



CALIFORNIA INSTITUTE *of* TECHNOLOGY

*One Hundred Eleventh Annual Commencement
June 10, 2005*



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

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CALIFORNIA INSTITUTE
of TECHNOLOGY

One Hundred Eleventh

Annual Commencement

Friday Morning at Ten O'Clock
June Tenth, Two Thousand Five

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

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

set the course for the development of Throop into the California Institute of Technology, a school he envisioned as a scientific institution of the highest rank.

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

Caltech today has a 124-acre campus and operates seven off-campus astronomical, seismological, and marine biological facilities, and administers NASA's Jet Propulsion Laboratory as well. At present, the Institute has an enrollment of some 2,000 students, more than half of whom are in graduate studies; about 280 professorial faculty members, including four Nobel laureates and three Crafoord laureates; and more than 100 research faculty members. Today, Caltech will award 217 students the B.S. degree; 120 students the M.S. degree; 2 scholars the degree of Engineer; and 182 doctoral candidates the Ph.D. degree, for a total of 521 graduates—quite a leap from the one man and one woman who constituted the first collegiate graduating class of Throop Polytechnic Institute.

Please note:

Video footage of commencement may be viewed on the Caltech website at <http://www.caltech.edu/commencement/>. Broadcast is scheduled to begin after 3:00 p.m.

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

SANDRA TSING LOH possesses an unusual, and singularly engaging, breadth of abilities. A graduate of Caltech, where she earned a bachelor's degree in physics and literature in 1983, she appears to have inherited (either genetically or environmentally, or both) an aptitude for science, indicated by the fact that both her father and brother were Caltech physics graduates before her. After graduation, however, the alternative talents lurking within apparently demanded ascendancy; she entered USC's graduate program in English, and ultimately embarked on a writing and performing career that has earned her local fame and growing national recognition as a humorist.

In the 1980s, Loh launched herself into the wacky world of performance art, using her skill at the piano (she was classically trained) to create quirky "spectacles" designed to amuse and amaze rush-hour commuters on the Harbor Freeway ("Spontaneous Demographics," September 1987) or to cheer on the frenzied fish spawning on the beach at Malibu ("Night of the Grunion," March 1989).

In the '90s, music gave way (temporarily) to a tumult of words—sharp, clever words; pithy, painful ones; uniquely Southern California metaphors. She began with columns for *Buzz* magazine in 1992, and thereafter produced an impressive amount of writing in a number of genres. Loh's unsettlingly frank and funny take on living in greater Los Angeles developed into the subject matter for solo shows, plays, essays, a novel, and radio commentaries.

The list of her book-length publications includes *Depth Takes a Holiday: Essays from Lesser Los Angeles* (1996), *Aliens in America* (1997), the novel *If You Lived Here, You'd Be Home By Now* (1997), and *A Year in Provence Van Nuys* (2001). She has had short pieces published in the *New York Times*, *Elle*, *Harper's Bazaar*, and *Vogue*, and she is a contributing editor to the *Atlantic Monthly*. Her short story "My Father's Chinese Wives" received the Pushcart Prize in Fiction in 1995, and *If You Lived Here...* was named one of the best books of 1997 by the *Los Angeles Times*.

Loh's distinctive voice is heard frequently on public radio: she delivers a national monthly commentary (*The Loh Down*) on the business program *Marketplace*, has been a regular commentator on NPR's *Morning Edition* and on Ira Glass's *This American Life*, and creates a side-splitting weekly program called *The Loh Life*, which airs locally in Southern California on KPCC-FM 89.3.

Musical expression continues to be a part of her life as well. She has composed and performed music for films, including writing the score for Jessica Yu's 1997 Oscar-winning documentary *Breathing Lessons: The Life and Work of Mark O'Brien*.

Caltech affirmed its close tie with Loh in 2001, when it awarded her the highest honor bestowed upon alumni, the Distinguished Alumni Award. Will this academic mark of respect nudge her back to the halls of science? With such wide-ranging talent, anything is possible. Having mined so many other apparently humorless areas for comedic material, who's to say that Sandra Tsing Loh can't unearth the humor in theoretical physics?

ACADEMIC PROCESSION

Chief Marshal

Kim C. Border, Ph.D.

Marshals

David G. Goodwin, Ph.D.

Barbara C. Green, Ph.D.

Michael R. Hoffmann, Ph.D.

Christof Koch, Ph.D.

Jean-Paul Revel, Ph.D.

Anneila I. Sargent, Ph.D.

Faculty Officers

David G. Goodwin, Ph.D.

Henry A. Lester, Ph.D.

David B. Wales, 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 Chairman of the Board of Trustees

PROGRAM

Organ Prelude	Leslie J. Deutsch, Ph.D.
PROCESSIONAL	The Caltech Convocations Brass and Percussion Ensemble <i>William W. Bing, M.M., Conductor</i>
PRESIDING	Kent Kresa <i>Chairman of the Board of Trustees California Institute of Technology</i>
COMMENCEMENT SPEAKER "PS: The Last Caltech Lesson"	Sandra Tsing Loh <i>Caltech, B.S. '83 Writer, performer, humorist</i>
CHORAL SELECTION "There's Just One" music by George Frideric Handel, lyrics by K. Giapis and D. Caldwell	The Caltech Glee Clubs <i>Donald G. Caldwell, D.M.A., Conductor</i>
CONFERRING OF DEGREES	David Baltimore, Ph.D. <i>President 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	Michael R. Hoffmann, Ph.D. <i>Dean of Graduate Studies</i>
For the Degree of Engineer	Michael R. Hoffmann, Ph.D. <i>Dean of Graduate Studies</i>
For the Degree of Doctor of Philosophy	Michael R. Hoffmann, Ph.D. <i>Dean of Graduate Studies</i>

Biology	Elliot M. Meyerowitz, Ph.D. <i>Division Chair</i>
Chemistry and Chemical Engineering	David A. Tirrell, Ph.D. <i>Division Chair</i>
Engineering and Applied Science	Richard M. Murray, Ph.D. <i>Division Chair</i>
Geological and Planetary Sciences	Kenneth A. Farley, Ph.D. <i>Division Chair</i>
The Humanities and Social Sciences	Jean E. Ensminger, Ph.D. <i>Division Chair</i>
Physics, Mathematics and Astronomy	Thomas A. Tombrello, Ph.D. <i>Division Chair</i>

ANNOUNCEMENT OF AWARDS
AND CONCLUDING REMARKS

President Baltimore

ALMA MATER

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

“Hail CIT”
by Manton Barnes, BS ’21 EE
(*The audience may join in;
lyrics are found on page 48.*)

RECESSIONAL

The Caltech Convocations Brass
and Percussion Ensemble

Organ Postlude

Dr. Deutsch

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

CANDIDATES FOR DEGREES

Bachelor of Science

- Maryam Ali *Islamabad, Pakistan* Chemical Engineering (Materials)
James Galante Anderson *New Hyde Park, New York* Economics
Luis Alberto Armendariz *El Paso, Texas* Applied and Computational Mathematics
Benjamin Shepard Aronin *White Plains, New York* Business Economics and Management
Vincent Churk-Man Auyeung* *Arcadia, California* Biology
Adam David Azarchs *Briarcliff Manor, New York* Physics
Robert Caston Bailey *Vacaville, California* Electrical Engineering
Arjun Krishnan Bansal* *Bangalore, India* Computer Science
Henry Adom Barnor *Accra, Ghana* Electrical Engineering
Kevin Carl Bartz* *Kailua, Hawaii* Applied and Computational Mathematics and Economics
Naman Jayant Bhatt* *Fremont, California* Physics
Adam Washburn Bongarzone *Hull, Massachusetts* Geophysics
Kyle Edward Bradley* *Cortez, Colorado* Geology
Ryan Payne Cabeen *Los Angeles, California* Engineering and Applied Science
Eric James Cady* *New Boston, New Hampshire* Physics and Control and Dynamical Systems (Minor)
Sirin Caliskan *Istanbul, Turkey* Astrophysics
Brant Edward Carlson* *Libertyville, Illinois* Physics
John Joseph Murphy Carrasco *Pasadena, California* Physics
Joseph Philip Carroll *Downers Grove, Illinois* Engineering and Applied Science
Luigi Francesco Celano *Boise, Idaho* Mechanical Engineering
Lyle Joseph Chamberlain *Oak City, Utah* Engineering and Applied Science and Control and Dynamical Systems (Minor)
Chelsea Chi Chang* *Arcadia, California* Electrical Engineering and Business Economics and Management
Kamalah Tai Santanisha Chang *Herndon, Virginia* Mechanical Engineering
Vincent Honping Chang *Irvine, California* Electrical Engineering
Jonathan Eric Chen* *Davie, Florida* Chemistry and Economics
Kwun Hung Cheung* *San Francisco, California* Physics
Carl Wing-Jang Chin *San Fernando, Trinidad* Electrical Engineering
Jeehwan Bryan Choi* *Los Angeles, California* Economics
Jeffrey Peter Chou *Somerset, New Jersey* Electrical Engineering and Control and Dynamical Systems (Minor)

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

Wendy W. Chou *Stamford, Connecticut* Engineering and Applied Science
Neil Choudri *Folsom, California* Biology and Business Economics and Management
Kyle Chrystal *Mission Viejo, California* Mechanical Engineering
William C. Chueh* *Rowland Heights, California* Applied Physics
Kevin Anthony Churchel *Anchorage, Alaska* Physics
Lorian Victoria Churchill* *Kalamazoo, Michigan* Biology
Brian Lowman Cleary *Grand Junction, Colorado* Biology and Business Economics and Management
Joanna Renee Cohen* *White Plains, New York* Mechanical Engineering
Wei Lien Stephen Dang* *La Canada, California* Applied Physics
Delia Rosca Davies *Fullerton, California* Mechanical Engineering
Nora Lee DeDontney* *Cloverdale, California* Mechanical Engineering and Geology
Elizabeth Rose Dorman* *Chicago, Illinois* Biology
Kevin Edward Duncklee *Shorewood, Wisconsin* Electrical Engineering
Zachary Thompson Dydek* *Austin, Texas* Mechanical Engineering and Control and Dynamical Systems (Minor)
Richard Driessnack Eager* *Falls Church, Virginia* Physics and Mathematics
Aimee Margaret Eddins *Warrenton, Virginia* Mechanical Engineering
Abigail Mary Elliott *Arcadia, California* Biology
Jesse Ramon Escobedo *San Francisco, California* Mechanical Engineering
Elizabeth Anne Felnagle *Gilbert, Arizona* Geobiology
Abraham Jacob Fetterman *Pittsford, New York* Physics and Business Economics and Management
Jason Rigel Finney *Santa Barbara, California* Physics
Kathleen Elizabeth Fischer* *Dallas, Texas* Mechanical Engineering
Jenny Allison Fisher* *Arcata, California* Planetary Science
Kathryn Watkins Fitch *San Antonio, Texas* Geobiology
Scott Michael Fleming *Cotati, California* Mechanical Engineering
Christopher Brian Franco* *Chula Vista, California* Biology
Lisa Fukui* *San Jose, California* Computer Science
Jared Matthew Gabor* *Greensburg, Pennsylvania* Physics
Juan Ramon Garcia *San Antonio, Texas* Engineering and Applied Science
Manuel Moses García *Stockton, California* Engineering and Applied Science
John David Geiszler *Great Falls, Montana* Applied Physics
Rajiv Kotesch Ghanta *Hyderabad, Andhra Pradesh, India* Electrical Engineering
Michelle Kim-Mai Giron *Los Angeles, California* Chemical Engineering (Materials)
Francisco Javier Godoy* *Caracas, Venezuela* Electrical Engineering
Yelena Golubov Kurchanova *St. Petersburg, Russia* Applied Physics and Business Economics and Management

