122nd Annual Commencement

CALIFORNIA INSTITUTE OF TECHNOLOGY

June 10, 2016

122nd Annual Commencement

CALIFORNIA INSTITUTE OF TECHNOLOGY

Friday, June 10, 2016
10:00 a.m.

ACADEMIC PROCESSION

Chief Marshal
Warren C. Brown, Ph.D.

Marshals
Barbara Green, Ph.D.
Mary Kennedy, Ph.D.
David Politzer, Ph.D.
David Prober, Ph.D.
Douglas Rees, Ph.D.
Leeat Yariv, Ph.D.

Faculty Officer
Kristine L. Haugen, 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 Vice Provosts
The Provost
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 *William W. Bing, M.M., Conductor*
Presiding	David L. Lee, Ph.D. *Chair of the Board of Trustees* *California Institute of Technology*
Commencement Speaker	Atul Gawande, M.D., M.P.H. *Surgeon, writer, and public health researcher*
Choral Selection "Ode to Joy" excerpts from Symphony No. 9 by Ludwig van Beethoven; Arranged by Dr. Deutsch *(Translation on page 56.)*	The Caltech Glee Club, the Caltech Convocation Brass and Percussion Ensemble, and Organ *Nancy Sulahian, M.M., Conductor*
Conferring of Degrees	Thomas F. Rosenbaum, Ph.D. *President* *Sonja and William Davidow Presidential Chair and Professor of Physics* *California Institute of Technology*

Presentation of Candidates for Degrees

For the Degree of Bachelor of Science	Joseph E. Shepherd, Ph.D. *Vice President for Student Affairs*
For the Degree of Master of Science	Douglas C. Rees, Ph.D. *Dean of Graduate Studies*

For the Degree of Doctor of Philosophy

Biology and Biological Engineering	Stephen L. Mayo, Ph.D. *Division Chair*
Chemistry and Chemical Engineering	David A. Tirrell, Ph. D. *Ross McCollum-William H. Corcoran Professor and Professor of Chemistry and Chemical Engineering*
Engineering and Applied Science	Guruswami Ravichandran, Ph.D. *Division Chair*
Geological and Planetary Sciences	John P. Grotzinger, Ph.D. *Division Chair*
Humanities and Social Sciences	Jean-Laurent Rosenthal, Ph.D. *Division Chair*
Physics, Mathematics and Astronomy	Fiona Harrison, Ph.D. *Division Chair*

Announcement of Awards and Concluding Remarks	President Rosenbaum
Alma Mater "Hail CIT" by Manton Barnes, B.S. '21 *(The audience may join in; lyrics are on page 56.)*	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 2016 commencement ceremony will begin shortly before 10 a.m. on Friday, June 10, at www.caltech.edu.

Follow along with the day's events on Facebook, Twitter, Instagram, and Snapchat. Share your photos and join the celebration by using #Caltech2016. (See page 60 for more information.)

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 34 Nobel Prizes, 7 Crafoord Prizes, 13 National Medals of Technology, and 58 National Medals 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.

Caltech is a place where bold discoveries are possible—where visionary scholars advance the boundaries of knowledge. We celebrate today the 579 graduates who will earn 249 bachelor's degrees, 140 master's degrees, and 190 Ph.D. degrees, and who will contribute to Caltech's impressive legacy and record of achievement around the world.

ABOUT THE SPEAKER

Atul Gawande, M.D., M.P.H., is a surgeon, writer, and public health researcher. He practices general and endocrine surgery at Brigham and Women's Hospital in Boston and is a professor in the Department of Health Policy and Management at the Harvard T. H. Chan School of Public Health, and he is the Samuel O. Thier Professor of Surgery at Harvard Medical School. He is executive director of Ariadne Labs, a joint center for health systems innovation between Brigham and Women's Hospital and the Harvard T. H. Chan School of Public Health. He is also the chairman of Lifebox, a nonprofit organization created with the goal of making surgery safer globally—especially in low-resource countries—through the distribution of appropriate technologies.

