



118th Annual Commencement  
CALIFORNIA INSTITUTE OF TECHNOLOGY

*June 15, 2012*



118th Annual Commencement  
CALIFORNIA INSTITUTE OF TECHNOLOGY

*Friday, June 15, 2012*  
*10:00 a.m.*

## LETTER FROM THE CHAIR AND THE PRESIDENT

*“In life, leadership and learning are inextricably linked, and without advancements in both, a community and society cannot flourish.”*

*—Jean-Lou Chameau, Caltech President*

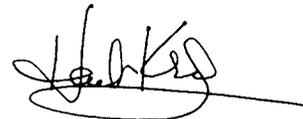
Welcome! It is a great honor and a privilege to join you in celebrating the graduation of the Caltech Class of 2012.

Reaching this milestone is a significant accomplishment. The academic achievements of our graduates—as well as the lessons learned through hard work and perseverance that accompanied those achievements—will continue to pay dividends.

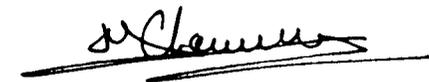
The Class of 2012 is composed of an extraordinary group of individuals, including some of the world’s most promising scientists, engineers, entrepreneurs, leaders, and scholars—and possibly a future Nobel laureate or two. They represent another generation of Renaissance scientists and engineers who will advance knowledge, benefit society, and continue to elevate Caltech as a world-class institution.

As these remarkable new alumni prepare for their next journey, we hope they reflect fondly on their time at Caltech and on the people who helped them during this chapter of their lives. We applaud the family members, professors, staff, friends, and generous supporters who aided each of these graduates in their educational journey. Together, they have prepared these graduates to carry the spirit of discovery and lifelong curiosity into every adventure as they transform our world.

Congratulations!



Kent Kresa



Jean-Lou Chameau

## ABOUT CALTECH

More than a century ago, in November 1891, Throop University opened its doors to six faculty members and 31 students. Within a few years, astronomer George Ellery Hale, chemist Arthur Amos Noyes, and physicist Robert Andrews Millikan had come together to transform Throop into a world-class science and engineering research and education institution.

Since then, Caltech has grown to nearly 300 professorial faculty, more than 600 postdocs, more than 1,200 graduate students, and almost 1,000 undergraduates—all of whom expand human knowledge and advance society through bold, collaborative explorations and creative, intensive scholarship in fundamental and applied sciences and engineering. Caltech scholars have accelerated life-changing discoveries and transformed the fields of energy, medicine, geoscience, and astrophysics. They have earned 32 Nobel Prizes, seven Crafoord Prizes, 10 National Medals of Technology, and 56 National Medals of Science. In 2011, Jacqueline K. Barton, the Arthur and Marian Hanisch Memorial Professor and professor of chemistry and chair of the Division of Chemistry and Chemical Engineering, became the first woman at Caltech to receive the National Medal of Science.

The Institute operates internationally recognized facilities for advanced research on its campus and oversees a seismological laboratory, NASA's Jet Propulsion Laboratory, and an unparalleled network of astronomical observatories.

At Caltech, Theodore von Kármán developed principles that influenced modern jet flight; today, Caltech and JPL scientists such as John Grotzinger and Bethany Ehlmann are advancing the robotic exploration of Mars.

Charles Richter created the first logarithmic scale for measuring the magnitude of earthquakes; Thomas Hanks and Hiroo Kanamori reinvented the

scale to provide more accurate readings of large quakes, from a greater distance; and today, K. Mani Chandy and R. Andreas Krause are working to adapt cell phones for use in earthquake forewarnings and detection.

Maarten Schmidt determined the nature of quasars; Mike Brown discovered an object larger than Pluto beyond the outer solar system, demoting Pluto to dwarf-planet status.

Clair Patterson's research on lead pollution prompted controls in the automobile industry; today, current faculty such as John Seinfeld, John Dabiri, Frances Arnold, and Sossina Haile are pioneering research into air quality and clean energy.

Linus Pauling determined the nature of the chemical bond; Max Delbrück helped inspire the creation of molecular genetics; today, David Baltimore is using gene therapy to aid in the fight against human HIV infections.

Caltech is a place where bold discoveries are possible—where visionary scholars advance the boundaries of knowledge. We celebrate today the 526 graduates who will earn 232 bachelor's degrees, 122 master's degrees, and 172 Ph.D. degrees, and who will contribute to Caltech's impressive legacy and record of achievement around the world.

## ACADEMIC PROCESSION

### *Chief Marshal*

Konstantinos P. Giapis, Ph.D.

### *Marshals*

Geoffrey A. Blake, Ph.D.

Scott E. Fraser, Ph.D.

Richard M. Murray, Ph.D.

Tapio Schneider, Ph.D.

Joseph E. Shepherd, Ph.D.

### *Faculty Officers*

Sossina M. Haile, Ph.D.

John O. Dabiri, 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 Doctor of Philosophy

Faculty Officers

The Faculty

The Chairs of the Divisions

The Deans

The Provost and Vice Provosts

The Vice Presidents

The Trustees

The Commencement Speaker

The President

The Chair of the Board of Trustees

## PROGRAM

Organ Prelude	Leslie J. Deutsch, Ph.D.
PROCESSIONAL	The Caltech Convocation Brass and Percussion Ensemble <i>William W. Bing, M.M., Conductor</i>
PRESIDING	Kent Kresa <i>Chair of the Board of Trustees California Institute of Technology</i>
COMMENCEMENT SPEAKER	Elon Musk <i>Founder, Chief Executive Officer, and Chief Technology Officer of SpaceX Cofounder, Chief Executive Officer, and Product Architect of Tesla Motors Chairman of SolarCity</i>
CHORAL SELECTION "Ode to Joy" excerpts from <i>Symphony No. 9</i> by Ludwig van Beethoven; Arranged by Dr. Deutsch <i>(Translation on page 58.)</i>	The Caltech Glee Club, the Caltech Convocation Brass and Percussion Ensemble, and Organ <i>Nancy Sulabian, M.M., Conductor</i>
CONFERRING OF DEGREES	Jean-Lou Chameau, Ph.D. <i>President California Institute of Technology</i>
PRESENTATION OF CANDIDATES FOR DEGREES	
For the Degree of Bachelor of Science	D. Roderick Kiewiet, Ph.D. <i>Dean of Undergraduate Students</i>
For the Degree of Master of Science	Joseph E. Shepherd, Ph.D. <i>Dean of Graduate Studies</i>

## For the Degree of Doctor of Philosophy

Biology	Stephen L. Mayo, Ph.D. <i>Division Chair</i>
Chemistry and Chemical Engineering	Jacqueline K. Barton, Ph.D. <i>Division Chair</i>
Engineering and Applied Science	Ares J. Rosakis, Ph.D. <i>Division Chair</i>
Geological and Planetary Sciences	Kenneth A. Farley, Ph.D. <i>Division Chair</i>
Humanities and Social Sciences	Jonathan N. Katz, Ph.D. <i>Division Chair</i>
Physics, Mathematics and Astronomy	B. Thomas Soifer, Ph.D. <i>Division Chair</i>
ANNOUNCEMENT OF AWARDS AND CONCLUDING REMARKS	President Chameau
ALMA MATER "Hail CIT" by Manton Barnes, B.S. '21 <i>(The audience may join in; lyrics are on page 59.)</i>	The Caltech Glee Club, the Caltech Convocation Brass and Percussion Ensemble, and Organ
RECESSIONAL	The Caltech Convocation Brass and Percussion Ensemble
Organ Postlude "The Throop Institute March," composed by E. C. Kammermeyer in 1900 for the Throop Institute Guitar and Mandolin Society	Dr. Deutsch

*Live streaming of Caltech's 2012 Commencement ceremony will begin shortly before 10 a.m. on Friday, June 15, at [www.ustream.tv/caltech](http://www.ustream.tv/caltech).*

## ABOUT THE SPEAKER

Elon Musk is a technology entrepreneur, business leader, and scientific innovator who is spearheading revolutionary ideas in three global industries: automobiles, energy, and space exploration.

Musk is the founder and chief executive officer of Space Exploration Technologies (SpaceX) and Tesla Motors, and the chairman of SolarCity. He is most well known for helping to make mass production of electric vehicles viable and for pioneering commercial spaceflight through the Hawthorne-based SpaceX, which sent the world's first commercial spacecraft to dock with the International Space Station in May. Prior to his more recent ventures, Musk cofounded PayPal, the world's leading Internet payment system, and served as the company's chairman and CEO.

In February 2011, Musk was recognized by *Forbes* as one of "America's 20 Most Powerful CEOs 40 and Under." In 2010, the Kitty Hawk Foundation honored him as a Living Legend in Aviation for creating the Falcon 9 rocket and Dragon spacecraft. That same year, Musk became the youngest recipient of the Automotive Executive of the Year Innovator Award for his work at Tesla Motors and was named to the *Time* 100. Earlier honors include being recognized for his work by *R&D* magazine in 2007 and receiving the National Space Society's 2009 Von Braun Award, given for leadership of the most significant achievement in space.

## CANDIDATES FOR DEGREES

### Bachelor of Science

Sara Ahmed *Louisville, Kentucky* Mechanical Engineering and Aerospace Engineering (Minor)  
James Kristian Anderson *Chariton, Iowa* Applied Physics and History (Minor)  
Hyunji Bae\* *Seoul, Republic of Korea* Mathematics  
Jee Su Baek\* *Seoul, Republic of Korea* Mechanical Engineering  
Gal Barak\* *East Brunswick, New Jersey* Biology  
Robert Daniel Barish *Bedford, New York* Biology  
Allison Haley Barnes *Brentwood, Tennessee* Planetary Science  
Samuel Benjamin Barnett\* *Highland Park, Illinois* Applied and Computational Mathematics and Business Economics and Management  
Marissa Christina Barrientos *Katy, Texas* Chemistry  
Geoffrey Stephen Beck *Urbana, Illinois* Chemistry  
Ishwari Nitin Bendre\* *Pune, Maharashtra, India* Mechanical Engineering and Business Economics and Management  
Tanvir Ahamed Bhuyain\* *Dhaka, Bangladesh* Mathematics and Physics  
Evan Reese Biggs\* *Ridgefield, Washington* Biology  
Suzanne Katherine Birner\* *Arlington Heights, Illinois* Geology  
Megan Chrystelle Larisch Boardman *Marietta, Georgia* Bioengineering  
Alexandre Boulgakov\* *Novosibirsk, Russia* Computer Science  
Zarathustra Elessar Brady\* *Phoenixville, Pennsylvania* Mathematics  
Kathryn Mary Brennan *Grosse Pointe Woods, Michigan* Biology  
Maxwell Bodkin Bryk *Iowa City, Iowa* Electrical Engineering  
Nicholas Salpeter Buckley† *Woodside, California* Engineering and Applied Science (Computational and Neural Systems)  
Peter Benjamin Buhler\* *Providence, Rhode Island* Geology  
Nicholas Otto Butler\* *Kansas City, Kansas* Applied and Computational Mathematics and Economics  
Alejandro Uriel Carbonara\* *Amherst, New York* Computer Science  
David Royce Carrega *Glendale, California* Mechanical Engineering

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

† Students whose names are followed by a dagger are close to completion and will receive diplomas at the end of the academic year in which all graduation requirements are met.