Bachelor of Science continued

- Yiyang Gong* *Lancaster, Pennsylvania* Electrical Engineering and Economics
Yuliya Gorlina *Skokie, Illinois* Mathematics
Viviana Gradinaru* *Vaslui, Romania* Biology
Jessica Lynn Gray* *Plano, Texas* Computer Science
Julian Ray Greene *Colorado Springs, Colorado* Physics
Isaac N. Gremmer *San Antonio, Texas* Engineering and Applied Science
David Richard Griswold* *Tupelo, Mississippi* Engineering and Applied Science
Haluna Penelope Frances Gunterman* *Placerville, California* Chemical Engineering
(Environmental) and Business Economics and Management
ChongQui Guo* *Garden Grove, California* Biology and Business Economics and
Management
Christian Alexander Gutierrez *Torrance, California* Electrical Engineering and Business
Economics and Management
Stephen Patrick Habegger *Elkhart, Indiana* Social Science
Christopher Hayes Habliston *Eugene, Oregon* Computer Science
Philip Coleman Harris *Armonk, New York* Physics
Yisen Susan He *Austin, Texas* Electrical Engineering and Economics
Bernadette Heyburn* *Littleton, Colorado* Physics
Barrett Emerson Heyneman* *Fallbrook, California* Mechanical Engineering
Jaclyn Marie Homnick *Delray Beach, Florida* Physics
Sue Ann Hong* *Seoul, Korea* Computer Science
Tina Hsu *Saratoga, California* Electrical Engineering
Haomiao Huang* *Austin, Texas* Electrical Engineering and Control and Dynamical
Systems (Minor)
Judith Ariadne Hubbard* *Ithaca, New York* Geology
Tracy Elizabeth Janov *Penn Valley, Pennsylvania* Mechanical Engineering
Lionel Prandi Jingles *San Francisco, California* Mechanical Engineering
Matthew Leigh Johnston* *Lodi, California* Electrical Engineering
Richard Kalantar Ohanian *Pasadena, California* Electrical and Computer Engineering
Jeffrey Lynn Kauffman* *New Holland, Pennsylvania* Engineering and Applied Science
(Aeronautics)
Margot Chieko Kimura *Waipahu, Hawaii* Mechanical Engineering
Victor Kiplangat Kirui *Nairobi, Kenya* Business Economics and Management
Ian Michael Krajbich* *Portland, Oregon* Physics and Business Economics and
Management
Oran James Ali Kremen *Falls Church, Virginia* Biology
Michael Kuhn* *Leipzig, Germany* Computer Science
Andrea Shin Hwei Kung *Edison, New Jersey* Chemistry
David Matthew Kurtz* *Idaho Falls, Idaho* Chemistry

Bachelor of Science continued

Jeffrey Charles Lamb *Temple City, California* Engineering and Applied Science
Thomas Matthew Lasko *Mentor, Ohio* Mechanical Engineering
Samantha Michelle Lawler *La Crescenta, California* Astrophysics
Jason Jaewan Lee *Gardena, California* Biology
Lucie Siu Lee *Sacramento, California* Chemistry
Peishan Lee* *Taipei, Taiwan* Biology
Shaun Philip Lee* *Pasadena, California* Electrical and Computer Engineering
Tony Eilo Lee* *Palo Alto, California* Physics
Ann Leu *Union City, California* Engineering and Applied Science
Shannon Doane Lewis *Alexandria, Virginia* Chemical Engineering (Materials)
Jennifer Xinge Li* *Morgantown, West Virginia* Biology
Ting Xi Timothy Liao* *Hong Kong, China* Physics and Computer Science
Alice Lin* *Huntington Beach, California* Biology and Business Economics and Management
Logan Thomas Teeley Linderman *Stockton, California* Geobiology
Binghai Ling* *Rochester, New York* Chemistry
EthelMae Victoria Loewer* *Arlington, Virginia* Chemical Engineering (Environmental)
Galen Randall Loram* *Ashland, Oregon* Economics
Manisha Ulhas Lotlikar* *Syosset, New York* Biology
Bertrand Howyen Lui* *Sebastian, Florida* Applied Physics
Kenneth Ly *West Covina, California* Engineering and Applied Science
Tammy Yee Wing Ma *Fremont, California* Engineering and Applied Science (Aeronautics)
Elizabeth Marie MacWilliams-Brooks *Colorado Springs, Colorado* Planetary Science
Davin Brice Maddox *Los Angeles, California* Mathematics
Marin Vassilev Markov* *Plovdiv, Bulgaria* Business Economics and Management
Christopher Lee McClendon* *Poquoson, Virginia* Biology
Neal Donald McDaniel* *Bartlesville, Oklahoma* Chemistry
Susan Terese McDonald *Berkeley Heights, New Jersey* Planetary Science
David Earle McKinney *Sun Valley, California* Biology
Christopher Joseph Meagher *Bangkok, Thailand* Electrical Engineering and English
Erik Michael Measure* *Las Cruces, New Mexico* Physics
Tomonari Scott Miyashita *Ann Arbor, Michigan* Physics
Brandon Michael Moore* *Iowa City, Iowa* Computer Science and Mathematics
Clare Elizabeth Moynihan* *Oak Park, California* Biology
Steven Mueller *Tucson, Arizona* Computer Science
Hung Dinh Nong* *Alhambra, California* Applied and Computational Mathematics and Control and Dynamical Systems (Minor)
Karin Ingegerd Öberg* *Karlskrona, Sweden* Chemistry
Ryan Ewy Olf* *Carmel, California* Physics

Bachelor of Science continued

Gwendolyn Giok Bwee Ong *Buena Park, California* Chemistry
Mhair-Armen Hagop Orchanian* *North Hollywood, California* Applied Physics
Sandra Neuenschwander Ottensmann* *Zionsville, Indiana* Chemistry
Kally Zhang Pan *Rochester, Minnesota* Biology and History
Weronika Anna Patena* *Nowy Sacz, Poland* Biology and Computer Science
Xiao Peng Peng* *New City, New York* Chemistry
Belle Eve Philibosian* *Pasadena, California* Geology
Aaron Grove Plattner* *Iowa City, Iowa* Computer Science
David Naoki Powers* *Thousand Oaks, California* Chemistry
Michael Orlando Priolo *Mission, Texas* Engineering and Applied Science (Aeronautics)
Justin James Purewal* *Huntington Beach, California* Applied Physics
Yan Qi* *Tianjin, China* Chemistry and Biology
Jason Daniel Quimby *Santa Ana, California* Biology
Jason Michael Raycroft *Brooklyn Park, Minnesota* Electrical Engineering
Elizabeth Hesper Rego *Albuquerque, New Mexico* Physics
Katherine Anne Richardson *Rowlett, Texas* Physics
Laura L. Rogers *Kansas City, Missouri* Mechanical Engineering
Nicholas Andrew Rupprecht* *Gurnee, Illinois* Mathematics
Evan David Rushton *Los Angeles, California* Biology
Ryan Scott Samson* *Poway, California* Economics
Peter Curtis Samuelson* *Cedar Hill, Texas* Mathematics
Hans Christopher Scholze *Kodiak, Alaska* Electrical Engineering
Ryan Scott Schram *Los Angeles, California* Engineering and Applied Science
Peter Stuart Seidel *Titusville, Florida* Economics
Candace Sachi Wai Mei Seu* *Hilo, Hawaii* Chemistry
Henry Po-ting Shu* *Walnut, California* Electrical and Computer Engineering
Scott Benjamin Singer* *Houston, Texas* Physics
Hans Peter Smith *Cincinnati, Ohio* Engineering and Applied Science
Jonathan Ching-Wah So* *Ottawa, Canada* Applied Physics
Benjamin Anthony Solecki *Pittsburgh, Pennsylvania* Business Economics and Management
and Engineering and Applied Science
Alan William Somers *San Antonio, Texas* Electrical Engineering
Veronica Tatiana Sovero *Thousand Oaks, California* Economics
Katherine Diane Stoy *Bakersfield, California* Mechanical Engineering
Chia Hsin Suen *Houston, Texas* Engineering and Applied Science
Joan Karen Sum Ping* *Port-Louis, Mauritius* Chemical Engineering (Environmental)
Derrick Yuan Sun* *Sugarland, Texas* Biology
Chalita Thanyakoop *Khon Kaen, Thailand* Biology
Rohit Parathundyil Thomas *Iowa City, Iowa* Mathematics

Bachelor of Science continued

- Samuel Wilford Thomsen* *Hyrum, Utah* Physics
Chirath Neranjana Thouppuarachchi *Colombo, Sri Lanka* Engineering and Applied Science
Neil Kumar Tiwari* *Glendale, California* Chemistry
Leo J. Tominna* *Troy, Michigan* Computer Science
Felipe Martin Torres *Cypress, California* Engineering and Applied Science (Aeronautics)
Vi Tuong Tran *Irvine, California* Chemistry
My-Ngoc Thi Truong *New York, New York* Engineering and Applied Science
Brian Saxton Underwood* *West Chester, Pennsylvania* Chemistry and Electrical
Engineering
Stephen Eric Underwood* *Springfield, Pennsylvania* Physics
Jared Fisher Updike *Mesa, Arizona* Computer Science
Jaime Manuel Valle *Miami Lakes, Florida* Physics
Nicholas James Van Buer* *Los Angeles, California* Geology
William Raymond Van de Water* *Lunenburg, Massachusetts* Physics and Business
Economics and Management
Andrea Elena Vasconcellos *Morganville, New Jersey* Biology
Igor Vaynman *Redwood City, California* Physics
Parth Ramanan Venkat *Grosse Pointe Farms, Michigan* Biology and Business Economics and
Management
Russeen Paul Wali *Van Nuys, California* Chemistry
Nicholas Reid Wall* *Sunnyvale, California* Biology
Claire Lydia Walton* *El Paso, Texas* Mathematics and English
Xiao Yu Wang* *Cerritos, California* Electrical Engineering
Joseph Vaughn Wasem* *Pullman, Washington* Physics
Jacob Johannes Weel *Stein, the Netherlands* Computer Science
Lauren Anne Wessel* *Dallas, Texas* Mechanical Engineering
Cory Haley White* *Grove City, Pennsylvania* Physics
Aaron Wiest* *Eagle Rock, California* Applied Physics
Elisabeth Blanche Wildanger *Los Altos, California* Mechanical Engineering
Sarah Michelle Wilhoit *Little Rock, Arkansas* Mechanical Engineering
Michael James Wilson* *Portland, Oregon* Computer Science
Philip Hao-chang Wong *Cleveland Heights, Ohio* Mechanical Engineering
Bin Wu* *Shanghai, China* Electrical Engineering
Jing Xiong* *Arcadia, California* Electrical Engineering
Joseph Zhen Ying Xu *Shanghai, China* Computer Science
Naijie Xu* *Beijing, China* Mathematics and Economics
Chuck-Hou Yee *Sacramento, California* Physics
Terry A. Yen* *Torrance, California* Chemistry
Mehmet Yenmez* *Konya, Turkey* Mathematics and Economics