Since 1998, Gawande has also been a staff writer for *The New Yorker* magazine, where his writing frequently focuses on major issues facing medicine and public health in the 21st century.

In addition to his magazine writing, Gawande is the author of four *New York Times* bestsellers: *Complications: A Surgeon's Notes on an Imperfect Science, Better, The Checklist Manifesto*, and, most recently, *Being Mortal: Medicine and What Matters in the End*.

Gawande earned a bachelor's degree in biology and political science from Stanford University in 1987. A Rhodes scholar, Gawande earned a master's degree in philosophy, politics and economics from Balliol College, Oxford, in 1989. In 1995, he graduated with a Doctor of Medicine from Harvard Medical School, and in 1999 he earned a Master of Public Health from the Harvard School of Public Health.

He is the winner of two National Magazine Awards, AcademyHealth's Impact Award for highest research impact on healthcare, a MacArthur Fellowship, and the Lewis Thomas Prize for writing about science.

CANDIDATES FOR DEGREES

Bachelor of Science

David Paul Addis* *Malvern, Pennsylvania* Mechanical Engineering and Business, Economics, and Management

Aman Agarwal* *New Delhi, India* Computer Science

Sandia Yun Akhtar* *Ellicott City, Maryland* Applied and Computational Mathematics and Economics

Monique Isabelle Alkiewicz *Mason, Ohio* Bioengineering

Kevin Chong An* *Jamaica, New York* Mathematics

Kristin Nicole Gregory Anderson *Folsom, California* Bioengineering and Business, Economics, and Management

Robert Maxwell Anderson* *St. Louis Park, Minnesota* Mechanical Engineering

Alexandros Giorgos Anemogiannis* *Atlanta, Georgia* Electrical Engineering

Sreenivas Appasani* *Nashua, New Hampshire* Computer Science

Elaine Janette Arbaugh* *Deerfield, Illinois* Computer Science

Luis Ignacio Ares *Miami, Florida* Mathematics

Thomas Lyman Arnold IV *Boxborough, Massachusetts* Mechanical Engineering

Sarah Keiko Megan Rose White Asano *Sunnyvale, California* Mechanical Engineering

Nima Daniel Badizadegan *Newton, Massachusetts* Electrical Engineering

Adam Alfredo Ball* *Carol Stream, Illinois* Physics

Lisa Jane Beckmann* *Torrance, California* Bioengineering

Timothy Watson Bennett *McLean, Virginia* Electrical Engineering

Joseph Don Berleant* *Little Rock, Arkansas* Engineering and Applied Science (Computation and Neural Systems) and Computer Science

Aditya Sharathkumar Bhagavathi* *West Windsor, New Jersey* Computer Science

Laksh Bhasin* *London, United Kingdom* Physics

James Cain Blackwood* *Rancho Palos Verdes, California* Mechanical Engineering and Business, Economics, and Management