### *Bachelor of Science continued*

Jacqueline Chan\* *Arcadia, California* Chemical Engineering (Process Systems)  
Amanda Brittany Chang\* *Potomac, Maryland* Electrical Engineering  
Eric Yu-Wei Chang\* *Westborough, Massachusetts* Mechanical Engineering  
Adrian Kristian Chapman\* *Santa Clarita, California* Physics  
Allen Chen\* *Cerritos, California* Mechanical Engineering  
Janet Chen *Cupertino, California* Mechanical Engineering  
John Luoning Chen *Woodland Hills, California* Bioengineering  
Joy Chieh-Yu Chen\* *Taichung, Taiwan (ROC)* Biology  
Rebecca Pei-Ying Chen\* *Fremont, California* Chemical Engineering (Biomolecular)  
Samson Chen\* *Flushing, New York* Electrical Engineering  
Wesley George Chen\* *Austin, Texas* Bioengineering  
Yutong Chen\* *Charlotte, North Carolina* Applied and Computational Mathematics  
Abraham Chien\* *Brooklyn, New York* Physics  
Sandeep Prasad Chinchali\* *Cupertino, California* Electrical Engineering and Control and Dynamical Systems (Minor)  
Margaret Jean-Yih Chiu\* *Gabanna, Ohio* Biology  
Soonwon Choi\* *Republic of Korea* Physics  
David Matthew Wai Leong Choy\* *Aiea, Hawaii* Mechanical Engineering  
Daniel Minha Chun *Wilmette, Illinois* Mathematics  
Emmet Martin Cleary\* *Rancho Cucamonga, California* Chemical Engineering (Process Systems)  
Laura Holland Conwill *Carlton, Oregon* Computer Science  
Skylar Christian Cook\* *Jupiter, Florida* Bioengineering  
Anna Elizabeth Craig\* *Sauk Centre, Minnesota* Applied Physics and Aerospace Engineering (Minor)  
Kristen Pauline Dahl *Eagleville, Pennsylvania* Mechanical Engineering  
Wei Dai\* *Taipei, Taiwan (ROC)* Computer Science  
Jessica Lynne Davis\* *Wichita, Kansas* Astrophysics  
Mackenzie Denali Day\* *North Bend, Washington* Geology  
Thimal Suranga de Alwis *Hammond, Louisiana* Mechanical Engineering  
Anik Debnath\* *Kolkata, India* Applied Physics  
Elizabeth Decolvenaere *Brooklyn, New York* Chemical Engineering (Materials)  
Hyung Wan Do\* *Seoul, Republic of Korea* Electrical Engineering and Business Economics and Management  
Cathy Yuanyi Dong\* *San Marcos, California* Biology  
Andrew Thomas Durnford *San Diego, California* Computer Science and History (Minor)  
Samuel Scott Elder\* *Fort Collins, Colorado* Mathematics and Chemistry

### *Bachelor of Science continued*

Clara Hoifung Eng\* *Hong Kong, People's Republic of China* Chemical Engineering (Biomolecular)  
Yuyang Fan\* *Nanjing, People's Republic of China* Mechanical Engineering  
Alex Fandrianto\* *Los Gatos, California* Computer Science and Engineering and Applied Science  
(Computation and Neural Systems)  
Alta Ying Fang\* *San Diego, California* Applied Physics  
Chi Feng\* *Ann Arbor, Michigan* Physics  
Aric Ahkeel Fitz-Coy *Gainesville, Florida* Mechanical Engineering  
Tianjia Jessie Ge\* *Columbia, South Carolina* Bioengineering (Synthetic Biology)  
Anirban Ghosh *Dublin, Ohio* Applied Physics  
Richard Greg Gianforte *Bozeman, Montana* Computer Science and Business Economics and  
Management  
Zachary William Gomez\* *Tempe, Arizona* Computer Science  
Andrew Jonathan Gong *Burlingame, California* Chemical Engineering (Materials)  
Chen (Chris) Gong\* *Tianjin, People's Republic of China* Applied Physics  
Keir Christopher Gonyea\* *Naperville, Illinois* Mechanical Engineering  
Deepthi Gopal\* *Bangalore, India* Physics  
Jennifer Josephine Greco *West Linn, Oregon* Astrophysics  
Luis Francisco Guerra\* *El Paso, Texas* Chemistry  
Raul Gutierrez\* *Paramount, California* Electrical Engineering  
Christopher J. Hallacy\* *Marietta, Georgia* Mechanical Engineering  
Joshua Robert Hardenbrook\* *Tempe, Arizona* Physics  
Thomas Norwood Harris\* *Grundy, Virginia* Mechanical Engineering and History  
Thomas John Heavey IV *Spokane, Washington* Chemistry  
Kelley Paige Hecker *Fairfax, Virginia* Computer Science  
Adriana Hertel-Wulff *Logan, Utah* Biology  
Wilson C. Ho\* *Oak Park, Illinois* Chemistry and Business Economics and Management  
Erin Elizabeth Hoops *El Dorado Hills, California* Engineering and Applied Science (Computation  
and Neural Systems)  
David Christopher Hu *North Royalton, Ohio* Geobiology and Business Economics and  
Management  
Jennifer Hu\* *Taipei, Taiwan (ROC)* Applied and Computational Mathematics  
Yunqing "Alexander" Hu\* *Hubei, People's Republic of China* Electrical Engineering  
Lei Ying Huang *Los Angeles, California* Business Economics and Management and Applied and  
Computational Mathematics  
Emil Rumenov Ibrishimov\* *Stara Zagora, Bulgaria* Computer Science  
Nathaniel Michael Indik\* *Tucson, Arizona* Physics

### *Bachelor of Science continued*

Janis Irene Intoy *Stafford, Virginia* Computer Science  
Anna Sergeevna Ivanova *Nashville, Tennessee* Chemistry  
Adivi Sai Iyer *St. Louis, Missouri* Physics  
Mythili Kasturi Iyer\* *Kendall Park, New Jersey* Chemical Engineering (Process Systems) and  
Business Economics and Management  
Jamie Lynn Jackson *Germantown, Tennessee* Computer Science  
Pengsu Jiang\* *Arcadia, California* Biology  
Granton Adarsh Jindal\* *Lafayette, Louisiana* Bioengineering  
Yea-ra Jo *Pusan, Republic of Korea* Biology  
Justin Christopher Johnson\* *Aurora, Illinois* Mathematics and Computer Science  
Theresa Juarez *El Paso, Texas* Mechanical Engineering  
Arvind Kannan\* *Saratoga, California* Chemical Engineering (Biomolecular)  
Robert Stephen Karl, Jr. *Rapid City, South Dakota* Computer Science  
Robert Frederick Karol\* *Fair Haven, New Jersey* Mechanical Engineering and Aerospace  
Engineering (Minor) and Control and Dynamical Systems (Minor)  
Stephanie Chiaki Kato\* *New York, New York* Mechanical Engineering  
Ryan E. Keeley *Huntington Beach, California* Physics and History  
Yousif Arthur Kelaita\* *Schaumburg, Illinois* Electrical Engineering  
Adam Zaki Khan\* *Irvine, California* Biology  
Rishi Das Khanna† *Millwood, New York* Electrical Engineering  
Sangkyu Kim *Seoul, Republic of Korea* Mechanical Engineering and Physics  
Daniil Andreevich Kitchaev\* *Rockville, Maryland* Chemical Engineering (Materials) and  
Computer Science  
Peter David Koch \* *Englewood, New Jersey* Physics  
Theodore Konstantinos Koenig *Berlin, Germany* Chemistry and Geological and Planetary Science  
(Minor) and History (Minor)  
Helen Christina Kondos\* *Plano, Texas* Economics and History  
Kevin Cai Kowalski\* *Las Vegas, Nevada* Computer Science  
Kent Ayumu Koyanagi\* *Torrance, California* Mechanical Engineering  
Pauline Juliet Ku *River Grove, Illinois* Biology  
Hanna Rachela Kuberczyk *Warsaw, Poland* Chemistry  
Kevin Aaron Kuns\* *Glendale, California* Physics  
Sharon Rong Kuo\* *Brea, California* Biology  
Stephany Lai *San Diego, California* Mechanical Engineering  
Nadia Chantal Lara *Houston, Texas* Chemistry  
Brian Robert Lawrence\* *Kensington, Maryland* Mathematics and History (Minor)

### *Bachelor of Science continued*

Edward Kar Wai Lee\* *Sudbury, Massachusetts* Bioengineering  
Ernest Yih Chyun Lee\* *Del Mar, California* Physics  
Grace Yoon Lee\* *Bundang, Republic of Korea* Applied and Computational Mathematics  
James Zongyu Lee\* *Tampa, Florida* Biology  
Yae Lim Lee\* *Busan, Republic of Korea* Electrical Engineering  
David Anthony Leon\* *Pasadena, California* Physics  
Nicole Ann Levac *Merton, Wisconsin* Chemical Engineering (Environmental)  
Aaron Mirels Levine\* *Piedmont, California* Computer Science  
Christopher Li\* *Sugar Land, Texas* Chemical Engineering (Process Systems) and Business  
Economics and Management  
Eric Li\* *Littleton, Massachusetts* Mechanical Engineering  
Grace Yahui Li\* *Madison, Alabama* Mechanical Engineering  
Lily Li *Irvine, California* Bioengineering (Synthetic Biology) and English (Minor)  
Scott Liao\* *San Jose, California* Computer Science  
Chuan-Song Alan Lin\* *Elk Grove, California* Engineering and Applied Science (Computation and  
Neural Systems) and Computer Science  
Jeffrey Lin\* *Republic of Singapore* Electrical Engineering and Political Science  
Ye Lu\* *Potomac, Maryland* Computer Science  
Brian Ma *Cupertino, California* Bioengineering  
Jennifer Ma\* *San Marino, California* Applied and Computational Mathematics and Business  
Economics and Management  
Elizabeth Marie Magalindan *Dallas, Texas* Biology  
Jeffrey Alexander Manning\* *Pasadena, California* Mathematics  
Harold Bert Martin† *Los Angeles, California* Chemical Engineering (Process Systems)  
Taylor Sparks Martin\* *Bellevue, Washington* Geobiology  
Jordan Eliot Maslov\* *Englewood, Colorado* Electrical Engineering  
Naomi Aubrey McArthur† *Omaha, Nebraska* Engineering and Applied Science (Computation and  
Neural Systems)  
Stephen Meisenhelter *Aberdeen, New Jersey* Bioengineering  
Brian Merlob† *Coral Springs, Florida* Political Science and Computer Science  
Martin Johann Eberhard Michelsen\* *Potter Valley, California* Computer Science  
Sean Martin Mills\* *Naperville, Illinois* Physics and English (Minor)  
Aarathi Minisandram *San Jose, California* Bioengineering  
Shruti Mishra\* *West Lafayette, Indiana* Bioengineering  
Adrian Mitrea\* *Columbia, Missouri* Mechanical Engineering  
Austin Michael Moehle\* *Walnut Creek, California* Physics

### *Bachelor of Science continued*

Shannon Rose Mohler\* *Marietta, Georgia* Chemical Engineering (Biomolecular)  
Nathan David Morison *Cincinnati, Ohio* Chemical Engineering (Process Systems) and English  
Luke Sebastian Moryl *Hinsdale, Illinois* Computer Science  
Alexandra Mihaela Musat\* *Bucharest, Romania* Mathematics  
Roshan Devan Nanu† *Southlake, Texas* Physics  
Jagannath Sam Nayak\* *Elmhurst, Illinois* Bioengineering (Synthetic Biology) and Business  
Economics and Management  
Russell Grant Newman *Acworth, Georgia* Mechanical Engineering  
Peter Ngo\* *Monterey Park, California* Mechanical Engineering  
Long Thanh Nguyen *Houston, Texas* Mechanical Engineering  
Paul Dongan Nguyen *Orange, California* Bioengineering (Synthetic Biology) and Business  
Economics and Management  
Eva Megan Nichols\* *Tucson, Arizona* Chemistry  
Joel Lawrence Nikolaus *Colorado Springs, Colorado* Physics  
Jim Ouyang *Chapel Hill, North Carolina* Computer Science  
Priyam Patel† *Irvine, California* Applied Physics  
Brian Nan Peng\* *Irvine, California* Biology  
Christopher A. Pombrol\* *Chula Vista, California* Mechanical Engineering  
Amy Celeste Proctor\* *Austin, Texas* Chemical Engineering (Biomolecular)  
Sylvia Mary Puglisi *Oxnard, California* Engineering and Applied Science (Computation and  
Neural Systems)  
Alexander D. Rasmussen\* *Leroy, Ohio* Physics  
Caitlin Anderson Regan\* *Tucson, Arizona* Bioengineering (Mechanics)  
Nicholas Anthony Robertson *Bridge City, Texas* Mechanical Engineering and Aerospace  
Engineering (Minor)  
Tommaso Rosi† *Fiorenzuola d'Arda, Italy* Applied and Computational Mathematics  
Giulio C. Rottaro *Caracas, Venezuela* Physics  
Tatyana Eleanor Saleski\* *Evanston, Illinois* Bioengineering  
Neha Samdaria\* *San Marino, California* Biology and Business Economics and Management  
Eric Griffin Samperton *Fort Bragg, North Carolina* Mathematics and English (Minor)  
Troy Evan Sandberg\* *Los Angeles, California* Bioengineering (Mechanics)  
Keshav Sunil Sapatnekar *Orono, Minnesota* Chemical Engineering (Biomolecular)  
Franz Alexander Sauer\* *San Ramon, California* Physics  
Bradley Larkin Saund\* *San Carlos, California* Mechanical Engineering  
Travis Luke Scholten *Dell Rapids, South Dakota* Physics  
Eric Thompson Schropp† *Fort Myers, Florida* Applied and Computational Mathematics

