1995 *José Miguel Hurtado, Jr.*

HERBERT J. RYSER MEMORIAL SCHOLARSHIPS

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

1994 *Roman Muchnik*

1995 *Amalavoyal Narasimha Chari*

*Devabhaktuni Srikrishna*

RICHARD P. SCHUSTER MEMORIAL PRIZE

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

1994 *David R. Vaughn*

1995 *David Emilio Chavez*

*Michael Tzu Ru*

ERNEST E. SECHLER MEMORIAL AWARD IN AERONAUTICS

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

1995 *Mark Eugene Walter*

## PRIZES AND AWARDS — *Continued*

### DON SHEPARD AWARD

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

1993

*Eve Astrid Andersson*

*David Alan Tahmoush*

1994

*Jerry Wei-Jen Shan*

1995

*Eve Astrid Andersson*

*Jessica Chang*

*Michael Christopher Greene*

*Karen Kustedjo*

*Eileen EE Ling Lau*

*Renny Sandra Talianchich*

*Wayne Hiroshi Yoshida*

*Inn Huam Yuk*

*Daniel Marc Zimmerman*

### SIGMA XI AWARD

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

1996 *John Douglas Naud*

### JOHN STAGER STEMPLE MEMORIAL PRIZE IN PHYSICS

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

1994 *James Edwin Larkin*

*Søren Pedersen*

### ALAN R. SWEEZY PRIZE IN ECONOMICS

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

1996 *Jason Chung-Shiang Hsu*

### MORGAN WARD PRIZE

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

1993 *Mitesh Patel*

PRIZES AND AWARDS — *Continued*

CHARLES WILTS PRIZE

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

1996 *Fernando Paganini Herrera*

FREDERICK J. ZEIGLER MEMORIAL AWARD

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

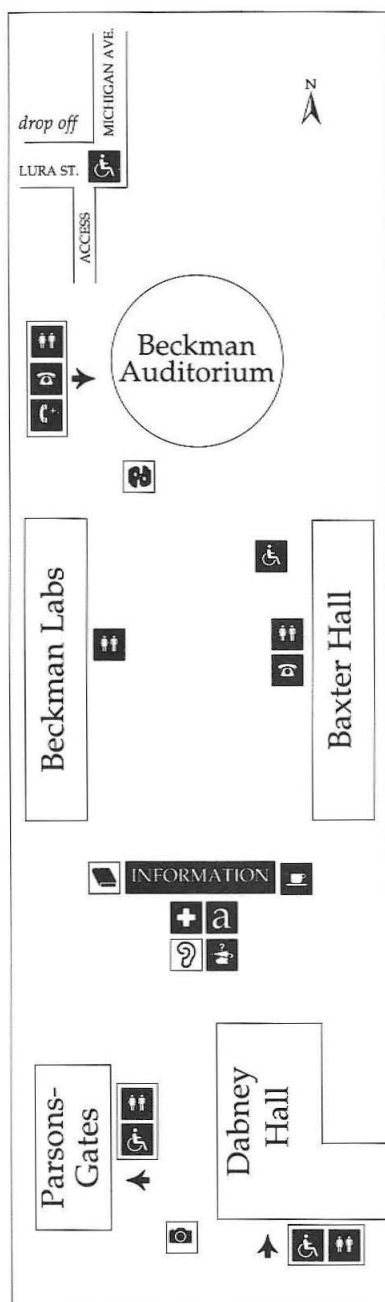
1994 *Amalavoyal Narasimha Chari*

1995 *Roman Muchnik*

CIT ALMA MATER

by Manton Barnes (BS '21 EE)







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



## SERVICES FOR COMMENCEMENT GUESTS

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

## SPECIAL SERVICES FOR PERSONS WITH DISABILITIES

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