Dryden Septimus Bouamalay *Oakland, California* Computer Science

Sarah Brandsen *Ankeny, Iowa* Physics

Emory Andrew Brown* *Stone Mountain, Georgia* Physics

* 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

Alexandra Morgan Brunson *Knoxville, Tennessee* English
Christopher Brian Cannella* *Orinda, California* Astrophysics
Grant Walter Carlson* *Atlanta, Georgia* Computer Science
Kurtis Mickel Carsch* *Bellevue, Washington* Chemistry
Matthew Yoshimi Cedeno *Virginia Beach, Virginia* Computer Science
Arun Chandra* *Fort Collins, Colorado* Bioengineering and Computer Science
Chien-Yi Chang* *Taipei, Taiwan (ROC)* Physics
Melissa Claire Chang* *Centennial, Colorado* Mechanical Engineering and Business, Economics, and Management
Ann Tai Chen* *Thousand Oaks, California* Bioengineering
Anthony Fu Chen* *Irvine, California* Biology and English (Minor)
Courtney Chen* *Kildeer, Illinois* Biology
Oliver Weisi Chen* *Solon, Ohio* Electrical Engineering
Aileen Cheng* *Fremont, California* Bioengineering and Computer Science (Minor)
David Bo Cheng* *Calabasas, California* Computer Science
Evelyn Sze Wing Chin *Cupertino, California* Chemical Engineering (Materials)
Nicholas Young Joon Cho* *Los Angeles, California* Computer Science
Dahan Choi* *Seoul, Republic of Korea* Applied Physics
Daniel Chou† *Blue Bell, Pennsylvania* Bioengineering
Anne Elizabeth Christian* *Calabasas, California* Biology and Geological and Planetary Sciences (Minor)
Daniel Yu-Kit Chui* *Syosset, New York* Mechanical Engineering and Computer Science (Minor)
John Michael Clark *Lewisville, Texas* Mathematics
Matthew Austin Clark *San Diego, California* Computer Science
John Dalton Co-Reyes* *Wilton, Connecticut* Computer Science
Ming Alexandra Cong* *Saratoga, California* Mathematics and Computer Science (Minor)
Matthew William Conroy *Lakewood, Colorado* Computer Science and History (Minor)
Melissa A. Cronin† *Monrovia, Maryland* Chemical Engineering (Process Systems)
Peter James Cuy* *Miami, Florida* Electrical Engineering
Lorinda Carol DaJose *Riverside, California* Planetary Science
Shival Vishnu Dasu† *Sunnyvale, California* Mathematics and Computer Science (Minor)
Anne Hope Davis* *Colorado Springs, Colorado* Chemistry and Geological and Planetary Sciences (Minor)
Nat M. DeFries *Austin, Texas* Chemical Engineering (Environmental)
Paul Byron Dieterle* *Madison, Wisconsin* Applied Physics

Bachelor of Science continued

Kayane Kohar Dingilian *Irvine, California* Chemical Engineering (Environmental)
Sean Thomas Dolan *Hartsdale, New York* Computer Science
Sith Domrongkitchaiporn *Bangkok, Thailand* Electrical Engineering
Esther Du *Walnut, California* Computer Science and Business, Economics, and Management
Rebecca R. Du* *San Diego, California* Bioengineering
Xiaomi Du *Cheshire, Connecticut* Biology
Patric Morgan Eck* *Fullerton, California* Applied and Computational Mathematics and Business, Economics, and Management
Kristin Alicia Eliason *Superior, Wisconsin* Mechanical Engineering
Kelechukwu Ikenna Emezie *Waxhaw, North Carolina* Computer Science
Clarke Jarett Esmerian* *Auburn, California* Astrophysics
Jonathan Tammer Eweis-LaBolle* *Davis, California* Mechanical Engineering
Martín Pablo Fabbri† *Los Angeles, California* Computer Science
Basith Ahmed Fahumy* *Princeton, New Jersey* Mechanical Engineering and Computer Science (Minor)
Wentao Fan* *Beijing, People's Republic of China* Physics
Tianhao Fang* *Fremont, California* Applied and Computational Mathematics and Business, Economics, and Management
Zachary Ryan Fein* *Dallas, Texas* Applied and Computational Mathematics
Aaron Gabriel Feldman* *Wilmington, Delaware* Mathematics and Computer Science
Jerry Feng *Knoxville, Tennessee* Computer Science
Jared Nicholas Forte *Lake Elsinore, California* Chemical Engineering (Biomolecular) and Philosophy (Minor)
Gabriel Julian Foster *Shorewood, Wisconsin* Mathematics
Edward Demharter Fouad* *Farmington, Connecticut* Mechanical Engineering
Constance Betsy Fu* *Dayton, Maryland* Applied and Computational Mathematics and Computer Science
Galen Forrest Gao* *Irving, Texas* Bioengineering
Christopher Viriyakosol Gardner *San Diego, California* Chemical Engineering (Biomolecular)
Edward Garza *Corpus Christi, Texas* Physics
Rachel Michelle Gates *Grass Valley, California* Engineering and Applied Science (Environmental Science and Engineering)
Iulia Gheorghita* *Orlando, Florida* Mathematics
Lauren Ann Gilbert *Spring Hill, Florida* Physics
Heather Delia Gold* *Poway, California* Engineering and Applied Science (Computation and Neural Systems)