## *Bachelor of Science continued*

Jasmine Soria Sears *Beaverton, Oregon* English  
Ayon Sen\* *Austin, Texas* Applied and Computational Mathematics  
Daniel Peter Sexton\* *Reno, Nevada* Biology and English (Minor)  
Juying Shang\* *Nanjing, People's Republic of China* Chemical Engineering (Materials)  
Nihar Sharma† *Noida, India* Computer Science  
Brendan Michael Sheehan *Woodbury, New York* Mechanical Engineering and Business Economics and Management  
Isaac Cameron Sheff *Iowa City, Iowa* Computer Science  
Jade Shi\* *Mountain View, California* Chemistry  
Robert Hideichi Shimizu *Honolulu, Hawaii* Computer Science  
Natnaree Siriwon *Bangkok, Thailand* Chemical Engineering (Biomolecular)  
Benjamin Luke Slawski *Kearney, Nebraska* Computer Science  
Alexandra Souverneva *Palo Alto, California* Chemistry and Biology  
Shyam Ramaswamy Srinivasan *Ellicott City, Maryland* Electrical Engineering  
Stasja Stanisic *Belgrade, Serbia* Computer Science  
Giordon Holtsberg Stark *Palm Beach Gardens, Florida* Physics  
Ka-Chuan Suen *St. Louis, Missouri* Physics  
Minkyung Christine Suh *Seoul, Republic of Korea* Applied and Computational Mathematics and Business Economics and Management  
Vincentius Jeremy Suhardi\* *Surabaya, East Java, Indonesia* Chemical Engineering (Biomolecular)  
Sylvia Camille Sullivan *Dallas, Texas* Chemical Engineering (Environmental)  
Vivian Zheng Sun\* *Cranbury, New Jersey* Planetary Science  
Yichuan Sun *Pleasanton, California* Mechanical Engineering  
Jessica Gabrielle Swallow\* *West Kingston, Rhode Island* Chemical Engineering (Materials) and English (Minor)  
Yoon Chan Taak\* *Seoul, Republic of Korea* Physics  
Albert Z. Tan\* *Chapel Hill, North Carolina* Electrical Engineering and Political Science  
Lihsih Tang\* *Appleton, Wisconsin* Biology  
Jamie Nicole Tayar *Sunrise, Florida* Astrophysics  
Nicole Nisha Thadani *Austin, Texas* Bioengineering and Business Economics and Management  
Jordan Corinne Theriot *Slidell, Louisiana* Chemistry  
Baojia Tong\* *Beijing, People's Republic of China* Physics  
Margaret Jing Yi Tse *Diamond Bar, California* Chemical Engineering (Biomolecular)  
Stephanie Tsuei *Southbury, Connecticut* Mechanical Engineering  
Arun Venkatraman\* *Plano, Texas* Electrical Engineering  
Elisa Claire Walsh\* *Westwood, Massachusetts* Biology and English (Minor)

## *Bachelor of Science continued*

Angie Wang\* *Glendale, California* Electrical Engineering  
Nathan Alexander Watson\* *Lubbock, Texas* Computer Science and Geological and Planetary Sciences (Minor)  
Marissa Liana Weichman\* *Bedford, Massachusetts* Chemistry  
Benjamin Samuel Weitz\* *Saint Paul, Minnesota* Mathematics and Computer Science  
Danika Fay Wellington *Goodlettsville, Tennessee* Planetary Science  
Katherine Michelle Wong\* *Fremont, California* Applied and Computational Mathematics  
Jacqueline Tingxue Wu\* *Gaithersburg, Maryland* Chemical Engineering (Environmental)  
Jianqiu Wu\* *Jiangsu, People's Republic of China* Mathematics  
Renee Teng-Pao Wu\* *Hong Kong, PRC* Physics  
Shengkai (Michael) Wu\* *Shanghai, People's Republic of China* Mathematics and Computer Science  
Doris Suiyi Xin\* *Arcadia, California* Computer Science  
Lita Fu-Ning Yang\* *Cupertino, California* Electrical Engineering  
Louis Yang\* *Ames, Iowa* Physics  
Vivian Yang\* *Glen Ellyn, Illinois* Biology  
Wubing Ye *Baton Rouge, Louisiana* Mechanical Engineering and Aerospace Engineering (Minor)  
Larissa Jennie Yee\* *Palo Alto, California* Chemistry  
Phillip Young\* *Ann Arbor, Michigan* Electrical Engineering  
Mary Beth Jean Yu\* *Northridge, California* Bioengineering  
Bonnie Zhang\* *Fremont, California* Electrical Engineering  
Helena Yingqi Zhang\* *Torrance, California* Physics  
Yuanjun Zhang *Santa Rosa, California* Independent Studies Program  
Fred Yuehua Zhao\* *Johnston, Iowa* Computer Science  
Qinren Zhen\* *Guangdong, People's Republic of China* Chemical Engineering (Materials)  
Xida Zheng\* *Wilmette, Illinois* Chemical Engineering (Process Systems)  
Caleb Joseph Ziegler *Denver, Colorado* Mathematics and Computer Science

## *Master of Science*

Behrooz Abiri (*Electrical Engineering*) B.Sc., Sharif University of Technology 2008; M.A.Sc., University of Toronto 2011.

Vinamra Agrawal (*Mechanical Engineering*) B.Tech., Indian Institute of Technology, Kanpur 2011.

Zachary Howard Aitken (*Mechanical Engineering*) B.S., The University of Texas at Austin 2009.

Amit Alon (*Electrical Engineering*) A.A., Johnson County Community College 2008; B.S., California Institute of Technology 2011.

Daniel James Alton (*Physics*) B.Sc., University of Western Australia 2005; B.Sc., Australian National University 2006.

Daniel Borsodi Araya (*Aeronautics*) B.S., Texas A&M University 2008; M.S., 2011.

Manan Arya (*Space Engineering*) B.A.Sc., University of Toronto 2011.

Christopher Teng Balmaseda (*Biochemistry and Molecular Biophysics*) B.A., University of California, Berkeley 1999.

Pavaman Bilgi (*Space Engineering*) B.S., Monash University 2010.

Mathieu Blanchard (*Space Engineering*) B.S., École Polytechnique 2010; Engineer, 2011.

Subhonmesh Bose (*Electrical Engineering*) B.Tech., Indian Institute of Technology, Kanpur 2009.

David Ross Brown (*Applied Physics*) B.S., California Institute of Technology 2007.

Stanley P. Burgos (*Applied Physics*) B.S., California Institute of Technology 2008.

Hayden Andrew Burgoyne (*Space Engineering*) S.B., Harvard College 2011.

Phares Lynn Carroll (*Mechanical Engineering*) B.S., Georgia Institute of Technology 2010.

Alicia Chang (*Chemistry*) B.S., University of California, Berkeley 2006.

Yingrui Chang (*Mechanical Engineering*) B.E., Tongji University 2009; M.S., Carnegie Mellon University 2010.

Jonathan Neil Chapman (*Social Science*) B.A., St. Catharine's College, University of Cambridge 2005.

Tong Chen (*Applied and Computational Mathematics*) B.S. (*Physics*), B.S. (*Statistics*), Peking University 2007; M.S. (*Applied Physics*), California Institute of Technology 2010.

Khai Xiang Chiong (*Social Science*) B.A., University of Cambridge 2010.

Jeesoon Choi (*Mechanical Engineering*) B.S., Seoul National University 2010.

Matthew Mitchell Coggon (*Chemical Engineering*) B.S., University of Massachusetts, Amherst 2010.

Evan Walter Creer (*Space Engineering*) B.S., Rensselaer Polytechnic Institute 2011.

Jordan Michael Croom (*Space Engineering*) B.E., Vanderbilt University 2011.

Niccolo Cymbalist (*Space Engineering*) B.Eng., Concordia University 2011.

Maria-Eleni Dimotsantou (*Chemical Engineering*) B.S., University of Patras 2010.

Brandon Nicholas Dotson (*Physics*) B.S. (*Chemistry*), B.S. (*Physics*), United States Military Academy 2010.

Reeve Dunne (*Mechanical Engineering*) B.S., Tufts University 2010.

## *Master of Science continued*

Lauren May Eaton (*Electrical Engineering*) B.S., Franklin and Marshall College 2008; J.D., Brooklyn Law School 2011.

Eyal En Gad (*Electrical Engineering*) B.Sc., Technion - Israel Institute of Technology 2008.

Nnoduka Chukwudile Eruchalu (*Electrical Engineering*) B.S., California Institute of Technology 2011.

Donglei Fan (*Electrical Engineering*) B.E., Tsinghua University 2010.

Amy Fu (*Chemical Engineering*) B.S., The Johns Hopkins University 2009.

Ramla Nkrumah Gabriel (*Environmental Science and Engineering*) B.A., Mount Holyoke College 2003.

Lingwen Gan (*Electrical Engineering*) B.S., Tsinghua University 2010.

Erika Francine Garcia (*Electrical Engineering*) B.S., California State University, Los Angeles 2007; M.S., 2009.

Carlos Roberto González (*Electrical Engineering*) B.S., Universidad de Los Andes 2007.

Marcello Gori (*Aeronautics*) B.S., Università degli Studi di Roma "La Sapienza" 2007; M.S., 2010.

Joshua Thomas Green (*Chemistry*) A.B., Harvard College 2010.

Morgane Anne Marie Grivel (*Aeronautics*) B.S., University of Maryland, College Park 2011.

Pedro Pablo Guerrero Vela (*Space Engineering*) B.S., Instituto Juan de Mairena 2005; Aeronautic Engineering, Escuela Superior de Ingenieros de Sevilla 2011; M.S., Cranfield University 2011.

Christopher John Hagel (*Social Science*) B.A., Northwestern University 2007.

Meisam Hajimorad (*Chemical Engineering*) B.S., Iowa State University 2006.

Wael Iyad Halbawi (*Electrical Engineering*) B.S., Texas A&M University at Qatar 2011.

Chao Han (*Electrical Engineering*) B.S., Tsinghua University 2007; M.S., 2010.

Mark Harfouche (*Electrical Engineering*) B.A.Sc., University of Toronto 2011.

Nicholas Arthur Heinz (*Materials Science*) B.S.M.E., University of Southern California 2008.

Christophe Hennekinne (*Aeronautics*) Diplôme d'Ingénieur, École Polytechnique 2010.

Jeffrey Thomas Hill (*Applied Physics*) B.A.Sc., University of Waterloo 2006.

Kristina Hogstrom (*Space Engineering*) B.S., Boston University 2011.

Grant Wendell Hollis IV (*Civil Engineering*) B.S. (*Civil Engineering*), B.S. (*Engineering Management*), University of the Pacific 2009.

Boram Daniel Hong (*Chemistry*) B.S., Macalester College 2007.

Chengyun Hua (*Mechanical Engineering*) B.S., The University of Michigan 2011.

Jin Fan Huang (*Social Science*) A.B., Brown University 2008.

Peter Shek Ho Hung (*Applied Physics*) B.S., California Institute of Technology 2008.

Ryan Colt Hurley (*Applied Mechanics*) B.S., University of Maryland, College Park 2011.

Jeremy Scott Hurwitz (*Computer Science*) S.B., Massachusetts Institute of Technology 2008; S.M., 2009.

### *Master of Science continued*

Katharine Ivanka Kalamaroff (*Physics*) B.S., United States Air Force Academy 2009.  
Fathima Rifkha Kameel (*Environmental Science and Engineering*) B.Sc., University of Perdeniya 2006; M.S., Kent State University 2009.  
Haekong Kim (*Physics*) B.S., Korea Advanced Institute of Science and Technology 2007.  
Ji Hun Hong Kim (*Bioengineering*) B.S., Korea Advanced Institute of Science and Technology 2005.  
Dennis Lok Ko (*Chemical Engineering*) B.S., The Johns Hopkins University 2008.  
Joanna Alicja Kolodziejska (*Materials Science*) B.S., University of California, Los Angeles 2008.  
Matthew Luke Kovach (*Social Science*) B.A., University of California, Santa Barbara 2010.  
Allison Lindsay Kunz (*Materials Science*) S.B., Massachusetts Institute of Technology 2008.  
Erin Christine Lamb (*Chemistry*) B.S., Duke University 2008.  
Anne Louise Laraia (*Environmental Science and Engineering*) B.S., University of Massachusetts, Lowell 2010.  
Euiwoong Lee (*Computer Science*) B.S., California Institute of Technology 2009.  
Wen-Hao Lee (*Electrical Engineering*) B.S., National Taiwan University 2008.  
Jiang Li (*Applied Physics*) B.S., Peking University 2007.  
Yang Liu (*Electrical Engineering*) B.E., Shandong University 2011.  
Kenneth James Lotito (*Chemistry*) B.S., University of Rochester 2008.  
Paul Macdonald Magyar (*Geochemistry*) A.B., Dartmouth College 2009.  
Monica Paola Martinez Ortiz (*Mechanical Engineering*) B.S., Universidad Nacional Autónoma de México 2010.  
Christin Joy Montz (*Computation and Neural Systems*) B.S., Texas A&M University 2007.  
Jonathan Philip Morgan (*Aeronautics*) B.S., Georgia Institute of Technology 2011.  
Wilton Mui (*Environmental Science and Engineering*) B.S., University of Florida 2010.  
Samantha Louise Myers (*Social Science*) B.S., University of Queensland 2006; B.A., 2007.  
Schetema Antuanette Nealy (*Chemistry*) A.S., San Bernardino Valley College 2001; B.S., University of California, Los Angeles 2004; M.S., California State University, Los Angeles 2008.  
Michael James Olson (*Computer Science*) B.S., Carnegie Mellon University 2004.  
Sang Hee Park (*Materials Science*) B.E., Kyungwon University 1999; M.S., Korea University 2001.  
Allyson Leigh Pellissier (*Social Science*) B.A., Rhodes College 2010.  
John Sebastian Pineda (*Astrophysics*) S.B. (*Mathematics*), S.B. (*Physics*), Massachusetts Institute of Technology 2010.  
Paul Peter Pirogovsky (*Chemical Engineering*) B.S., Oregon State University 2007.  
Kirill Pogorelskiy (*Social Science*) B.S., R.Y. Alekseev Nizhny Novgorod State Technical University 2007; M.S., National Research University 2009.  
Paula Flor Popescu (*Applied Physics*) A.B., Harvard College 2007.