Bachelor of Science continued

Joanne Wing Lan Yim* *Honolulu, Hawaii* Electrical Engineering

In Jung Yoon *Portland, Oregon* Electrical Engineering

Thomas Joseph Zacharia *Hinsdale, Illinois* Economics

David Yu Zhang *Overland Park, Kansas* Biology

Libin Zhang* *Beijing, China* Geobiology and Business Economics and Management

Wei Zhang* *Sichuan, China* Chemistry

Zhipeng Zhang* *Jilin City, China* Physics and Economics

Kai Zhu *Houston, Texas* Physics

Kristen Kay Zortman *Stevens Point, Wisconsin* Engineering and Applied Science

(Aeronautics)

Master of Science

- Anura Yamesh Abeyesinghe (*Physics*) A.B., Dartmouth College 2001.
- Panagiotis Dimitri Aliferis (*Physics*) Diploma, National University of Athens 2000; M.S., University of Michigan 2002.
- Behnam Analui (*Electrical Engineering*) B.S., Sharif University of Technology 1998; M.S., 2000.
- Marco Andreetto (*Electrical Engineering*) Laurea, Università di Padova 2001.
- Motofumi Arii (*Electrical Engineering*) B.E., Kyushu Institute of Technology 1995; M.E., 1997.
- Blake Waters Axelrod (*Applied Physics*) B.S., Haverford College 1999.
- Aydin Babakhani (*Electrical Engineering*) B.S., Sharif University of Technology 2003.
- Andrew Harris Babiskin (*Chemical Engineering*) B.S., University of Maryland 2003.
- Tom Baehr-Jones (*Applied Physics*) B.S., California Institute of Technology 2002.
- Kristina Marie Barkume (*Planetary Science*) B.A., Reed College 2003.
- Derek William Bartlett (*Chemical Engineering*) B.S., Stanford University 2003.
- Vern Garrett Bittner Jr. (*Chemistry*) B.S., University of Wyoming 2001.
- Charlotte Lorraine Bolyard (*Aeronautics*) B.S. University of Virginia 2004.
- Julia Marie Badger Braman (*Mechanical Engineering*) B.S., Purdue University 2003.
- Katherine Scott Brantley (*Geology*) B.S., California Institute of Technology 2003.
- Guillaume Alain Brès (*Mechanical Engineering*) Diplôme d'Ingénieur, Ecole Centrale de Lyon 2001; M.S., Pennsylvania State University 2002.
- Alexander Lindale Brown (*Social Science*) B.S. (*Actuarial Science*), B.S. (*Economics*), Ohio State University 2003.
- Yuan-Heng Chao (*Electrical Engineering*) B.S., California Institute of Technology 2004.
- Jae-Woo Choi (*Electrical Engineering*) B.S., California Institute of Technology 2004.
- Micol Huw Christopher (*Astrophysics*) A.B., Harvard College 1999.
- Lisa Cowan (*Materials Science*) B.S., California Institute of Technology 2001.
- Orion Steven Kwong-Yu Crisafulli (*Applied Physics*) B.S.E., Princeton University 2003.
- Stephanie June Culler (*Chemical Engineering*) B.S., University of California, San Diego 2003.
- Erin Julia Daida (*Chemistry*) S.B., Massachusetts Institute of Technology 2003.
- Jean-Thibault de Besombes (*Aeronautics*) Ingénieur, Ecole Polytechnique 2004.
- Michael John deLorimier (*Computer Science*) B.S., University of California, Berkeley 2002.
- Cesar Alberto Del Solar (*Electrical Engineering*) B.S., California Institute of Technology 2004.
- Jennifer Anne Dionne (*Applied Physics*) B.S. (*Systems Science and Engineering*), B.S. (*Physics*), Washington University in Saint Louis 2003.
- Sharif Mohamed Elcott (*Computer Science*) B.S., University of California, Los Angeles 2003.
- Alan Oi Lun Fung (*Bioengineering*) B.S., Purdue University 1998; M.S., University of Michigan 2002.
- Ilian Alexandrov Gachevski (*Mathematics*) M.Sc., Sofia University 1998.
- Harmony Belinda Gates (*Chemical Engineering*) B.S., University of California, Irvine 2002.

Master of Science continued

- Rohit Sudhir Gawande (*Electrical Engineering*) B.E., Government College of Engineering, Pune 2002; M.Sc., Chalmers University of Technology 2004.
- Kok Win Goh (*Physics*) B.A., Wesleyan University 1999.
- Noah MacLeod Burnham Gourlie (*Biochemistry and Molecular Biophysics*) B.S., Yale University 2003.
- Erik Michael Granstedt (*Applied Physics*) B.S., California Institute of Technology 2004.
- Nathaniel Asoka Gray (*Computer Science*) B.S., University of California, Los Angeles 1996.
- Jonathan Earl Green (*Applied Physics*) B.S., University of California, Irvine 2002.
- Melissa Jane Griggs (*Applied Physics*) B.S., Syracuse University 2003.
- Kristjan Gudmundsson (*Mechanical Engineering*) B.S., University of Iceland 2003.
- Xin Guo (*Planetary Science*) B.S., Peking University 2003.
- Benjamin Lee Hansen (*Materials Science*) B.S., Brigham Young University 2002.
- Adam Jacob Hartwick (*Chemical Engineering*) B.S., University of California, Santa Barbara 2001.
- Kristy Michelle Hawkins (*Chemical Engineering*) B.S., Texas A&M University 2002.
- Mark Hesselink (*Aeronautics*) B.S., University of Twente 2001; M.S., 2004.
- Michael Joseph Hochberg (*Applied Physics*) B.S., California Institute of Technology 2002.
- Nicolas Henry Hudson (*Mechanical Engineering*) B.E., University of Canterbury 2003.
- Winston Paul Jackson (*Applied Mechanics*) B.S., Southern University and A&M College 2003.
- Glenn Evans Jones (*Electrical Engineering*) B.S., California Institute of Technology 2003.
- Heidi Joy Kamp (*Social Science*) B.S. (*Mathematics*), B.S., (*Economics*), University of Minnesota 2003.
- Ravi Venkata Subramanya Kanda (*Geophysics*) B.Tech., Indian Institute of Technology, Bombay 1994; M.S., University of Cincinnati 1997; M.S., University of Kentucky 2001.
- Yoshihiro Kaneko (*Geophysics*) B.S., University of California, Los Angeles 2003.
- Nachiket Ganesh Kapre (*Electrical Engineering*) B.E., Government College of Engineering, Pune 2002.
- Amit Prakash Kenjale (*Electrical Engineering*) B.S., California Institute of Technology 2002.
- Mikhail N. Kislitsyn (*Materials Science*) B.S., Higher Chemical College of the Russian Academy of Sciences 2001; M.S., 2003.
- Dmitriy Leonidovich Kogan (*Control and Dynamical Systems*) B.S., Harvey Mudd College 2003.
- Robert Evans Kopp III (*Geobiology*) S.B., University of Chicago 2002.
- Richard Michael Jack Kramer (*Aeronautics*) B.S., University of Auckland 2004.
- Jeffrey J. Krimmel (*Mechanical Engineering*) B.S., University of Texas at Austin 2003.
- Brian Joseph Kwan (*Chemistry*) B.S., Stanford University 2000.
- Paul Edward Laufer (*Electrical Engineering*) B.S., California State Polytechnic University, Pomona 2002.

Master of Science continued

- Elizabeth Danette Lester (*Bioengineering*) B.S., Baylor University 2003.
- Claire Isabelle Levallant (*Mathematics*) Ingénieur, Ecole Normale Supérieure de Cachan 2002.
- Weiyi Li (*Electrical Engineering*) B.S., California Institute of Technology 2004.
- Ricky Lim (*Applied Mechanics*) B.S., Harvey Mudd College 2002.
- Hsuan-Tien Lin (*Computer Science*) B.S., National Taiwan University 2001.
- Lilyn Liu (*Biology*) B.S., Stanford University 2002.
- Xerxes Felipe López-Yglesias (*Physics*) B.S., University of California, Santa Barbara 2002.
- Matthew Steven Lucas (*Materials Science*) B.S. (*Materials Science and Engineering*), B.S. (*Physics*), Carnegie Mellon University 2003.
- Jeremy Chee-Ming Ma (*Mechanical Engineering*) B.S., University of California, Los Angeles 2004.
- Jason Robert Joseph Martineau (*Biochemistry and Molecular Biophysics*) B.S., University of Maryland, College Park 2003.
- Laurent Alexandre Mathevet (*Social Science*) Licence, University of Saint-Etienne 2002; Maîtrise 2003.
- Kyle Alan Mattes (*Social Science*) B.A., Northwestern University 1997.
- Jennifer Mederos (*Chemical Engineering*) B.S., University of California, Riverside 1997.
- Alisa Caroline Miller (*Geophysics*) B.S., University of Arizona 2001.
- Sarah Ellen Minson (*Geophysics*) B.A., University of California, Berkeley 2003.
- Carlos Mochon (*Physics*) S.B., Massachusetts Institute of Technology 1999.
- Sally Page Moffett (*Aeronautics*) B.S., University of Virginia 2004.
- Maziar Motahari (*Applied Mechanics*) B.S., University of Tehran 1996; M.S., 1997.
- Helia Naeimi (*Computer Science*) B.S., Sharif University of Technology 2002.
- Laura Elizabeth Panattoni (*Social Science*) B.S., Duke University 2000.
- Raviv Perahia (*Applied Physics*) B.A., B.S., Boston University 2003.
- Ryan Petterson (*Geology*) B.A., University of California, Berkeley 2000.
- Florian Peter Pintgen (*Applied Physics*) Ingenieur, Technische Universität München 2000.
- Poh Chieh Benny Poon (*Aeronautics*) A.B., B.S., University of Illinois at Urbana-Champaign 2004.
- Piyush Prakash (*Computer Science*) B.S., California Institute of Technology 2002.
- Emma Sojourner Gage Rainey (*Planetary Science*) B.A. (*Physics*), B.S. (*Geophysics*), University of Minnesota 2003.
- Brenda Jeannette Ramirez (*Mechanical Engineering*) B.S., California State Polytechnic University, Pomona 2002.
- Lavanya Reddy (*Computation and Neural Systems*) B.S., California Institute of Technology 2002; B.A., Mount Holyoke College 2003.
- Julian Darius Revie (*Biochemistry and Molecular Biophysics*) B.S., Yale University 2002.
- Julián José Rímoli (*Aeronautics*) Ingeniero Aeronáutico, Universidad Nacional de la Plata 2001.
- Troy Dean Rockwood (*Electrical Engineering*) B.S., Brigham Young University 1998.