Bachelor of Science continued

Daniel Jose Gomez *Dallas, Texas* Applied and Computational Mathematics
Eric Rabkin Gorlin *San Francisco, California* Computer Science and Philosophy (Minor)
Joseph Michael Grappone Jr.* *Richmond, Virginia* Mechanical Engineering
Webster Jingtao Guan* *Lisle, Illinois* Chemical Engineering (Biomolecular)
Ayush Gupta* *Portland, Oregon* Chemistry
Albert Thomas Gural* *Clifton, Virginia* Electrical Engineering and Computer Science (Minor)
Daniel Robert Guth *Annapolis, Maryland* Mathematics
James Tae-Woong Ha* *Honolulu, Hawaii* Biology and Computer Science (Minor)
Cody Han† *Pittsburgh, Pennsylvania* Computer Science
Sheila Gabriella Handler *Oakton, Virginia* Chemistry
Wade Daniel Hann-Caruthers *Charlotte, North Carolina* Mathematics and Computer Science (Minor)
Christopher Sprague Hazard* *Potomac, Maryland* Computer Science
Alexander Michael Henny *South Portland, Maine* Mathematics and Environmental Science and Engineering (Minor)
Emilia Sakai Hernandez *Fairfield, Connecticut* Chemistry and Geochemistry
Timothy Philip Holland* *Hingham, Massachusetts* Computer Science
Samuel Joshua Holo *New York, New York* Planetary Science
Andrew Ji-Chuang Hou* *Artesia, California* Bioengineering
William Michael Hoza* *Olympia, Washington* Computer Science and Mathematics
Alexander Der-Sheng Hsu* *Saratoga, California* Biology
Tianyi Hu *Rockville, Maryland* Astrophysics
May Hui* *Oakland, California* Biology
Sylvia Katherine Hurlimann* *Newton, Massachusetts* Chemistry
Vy-Luan Khang Huynh* *Goleta, California* Computer Science
Alina Tiffany Hwang* *Gaithersburg, Maryland* Electrical Engineering
Jonathan Watson Ikpeazu *Los Angeles, California* Computer Science and Business, Economics, and Management
Alexandra Katarina Ilic* *Austin, Texas* Mechanical Engineering
Seong Bin Im† *Leesburg, Virginia* Business, Economics, and Management
Aakash Indurkhya *Charlotte, North Carolina* Computer Science
Catherine Elizabeth Jamshidi* *Alexandria, Virginia* Computer Science and Business, Economics, and Management
Nauman Muhammed Javed* *Oviedo, Florida* Physics
Katherine Jiang *Saratoga, California* Applied Physics
Rushikesh Sanjeev Joshi* *Sunnyvale, California* Computer Science

Bachelor of Science continued

Soumya Kannan* *Palo Alto, California* Bioengineering

Aditya Karan* *Naperville, Illinois* Computer Science and Applied and Computational Mathematics

Megan Jane Keehan *McLean, Virginia* Computer Science

Emil Timergalievich Khabiboulline* *Geneva, Illinois* Physics

Kyu Kim* *Mission Hills, California* Mechanical Engineering

Minsoo Kim* *Seoul, Republic of Korea* Bioengineering and Applied and Computational Mathematics

Shi En Kim* *Alor Star, Malaysia* Chemical Engineering (Materials)

Anup Kishore *Chappaqua, New York* Mechanical Engineering and Computer Science (Minor)