### *Master of Science continued*

Marissa Anne Quitt (*Biology*) B.S. (*Biology*), B.S. (*Computer Science*), Harvey Mudd College 2009.  
Michael Brian Rauls (*Mechanical Engineering*) B.S., University of California, Los Angeles 2010.  
Navaneetha Krishnan Ravichandran (*Space Engineering*) B.Tech., M.Tech., Indian Institute of Technology, Madras 2011.  
Russell Eugene Roberson (*Chemistry*) B.S., University of California, Berkeley 2008.  
Brandon Scott Runnels (*Mechanical Engineering*) B.S., New Mexico Institute of Mining and Technology 2011.  
Amirreza Safaripour Tabbalvandani (*Electrical Engineering*) B.Sc., Sharif University of Technology 2010.  
Sermet Sahaner (*Aeronautics*) B.S., Istanbul Technical University 2010.  
Bruno Savard (*Space Engineering*) B.Eng., École Polytechnique de Montréal 2011; Engineer, ISAE-Supaero 2011.  
Joseph Malcolm Schaeffer (*Computer Science*) B.S., California Institute of Technology 2003.  
Joel Simon Scheingross (*Geology*) B.A., B.S., University of California, Berkeley 2007.  
Karin Maria Schlottke (*Space Engineering*) Diplom-Ingenieur, University of Stuttgart 2013.  
Bryan Eric Schmidt (*Aeronautics*) B.S., Case Western Reserve University 2011.  
Nicholas Eugene Scianmarello (*Electrical Engineering*) B.S., California Institute of Technology 2011.  
Krishna Shankar (*Mechanical Engineering*) B.S., University of Illinois at Urbana-Champaign 2011.  
Euncheol Shin (*Social Science*) B.A., B.S., Yonsei University 2009.  
Kyounggha Shin (*Physics*) B.S., Seoul National University 2012.  
Seung Woo Shin (*Computer Science*) B.S., California Institute of Technology 2010.  
Charles Gregor Slominski (*Chemical Engineering*) B.S., University of Pennsylvania 2010.  
Sarah Pearl Slotznick (*Geobiology*) S.B., Massachusetts Institute of Technology 2009.  
Zachary Martin Sternberger (*Aeronautics*) B.S., Virginia Polytechnic Institute and State University 2011.  
Tom Caton Arnaud Stokkermans (*Aeronautics*) B.S., Delft University of Technology 2011.  
Vincentius Jeremy Suhardi (*Chemistry*) B.S., California Institute of Technology 2012.  
Syed Faisal Tajdar (*Materials Science*) B.S., M.S., Stanford University 2004.  
Patrick Tawagi (*Space Engineering*) B.A.Sc., University of Ottawa 2011.  
Grant Paul Tepley (*Physics*) B.A., University of Wisconsin-Madison 2009.  
Matthew David Thill (*Electrical Engineering*) B.S., California Institute of Technology 2009.  
Christos Thrampoulidis (*Electrical Engineering*) Diploma, University of Patras 2011.  
Rebecca Suzanne Tucker (*Physics*) B.S., Georgia Institute of Technology 2008.  
Ruizhe Wang (*Electrical Engineering*) B.S., Tsinghua University 2010.  
Lee Laponder Wilson (*Space Engineering*) B.S., University of Canterbury 2011.

## *Master of Science continued*

- Ming Fai Wong (*Electrical Engineering*) B.Eng., University of Toronto 2010.  
Wen Yan (*Mechanical Engineering*) B.S., Tsinghua University 2011.  
Kiyoul Yang (*Electrical Engineering*) B.S., Korea Advanced Institute of Science and Technology 2008; M.S., 2010.  
Kai Pui Yuet (*Chemical Engineering*) S.B. (*Biology*), S.B. (*Chemical Engineering*), Massachusetts Institute of Technology 2009.  
Changhong Zhao (*Electrical Engineering*) B.E., Tsinghua University 2010.  
Aaron Benjamin Zimmerman (*Physics*) B.S., The University of New Mexico 2008.

## *Doctor of Philosophy*

### DIVISION OF BIOLOGY

- Ronald Edward Bryan (*Computation and Neural Systems*) S.B., Massachusetts Institute of Technology 2004.  
Thesis: Distance Based Visual Cues to Interpersonal Trust.
- Kuang-Jung Chang (*Biology*) B.S., National Chung Hsing University 2000; M.S., National Central University 2003.  
Thesis: A Role for Protein Kinase Dbf2-Mob1 in Mitotic Exit.
- Aadel Ahmed Chaudhuri (*Biology*) S.B., Massachusetts Institute of Technology 2004.  
Thesis: MicroRNAs 155 and 125b Physiologically and Pathologically Regulate Hematopoiesis and Immunity.
- Andrea Choe (*Biology*) B.S., University of California, Los Angeles 2002.  
Thesis: Pheromones in Free-Living and Parasitic Nematodes.
- Alana Doreen Dixson (*Biology*) B.A., Yale College 1997.  
Thesis: Zebrafish Magnetite and Long-lived Rohon-Beard Neurons: Expanding Our View of Two Zebrafish Sensory Systems in Development and Adulthood.
- Megan J. Dobro (*Biology*) B.S., Bridgewater State College 2007.  
Thesis: The Structural Biology of HIV Budding and Maturation.
- Shawnalea Jimée Frazier (*Biochemistry and Molecular Biophysics*) B.S., M.S., Kansas State University 2006.  
Thesis: Optimization of the GluCl/IVM Neuronal Silencing Tool via Protein Engineering.
- Mayra Garcia (*Biology*) B.A., Scripps College 2005.  
Thesis: Dorsal-ventral Patterning and Gene Regulation in the Early Embryo of *Drosophila melanogaster*.
- Flora Irma Hinz (*Biology*) B.A., Cornell University 2006.  
Thesis: Genetically Restricted Metabolic Labeling in *Danio rerio*, A Simple Vertebrate Capable of Protein Synthesis-dependent Memory Formation.
- Stephanie Lynn Johnson (*Biochemistry and Molecular Biophysics*) B.S., Stanford University 2006.  
Thesis: DNA Mechanics and Transcriptional Regulation in the *E.coli lac* Operon.
- Cambrian Yangshao Liu (*Biochemistry and Molecular Biophysics*) A.B., Harvard College 2005.  
Thesis: Characterization of an Unusual Collection of Olfactory Neurons in the Nose.
- Stefan C. Materna (*Biochemistry and Molecular Biophysics*) Diplom, University of Fribourg 2002.  
Thesis: The Regulatory Origin of Oral and Aboral Mesoderm in Sea Urchin Embryos.
- Kelly Jean Matzen (*Biochemistry and Molecular Biophysics*) B.S., Boston College 2005.  
Thesis: Engineering of Dengue Virus Refractoriness in *Aedes aegypti* and Development of an Underdominant Gene Drive System in *Drosophila melanogaster*.

*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*

- Sheung Chee Thomas Ng (*Biology*) B.S., University of California, Berkeley 2004.  
Thesis: Non-Invasive *in vivo* Molecular Imaging of Cancer Nanotherapy Uptake and Response with PET/MRI.
- Alex Nisthal (*Biochemistry and Molecular Biophysics*) B.S., California State Polytechnic University, Pomona 2006.  
Thesis: Accelerating the Interplay between Theory and Experiment in Protein Design.
- Nathan William Pierce (*Biology*) B.S., Stanford University 2006.  
Thesis: Sequential Processivity and CAND1 Regulate SCF Ubiquitin Ligases.
- Yue Shen (*Biology*) B.S., Peking University 2005.  
Thesis: Inter-Kingdom Communication between a Bacterial Mutualist and Its Mammalian Host.
- Christian J. M. Suloway (*Biology*) B.S., University of Illinois at Urbana-Champaign 2001.  
Thesis: Structural Insights into Tail-anchored Protein Targeting by Get3.
- Jonathan W. Young (*Biology*) B.A., Reed College 2003.  
Thesis: Architecture, Dynamics, and Function of the General Stress Response System in *B. subtilis*.
- Kenneth Kwok-Chang Yu (*Biology*) B.A., Northwestern University 2003.  
Thesis: Engineering Immunity against HIV.
- Jingli A. Zhang (*Biology*) B.S., University of California, Berkeley 2005.  
Thesis: Global Analysis of Dynamic Epigenetic Marking and Transcriptional Regulation Underlying T-Cell Lineage Commitment.

## DIVISION OF CHEMISTRY AND CHEMICAL ENGINEERING

- Angela Patricia Blum (*Chemistry*) B.A., Lewis and Clark College 2005.  
Thesis: Structure-Function Studies of Nicotinic Acetylcholine Receptors Using Unnatural Amino Acids and Synthetic Agonist Analogs.
- Mu-Jeng Cheng (*Chemistry*) B.S., National Kaohsiung Normal University 1999; M.S., National Tsing Hua University 2002.  
Thesis: Mechanistic Insights into Alkane C-H Activation and Functionalization by Metal Oxide Surfaces and Organometallic Complexes.
- Jelena Culic-Viskota (*Chemical Engineering*) B.S., Polytechnic University 2007; M.S., California Institute of Technology 2009.  
Thesis: Synthesis and Functionalization of Second Harmonic Generation Nanocrystals and Their Application in Biological Imaging.
- Andrew Joseph Downard (*Chemical Engineering*) B.S., M.B.A., University of Notre Dame 2004; M.S., California Institute of Technology 2007.  
Thesis: Classification of Sub-10 nm Aerosol: Theory, Instrument Development, and Experiment.

## *Doctor of Philosophy continued*

- Alec Charles Durrell (*Chemistry*) B.S., University of North Carolina at Chapel Hill 2006.  
Thesis: Electronic Structures and Reactivity Patterns of Dipalladium(11,11) and Diplatinum(11,11) Complexes.
- Kate Elizabeth Galloway (*Chemical Engineering and Biology*) B.S., University of California, Berkeley 2005; M.S., California Institute of Technology 2007.  
Thesis: The Development of RNA-based Control Systems to Regulate Signaling and Dictate Cell Fate in a Model MAPK Pathway.
- Jason M. Gamba (*Chemical Engineering*) B.S., Rensselaer Polytechnic Institute 2004; M.S., California Institute of Technology 2006.  
Thesis: The Role of Transport Phenomena in Whispering Gallery Mode Optical Biosensor Performance.
- Wendy Mercer Geil (*Chemistry*) B.S., Boise State University 2005.  
Thesis: Regulation of Wild-Type and Mutant p53 through DNA-mediated Charge Transport.
- Christopher Dennis Gilmore (*Chemistry*) B.S., Boston College 2005.  
Thesis: Aryne Annulation Reactions toward the Synthesis of Heterocyclic Molecules.
- Sean M. A. Kedrowski (*Chemistry*) B.S., Duke University 2005.  
Thesis: I. Chemical-Scale Studies of Ligand-Gated Ion Channels, and II. Novel Methods for Phosphonate Synthesis.
- Gregory Michael Kimball (*Chemistry*) B.A., Columbia University 2006.  
Thesis:  $Zn_3P_2$  and  $Cu_2O$  Substrates for Solar Energy Conversion.
- Russell Scott Komor (*Chemical Engineering*) B.S., University of California, Berkeley 2006; M.S., California Institute of Technology 2008.  
Thesis: Recombinatorial and Predictive Methods to Increase Cellulase Thermostability and Structural Analysis of a Thermostable P450.
- Jean Li (*Chemistry*) B.A., Columbia University, Columbia College 2005.  
Thesis: Improving Selectivity in Olefin Metathesis for Small Molecule Synthesis and Materials Applications.
- Joe Chih Yao Liang (*Chemical Engineering*) B.S., University of California, Berkeley 2006; M.S., California Institute of Technology 2008.  
Thesis: High-Throughput Strategies for the Scalable Generation of RNA Component Functions.
- David Alexander Long (*Chemistry*) B.A. (*Chemistry*), B.A. (*Mathematics*), Kenyon College 2007.  
Thesis: Frequency-Stabilized Cavity Ring-Down Spectroscopy of  $O_2$  and  $CO_2$  to Support Atmospheric Remote Sensing.
- Andrew Richard Metcalf (*Environmental Science and Engineering*) B.S., M.S., The Pennsylvania State University 2005; M.S., California Institute of Technology 2007.  
Thesis: Atmospheric Black Carbon: Measurements in the Los Angeles Atmosphere and Aging by Condensation of Organic Aerosol.