Master of Science continued

- Colette Vanessa Salyk (*Planetary Science*) S.B., Massachusetts Institute of Technology 2003.
- Jerrold Joseph Schwartz (*Biochemistry and Molecular Biophysics*) B.Sc., University of British Columbia 2003.
- Santiago De Jesus Solares (*Chemical Engineering*) B.S., University del Valle 1994; Licenciado, 1995; M.S., University of Miami 1996.
- Armin Sorooshian (*Chemical Engineering*) B.S., University of Arizona 2003.
- Ramesh Srinivasan (*Chemical Engineering*) B.ChE., University of Mumbai 1995.
- Jin-Yoo Suh (*Materials Science*) B.S., Seoul National University 1995; M.S., 1997.
- Gunjan Sukul (*Materials Science*) B.Tech., Institute of Technology, Banaras Hindu University 2003; M.S., Royal Institute of Technology 2003.
- Daniel Sutoyo (*Civil Engineering*) B.S., Harvey Mudd College 2004.
- Mark Alan Szwast (*Chemical Engineering*) B.S.E., Arizona State University 2003.
- Katsuaki Tanabe (*Applied Physics*) B.Eng., University of Tokyo 2001; M.Eng., 2003.
- Andrew Allen Tchieu (*Aeronautics*) B.S., University of California, San Diego 2004.
- Randolph Tjoa (*Electrical Engineering*) B.Eng., National University of Singapore 2003.
- Lydia Ann Treviño (*Mechanical Engineering*) B.S., University of California, Los Angeles 2003.
- Tristan Scott Ursell (*Applied Physics*) B.S., Rensselaer Polytechnic Institute 2003.
- Nathalie Maria Vriend (*Aeronautics*) B.S., University of Twente 2001; M.S., 2004.
- Jeffrey Scott Wiezorek (*Biology*) B.A., University of Pennsylvania 1993; M.D., Columbia University 1998.
- Richard Alan Wildman, Jr. (*Environmental Science and Engineering*) B.S., Yale University 2001.
- Maung Nyan Win (*Chemical Engineering*) B.S., Virginia Commonwealth University 2003.
- Michael Timothy Wolf (*Mechanical Engineering*) B.S., Stanford University 1997.
- Jigang Wu (*Electrical Engineering*) B.S., Tsinghua University 2001; M.S., 2004.
- Min Yang (*Physics*) B.S., Beijing University 1998.
- Zhonghua Yang (*Geochemistry*) B.S., University of Science and Technology of China 2000.
- David Thomas Young (*Social Science*) B.Sc., University of Canterbury 2001.
- Kakani Katija Young (*Aeronautics*) A.A.S., Edmonds Community College 2000; B.S.A.A., University of Washington 2004.
- Theodore Ernest Yu (*Electrical Engineering*) B.S., California Institute of Technology 2004.
- Guoyun Zhang (*Materials Science*) B.S., Tsinghua University 1997.
- Libin Zhang (*Geobiology*) B.S., California Institute of Technology 2005.
- Ling Zheng (*Mechanical Engineering*) B.S., Tsinghua University 2003.

Degree of Engineer

- Michael Bernard Johnson (*Aeronautics*) B.Sc., Queen's University 1999; M.S., California Institute of Technology 2000.
- Michael James Sekerak (*Aeronautics*) B.S., Illinois Institute of Technology 1999; M.S., California Institute of Technology 2001.

Doctor of Philosophy

DIVISION OF BIOLOGY

- Xavier Ignacio Ambroggio (*Biology*) B.S., George Mason University 1999.
Thesis: Structural and Functional Studies of Jamm Domain Proteins and Their Role in the Ubiquitin System.
- Magdalena Bak-Maier (*Cellular and Molecular Neurobiology*) B.S., New York University 1999.
Thesis: Commissural Axon Kinetics and the Role of Netrin in Early Brain Circuitry Development.
- Susannah Dale Barbee (*Biology*) B.A., Harvard-Radcliffe College 1997.
Thesis: The Functions of Phosphatidylinositol₃-Kinase in T Lymphocyte Development: Roles in Positive Selection and Thymic Exit.
- Sujata Bhattacharyya (*Biology*) B.Sc., Saint Xavier's College 1996; M.Sc., Institute of Science, University of Bombay 1998.
Thesis: Embryonic Origin of the Olfactory Sensory System: Fate Map, Lineage Analysis and Specification of the Avian Olfactory Placode.
- Gloria Bohyun Choi (*Biology*) B.A., University of California, Berkeley 1999.
Thesis: Characterization of the Circuitries Mediating Innate Reproductive and Defensive Behaviors from the Amygdala to the Hypothalamus.
- Jeffrey Michael Copeland (*Biology*) B.A., University of Virginia 1996.
Thesis: Identification of Novel Cell Death Regulators in *C. elegans* and *Drosophila*.
- Laura Rosemary Croal (*Biology and Geobiology*) B.S., University of Wisconsin-Madison 1999.
Thesis: Fe(II) Oxidation by Anaerobic Phototrophic Bacteria: Molecular Mechanisms and Geological Implications.
- Shabnam Sarah Farivar (*Biology*) B.A., University of California, Berkeley 1998.
Thesis: Cytoarchitecture of the Locust Olfactory System.
- Christopher Edward Hart (*Biology*) B.S., Siena College 1998.
Thesis: Inferring Genetic Regulatory Network Structure: Integrative Analysis of Genome-Scale Data.
- Geoffrey Kai Tong Hom (*Biochemistry and Molecular Biophysics*) B.A., University of California, Berkeley 1999.
Thesis: Advances in Computational Protein Design: Development of More Efficient Search Algorithms and their Application to the Full-Sequence Design of Larger Proteins.
- Jun Ryul Huh (*Biology*) B.S., Seoul National University 1996; M.S., 1998.
Thesis: To Die or to Differentiate: Apoptotic and Non-apoptotic Roles of Death Molecules in *Drosophila melanogaster*.
- Thomas Hin-Chai Leung (*Biology*) B.S., Stanford University 1998.
Thesis: Specificity of Transcription Activation by NF- κ B Subunits.
- Angie Siu Yee Mah (*Biochemistry and Molecular Biophysics*) B.Sc., McGill University 1999.
Thesis: Regulation of Protein Kinase Dbf2 in Mitotic Exit.

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

Doctor of Philosophy continued

- Ofer Mazor (*Computation and Neural Systems*) A.B., B.S., Brown University 1998.
Thesis: Neural Dynamics and Population Coding in the Insect Brain.
- Joyce Yaochun Peng (*Biology*) B.S., National Tsing Hua University 1996; M.S., California Institute of Technology 1998.
Thesis: Structure and Function Prediction of Human Muscarinic Acetylcholine Receptor 1, Cation- π Studies, and Protein Design.
- Leila Reddy (*Computation and Neural Systems*) B.A., Pomona College 2000.
Thesis: Attention and the Processing of Natural Stimuli: Psychophysics, fMRI and Single Unit Recordings in the Human Brain.
- Premal S. Shah (*Biochemistry and Molecular Biophysics*) B.S., University of Maryland 1998.
Thesis: Advances in Force Field Development and Sequence Optimization Methods for Computational Protein Design.
- Donghun Shin (*Biology*) B.S., Seoul National University 1995; M.S., 1997.
Thesis: Identification and Characterization of Endothelial Specific Genes.
- Claudiu Simion (*Biology*) B.S., California Institute of Technology 1999.
Thesis: Orienting and Preference: An Enquiry into the Mechanisms Underlying Emotional Decision Making.
- Hui Yu (*Biology*) B.S., Fudan University 1990.
Thesis: *C. elegans* Male Tail Development.

DIVISION OF CHEMISTRY AND CHEMICAL ENGINEERING

- Darren Lee Beene (*Chemistry*) B.A., Portland State University 1991; B.S., University of Arizona 1998.
Thesis: Chemical Scale Investigations of Ligand-Gated Ion Channels Using Unnatural Amino Acids.
- Diego Benitez (*Chemistry*) B.S., Universidad Nacional Autonoma de Mexico 2001.
Thesis: Theoretical Study of the Mechanism of Olefin Metathesis and Synthesis of Cyclic Polymers.
- Timothy Patrick Best (*Chemistry*) B.S., Butler University 1999.
Thesis: Localization of DNA-Binding Polyamides in Living Cells.
- Theodore Alexander Betley (*Chemistry*) B.S.E., University of Michigan 1999.
Thesis: Coordination Chemistry from Trigonally Coordinated Iron Platforms: Chemistry Relevant to Dinitrogen Reduction.
- Wendy Belliston Bittner (*Chemistry*) B.A., Bryn Mawr College 1999.
Thesis: Ultrafast Photoreduction of Nitric Oxide Synthase by Electron Tunneling Wires.
- Christopher J. Borths (*Chemistry*) B.S., University of Kentucky 1998; M.S., University of California, Berkeley 2000.
Thesis: Investigations in Enantioselective Catalysis. Development of Novel Asymmetric Organocatalytic Reactions.

Doctor of Philosophy continued

- Elizabeth Loraine Borths (*Biochemistry and Molecular Biophysics*) B.S., University of Kentucky 1998.
Thesis: Structural and Biochemical Characterization of the Vitamin B₁₂ ABC Transporter, BtuCD-F.
- Sean Pomeroy Brown (*Chemistry*) B.S., University of California, Davis 1998.
Thesis: Iminium and Enamine Activation: Methods for Enantioselective Organocatalysis.
- Steven Douglas Brown (*Chemistry*) B.S., University of Utah 2000.
Thesis: The Chemistry of Tris(phosphino)borate Supported Iron-Nitrogen Multiply-Bonded Linkages.
- Ileana Cristina Carpen (*Chemical Engineering*) B.S., Stanford University 1999; M.S., California Institute of Technology 2002.
Thesis: Studies of Suspension Behavior. I. Instabilities of Non-Brownian Suspensions. II. Microrheology of Colloidal Suspensions.
- Serena Hsin-Yi Chung (*Chemical Engineering*) B.S., University of Illinois at Urbana-Champaign 1995; M.S., California Institute of Technology 2001.
Thesis: Global Distribution, Radiative Forcing, and Climate Impact of Carbonaceous Aerosols.
- Andrei Deev (*Chemistry*) B.S., Moscow Institute of Physics and Technology 1997; M.S., 1998.
Thesis: Cavity Ringdown Spectroscopy of Atmospherically Important Radicals.
- Robert Michael Dirks (*Chemistry*) B.A., Wabash College 2000.
Thesis: Analysis, Design, and Construction of Nucleic Acid Devices.
- Benjamin S. Edelson (*Chemistry*) A.B., Harvard College 2000.
Thesis: Nuclear Localization of Polyamide-Fluorescein Conjugates in Cell Culture.
- Ramez Ahmed Elgammal (*Chemistry and Physics*) B.S. (*Biology*), H.B.S. (*Chemistry*), Central Michigan University 1996; M.S. (*Applied Physics*), California Institute of Technology 2001; M.S. (*Physics*), 2002.
Thesis: Theoretical and Experimental Investigations in MEMS-Based Force-Detected NMR.
- Eric James Fechter (*Chemistry*) B.S., California State Polytechnic University, San Luis Obispo 2000.
Thesis: Design of Sequence-Specific DNA Intercalators.
- Eric Matthew Ferreira (*Chemistry*) S.B., Massachusetts Institute of Technology 2000.
Thesis: The Design and Development of Palladium-Catalyzed Aerobic Oxidative Transformations.
- Jonathan Michael Galownia (*Chemical Engineering and Chemistry*) B.S., University of Illinois at Urbana-Champaign 2000; M.S., California Institute of Technology 2003.
Thesis: I. Synthesis, Characterization, and Base Catalysis of Novel Zeolite Supported Super-basic Materials. II. Oxidative Dehydrogenation of Ethane Over Reduced Heteropolyanion Catalysts.