Michael J. Klionsky *Boca Raton, Florida* Applied and Computational Mathematics

Matthew Long Klucher† *Bellevue, Washington* Electrical Engineering and Computer Science (Minor)

Nikola Borislavov Kovachki* *Sofia, Bulgaria* Mathematics

Brian David Kubisiak* *Chanhassen, Minnesota* Electrical Engineering and Computer Science (Minor)

Meera Mahesh Kumar *San Ramon, California* Chemical Engineering (Materials)

Vansh Kumar* *Vienna, Virginia* Applied and Computational Mathematics and Computer Science

Vibhor Kumar* *Cincinnati, Ohio* Computer Science

Jessica Coco Lam* *Scarsdale, New York* Biology

Chengyi A. Lee* *San Jose, California* Computer Science

Donsuk Lee* *Seoul, Republic of Korea* Computer Science

Grace Lee* *Artesia, California* Engineering and Applied Science (Environmental Science and Engineering) and Geological and Planetary Sciences (Minor)

Hyunseok Lee* *Seoul, Republic of Korea* Physics

Jihoon William Lee* *Redmond, Washington* Bioengineering

Margaret Ann Lee *Bedford, Texas* Mechanical Engineering

Grace Anne Leishman *Rye, New York* Business, Economics, and Management and Geological and Planetary Sciences (Minor)

Bianca Arielle Lepe* *Granada Hills, California* Bioengineering and Business, Economics, and Management

Alex Yucheng Lew* *Marlboro, New Jersey* Computer Science

Jiaxin Li† *Beijing, Peoples Republic of China* Electrical Engineering

Joanne Li *San Diego, California* Computer Science

Kevin (Kevli) Li* *Silver Spring, Maryland* Computer Science

Bachelor of Science continued

Monica Shaojin Li* *Boulder, Colorado* Mechanical Engineering
Dennis Nine Liao* *Bellevue, Washington* Electrical Engineering
David James Lichko* *Deerfield, Illinois* Mathematics
Binjih Lin *Fremont, California* Electrical Engineering
Bryant JiaWei Lin *Raleigh, North Carolina* Computer Science
Xintong Lin* *Akron, Ohio* Computer Science
Yuchen Lin *Pearland, Texas* Mathematics and Computer Science
Amarise Noelle Little* *Orlando, Florida* Applied and Computational Mathematics
Cong Liu* *Beijing, People's Republic of China* Applied and Computational Mathematics and Business, Economics, and Management and Computer Science (Minor)
Sheila Lo *Arcadia, California* Mechanical Engineering
Mark Edward Lorden *Brookline, New Hampshire* Mechanical Engineering
Anthony Erich Lutz† *Woodbridge, Virginia* Physics
Harinee Jaganiyaa Maiyuran* *Irvine, California* History and Philosophy of Science
Chaitanya Lakshmidhar Malladi* *Saratoga, California* Bioengineering and English (Minor)
Ajay Uday Mandlekar* *Cupertino, California* Electrical Engineering and Computer Science
Aashrita Mangu* *South Pasadena, California* Electrical Engineering and Geological and Planetary Sciences (Minor)
Lasya Marla *San Jose, California* Physics and Computer Science (Minor)
Mateo Martinez *Houston, Texas* Chemical Engineering (Process Systems)
Jacqueline Joy Masehi-Lano* *San Marino, California* Bioengineering
Ishan Harshad Mehta* *Fort Gratiot, Michigan* Chemistry and Economics
Calli Christine Meyer* *Austin, Texas* Electrical Engineering
Alice Jamie Marie Ghislaine Michel* *La Cañada, California* Geobiology
Ismael Mireles† *Long Beach, California* Astrophysics
Ritvik Jay Mishra* *Seattle, Washington* Computer Science
Madhav Mohandas* *Naperville, Illinois* Computer Science
Matthew Robert Morgan† *Costa Mesa, California* Computer Science
Hamik Mukelyan *Burbank, California* Computer Science
Alexander Heng-hoe Mun *Rye, New York* Mathematics and Computer Science (Minor)
August William Nanz* *Escondido, California* Mechanical Engineering
John Capuano Naruk* *Houston, Texas* Electrical Engineering
Santiago Gustavo Navonne* *Lugano, Switzerland* Electrical Engineering and Business, Economics, and Management
Katherine Kieu Han Nguyen* *Los Angeles, California* Applied and Computational Mathematics