### *Doctor of Philosophy continued*

- John Tuan Ngo (*Biochemistry and Molecular Biophysics*) B.S., University of California, Santa Barbara 2005.  
Thesis: Noncanonical Amino Acids in the Interrogation of Cellular Protein Synthesis.
- Paul Frederick Oblad (*Chemistry*) B.S., University of Utah 2006.  
Thesis: Toward the Upgrading of Hydrocarbons: Synthesis, Characterization, and Reactivity of Platinum and Palladium Complexes.
- Leslie Esther O'Leary (*Chemistry*) B.S., University of Minnesota 2007.  
Thesis: Mixed Functionality Semiconductor Surfaces: Formation, Characterization, Interfacial Dynamics, and Applications.
- Eric Daniel Olmon (*Chemistry*) B.S., Ohio State University 2005.  
Thesis: Investigating DNA-mediated Charge Transport by Time-resolved Spectroscopy.
- Nyssa Leigh Puskar (*Chemistry*) B.S., University of Florida 2006.  
Thesis: Structure-Function Studies of Nicotinic Acetylcholine Receptors Using Unnatural Amino Acids.
- Philip A. Romero (*Biochemistry and Molecular Biophysics*) B.S.E., Tulane University 2004; M.S., 2005.  
Thesis: Statistical Models of the Protein Fitness Landscape: Applications to Protein Evolution and Engineering.
- Hang Song (*Chemistry*) B.A., Williams College 2006.  
Thesis: Recognition of Nucleic Acid Mismatches by Luminescent Ruthenium Complexes.
- Pamela Alisa Sontz (*Chemistry*) B.S., Indiana University at Bloomington 2006.  
Thesis: DNA-mediated Charge Transport in a Biological Context: Cooperation among Metalloproteins to Find Lesions in the Genome.
- Matthew Kiran Sprague (*Chemistry*) B.A., B.S., Ithaca College 2005.  
Thesis: Cavity Ringdown Spectroscopy, Kinetics, and Quantum Chemistry of Atmospherically Relevant Reactions.
- Pamela Michele Tadross (*Chemistry*) B.S., New York University 2005.  
Thesis: Exploiting the Reactivity of Arynes in the Total Synthesis of Natural Products.
- Ayumi Takaoka (*Chemistry*) B.S., University of California, Berkeley 2006.  
Thesis: Investigations on Low-Valent Group 8 and 9 Metalloradicals.
- Douglas Weng Wah Tham (*Chemistry*) B.A., B.S., M.S., University of Pennsylvania 2005.  
Thesis: Silicon Nanostructure Photovoltaics.
- Patrick Lauren Theofanis (*Chemistry*) B.S., University of California, Los Angeles 2006.  
Thesis: The Quantum Electron Dynamics of Materials Subjected to Extreme Environments.
- Renee Michelle Thomas (*Chemistry*) B.A., Cornell University 2008.  
Thesis: The Design, Synthesis, and Application of Ruthenium Metathesis Catalysts for the Preparation of Small Molecules and Polymers.

### *Doctor of Philosophy continued*

- Ian Albert Tonks (*Chemistry*) B.A., Columbia University 2006.  
Thesis: Fundamental Studies of Early Transition Metal-Ligand Multiple Bonds: Structure, Electronics, and Catalysis.
- Ryan Matthew Turner (*Chemical Engineering*) B.S., Clarkson University 2004; M.S., California Institute of Technology 2006.  
Thesis: Reshaping Elastomers with Light: First Principles Model of Diffusion-Induced Deformation.
- Edward Charles Weintrob (*Chemistry*) B.A., Columbia University 2006.  
Thesis: Synthesis, Characterization, and Reactivity Studies of Pyridine Bis(*anilide*) Iron Complexes.
- Jen-Kan Yu (*Chemistry*) B.S., National Taiwan University 2002; M.S., 2004.  
Thesis: Nanostructured Silicon Thermoelectrics.
- Zhaoyan Zhu (*Chemistry*) B.S., University of Science and Technology of China 2004.  
Thesis: Studies in Recombination and Dissociation Reactions for Collisional Energy Transfer and Electron Transfer of Nanocrystals and Dye Molecules.
- Jonathan Eric Zuckerman (*Biochemistry and Molecular Biophysics*) B.A., The Johns Hopkins University 2006.  
Thesis: Targeting Tumors and the Kidney with siRNA Nanoparticles and Evaluation of Extracellular MicroRNA-based Methodologies to Track Their Activity.
- DIVISION OF ENGINEERING AND APPLIED SCIENCES
- Pablo Abad-Manterola (*Mechanical Engineering*) B.S., Stanford University 2006; M.S., California Institute of Technology 2008.  
Thesis: Axel Rover Tethered Dynamics and Motion Planning on Extreme Planetary Terrain.
- Qi An (*Materials Science*) B.S., University of Science and Technology of China 2002; M.S., 2007; M.S., California Institute of Technology 2009.  
Thesis: Atomistic Simulations of Material Properties under Extreme Conditions.
- Mayank Bakshi (*Electrical Engineering*) B.Tech., Indian Institute of Technology, Kanpur 2003; M.Tech., 2005.  
Thesis: Network Coding and Distributed Compression over Large Networks: Some Basic Principles.
- Dionysios Barmpoutis (*Computation and Neural Systems*) Diploma, National Technical University of Athens 2006; M.S., Columbia University 2007.  
Thesis: Network Structure Optimization with Applications to Minimizing Variance and Crosstalk.
- Elizabeth Anne Bodine-Baron (*Electrical Engineering*) B.A., B.S., University of Texas at Austin 2006; M.S., California Institute of Technology 2009.  
Thesis: Peer Effects in Social Networks: Search, Matching Markets, and Epidemics.

### *Doctor of Philosophy continued*

- Philipp Andreas Boettcher (*Aeronautics*) B.S., Purdue University 2006; M.S., California Institute of Technology 2007.  
Thesis: Thermal Ignition.
- Florian Bohn (*Electrical Engineering*) B.S., California Institute of Technology 2001; M.S., University of California, Santa Barbara 2003.  
Thesis: Integrated Circuit Signal Generation and Detection Techniques for Microwave and Sub-Millimeter Wave Signals.
- Angela Maria Capece (*Aeronautics and Physics*) B.S., Lehigh University 2005; M.S., California Institute of Technology 2007.  
Thesis: Plasma-Surface Interactions in Hollow Cathode Discharges for Electric Propulsion.
- Man Nin Chan (*Environmental Science and Engineering*) B.Eng., Hong Kong University of Science and Technology 2000; M.Sc., 2002, M.Phil., 2004.  
Thesis: Mass Spectrometric Analysis of Organic Aerosol Composition: Laboratory and Ambient.
- Christopher SungWook Chang (*Electrical Engineering*) B.S., Seoul National University 2006; M.S., California Institute of Technology 2008.  
Thesis: Applications of Coding in Network Communications.
- In Ho Cho (*Civil Engineering and Computational Science and Engineering*) B.S., Seoul National University 2001; M.S., 2003.  
Thesis: Virtual Earthquake Engineering Laboratory with Physics-Based Degrading Materials on Parallel Computers.
- Charles DeBoer (*Electrical Engineering*) B.A., Occidental College 2001; B.S., California Institute of Technology 2001; M.S., 2010.  
Thesis: Biomimetic Accommodating Intraocular Lens.
- William P. Dempsey (*Bioengineering*) B.S., M.S., The Johns Hopkins University 2007.  
Thesis: Establishing a Genetic and Exogenous Toolbox for Studying Multiple Stages of Vertebrate Development *in vivo*.
- Xiaowei Deng (*Aeronautics*) M.S., Tsinghua University 2006.  
Thesis: Clefted Equilibrium Shapes of Superpressure Balloon Structures.
- Arthur Gerard Fitzmaurice III (*Environmental Science and Engineering and Cellular and Molecular Neurobiology*) S.B. (*Chemical Engineering*), S.B. (*Environmental Engineering Science*), Massachusetts Institute of Technology 2003; S.M., 2004; M.S., California Institute of Technology 2006.  
Thesis: The Role of Pesticide-Induced Aldehyde Dehydrogenase Inhibition in the Pathogenesis of Parkinson's Disease.
- William Chastang Ford (*Computation and Neural Systems*) B.S., University of Pittsburgh 2003.  
Thesis: I. Quantal Effects in Biochemical Cooperativity and a Proposed Mechanism for the Differentiation of Calcium Signaling in Synaptic Plasticity. II. Evolutionary Algorithms for the Optimization of Methods in Computational Chemistry.

### *Doctor of Philosophy continued*

- Elisa Franco (*Control and Dynamical Systems and French*) B.S., University of Trieste 2002.  
Thesis: Analysis, Design and *in vitro* Implementation of Robust Biochemical Networks.
- Jonathan Harel (*Electrical Engineering*) B.S., California Institute of Technology 2003; M.S., 2006.  
Thesis: Neural Pattern Similarity and Visual Perception.
- Xin Hu (*Applied and Computational Mathematics*) B.S., Peking University 2004; M.S., 2007.  
Thesis: Multiscale Modeling and Computation of 3D Incompressible Turbulent Flows.
- Jinghao Huang (*Applied and Computational Mathematics and Materials Science*) B.S., Tsinghua University 2007.  
Thesis: Discrete Differential Form Subdivision and Vector Field Generation over Volumetric Domain.
- Jingqing Huang (*Electrical Engineering*) B.S., Cornell University 2005; M.S., California Institute of Technology 2010.  
Thesis: Wavelength-scale Confinement of Light and Its Applications in On-Chip Photonic Devices.
- Ruo-Gu Huang (*Electrical Engineering*) B.S., National Tsing-hua University 1999; M.S., National Chiao-Tung University 2001; M.S., California Institute of Technology 2007.  
Thesis: High-Performance Silicon Nanowire Electronics.
- Michio Inoue (*Aeronautics and Applied and Computational Mathematics*) B.S., University of Tokyo 2007; M.S., California Institute of Technology 2009.  
Thesis: Large-Eddy Simulation of the Flat-Plate Turbulent Boundary Layer at High Reynolds Numbers.
- Henry O. Jacobs (*Control and Dynamical Systems*) B.A., New York University 2008.  
Thesis: Geometric Descriptions of Couplings in Fluids and Circuits.
- Andrew T. Jennings (*Materials Science*) B.S.E., The University of Pennsylvania 2008.  
Thesis: Deformation Mechanisms in Nanoscale Single Crystalline Electroplated Copper Pillars.
- M. Amin Khajehnejad (*Electrical Engineering*) B.S., University of Tehran 2007; M.S., California Institute of Technology 2009.  
Thesis: Combinatorial Regression and Improved Basis Pursuit for Sparse Estimation.
- Devvrath Khatri (*Aeronautics*) B.Tech., Indian Institute of Technology, Madras 2006; M.S., California Institute of Technology 2007.  
Thesis: Non-Destructive Evaluation of Material System Using Highly Nonlinear Acoustic Waves.
- Krista S. Langeland (*Materials Science*) A.B., Harvard College 2006.  
Thesis: Thin-Film Silicon Photovoltaics: Characterization of Thin-Film Deposition and Analysis of Enhanced Light Trapping from Scattering Nanoparticle Arrays.