Doctor of Philosophy continued

- Neil Kamal Garg (*Chemistry*) B.S., New York University 2000.
Thesis: The Total Synthesis of Dragmacidins D and F.
- Spencer Eugene Hall (*Chemistry*) B.S., Brigham Young University 1997; M.S., 2000.
Thesis: Development of a Structure Prediction Method for G-Protein Coupled Receptors.
- Jeremy David Heidel (*Chemical Engineering and Biology*) S.B. (*Biology*), S.B. (*Chemical Engineering*), Massachusetts Institute of Technology 1999; M.S., California Institute of Technology 2001.
Thesis: Targeted, Systemic Non-Viral Delivery of Small Interfering RNA *in vivo*.
- William W. Ja (*Chemistry*) B.S., University of California, Berkeley 1998.
Thesis: Peptide Modulators of G Protein Signaling.
- David Matthew Jenkins (*Chemistry*) B.A., Cornell University 2000.
Thesis: Low Spin Pseudotetrahedral Cobalt Tris(phosphino)borate Complexes.
- Elizabeth Anne Vincent Jones (*Chemical Engineering and Biology*) B.A.Sc., University of Waterloo 1999; M.S., California Institute of Technology 2002.
Thesis: Blood Flow and the Mammalian Embryo.
- Vadym A. Kapinus (*Chemistry*) B.S., Moscow Institute of Physics and Technology 1995; M.S., 1997.
Thesis: Photophysical Properties of Protonated Aromatic Hydrocarbons.
- Sara Bernadine Klamo (*Chemistry*) B.S., Wayne State University 1999.
Thesis: Direct Examination of Initiation and Propagation Kinetics of Zirconocene-Catalyzed Alkene Polymerization.
- Bruce Michael Lambert (*Chemistry and Physics*) B.S., Bates College 1997.
Thesis: Force-Detected, Single-Molecule Spectroscopy and Imaging Using Nanoscale Mechanical Resonators.
- Hyunjoo Lee (*Chemical Engineering and Chemistry*) B.S., Seoul National University 1998; M.S., 2000; M.S., California Institute of Technology 2003.
Thesis: A New Strategy for Synthesizing Zeolites and Zeolite-like Materials.
- Youyong Li (*Chemistry*) B.S., Peking University 1997; M.S., 2000.
Thesis: Atomistic Simulation of Macromolecules.
- Michael A. Marques (*Chemistry*) B.S., Santa Clara University 2000.
Thesis: The Molecular Recognition of DNA by Novel Heterocycles.
- Peter Meinhold (*Biochemistry and Molecular Biophysics*)
Thesis: Engineering Cytochrome P450 BM-3 for Selective Hydroxylation of Alkanes.
- John Frank Murphy (*Chemical Engineering*) B.S., Cornell University 1999; M.S., California Institute of Technology 2001.
Thesis: Methods for Collection and Processing of Gene Expression Data.
- Robert J. Nielsen (*Chemical Engineering and Chemistry*) B.S., Northwestern University 1998.
Thesis: Computational Strategy in Catalyst Design.

Doctor of Philosophy continued

- Alan Bowers Northrup (*Chemistry*) A.B., Harvard College 2000.
Thesis: Design and Development of New Enantioselective Organocatalytic Transformations, a Two-Step Synthesis of Carbohydrates, and Progress toward the Total Synthesis of Callipeltoside C.
- Jonathan S. Owen (*Chemistry*) B.S., University of Wisconsin-Madison 2000.
Thesis: A Study of Ligand Substitution and Its Importance in the C-H Activation of Methane and Methanol.
- Ernest James Petersson (*Chemistry*) B.A., Dartmouth College 1998.
Thesis: Investigations of Ion Channel Structure and Function. I. Studies of Nicotine Binding to the Acetylcholine Receptor. II. Development of Tools for Studying Learning and Memory with Unnatural Amino Acids.
- Stephen R. Popielarski (*Chemical Engineering*) B.S., Rensselaer Polytechnic Institute 1999; M.S., California Institute of Technology 2004.
Thesis: Development of a Nanoparticle-Based Model Delivery System to Guide the Rational Design of Gene Delivery to the Liver.
- Adam Thomas Poulin-Kerstien (*Chemistry*) B.A., Amherst College 2000.
Thesis: DNA-Templated Dimerizations of Minor Groove-Binding Polyamides.
- Xin Qi (*Chemistry*) B.S., Peking University 1991.
Thesis: Unnatural Amino Acid Incorporation to Rewrite the Genetic Code and RNA-peptide Interactions.
- Isaac Michael Rutenberg (*Chemistry*) B.S., Colorado School of Mines 2000.
Thesis: Functionalized Polymers and Surfaces via Ring-Opening Metathesis Polymerization.
- Daniel Paul Sanders (*Chemistry*) B.S., Case Western Reserve University 1996; M.S. 1999.
Thesis: Development of Fluorinated Monomers and Polymers for Advanced Photolithographic Applications.
- Catherine Ann Sarisky (*Chemistry*) B.A., New College of the University of South Florida 1995.
Thesis: Exploration of the Determinants of Protein Structure and Stability by Protein Design.
- Shantanu Sharma (*Chemistry*) B.S., California State University, Los Angeles 2001.
Thesis: Prediction of Structure and Antagonist Binding Site in Human and Rodent Chemokine Receptor 1.
- Wei Shen (*Chemical Engineering and Biology*) B.S., East China University of Science and Technology 1992; M.S., 1995; M.S., California Institute of Technology 2001.
Thesis: Structure, Dynamics, and Properties of Artificial Protein Hydrogels Assembled through Coiled-coil Domains.
- Brian Christopher Sisk (*Chemistry*) B.S., Western Kentucky University 1999; M.S., 2000.
Thesis: Computational Optimization of Chemical Vapor Detector Arrays.

Doctor of Philosophy continued

Andrew J. Spakowitz (*Chemical Engineering*) B.S., University of Wisconsin–Madison 1999; M.S., California Institute of Technology 2001.

Thesis: Semiflexible Polymers: Fundamental Theory and Applications in DNA Packaging.

Ramesh Srinivasan (*Chemical Engineering and Chemistry*) B.ChE., University of Mumbai 1995.

Thesis: Structural Dynamics of Complex Molecules by Ultrafast Electron Diffraction: Concepts, Methodology and Applications.

Heather Ann Sumner (*Chemistry*) B.A., Williams College 1995.

Thesis: Gas Phase Reaction Dynamics and Design of Molecular Clusters and Bioconjugates.

Terry Torao Takahashi (*Biochemistry and Molecular Biophysics*) B.S., Claremont McKenna College 1998; M.S., California Institute of Technology 2004.

Thesis: *In Vitro* Selection of RNA Binding Peptides.

Andrew K. Udit (*Chemistry*) B.Sc., University of Toronto 2000.

Thesis: P450 BM3 Electrochemistry and Electrocatalysis.

Jeremy John Weaver (*Chemistry*) B.A., Gustavus Adolphus College 2000.

Thesis: Corroles.

Susanna Leigh Widicus Weaver (*Chemistry*) B.S., Illinois Wesleyan University 2000.

Thesis: Rotational Spectroscopy and Observational Astronomy of Prebiotic Molecules.

Lauren J. Webb (*Chemistry*) B.A., Bowdoin College 2000.

Thesis: Chemical Characterization and Charge Carrier Dynamics of Crystalline Silicon(III) Surfaces Modified with Surface-Bound Organic Functional Groups.

James Michael Zahler (*Chemical Engineering and Applied Physics*) B.A., Texas A&M University 1999; M.S., California Institute of Technology 2002.

Thesis: Materials Integrations for High-Performance Photovoltaics by Wafer Bonding.

DIVISION OF ENGINEERING AND APPLIED SCIENCES

Gabriel Alejandro Acevedo Bolton (*Bioengineering*) B.S., University of California, Berkeley 1998; M.S., California Institute of Technology 1999.

Thesis: Blood Flow Effects on Heart Development and a Minimally Invasive Technique for *in vivo* Flow Alterations.

Steven Wayne Alves (*Civil Engineering*) B.S., Harvey Mudd College 2000; M.S., California Institute of Technology 2001.

Thesis: Nonlinear Analysis of Pacoima Dam with Spatially Nonuniform Ground Motion.

Deniz Karapetian Armani (*Electrical Engineering*) B.S., University of Illinois at Urbana-Champaign 2000; M.S., California Institute of Technology 2003.

Thesis: Ultra-High-Q Planar Microcavities and Applications.

Roya Bahreini (*Environmental Science and Engineering*) B.S., University of Maryland 1999; M.S., California Institute of Technology 2003.

Thesis: Studies with the Aerosol Mass Spectrometer.