Bachelor of Science continued

Tian Nie* *Wuxi, People's Republic of China* Mathematics
Patrick Fanfei Nikong* *Beaverton, Oregon* Chemical Engineering (Materials)
Ariel Margaret O'Neill* *Minnetonka, Minnesota* Biology
Meghana Sai Pagadala* *Rock Island, Illinois* Chemistry
Torkom Anthony Pailevanian* *Glendale, California* Electrical Engineering
Juan Diego Palomino* *Pasadena, California* Computer Science
Cheol Woo Park* *Daejeon, Republic of Korea* Physics
Grace Eunhye Park* *Elkins Park, Pennsylvania* Computer Science
Hong Joon Park *Upper Saddle River, New Jersey* Biology and Computer Science (Minor)
Catherine Ann Pavlov* *Woodside, California* Mechanical Engineering
Haley Illyse Pawlow *Mt. Prospect, Illinois* Electrical Engineering
Thomas Rendon Peterson *Newhall, California* Mechanical Engineering
Alexander Charles Pien* *Camas, Washington* Chemical Engineering (Biomolecular)
Valerie Bernice Pietrasz *Alta Loma, California* Planetary Science and Mechanical Engineering
Riley Michael Pinkerton* *Nashotah, Wisconsin* Computer Science and Mathematics
Patrick Julian Tassilo Rall *Munich, Germany* Physics and Computer Science (Minor)
William Augusto Reichard *Guaynabo, Puerto Rico* Chemistry
Stephanie Nicole Reyes *Chicago, Illinois* Mathematics
William Weiss Rieger† *McLean, Virginia* Physics
Ryan Anthony Ripper *Anaheim, California* Applied and Computational Mathematics
Andrew M. Romine *Kennett Square, Pennsylvania* Chemistry and Business, Economics, and Management and History (Minor)
Tatiana Aiko Roy *Carlsbad, California* Applied Physics and Aerospace Engineering (Minor)
Xander Rudelis *Plano, Texas* Chemical Engineering (Process Systems)
Keegan Alexander Ryan* *Webster, Minnesota* Computer Science and Applied and Computational Mathematics
Ellora Sarkar *Pinecrest, Florida* Economics
Samuel Francis Savitz* *Ocoee, Florida* Physics and Chemistry
Nicholas Benjamin Schiefer* *Pickering, Canada* Computer Science
Dylan Eric Schultz *St. Louis, Missouri* Applied and Computational Mathematics and Business, Economics, and Management
Daniel Seabra de Andrade* *Coralville, Iowa* Electrical Engineering
Mehmet Sencan *Istanbul, Turkey* Applied Physics
Neera Manoj Shah* *Riverside, California* Biology
Nehaly Manoj Shah* *Riverside, California* Biology and English (Minor)
Elly Shao *Oxnard, California* Astrophysics