## *Doctor of Philosophy continued*

- Lap Man Lee (*Bioengineering*) B.E., Hong Kong University of Science and Technology 2003; M.S., The University of Arizona 2006.  
Thesis: The Implementation of Optofluidic Microscopy on a Chip Scale and Its Potential Applications in Biology.
- Jeffrey Allen LeHew (*Aeronautics*) B.S., Milwaukee School of Engineering 2006; M.S., California Institute of Technology 2007.  
Thesis: Spatio-temporal Analysis of the Turbulent Boundary Layer and An Investigation of the Effects of Periodic Disturbances.
- Joseph H. Levine (*Computation and Neural Systems*) S.B. (*Electrical Engineering*), S.B. (*Mathematics*), Massachusetts Institute of Technology 2002; S.M., 2003.  
Thesis: Genetic Regulatory Circuit Dynamics: Analysis and Synthesis.
- Chen Li (*Materials Science*) B.S., Peking University 2003; M.Sc., University of British Columbia 2005; M.S., California Institute of Technology 2007.  
Thesis: Phonon Anharmonicity of Ionic Compounds and Metals.
- Alice Lin (*Computation and Neural Systems*) B.S., California Institute of Technology 2005.  
Thesis: Neural and Behavioral Investigations of Social Reward Processing.
- Jeffrey Chun-Hui Lin (*Electrical Engineering*) B.S., (*Civil Engineering*), B.S. (*Mechanical Engineering*), National Taiwan University 1999; M.S., 2002; M.S., California Institute of Technology 2007.  
Thesis: MEMS for Glaucoma.
- Stéphane K. Lintner (*Applied and Computational Mathematics*) Magistère, D.E.A., Ecole Normale Supérieure de Cachan 2002.  
Thesis: High-Order Integral Equation Methods for Diffraction Problems Involving Screens and Apertures.
- Hsi-Chun Liu (*Electrical Engineering*) B.S., National Taiwan University 2004; M.S., California Institute of Technology 2008.  
Thesis: Theory and Experiment of Slow-Light Coupled-Resonator Structures.
- Bo Lu (*Electrical Engineering*) B.S., Peking University 2007; M.S., California Institute of Technology 2008.  
Thesis: Parylene as a New Membrane Material for Biomems Applications.
- Michael Mello (*Aeronautics*) B.S., Bridgewater State College 1985; M.S., University of Rochester 1988.  
Thesis: Identifying the Unique Ground Motion Signatures of Supershear Earthquakes: Theory and Experiments.
- Jose L. Mendoza-Cortes (*Materials Science*) B.S., Instituto Tecnológico y de Estudios Superiores de Monterrey 2008; M.S., California Institute of Technology 2010.  
Thesis: Design of Molecules and Materials for Applications in Clean Energy, Catalysis and Molecular Machines Through Quantum Mechanics, Molecular Dynamics and Monte Carlo Simulations.

## *Doctor of Philosophy continued*

- Joshua Kieran Michener (*Bioengineering*) S.B., Massachusetts Institute of Technology 2006.  
Thesis: Combining Rational and Evolutionary Approaches to Optimize Enzyme Activity in *Saccharomyces cerevisiae*.
- Gerald Matthew Miller (*Applied Physics*) B.S., University of California, Santa Barbara 2003.  
Thesis: Electron Transport in Silicon Nanocrystal Devices: From Memory Applications to Silicon Photonics.
- Auna Louise Moser (*Applied Physics*) B.S., California Institute of Technology 2002.  
Thesis: Dynamics of Magnetically Driven Plasma Jets: An Instability of an Instability, Gas Cloud Impacts, Shocks, and Other Deformations.
- Patrick G. Mullen (*Computer Science*) B.S., California Institute of Technology 2002; M.S., 2007.  
Thesis: Eulerian Geometric Discretizations of Manifolds and Dynamics.
- Matthew J. Munson (*Aeronautics*) B.S., Illinois Institute of Technology 2002; M.S., 2003.  
Thesis: Low Reynolds Number Active Flow Control via Real-Time Particle Image Velocimetry.
- Jayakrishnan U. Nair (*Electrical Engineering*) B.Tech., M.Tech., Indian Institute of Technology, Bombay 2007.  
Thesis: Scheduling for Heavy-Tailed and Light-Tailed Workloads in Queuing Systems.
- Matthew John Nelson (*Computation and Neural Systems*) B.S.E., B.S., The University of Michigan 2003.  
Thesis: Understanding and Applying Extracellular Recordings in Awake, Behaving Animals.
- Omid Noroozian (*Electrical Engineering*) B.S., Sharif University of Technology 2004; M.S., Delft University of Technology 2006; M.S., California Institute of Technology 2009.  
Thesis: Superconducting Microwave Resonator Arrays for Submillimeter/Far-infrared Imaging.
- Jordan Robert Raney (*Materials Science*) B.S. (*Computer Science*), B.S. (*Physics*), University of Minnesota 2005; M.S., California Institute of Technology 2010.  
Thesis: Hierarchical Structures of Aligned Carbon Nanotubes as Low-Density Energy-Dissipative Materials.
- Jason Tyler Rolfe (*Computation and Neural Systems*) S.B., Massachusetts Institute of Technology 2003; M.S., California Institute of Technology 2007.  
Thesis: Intrinsic Gradient Networks.
- Kaushik Sengupta (*Electrical Engineering*) B.Tech., M. Tech., Indian Institute of Technology, Kharagpur 2007; M.S., California Institute of Technology 2008.  
Thesis: Silicon-based Terahertz Circuits and Systems.
- Brian Lawrence Standley (*Applied Physics*) B.S., University of Idaho 2004; M.S., California Institute of Technology 2006.  
Thesis: Graphene as a Platform for Novel Nanoelectronic Devices.
- Eve Virginia Stenson (*Applied Physics*) B.S. (*Chemistry*), B.S. (*Physics*), Fordham University 2004.  
Thesis: Fields, Forces, and Flows: What Laboratory Experiments Reveal About the Dynamics of Arched Plasma Structures.

## *Doctor of Philosophy continued*

- Robert Chess Abernathy Stetson (*Computation and Neural Systems*) A.B., Harvard College 2001; M.S., University of Texas 2006.  
Thesis: Interaction of Planning Regions in Cortex.
- Ravi Teja Sukhavasi (*Electrical Engineering*) B.Tech., Indian Institute of Technology, Kanpur 2007; M.S., California Institute of Technology 2008.  
Thesis: Distributed Control and Computing: Optimal Estimation, Error Correcting Codes, and Interactive Protocols.
- Hongjin Tan (*Materials Science*) B.S., Nanjing University 2006; M.S., California Institute of Technology 2008.  
Thesis: A Study of the Thermodynamics and Kinetics of  $\text{LiFePO}_4$  as a Cathode Material for Li Batteries.
- Vaughan L. Thomas (*Mechanical Engineering*) B.B.A., Howard University 1990; B.S., University of Maryland at College Park 2000.  
Thesis: Particle-based Modeling of Ni-YSZ Anodes.
- Pratyush Tiwary (*Materials Science*) B.Tech., Banaras Hindu University 2007; M.S., California Institute of Technology 2008.  
Thesis: Atomistic Simulations of Materials: Methods for Accurate Potentials and Realistic Time-Scales.
- Nils Peter Egon Welinder (*Computation and Neural Systems*) B.Sc., Imperial College London 2007.  
Thesis: Hybrid Human-Machine Vision Systems: Image Annotation using Crowds, Experts and Machines.
- Juhwan Yoo (*Electrical Engineering*) B.S., California Institute of Technology 2006.  
Thesis: Compressed Sensing Receivers: Theory, Design, and Performance Limits.
- Ted Yu (*Materials Science*) B.S., University of California, Los Angeles 1997; M.S., University of California, Berkeley 2000.  
Thesis: Degradations and Improvements in PEM Fuel Cell Materials: A Computational Study.
- John Lewis Ziegler (*Aeronautics*) B.S., Rensselaer Polytechnic Institute 2006; M.S., California Institute of Technology 2007.  
Thesis: Simulations of Compressible, Diffusive, Reactive Flows with Detailed Chemistry Using a High-Order Hybrid WENO-CD Scheme.

## DIVISION OF GEOLOGICAL AND PLANETARY SCIENCES

- Laura Alisic (*Geophysics and Computational Science and Engineering*) Propedeuse, Universiteit Utrecht 2002; Doctoraal, 2006; M.S., California Institute of Technology 2008.  
Thesis: Multi-Scale Dynamics and Rheology of Mantle Convection with Plates.
- Konstantin Batygin (*Planetary Science*) B.S., University of California, Santa Cruz 2008; M.S., California Institute of Technology 2010.  
Thesis: Orbits and Interiors of Planets.

## *Doctor of Philosophy continued*

- Anna Rose Beck (*Environmental Science and Engineering*) B.S. Denison University 2004; M.S., California Institute of Technology 2007.  
Thesis: Iron in the Ocean: Laboratory Experiments of Iron Geochemistry in the Presence of Marine Particles.
- Daniel James Bower (*Geophysics*) B.Sc., University of Durham 2004; M.Phil., University of Cambridge 2006; M.S., California Institute of Technology 2008.  
Thesis: Geodynamics of Earth's Deep Mantle.
- Alan Daniel Chapman (*Geology*) B.S., University of Minnesota 2005.  
Thesis: Late Cretaceous Gravitational Collapse of the Southern Sierra Nevada Batholith and Adjacent Areas above Underplated Schists, Southern California.
- Ting Chen (*Geophysics*) B.S., University of Science and Technology of China 2005; M.S., California Institute of Technology 2008.  
Thesis: Part I: Structure of Central and Southern Mexico from Velocity and Attenuation Tomography; Part II: Physics of Small Repeating Earthquakes.
- Steven Brooks Kidder (*Geology*) B.S., University of Minnesota 1999; M.S., University of Arizona 2002.  
Thesis: Microstructural, Metamorphic and Experimental Constraints on Differential Stress and Temperature in the Middle Crust.
- Zachary John Lebo (*Environmental Science and Engineering*) B.S., The Pennsylvania State University 2007.  
Thesis: Computational Modeling Studies of Fundamental Aerosol-Cloud Interactions.
- Andrew Keith Matzen (*Geology*) B.S., University of Tulsa 2005; M.S., California Institute of Technology 2011.  
Thesis: Fe-Mg and Ni Partitioning between Olivine and Silicate Melt.
- Timothy Moore Merlis (*Environmental Science and Engineering*) B.S., Columbia University 2006.  
Thesis: The General Circulation of the Tropical Atmosphere and Climate Changes.
- Caitlin Anne Murphy (*Geophysics*) S.B., Massachusetts Institute of Technology 2007.  
Thesis: Thermoelasticity of Hexagonal Close-Packed Iron from the Phonon Density of States.
- Alejandro Soto (*Planetary Science*) B.A., Dartmouth College 1997; M.S., Stanford University 2000.  
Thesis: Dynamical Paleoclimatology of Mars.
- Nivedita Thiagarajan (*Geochemistry*) B.S., Rice University 2005.  
Thesis: Using Clumped Isotopes and Radiocarbon to Characterize Rapid Climate Change During the Last Glacial Cycle.

## DIVISION OF THE HUMANITIES AND SOCIAL SCIENCES

- Cary David Frydman (*Social Science*) B.A., Northwestern University 2006; M.S., California Institute of Technology 2009.  
Thesis: Essays in Neurofinance.

## *Doctor of Philosophy continued*

- Vanessa Janowski (*Social Science*) A.B., Yale College 2004; M.Sc., London School of Economics 2005; M.S., California Institute of Technology 2009.  
Thesis: Computational Biases in Decision-Making.
- SangMok Lee (*Social Science*) B.A., Sogang University 2006.  
Thesis: Three Essays on Microeconomic Theory.
- Inés Levin Fiorelli (*Social Science*) Licenciada en Economía, Universidad ORT Uruguay 2004; M.S., California Institute of Technology 2008.  
Thesis: A New Approach to the Study of Political Participation.
- Mohamed Mostagir (*Social Science*) B.Sc., Ain Shams University 1999; M.Sc., University of Delaware 2002, S.M., Massachusetts Institute of Technology 2005; M.S., California Institute of Technology 2008.  
Thesis: Robust Dynamic Mechanisms.
- Salvatore Nunnari (*Social Science*) B.A., Università Commerciale “L. Bocconi” 2004; M.A., 2006; M.S., California Institute of Technology 2009.  
Thesis: Essays on Dynamic Political Economy.