Doctor of Philosophy continued

- Jeffrey Myles Bergthorson (*Aeronautics and Chemistry*) B.Sc., University of Manitoba 1999; M.S., California Institute of Technology 2000.
Thesis: Experiments and Modeling of Impinging Jets and Premixed Hydrocarbon Stagnation Flames.
- Harish Subrahmanya Bhat (*Control and Dynamical Systems*) A.B., Harvard College 2000.
Thesis: Lagrangian Averaging, Nonlinear Waves, and Shock Regularization.
- Justin Scott Boland (*Electrical Engineering*) B.S., University of Texas at Dallas 2000; M.S., California Institute of Technology 2001.
Thesis: Micro Electret Power Generators.
- Stacey Walker Boland (*Mechanical Engineering*) B.S., University of Texas at Dallas 2000; M.S., California Institute of Technology 2001.
Thesis: Sol-gel Synthesis of Highly Oriented Lead Barium Titanate and Lanthanum Nickelate Thin Films for High Strain Sensor and Actuator Applications.
- Christopher Shawn Boxe (*Environmental Science and Engineering and Geology*) B.S., Morehouse College 1999; M.S. (*Planetary Science*), California Institute of Technology 2001; M.S. (*Environmental Science and Engineering*), 2002.
Thesis: Nitrate Photochemistry and Interrelated Chemical Phenomena in Ice.
- Philippe Chatelain (*Aeronautics and Applied and Computational Mathematics*) Ingénieur Civil Mécanicien, Université Catholique de Louvain 1999; M.S., California Institute of Technology 2000.
Thesis: Contributions to the Three-Dimensional Vortex Element Method and Spinning Bluff Body Flows.
- Stephanie Sienyee Chow (*Computation and Neural Systems*) B.Sc., University of Toronto 1995; M.A., Queen's University 1998.
Thesis: Speciation in Digital Organisms.
- Matthew M. Cook (*Computation and Neural Systems*)
Thesis: Networks of Relations.
- Georgia B. Cua (*Civil Engineering and Geophysics*) B.S., Harvey Mudd College 1998; M.S., California Institute of Technology 2000.
Thesis: Creating the Virtual Seismologist: Developments in Ground Motion Characterization and Seismic Early Warning.
- Uri Vaughan Cummings (*Electrical Engineering*) B.A., Wesleyan University 1994; B.S., California Institute of Technology 1994; M.S., California Institute of Technology 1995.
Thesis: Linearized and High Frequency Electrooptic Modulators.
- John Oluseun Dabiri (*Bioengineering and Aeronautics*) B.S.E. (*Mechanical Engineering and Aeronautics*), Princeton University 2001; M.S., California Institute of Technology 2003.
Thesis: Unsteady Fluid Mechanics of Starting-Flow Vortex Generators with Time-Dependent Boundary Conditions.
- Domitilla Del Vecchio (*Control and Dynamical Systems*) Diploma, Università degli Studi di Roma "Tor Vergata" 1999.
Thesis: State Estimation in Multi-Agent Decision and Control Systems.

Doctor of Philosophy continued

- Bradley Scott Dooley (*Aeronautics and Planetary Science*) B.S., Rice University 1993; M.S., California Institute of Technology 1994.
Thesis: Stereo Digital Particle Image Velocimetry Investigation of a Free Surface Mixing Layer.
- Evan David Dorn (*Computation and Neural Systems*) B.S., B.A., Swarthmore College 1997.
Thesis: Universal Biosignatures for the Detection of Life.
- Jeffrey B. Endelman (*Bioengineering*) B.S., Northwestern University 2000; M.S., University of California, Santa Barbara 2002.
Thesis: Design and Analysis of Combinatorial Protein Libraries Created by Site-Directed Recombination.
- James Malcolm Faddy (*Aeronautics and Planetary Science*) M.E., University of Queensland 1998; M.E., 2000.
Thesis: Flow Structure in a Model of Aircraft Trailing Vortices.
- Ilja Friedel (*Computer Science*) B.S., University of Jena 1997; M.S., University of Kaiserslautern 1999; M.S., California Institute of Technology 2002.
Thesis: Approximation of Surfaces by Normal Meshes.
- Jimmy Fung (*Aeronautics and Control and Dynamical Systems*) B.S., Virginia Polytechnic Institute and State University 1997; M.S., 1998; M.S., California Institute of Technology 1999.
Thesis: Coarse Analysis of Multiscale Systems: Diffuser Flows, Charged Particle Motion, and Connections to Averaging Theory.
- Marcel Gavrilu (*Computer Science*) B.S., California Institute of Technology 1997; M.S., 2001.
Thesis: Towards More Efficient Interval Analysis: Corner Forms and a Remainder Interval Newton Method.
- William M. J. Green (*Electrical Engineering*) B.Sc., University of Alberta 1999; M.S., California Institute of Technology 2000.
Thesis: InGaAsP-InP Semiconductor Microcavity Geometries for Annular Bragg Reflection, Optical Switching, and Sensing.
- Irene Michelle Gregory (*Control and Dynamical Systems*) S.B., Massachusetts Institute of Technology 1988; M.S., University of Michigan 1990.
Thesis: Design and Stability Analysis of an Integrated Controller for Highly Flexible Advanced Aircraft Utilizing the Novel Nonlinear Dynamic Inversion.
- Lawrence Cary Gunn III (*Electrical Engineering*) B.S., United States Air Force Academy 1995; M.S., California Institute of Technology 2001.
Thesis: Integration of Complex Optical Functionality in a Production CMOS Process.
- Anna Iwaniec Hickerson (*Bioengineering*) B.S., California Institute of Technology 2000.
Thesis: An Experimental Analysis of the Characteristic Behaviors of an Impedance Pump.
- Stephen Richard Hostler (*Mechanical Engineering*) B.S.E., Case Western Reserve University 2000; M.S., California Institute of Technology 2001.
Thesis: Wave Propagation in Granular Materials.

Doctor of Philosophy continued

- Hung-Te Hsieh (*Electrical Engineering*) B.S., National Taiwan University 1998; M.S., California Institute of Technology 2002.
Thesis: Operation of Holographic Elements with Broadband Light Sources.
- James Sean Humbert (*Mechanical Engineering*) B.S., University of California, Davis 1997; M.S., California Institute of Technology 1999.
Thesis: Bio-Inspired Visuomotor Convergence in Navigation and Flight Control Systems.
- Scott Irving Jackson (*Aeronautics and Geophysics*) S.B., Brown University 1999; M.S., California Institute of Technology 2000.
Thesis: Gaseous Detonation Initiation via Wave Implosion.
- Yindi Jing (*Electrical Engineering*) B.E., University of Science and Technology of China 1996; M.E., 1999; M.S., California Institute of Technology 2000.
Thesis: Space-Time Code Design and Its Applications in Wireless Networks.
- Olga Kowalewsky (*Aeronautics and Computer Science*) Vordiplom, Aachen University of Technology 1996; Diplom, 2000; M.S., California Institute of Technology 2001.
Thesis: Theory of Complex Lattice Quasicontinuum and Its Application to Ferroelectrics.
- Seung-Yub Lee (*Materials Science*) B.S., Yonsei University 1997; M.S., University of California, Los Angeles 2000; M.S., California Institute of Technology 2002.
Thesis: Deformation Mechanisms of Bulk Metallic Glass Matrix Composites.
- Fei Fei Li (*Electrical Engineering*) B.A., Princeton University 1999; M.S., California Institute of Technology 2002.
Thesis: Visual Recognition: Computational Models and Human Psychophysics.
- Nathan Jacob Litke (*Computer Science*) B.A., University of Waterloo 1998; M.S., California Institute of Technology 2001.
Thesis: Variational Methods in Surface Parameterization.
- Miao-Ling Lu (*Environmental Science and Engineering*) B.S., National Taiwan University 1996; M.S., 1998; M.S., California Institute of Technology 2000.
Thesis: Large-Eddy Simulations of Marine Cumulus and Stratocumulus and Study of Humidity Halos and Aerosol Indirect Radiative Effects.
- Daniella Meeker (*Computation and Neural Systems*) B.A., University of Chicago 1998.
Thesis: Cognitive Neural Prosthetics.
- Sundeep Mukherjee (*Materials Science*) B.Tech., Indian Institute of Technology 1998; M.S., University of Alabama 2000; M.S., California Institute of Technology 2003.
Thesis: Study of Crystallization Behavior, Kinetics and Thermodynamics of Bulk Metallic Glasses Using Noncontact Electrostatic Levitation Technique.
- Saleem Mukhtar (*Computation and Neural Systems*) B.S., Carnegie Mellon University 1996.
Thesis: Interval Modulation: A New Paradigm for the Design of High Speed Communication Systems.
- George T. Paloczi (*Applied Physics*) B.S., University of California, Santa Barbara 1999; M.S., California Institute of Technology 2001.
Thesis: Polymer Integrated Optics: Device Architectures and Fabrication Methods.

Doctor of Philosophy continued

- Antonis Papachristodoulou (*Control and Dynamical Systems and Aeronautics*) B.A., M.E., Cambridge University 2000.
Thesis: Scalable Analysis of Nonlinear Systems Using Convex Optimization.
- Florian Peter Pintgen (*Applied Physics*) Ingenieur, Technische Universität München 2000.
Thesis: Detonation Diffraction in Mixtures with Various Degrees of Instability.
- Nicolas Frédéric Ponchaut (*Aeronautics and Mechanical Engineering*) Candidat Ingénieur, Université De Liège 1997; Ingénieur Aérospatiale 2000; M.S., California Institute of Technology 2001.
Thesis: Part I: 3DPTV Advances and Error Analysis. Part II: Extension of Guderley's Solution for Converging Shock Waves.
- Stephen Prajna (*Control and Dynamical Systems*) S.T., Institut Teknologi Bandung 1998; M.Sc., University of Twente 2000.
Thesis: Optimization-Based Methods for Nonlinear and Hybrid Systems Verification.
- Carlos Alejandro Romero Talamás (*Mechanical Engineering and Applied Physics*) Industrial Physics Engineering, Instituto Tecnológico y de Estudios Superiores de Monterrey 1995; M.S., International Space University 1998; M.S., California Institute of Technology 2000.
Thesis: Investigations of Spheromak Plasma Dynamics: High-Speed Imaging at the Sustained Spheromak Physics Experiment and Magnetic Diagnostics at the Caltech Spheromak Experiment.
- Silvio Savarese (*Electrical Engineering*) Laurea, Università degli Studi di Napoli - Federico II 1998; M.S., California Institute of Technology 2001.
Thesis: Shape Reconstruction from Shadows and Reflections.
- Geoffrey D. Staneff (*Materials Science*) B.S., University of Washington 1998; M.S., California Institute of Technology 2003.
Thesis: High-pressure Synthesis of Thermoelectric Materials.
- Valentin Gabriel Stredie (*Applied and Computational Mathematics*) B.S., California Institute of Technology 1999.
Thesis: Mathematical Modeling and Simulation of Aquatic and Aerial Animal Locomotion.
- Jeremy Christopher Thorpe (*Electrical Engineering*) B.S., University of California, Riverside 2000; M.S., California Institute of Technology 2001.
Thesis: Analysis and Design of Protograph Based LDPC Codes and Ensembles.
- Daniel Pierre Thunnissen (*Mechanical Engineering*) B.S.E., University of Michigan 1995; M.S., University of Illinois at Urbana-Champaign 1996.
Thesis: Propagating and Mitigating Uncertainty in the Design of Complex Multidisciplinary Systems.
- Andrew Neil Westhead (*Applied and Computational Mathematics*) B.S., M.S., Imperial College London 1998.
Thesis: Upscaling for Two-phase Flows in Porous Media.