## DIVISION OF PHYSICS, MATHEMATICS AND ASTRONOMY

- Zeeshan Ahmed (*Physics*) B.S., University of Southern California 2005; M.S., California Institute of Technology 2008.  
Thesis: A Dark-Matter Search Using the Final CDMS II Dataset and a Novel Detector of Surface Radiocontamination.
- Denis Bashkurov (*Physics*) M.S., M. V. Lomonosov Moscow State University 2005.  
Thesis: Symmetries in Three-Dimensional Superconformal Quantum Field Theories.
- Dan Dumitru Betea (*Mathematics*) B.S., Vanderbilt University 2007.  
Thesis: Elliptic Combinatorics and Markov Processes.
- Varun B. Bhalerao (*Astrophysics*) B.Tech., Indian Institute of Technology, Bombay 2006; M.S., California Institute of Technology 2008.  
Thesis: Neutron Stars and NuSTAR: A Systematic Survey of Neutron Star Masses in High Mass X-ray Binaries and Characterization of CdZnTe Detectors for NuSTAR.
- Laura Grace Book (*Physics*) B.S., University of Illinois at Urbana-Champaign 2007; M.S., California Institute of Technology 2011.  
Thesis: Cosmological Consequences of Gravitation: Structure Formation and Gravitational Waves.
- Justus A. Brevik (*Physics*) B.S., University of Washington 2003.  
Thesis: Searching for Primordial Gravitational Waves at Degree Scales from the South Pole.
- Jasper Chan (*Physics*) B.A.Sc., University of Toronto 2007.  
Thesis: Laser Cooling of an Optomechanical Crystal Resonator to Its Quantum Ground State of Motion.

## *Doctor of Philosophy continued*

- Yi-Chih Chiu (*Mathematics*) B.S., National Taiwan University 1999; M.S., 2002.  
Thesis: On the Weil-Étale Cohomology of S-integers.
- Tony Chu (*Physics*) B.A., Cornell University 2006.  
Thesis: Numerical Simulations of Black-Hole Spacetimes.
- Ann Marie Cody (*Astrophysics*) University of Cambridge 2005; M.S., California Institute of Technology 2007.  
Thesis: A Search for Pulsation in Young Brown Dwarfs and Very Low Mass Stars.
- Aaron David Kiyoshi Finck (*Physics*) S.B., Massachusetts Institute of Technology 2005.  
Thesis: Studies of Exciton Condensation and Transport in Quantum Hall Bilayers.
- Thiago Signorini Gonçalves (*Astrophysics*) B.S., Universidade Federal do Rio de Janeiro 2003; M.S., Observatório Nacional 2004.  
Thesis: Topics in Galaxy Evolution: Early Star Formation and Quenching.
- Anna Elisabeth Krause (*Astrophysics*) Diplom, University of Bonn 2007; M.S., California Institute of Technology 2010.  
Thesis: Topics in Large-Scale Structure.
- Hsin-Hua Lai (*Physics*) B.S., National Tsing Hua University 2004.  
Thesis: Ladder Studies of Gapless Quantum Spin Liquids: Spin Bose-metal and SU(2)-invariant Majorana Spin Liquids.
- Samuel Kuhnman Lee (*Astrophysics*) S.B., Massachusetts Institute of Technology 2007; M.S., California Institute of Technology 2009.  
Thesis: Three Paths to Particle Dark Matter.
- Tony Eilo Lee (*Physics*) B.S., California Institute of Technology 2005.  
Thesis: Quantum Nonequilibrium Physics with Rydberg Atoms.
- Milo Miaoyu Lin (*Physics*) B.S., California Institute of Technology 2006.  
Thesis: Protein Folding and Macromolecular Dynamics: Fundamental Limits of Length and Time Scales.
- Yousi Ma (*Physics*) B.S., University of Minnesota 2005; M.S., California Institute of Technology 2009.  
Thesis: Search for Signatures of Extra Dimensions in the Diphoton Mass Spectrum with the CMS Detector.
- Matthew Hayward Matheny (*Physics*) B.S., University of Kansas 2005.  
Thesis: Nonisochronous Oscillations in Piezoelectric Nanomechanical Resonators.
- Mateusz Konrad Matuszewski (*Physics*) B.A., Columbia University 1999; M.S., California Institute of Technology 2002.  
Thesis: The Faint Intergalactic Redshifted Emission Balloon and the Cosmic Web Imager: Two Integral Field Spectrographs Designed to Study Emission from the Intergalactic Medium.
- David Craig Moore (*Physics*) B.S., Yale College 2006.  
Thesis: A Search for Low-Mass Dark Matter with the Cryogenic Dark Matter Search and the Development of Highly Multiplexed Phonon-mediated Particle Detectors.

## *Doctor of Philosophy continued*

- David Andrew Nichols (*Physics*) B.A., Claremont McKenna College 2006; M.S., California Institute of Technology 2008.  
Thesis: Visualizing, Approximating, and Understanding Black-Hole Binaries.
- Evan Patrick O'Connor (*Physics*) B.S., University of Prince Edward Island 2007.  
Thesis: Topics in Core-Collapse Supernova Theory: The Formation of Black Holes and the Transport of Neutrinos.
- Mhair-Armen Hagop Orchanian (*Physics*) B.S., California Institute of Technology 2005.  
Thesis: Electron Neutrino Appearance in the MINOS Experiment.
- Joseph Lee Richards (*Physics*) S.B., S.M., Massachusetts Institute of Technology 2000.  
Thesis: The Radio Variability of Gamma-Ray Blazars.
- Brian Zachary Simanek (*Mathematics*) B.A., Williams College 2007.  
Thesis: Asymptotic Properties of Orthogonal and Extremal Polynomials.
- Jaewon Song (*Physics*) B.S., Seoul National University 2006.  
Thesis: 4d/2d Correspondence: Instantons and W-Algebras.
- Amy Ruth Trangsrud (*Physics*) A.B., Princeton University 2004.  
Thesis: The SPIDER CMB Polarimeter.
- Dmitriy Tselikhovich (*Astrophysics*) B.S., Belarusian State University 2006; M.S., Carleton University 2008; M.S., California Institute of Technology 2011.  
Thesis: The Cosmic Stories: Beginning, Evolution and Present Days of the Universe.
- Vidya Venkateswaran (*Mathematics*) B.S., Stanford University 2007.  
Thesis: Vanishing Results for Hall-Littlewood Polynomials.
- Alden Kent Walker (*Mathematics*) B.A., Haverford College 2007.  
Thesis: Surface Maps into Free Groups.
- Brian M. Willett (*Physics*) B.S., Cornell University 2007.  
Thesis: Localization and Dualities in Three Dimensional Superconformal Field Theories.
- Dalziel Joseph Wilson (*Physics*) B.A., University of California, Berkeley 2005.  
Thesis: Cavity Optomechanics with High Stress Silicon Nitride Films.
- Yi-Tao Wu (*Mathematics*) B.S., University of Science and Technology of China 2004; M.S., 2007.  
Thesis: One the P-Adic Local Invariant Cycle Theorem.
- Itamar Yaakov (*Physics*) B.A., Technion – Israel Institute of Technology 2005; M.Sc., Weizmann Institute of Science 2006.  
Thesis: Localization of Gauge Theories on the Three-Sphere.

## **PRIZES AND AWARDS**

*Prizes and awards are listed only for those students receiving degrees in 2012, and include prizes and awards received by them in previous years.*

### 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.

2012 *Laura Holland Conwill, Christopher J. Hallacy*

### 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.

2012 *Margaret Jean-Yih Chiu*

### GEORGE W. HOUSNER AWARD

Formerly the Sigma Xi Award, awarded to a senior selected for an outstanding piece of original scientific research.

2012 *Tanvir Ahamed Bhuyain*

### 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.*

*The prizes above are announced at the commencement ceremony.*

UPPER CLASS MERIT PRIZE (CARNATION SCHOLARSHIP)

Caltech awarded the Upper Class Merit Prize, funded by the Carnation Merit Award Fund, for academic excellence to undergraduates. The prize was 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.

- 2008 *Qinren Zhen*, Carnation Merit Award
- 2009 *Brian Robert Lawrence*, Upper Class Merit Prize

AXLINE MERIT SCHOLARS

These scholarships, which were renewable contingent on academic performance, were awarded to selected freshmen whose record of personal and academic accomplishment was judged outstanding among incoming freshmen.

- |      |  |   |
|------|--|---|
| 2007 | <i>Andrew Thomas Durnford</i>                              | <i>Brian Robert Lawrence</i>                    |
| 2008 | <i>Andrew Thomas Durnford</i><br><i>Samuel Scott Elder</i> | <i>Brian Robert Lawrence</i><br><i>Ayon Sen</i> |
| 2009 | <i>Andrew Thomas Durnford</i><br><i>Samuel Scott Elder</i> | <i>Brian Robert Lawrence</i><br><i>Ayon Sen</i> |
| 2010 | <i>Andrew Thomas Durnford</i><br><i>Samuel Scott Elder</i> | <i>Brian Robert Lawrence</i><br><i>Ayon Sen</i> |
| 2011 | <i>Samuel Scott Elder</i><br><i>Brian Robert Lawrence</i>  | <i>Ayon Sen</i>                                 |

APOSTOL AWARD FOR EXCELLENCE IN TEACHING IN MATHEMATICS

Named in honor of Tom Apostol, who was a great teacher at Caltech for over 50 years, the award recognizes excellence in teaching by our graduate and undergraduate teaching assistants.

- 2010 *Alden Kent Walker*
- 2012 *Samuel Scott Elder*

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.

- 2008 *Angela Maria Capece*
- 2009 *Michael Mello*
- 2010 *Jeffrey Allen LeHew*

ROBERT P. BALLE CALTECH MATHEMATICS SCHOLARS AWARD

Awarded to the mathematics major entering his or her senior year who has demonstrated the most outstanding performance in mathematics courses completed in the student's first three years at Caltech.

- 2011 *Brian Robert Lawrence*

WILLIAM F. BALLHAUS PRIZE

Awarded to aeronautics students for outstanding doctoral dissertations.

- 2012 *Xiaowei Deng, Michio Inoue*

ERIC TEMPLE BELL UNDERGRADUATE MATHEMATICS  
RESEARCH PRIZE

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

2012 *Alexandra Mihaela Musat*

AMASA BISHOP SUMMER STUDY ABROAD PRIZE

Awarded to one or more freshman, sophomore, or junior to fund summer study abroad in an organized program with the aim of gaining exposure to foreign language and international issues or cultures, including global issues in the sciences and engineering.

2010 *Joel Lawrence Nikolaus*

2011 *Eric Yu-Wei Chang, Mackenzie Denali Day, Travis Luke Scholten*

RICHARD G. BREWER PRIZE IN PHYSICS

Awarded to the freshman with the most interesting solutions to the Physics 11 “hurdles,” in recognition of demonstrated intellectual promise and creativity at the very beginning of his or her Caltech education.

2009 *Nicholas Otto Butler*

ROLF D. BUHLER MEMORIAL AWARD IN AERONAUTICS

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

2012 *Christophe Hennekinne*

CALTECH ALUMNI ASSOCIATION SPIRIT AWARD

Commemorates extraordinary activities by Caltech undergraduate students, graduate students, and postdoctoral scholars who best exemplify the spirit, tradition, and values of Caltech. This Award is given only when the Association finds that exceptional activities have occurred which merit this special recognition. CAA Spirit Awardees for 2012 include students who conceived and participated in the audacious “MIT Sold” prank on November 30, 2009.

2012 *Alexander D. Rasmussen, Isaac Cameron Sheff, Jordan Corinne Theriot*

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.

2012 *Xin Hu, Stéphane Lintner*

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.

2009 *Elizabeth Decolvenaere*

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.

2012 *Philipp Andreas Boettcher*

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.

2011 *Raul Gutierrez, Adam Zaki Khan*

#### 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.

2012 *Michael Mello*

#### DEANS' CUP AND STUDENT LIFE AND MASTER'S AWARDS

Two awards, selected by the deans, the director of student 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.

2011 *Aarathi Minisandram*, Dean's Cup

2012 *Nadia Chantal Lara*, Dean's Cup

*Adam Zaki Khan*, Student Life and Master's

*Thomas John Heavey IV*, Student Life and Master's

*Yuyang Fan*, Student Life and Master's

*Skylar Christian Cook*, Student Life and Master's

*Shannon Rose Mohler*, Student Life and Master's

#### DEMETRIADES-TSAFKA-KOKKALIS PRIZE IN BIOTECHNOLOGY OR RELATED FIELDS

Awarded annually to a Ph.D. candidate for the best thesis, publication, or discovery in biotechnology or related fields at the Institute in the preceding 12 months. Winners are selected by the bioengineering faculty. This prize is made possible by a gift from Anna Kokkalis Demetriades and Sterge T. Demetriades, Eng '58.

2012 *Philip A. Romero*

#### DEMETRIADES-TSAFKA-KOKKALIS PRIZE IN ENTREPRENEURSHIP OR RELATED FIELDS

Awarded annually for the best business plan or proposal, start-up, thesis, publication, discovery, or related efforts by student(s) in entrepreneurship or related fields at the Institute in the preceding 12 months. This prize is made possible by a gift from Anna Kokkalis Demetriades and Sterge T. Demetriades, Eng '58.