Doctor of Philosophy continued

- Vincent Wheatley (*Aeronautics and Planetary Science*) B.E., University of Queensland 1998; M.Eng.Sc., 2000.
Thesis: On the Richtmyer-Meshkov Instability in Magnetohydrodynamics.
- Christopher John White (*Electrical Engineering*) B.S., University of Illinois at Urbana-Champaign 1999; M.S., California Institute of Technology 2001.
Thesis: A Solid-state Atomic Frequency Standard.
- Richard Edward Wirz (*Aeronautics and Electrical Engineering*) B.S., Virginia Polytechnic Institute and State University 1992; M.S., California Institute of Technology 2001.
Thesis: Discharge Plasma Processes of Ring-Cusp Ion Thrusters.
- Jeremy Witzens (*Electrical Engineering*) Diplôme d'Ingénieur, École Polytechnique 2000; M.S., California Institute of Technology 2001.
Thesis: Dispersion in Photonic Crystals.
- Jian Wu (*Materials Science*) B.S., Tsinghua University 1999; M.S., California Institute of Technology 2001.
Thesis: Defect Chemistry and Proton Conductivity in Ba-based Perovskites.
- Kaiwen Xia (*Mechanical Engineering and Geophysics*) B.S., University of Science and Technology of China 1995; M.S., 1998; M.S., California Institute of Technology 2000.
Thesis: Laboratory Investigations of Earthquake Dynamics.
- Yu Xiao (*Mechanical Engineering and Materials Science*) B.S., University of Science and Technology of China 1995; M.S., 1998.
Thesis: The Influence of Oxygen Vacancies on Domain Patterns in Ferroelectric Perovskites.
- Jun Xie (*Electrical Engineering*) B.E., Zhejiang University 1996; M.S., California Institute of Technology 2000.
Thesis: Integrated Parylene LC-ESI on a Chip.
- Donghua Xu (*Materials Science*) B.E., Jilin University 1998; M.S., 2001; M.S., California Institute of Technology 2002.
Thesis: Development of Novel Binary and Multi-component Bulk Metallic Glasses.
- Lan Yang (*Applied Physics*) B.S., University of Science and Technology of China 1996; M.S., California Institute of Technology 2000.
Thesis: Fabrication and Characterization of Microlasers by the Sol-Gel Method.
- Arash Yavari (*Applied Mechanics and Mathematics*) B.S., Sharif University of Technology 1997; M.S., George Washington University 2000.
Thesis: Atomic Structure of Ferroelectric Domain Walls, Free Surfaces and Steps.
- Xinwei Yu (*Applied and Computational Mathematics*) B.S., Peking University 1997; M.S., 2000.
Thesis: Localized Non-blowup Conditions for 3D Incompressible Euler Flows and Related Equations.
- Qingsong Zhang (*Materials Science*) B.E., Tsinghua University 1996; M.S., California Institute of Technology 2000.
Thesis: Atomistic Simulation of Barium Titanate.
- Jijie Zhou (*Bioengineering*) B.S., Peking University 1997; M.S., 2000.
Thesis: Nanowicking: Multi-scale Flow Interaction with Nanofabric Structures.

Doctor of Philosophy continued

DIVISION OF GEOLOGICAL AND PLANETARY SCIENCES

Tanja Bosak (*Geobiology*) B.Sc., University of Zagreb 1998.

Thesis: Laboratory Models of Microbial Biosignatures in Carbonate Rocks.

Jane Ellen Dmochowski (*Geophysics*) B.S., University of California, Santa Barbara 1995; M.S., California Institute of Technology 1997.

Thesis: Application of MODIS-ASTER (Master) Simulator Data to Geological Mapping of Young Volcanic Regions in Baja California, Mexico.

William R. Keller (*Geophysics*) B.S., University of Arizona 1996.

Thesis: Cenozoic Plate Tectonic Reconstructions and Plate Boundary Processes in the Southwest Pacific.

David Lawrence Shuster (*Geochemistry*) B.A., University of California, Berkeley 1996; M.S., California Institute of Technology 2003.

Thesis: Application of Spallogenic Noble Gases Induced by Energetic Proton Irradiation to Problems in Geochemistry and Thermochronometry.

Zhengrong Wang (*Geochemistry*) B.S., University of Science and Technology of China 1996; M.S., 1999; M.S., California Institute of Technology 2002.

Thesis: Oxygen Isotope Studies of the Petrogenesis of Hawaiian Lavas and a Theoretical Study on Equilibrium Thermodynamics of Multiply-Substituted Isotopologues.

DIVISION OF HUMANITIES AND SOCIAL SCIENCES

Paul Jay Healy (*Social Science*) B.S., Purdue University 2000; M.S., California Institute of Technology 2003.

Thesis: Institutions, Incentives and Behavior: Essays in Public Economics and Mechanism Design.

Kevin A. Roust (*Social Science*) B.S., California Institute of Technology 1997; M.S., 2003.

Thesis: Minority Rights in Majoritarian Institutions.

DIVISION OF PHYSICS, MATHEMATICS AND ASTRONOMY

Sever Achimescu (*Mathematics*) B.Sc., M.Sc., West University of Timisoara 1995; M.Sc., University of South Alabama 1998.

Thesis: Hilbert Modular Forms of Weight $1/2$.

Kevin Michael Birnbaum (*Physics*) B.S., Stanford University 1999.

Thesis: Cavity QED with Multilevel Atoms.

Andreea Boca (*Physics*) A.B., Harvard College 1999.

Thesis: Experiments in Cavity QED: Exploring the Interaction of Quantized Light with a Single Trapped Atom.

Allen David Boozer (*Physics*) B.S., University of Virginia 1996.

Thesis: Raman Transitions in Cavity QED.

Kaihua Cai (*Mathematics*) B.S., University of Science and Technology of China 2000.

Thesis: Dispersive Properties of Schrödinger Equations.

Doctor of Philosophy continued

- Martin Centurion Mac Lean (*Physics*) B.S., University of Michigan 2000.
Thesis: Study of the Nonlinear Propagation of Femtosecond Laser Pulses.
- Silviu Doru Covrig (*Physics*) B.Sc., University of Bucharest 1995; M.Sc., 1996.
Thesis: A Measurement of Parity-Violating Asymmetries in the G^0 Experiment in Forward Mode.
- Luca R. Diaconescu (*Physics*) B.Eng., Carleton University 1995; B.Sc., 1996; M.Eng., 1997, M.S., California Institute of Technology 2000.
Thesis: Applications of Effective Field Theory to Electron Scattering.
- Joshua Aaron Eisner (*Astrophysics*) A.B., Harvard College 1999.
Thesis: High Angular Resolution Studies of the Structure and Evolution of Protoplanetary Disks.
- Alison J. Farmer (*Astrophysics*) B.A., M.Sc., University of Cambridge 2000.
Thesis: Adventures in Theoretical Astrophysics.
- Stephan Ichiriu (*Physics*) B.S. (*Physics and Mathematics*), Indiana University 1999.
Thesis: Investigation of Spin Injection in Semiconductors: Theory and Experiment.
- Bryan Anthony Jacoby (*Astrophysics*) B.S., Pennsylvania State University 1997.
Thesis: Recycled Pulsars.
- Jennifer Michelle Johnson (*Mathematics and Chemistry*) B.S., College of William and Mary 1998.
Thesis: Artin L-functions for Abelian Extensions of Imaginary Quadratic Fields.
- William C. Jones (*Physics*) B.A., Princeton University 1998.
Thesis: A Measurement of the Temperature and Polarization Anisotropies in the Cosmic Microwave Background Radiation.
- Daniel Jerome Katz (*Mathematics*) B.A., Princeton University 1997.
Thesis: On p -Adic Estimates of Weights in Abelian Codes over Galois Rings.
- Melinda Jane Kellogg (*Physics*) B.S., University of California, Santa Barbara 1993; M.S., California Institute of Technology 1999.
Thesis: Evidence for Excitonic Superfluidity in a Bilayer Two-Dimensional Electron System.
- Michael Henry Kesden (*Physics*) B.A., Princeton University 2000.
Thesis: To the Horizon and Beyond: Weak Lensing of the CMB and Binary Inspirals into Horizonless Objects.
- Christopher Lee (*Physics*) B.A., Reed College 1999.
Thesis: Probing Physics and the Standard Model and Beyond with Electroweak Baryogenesis and Effective Theories of the Strong Interactions.
- Hok Kong Lee (*Physics*) M.S., Oxford University 1999.
Thesis: Gauge Theory and Supergravity Duality in the PP-Wave Background.
- Yi Li (*Physics*) B.S., California Institute of Technology 1998; M.S., 2000.
Thesis: Topological Sigma Models and Generalized Geometries.

Doctor of Philosophy continued

- Benjamin A. Mazin (*Astronomy*) B.S., Yale University 1997.
Thesis: Microwave Kinetic Inductance Detectors.
- Tristan McLoughlin (*Physics*) B.A., Trinity College Dublin 1999.
Thesis: The Near-Penrose Limit of AdS/CFT.
- Carlos Mochon (*Physics*) S.B., Massachusetts Institute of Technology 1999.
Thesis: From Non-Abelian Anyons to Quantum Computation to Coin-Flipping by Telephone.
- Irina Nenciu (*Mathematics*) B.S., University of Bucharest 2001.
Thesis: Lax Pairs for the Ablowitz-Ladik System Via Orthogonal Polynomials on the Unit Circle.
- Takuya Okuda (*Physics*) B.S., Kyoto University 2000; M.S., California Institute of Technology 2004.
Thesis: Large N Dualities in Topological String Theory.
- Yasser Rathore (*Physics*) B.A., Middlebury College 1998.
Thesis: Resonant Excitation of White Dwarf Oscillations in Compact Object Binaries.
- George G. Shapovalov (*Physics*) M.Sc., Kiev State Shevchenko University 1996.
Thesis: Mechanosensitive Channels of Bacteria: Structure and Function.
Electrophysiology as a High Resolution Technique of Ion Channel Study.
- Kris Raymond Sigurdson (*Physics*) B.A., Simon Fraser University 2000.
Thesis: Variations on the Standard Model of the Universe.
- Mihai Valentin Stoiciu (*Mathematics*) M.A., University of Bucharest 2000.
Thesis: Zeros of Random Orthogonal Polynomials on the Unit Circle.
- Ian Jakov Swanson (*Physics*) B.S., College of William and Mary 2000.
Thesis: Superstring Holography and Integrability in $AdS_5 \times S^5$.
- Tzer-jen Wei (*Mathematics*) B.S., National Taiwan University 1996; M.S., 1998.
Thesis: Descriptive Properties of Measure Preserving Actions and the Associated Unitary Representations.
- Nevin Nachum Weinberg (*Astronomy*) B.A., University of Chicago 2000.
Thesis: I. Ash Injection and Exposure During Radius Expansion Type I X-ray Bursts.
II. Stellar Dynamics at the Galactic Center. III. Weak Gravitational Lensing by Dark Matter Concentrations.
- Margaret Ellen Wessling (*Physics*) B.A., Amherst College 1999; M.S., California Institute of Technology 2002.
Thesis: Heavy Pentaquarks in the Diquark Model and the Large N_c Expansion.
- David Whitehouse (*Mathematics*) B.S., Imperial College London 1999; C.A.S.M., Cambridge University 2000.
Thesis: The Twisted Weighted Fundamental Lemma for the Transfer of Automorphic Forms from $GSp(4)$ to $GL(4)$.
- Paul Alexander Wiggins (*Physics*) B.S., Cornell University 1999.
Thesis: Biology Beyond Biochemistry: The Mechanics of Life.