2008 *Andrew Joseph Downard*

#### DEMETRIADES-TSAFKA-KOKKALIS PRIZE IN ENVIRONMENTALLY BENIGN RENEWABLE ENERGY SOURCES OR RELATED FIELDS

Awarded annually to a Ph.D. candidate for the best thesis, publication, discovery, or related efforts in benign renewable energy sources or related fields at the Institute in the preceding 12 months. This prize is made possible by a gift from Anna Kokkalis Demetriades and Sterge T. Demetriades, Eng '58.

2012 *Leslie Esther O'Leary*

#### DEMETRIADES-TSAFKA-KOKKALIS PRIZE IN NANOTECHNOLOGY OR RELATED FIELDS

Awarded annually to a Ph.D. candidate for the best thesis, publication, or discovery in nanotechnology or related fields at the Institute in the preceding 12 months. This prize is made possible by a gift from Anna Kokkalis Demetriades and Sterge T. Demetriades, Eng '58.

2012 *Andrew T. Jennings, Jordan Robert Raney*

#### DEMETRIADES-TSAFKA-KOKKALIS PRIZE IN SEISMO-ENGINEERING, PREDICTION, AND PROTECTION

Awarded annually to a Ph.D. candidate for the best thesis, publication, or discovery in seismo-engineering, prediction, and protection at the Institute in the preceding 12 months. Winners are selected by the faculty. This prize is made possible by a gift from Anna Kokkalis Demetriades and Sterge T. Demetriades, Eng '58.

2012 *Michael Mello*

#### 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.

2010 *Ruizhe Wang*

2011 *Amy Fu*

#### EVERHART DISTINGUISHED GRADUATE STUDENT LECTURER AWARD

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

2011 *Kate Elizabeth Galloway*

#### DORIS EVERHART SERVICE AWARD

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

2012 *Kathryn Mary Brennan*

#### 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.

2012 *Nathan William Pierce*

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

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

2012 *Soonwon 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.

2011 *Soonwon Choi*

#### 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.

2011 *Ye Lu*

#### 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.

2011 *Brian Robert Lawrence, Vincentius Jeremy Subardi*

#### GRADUATE DEANS' AWARD FOR OUTSTANDING COMMUNITY SERVICE

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

2012 *Daniel James Bower, Megan J. Dobro*

#### GEORGE W. AND BERNICE E. 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.

2012 *Anna Elizabeth Craig*

#### DAVID M. GREETHER PRIZE IN SOCIAL SCIENCE

Awarded to the undergraduate student who demonstrates outstanding performance and creativity in one of the social science options. Funded by Susan G. Davis in recognition of David M. Grether's contributions to econometrics and experimental economics and his service to the Division of the Humanities and Social Sciences, the prize is awarded annually by a committee of social science faculty and carries a cash award of \$500.

2012 *Brian Merlob*

#### 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.

2011 *Evan Reese Biggs, Eva Megan Nichols*

#### ALEXANDER P. AND ADELAIDE F. HIXON PRIZE FOR WRITING

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

2009 *Evan Reese Biggs, Amy Celeste Proctor, Neha Samdaria*

#### HANS G. HORNUNG PRIZE

Awarded for the best oral Ph.D. defense presentation by a student advised by aerospace faculty. The decision is made by a committee of students who attend all thesis presentations for the year.

2012 *Philipp Andreas Boettcher*

#### SCOTT RUSSELL JOHNSON GRADUATE DISSERTATION PRIZE IN MATHEMATICS

Awarded for the best graduate dissertation in mathematics.

2012 *Vidya Venkateswaran, Alden Kent Walker*

#### 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.

2011 *Alden Kent Walker*

#### 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.

2012 *Zarathustra Elessar Brady, Brian Robert Lawrence*

#### KALAM PRIZE FOR AEROSPACE ENGINEERING

Awarded to a student in the aerospace engineering Master's program whose academic performance was exemplary and who shows high potential for future achievements at Caltech. This prize was made possible through the generosity of Dr. Abdul Kalam, the 11th president of India, himself an aerospace engineer.

2012 *Pedro Pablo Guerrero Vela*

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

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

2012 *Kevin Aaron Kuns*

#### MARGIE LAURITSEN LEIGHTON PRIZE

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

2010 *Helena Yingqi Zhang*

#### LIBRARY FRIENDS' SENIOR THESIS PRIZE

This prize was established in 2010 to recognize a senior thesis that exemplifies scholarly research, including the effective use of library resources and other bibliographic materials. A \$1,200 cash award accompanies the citation. The senior thesis is an extensive, independent written work usually undertaken during a senior thesis course series. The University Librarian and the Friends of Caltech Libraries oversee the evaluation and nomination process and make recommendations to the Undergraduate Academic Standards and Honors Committee for final selection. At the discretion of the Friends of Caltech Libraries, more than one award, or none, may be made in any year.

2012 *Eva Megan Nichols*

#### MARI PETERSON LIGOCKI ('81) MEMORIAL AWARD

Awarded to a student who has improved the quality of student life at Caltech through his or her personal character.

2012 *Daniel Peter Sexton*

#### GORDON MCCLURE MEMORIAL COMMUNICATIONS PRIZE

Awarded to undergraduate students for excellence in essay writing in three subjects: English, history, and philosophy.

2010 *Jessica Gabrielle Swallow*

2011 *Elisa Claire Walsh*

2012 *Pengsu Jiang*

#### THE HERBERT NEWBY MCCOY AWARD

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

2012 *Pamela Alisa Sontz, Ayumi Takaoka*

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

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

2009 *Sylvia Camille Sullivan*

#### MECHANICAL ENGINEERING AWARD

Awarded to a candidate for the degree of Bachelor of Science in mechanical engineering whose academic performance has demonstrated outstanding original thinking and creativity, as judged by a faculty committee appointed each year by the executive officer for mechanical engineering. The prize consists of a citation and a cash award.

2012 *Robert Frederick Karol*

#### JAMES MICHELIN SCHOLARSHIP

Given in memory of geologist James Michelin, who worked in the oil fields of Southern California in the 1930s and dreamed of returning to college at Caltech, this annual award recognizes undergraduate students for their contributions to the field of geology or geophysics.

2012 *Suzanne Katherine Birner*

#### 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.

2012 *Aric Abkeel Fitz-Coy, Aarathi Minisandram, Shruti Mishra,  
Giulio C. Rottaro*

#### RODMAN W. PAUL HISTORY PRIZE

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

2011 *Anna Elizabeth Craig*

#### PRESIDENT'S SCHOLARS

These scholarships, which were renewable contingent on academic performance, were awarded to selected freshmen to promote the breadth and diversity of the Caltech undergraduate student body.

2007	<i>Giulio C. Rottaro</i>	<i>Jasmine Soria Sears</i>
2008	<i>David Matthew Wai Leong Choy</i> <i>Thomas Norwood Harris</i> <i>Lei Ying Huang</i> <i>Nadia Chantal Lara</i>	<i>David Anthony Leon</i> <i>Giulio C. Rottaro</i> <i>Jasmine Soria Sears</i>
2009	<i>David Matthew Wai Leong Choy</i> <i>Thomas Norwood Harris</i> <i>Lei Ying Huang</i> <i>Nadia Chantal Lara</i>	<i>David Anthony Leon</i> <i>Giulio C. Rottaro</i> <i>Jasmine Soria Sears</i>
2010	<i>David Matthew Wai Leong Choy</i> <i>Thomas Norwood Harris</i> <i>Nadia Chantal Lara</i>	<i>David Anthony Leon</i> <i>Jasmine Soria Sears</i>
2011	<i>David Matthew Wai Leong Choy</i> <i>Thomas Norwood Harris</i> <i>Nadia Chantal Lara</i>	<i>David Anthony Leon</i> <i>Giulio C. Rottaro</i>

#### 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.

2011 *Mackenzie Denali Day*

#### HERBERT J. RYSER MEMORIAL SCHOLARSHIPS

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

2010 *Brian Robert Lawrence*

2011 *Zarathustra Elessar Brady, Samuel Scott Elder, Jeffrey Alexander Manning, Alexandra Mihaela Musat*

#### SAN PIETRO TRAVEL PRIZE

Awarded to one or more sophomore, junior, or senior to fund an adventurous and challenging summer travel experience that expands the recipient's cultural horizons and knowledge of the world.

2010 *Clara Hoifung Eng, Anna Sergeevna Ivanova, Eva Megan Nichols, Caitlin Anderson Regan*

2011 *Elisa Claire Walsh*

2012 *Allison Haley Barnes, Geoffrey Stephen Beck*

#### 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.

2011 *Arvind Kannan*

2012 *Eva Megan Nichols*

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

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

2011 *Helen Christina Kondos*

#### 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.

2008 *Michael Mello, Matthew J. Munson*

2010 *Philipp Andreas Boettcher*

#### RENUKA D. SHARMA AWARD

Awarded to a sophomore chemistry major for outstanding performance during his or her freshman year.

2010 *Wilson C. Ho*

#### 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.

2009 *Kathryn Mary Brennan, Anna Elizabeth Craig*

2010 *Justin Christopher Johnson, Daniil Andreevich Kitchaev,  
Travis Luke Scholten*

2011 *David Matthew Wai Leong Choy, Aarathi Minisandram,  
Nathan David Morison, Xida Zheng*

#### 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.

2009 *David Craig Moore*

2010 *Brian M. Willett*

#### 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.

2010 *Kathryn Mary Brennan*

#### FRANK TERUGGI MEMORIAL AWARD

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

2011 *Kathryn Mary Brennan*

#### CHARLES AND ELLEN WILTS PRIZE

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

2012 *M. Amin Khajehnejad*

#### FREDERICK J. ZEIGLER MEMORIAL AWARD

Awarded to an outstanding sophomore or junior in pure 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.

2009 *Brian Robert Lawrence*

2010 *Zarathustra Elessar Brady*

2011 *Yutong Chen*

## THE MEANING OF ACADEMIC DRESS

The costumes of those in the academic procession have a specific symbolism that dates back to at least the 14th century. Academic institutions in the United States adopted a code of academic dress in 1895 that has been revised from time to time. The dress of institutions in other countries varies, and there is not a worldwide code, but the basic elements are present in all academic costumes.

Caltech's David Elliot (1917-2007), professor of history, emeritus, wrote the following about academic costumes:

“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. . . .

“With this color and symbolism, which is medieval 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.”

## ODE TO JOY

*Text of Beethoven Ninth Symphony excerpt, after the poem "An die Freude ("To Joy")  
by Johann Christoph Friedrich von Schiller*

<i>Freude, schöner Götterfunken</i>	Joy, beautiful spark of the gods
<i>Tochter aus Elysium,</i>	Daughter of Elysium,
<i>Wir betreten feuertrunken,</i>	We enter, drunk with fire,
<i>Himmlische, dein Heiligtum!</i>	Heavenly one, your sanctuary!
<i>Deine Zauber binden wieder</i>	Your magic unites again
<i>Was die Mode streng geteilt;</i>	Whatever custom had strictly divided.
<i>Alle Menschen werden Brüder,</i>	All men will become brothers,
<i>Wo dein sanfter Flügel weilt.</i>	Where your gentle wing rests.
<i>Wem der große Wurf gelungen,</i>	Whoever has had the great fortune
<i>Eines Freundes Freund zu sein;</i>	To be a friend's friend,
<i>Wer ein holdes Weib errungen,</i>	Whoever has conquered a noble woman,
<i>Mische seinen Jubel ein!</i>	Let him mix in his jubilation!
<i>Ja, wer auch nur eine Seele</i>	Indeed, whoever can call even one soul
<i>Sein nennt auf dem Erdenrund!</i>	His own on this round earth!
<i>Und wer's nie gekonnt, der stehle</i>	And whoever was never able to, must creep away
<i>Weinend sich aus diesem Bund!</i>	Tearfully away from this union!

## HAIL CIT

*(Caltech alma mater)*

by Manton Barnes, B.S. '21

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.



Congratulations to today's graduates. We welcome them to the family of Caltech alumni!

For more than 100 years, Caltech's alumni have gone forward from this day to make a positive impact in the world. We know this year's class will do the same, and that future Techers will be inspired by the achievements of the Class of 2012.

There are more than 22,000 alumni around the world to connect with socially and professionally. The Caltech Alumni Association is here to help our alumni stay in touch with Caltech and with each other, both in person and online.

Graduates, your alumni community is proud of you. We encourage you to go and make the world a better place!

Jim Simmons, BS '72  
President, Board of Directors  
Caltech Alumni Association  
[www.alumni.caltech.edu](http://www.alumni.caltech.edu)

*The passing of the torch  
symbolizes the spirit of research  
going from one hand to the next,  
from one generation to the next,  
from youth to maturity.*