PRIZES AND AWARDS

Prizes and awards are listed only for those students receiving degrees in 2005, 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.

Name of 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.

2005 *Galen Loram*

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.

2005 *Haluna Gunterman, Andrea Vasconcellos*

SIGMA XI AWARD

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

2005 *Brant Carlson*

The four prizes above are announced at the commencement ceremony.

ROSALIND W. ALCOTT MERIT SCHOLARSHIP, UPPER CLASS MERIT AWARD, 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.

2003 *Vincent Auyeung*

2004 *Vincent Auyeung*
Wei Lien Dang
Jenny Fisher
Yiyang Gong
Judith Hubbard

Jennifer Li
Binghai Ling
Christopher McClendon
Clare Moynihan
Yan Qi

Neil Tiwari
Joseph Wasem
Zhipeng Zhang

2005 *Vincent Auyeung*

Arjun Bansal
Brant Carlson
Wei Lien Dang
Jenny Fisher
Christopher Franco
Lisa Fukui
Yiyang Gong
Viviana Gradinaru
ChongQin Guo
Judith Hubbard

Matthew Johnston
Tony Lee
Jennifer Li
Binghai Ling
EthelMae Loewer
Galen Loram
Marin Markov
Christopher McClendon
Clare Moynihan
Karin Öberg
Ryan Olf

Weronika Patena
Xiao Peng
Yan Qi
Joan Sum Ping
Neil Tiwari
Brian Underwood
Joseph Wasem
Bin Wu
Jing Xiong
Mehmet Yenmez

AXLINE MERIT SCHOLARS

Awarded to selected freshmen whose record of personal and academic accomplishment is judged outstanding among incoming freshmen. These scholarships are renewable, contingent on academic performance.

2000 *David Zhang*

2002 *Vincent Auyeung*

Richard Eager

David Kurtz

Shannon Lewis

Jennifer Li

Binghai Ling

Xiao Peng

David Zhang

CHARLES D. BABCOCK AWARD

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

2002 *Michael Johnson*

2003 *Jeffrey Bergthorson*

WILLIAM F. BALLHAUS PRIZE

Awarded to aeronautics students for outstanding doctoral dissertations.

2005 *Jeffrey Bergthorson, Kaiwen Xia*

BECKMAN SCHOLARS

Awarded to two sophomore students in the divisions of biology and chemistry and chemical engineering on the basis of academic achievement and research potential. Award winners collaborate with a faculty mentor during two summers and the intervening academic year.

2003 *Vincent Auyeung, Neil Tiwari*

BHANSALI PRIZE IN COMPUTER SCIENCE

Awarded to an undergraduate student for outstanding research in computer science in the current academic year.

2005 *Shaun Lee*

ROLF D. BUHLER MEMORIAL AWARD IN AERONAUTICS

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

2005 *Richard Kramer, Andrew Tchieu*

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.

2004 *Jenny Fisher*

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

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

2005 *Xinwei Yu*

BONNIE CASHIN PRIZE FOR IMAGINATIVE THINKING

Awarded each year to the entering freshman who has written the most imaginative essays in the application for freshman admission.

2001 *Katherine Stoy*

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.

2005 *Vincent Wheatley*

DONALD S. CLARK MEMORIAL AWARD

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.

2004 *Haluna Gunterman, Lisa Fukui*

THE DONALD COLES PRIZE IN AERONAUTICS

Awarded to the graduating Ph.D. student in aeronautics whose thesis displays the best design of an experiment or the best design for a piece of experimental equipment.

2005 *John Dabiri*

DEANS' CUP AND CAMPUS LIFE AND MASTER'S AWARD

Two or more awards, selected by the deans, the assistant vice president for campus life, and the master of student houses, respectively, and 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.

2004 *Derrick Yuan Sun, Campus Life*
 Galen Loram, Dean's Cup

2005 *Jason Quimby, Neil Tiwari, Chuck-Hou Yee, Campus Life*
 Jenny Fisher, Dean's Cup

DEMETRIADES-TSAFKA PRIZE IN BIOENGINEERING OR RELATED FIELDS

Awarded annually to a Ph.D. candidate for the best thesis, publication, or discovery in bioengineering or related fields during the past year.

2005 *Jeffrey Endelman*

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.

2001 *Ileana Carpen, Andrew Spakowitz, Hyunjoo Lee*

EVERHART DISTINGUISHED GRADUATE STUDENT LECTURER AWARD

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

2002 *Ramesh Srinivasan*

2003 *Ian Swanson*

2004 *Melinda Kellogg*

2005 *Tanja Bosak*

LAWRENCE L. AND AUDREY W. FERGUSON PRIZE

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

2005 *Gloria Choi*

HAREN LEE FISHER MEMORIAL AWARD IN JUNIOR PHYSICS

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

2004 *Tony Lee*

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.

2004 *Bin Wu*

JACK E. FROEHLICH MEMORIAL AWARD

Awarded to a junior in the upper 5 percent of his or her class who shows outstanding promise for a creative professional career.

2004 *Wei Lien Stephen Dang*

GRADUATE DEANS' AWARD FOR OUTSTANDING COMMUNITY SERVICE

Awarded to Ph.D. candidates who, throughout their graduate years at the Institute, have made great contributions to graduate life and whose qualities of leadership and responsibility have been outstanding.

2005 *Deniz Armani, Lauren Webb*

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.

2004 *Yan Qi*

ALEXANDER P. AND ADELAIDE F. HIXON PRIZE FOR WRITING

Awarded annually in recognition of the best writing in freshman humanities courses.

2002 *Katherine Anne Richardson, Tomonari Scott Miyashita*

SCOTT RUSSELL JOHNSON PRIZE FOR EXCELLENCE IN GRADUATE STUDY IN MATHEMATICS

Awarded to continuing graduate students for excellence in one or more of the following: extraordinary progress in research, excellence in teaching, or excellent performance as a first-year graduate student.

2001 *Daniel Katz, Mihai Stoiciu*

2002 *Irina Nenciu*

2003 *Daniel Katz, Mihai Stoiciu*

2004 *Irina Nenciu, David Whitehouse*

SCOTT RUSSELL JOHNSON GRADUATE DISSERTATION PRIZE IN MATHEMATICS

Awarded for the best graduate dissertation in mathematics.

2005 *Irina Nenciu*

SCOTT RUSSELL JOHNSON UNDERGRADUATE MATHEMATICS PRIZE

Awarded for the best graduating mathematics major. Special consideration is given to independent research done as a senior thesis or SURF project.

2005 *Nicholas Rupprecht*

D. S. KOTHARI PRIZE IN PHYSICS

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

2005 *Brant Carlson*

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.

2002 *David Kurtz*

THE HERBERT NEWBY McCOY AWARD

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

2005 *Theodore Betley, Neil Garg, Ernest Petersson*

MARY A. EARL McKINNEY PRIZE IN LITERATURE

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

2002 *Kyle Bradley*

2003 *Juan Ramon Garcia*

2005 *Christopher Meagher*

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.

2005 *Elizabeth Rego, Tammy Ma, Jonathan So, Philip Wong*

RODMAN W. PAUL HISTORY PRIZE

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

2005 *Karin Öberg*

PRESIDENT'S SCHOLARS

Awarded to selected freshmen to promote the breadth and diversity of the Caltech undergraduate student body.

2001 *Juan Ramon Garcia*

2002 *Kamalah Chang*
Julian Greene
Christian Gutierrez

Lionel Jingles
Ryan Samson
Claire Walton

Sarah Wilhoit
Terry Anne Yen

HERBERT J. RYSER MEMORIAL SCHOLARSHIPS

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

2004 *Mehmet Yenmez*

ELEANOR SEARLE PRIZE IN LAW, POLITICS, AND INSTITUTIONS

Awarded annually to an undergraduate or graduate student whose work in history or the social sciences exemplifies Eleanor Searle's interests in the use of power, government, and law.

2005 *Joseph Wasem*

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.

2002 *Candace Seu, Shaun Lee, Kristen Zortman*

2004 *Henry Barnor, Alice Lin, Marin Markov, William Van de Water*

HALLETT SMITH PRIZE

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

2004 *Christopher Meagher, Nicholas Rupprecht*

2005 *Shannon Lewis, Aaron Wiest*

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.

2002 *Melinda Kellogg*

2004 *Kris Sigurdson*

PAUL STUDENSKI MEMORIAL FUND PRIZE

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

2004 *Libin Zhang*

MORGAN WARD PRIZE

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

2002 *Richard Eager*

CHARLES WILTS PRIZE

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

2005 *Deniz Armani*

FREDRICK J. ZEIGLER MEMORIAL AWARD

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

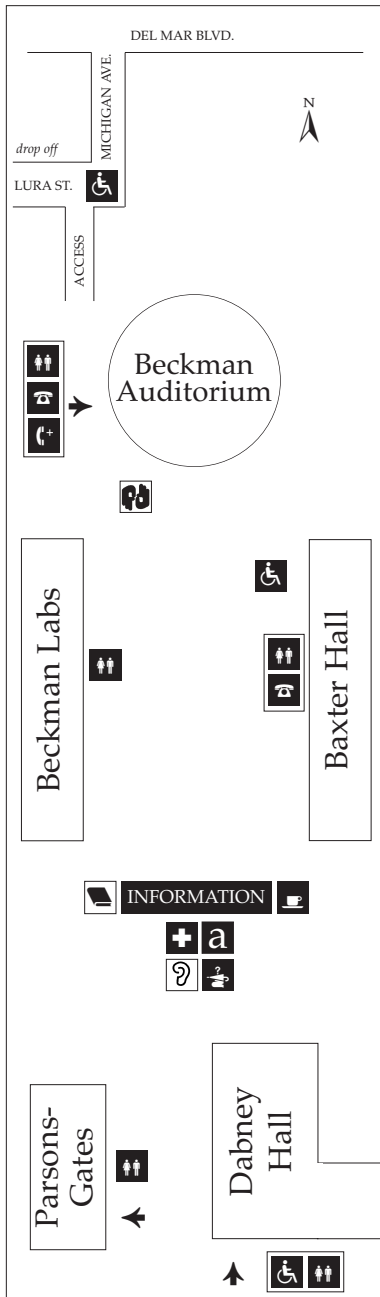
2003 *Mehmet Yenmez*

Hail CIT







(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.
-  Information about the nearest location for FIRST AID SERVICES is 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.)
-  CALTECH BOOKSTORE sells souvenirs, film, and other items. ATHENAEUM luncheon tickets on sale 8–10 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 of Baxter Hall.
-  AMPLIFIED TELEPHONE is available in Beckman Auditorium.