Bachelor of Science continued

Samriddhi Shree Sharma *Philadelphia, Pennsylvania* Applied and Computational Mathematics
Dongying Erin Shen* *Shanghai, People's Republic of China* Chemical Engineering (Biomolecular)
Laura Hui-Shin Shou* *Mountain View, California* Mathematics
Elliot Tyler Simon *Alexandria, Virginia* Mathematics and Computer Science
Karthik Guruswamy Siva* *Newark, Delaware* Physics
Valentin Alexander Skoutnev* *The Woodlands, Texas* Physics
Matthew Dennis Smalley *Newhall, California* Biology
Jun Ho Son* *Seoul, Republic of Korea* Physics
Tara Sowrirajan* *Denver, Colorado* Computer Science
Gregory Saichiro Stevens *Bow, New Hampshire* Biology
Juliet (Ye) Su* *Calgary, Canada* Chemistry
Yubo Su* *Johns Creek, Georgia* Physics and Computer Science
Ömer Subaşi* *Istanbul, Turkey* Mechanical Engineering
Qunchao Sun* *Ningbo, People's Republic of China* Applied and Computational Mathematics
Cynthia J. Sung* *Seoul, Republic of Korea* Chemistry
Naveen Tadepalli *Calabasas, California* Mechanical Engineering
Kevin Taihao Tang *Monterey, California* Computer Science
Rebecca Kunnie Tang *Fitchburg, Massachusetts* Physics
Rachel Diane Thorp *La Cañada, California* Astrophysics and Computer Science (Minor)
Torin Robert Thosath† *Punta Gorda, Florida* Business, Economics, and Management
Huey-ru (Debbie) Tsai *Los Altos, California* Computer Science
Christine Tseng* *Saratoga, California* Engineering and Applied Science (Computation and Neural Systems) and Computer Science (Minor)
Jean-Alexandre Turban *Miami, Florida* Mechanical Engineering
Christopher Paul Varnerin *Watchung, New Jersey* Engineering and Applied Science
Hannah Alane Walsh *Plano, Texas* Mechanical Engineering
Daniel Wang* *Chanhassen, Minnesota* Computer Science
Jack Haocheng Wang* *San Gabriel, California* Computer Science
Jingwen Wang* *Santa Clara, California* Computer Science
Sharon Wang* *Rowland Heights, California* Electrical Engineering
Siyuan Stella Wang *Moorpark, California* Bioengineering
David Austin Warrick *Carrollton, Texas* Computer Science
Nancy Yahan Wen* *North Potomac, Maryland* Computer Science
Michael James Wheeler* *Whittier, California* Mathematics
Theodore Johann Shaw Wilkening* *Bowie, Maryland* Mechanical Engineering

Bachelor of Science *continued*

Jalani Kofi Williams *Omaha, Nebraska* Mechanical Engineering and Computer Science (minor)
Connor K. Wilson *Republic, Washington* Engineering and Applied Science (Computation and Neural Systems)
Stephanie Wong *Palos Verdes Estates, California* Chemistry
Yuanyuan Xu *Yueqing, People's Republic of China* Bioengineering
Albert Huaju Yang *Portland, Oregon* Mechanical Engineering
Cassidy Yang* *Naperville, Illinois* Physics and Business, Economics, and Management
Sharon Yunju Yang* *Taipei, Taiwan (ROC)* Computer Science
Kevin Shimin Yei* *Carlsbad, California* Bioengineering
Kexin Yi* *Hunan, People's Republic of China* Physics
Patrick Ao Yu* *The Woodlands, Texas* Applied Physics
Shengyang Kevin Yu* *Seattle, Washington* Bioengineering
Kevin Alexander Yuh* *Upper Arlington, Ohio* Computer Science
Anthony Zhang† *Albuquerque, New Mexico* Electrical Engineering
Jerry Xiri Zhang* *Pittsburgh, Pennsylvania* Computer Science
Andrew Zhao* *Webster, New York* Computer Science and Economics
Taokun Zheng* *Shanghai, People's Republic of China* Computer Science and Mathematics
Tiffany Zhou* *Brentwood, California* Bioengineering
Nicholas Farrell Zolman* *Mount Sterling, Kentucky* Mathematics
Leonardo Z. Zornberg* *Austin, Texas* Chemical Engineering (Materials)

Master of Science

Ehsan Abbasi *(Electrical Engineering)* B.Sc., Sharif University of Technology 2014.

Nicholas Joseph Adams-Cohen *(Social Science)* B.A., University of California, Santa Barbara 2011; M.A., Stanford University 2014.

Theodore Glenn Albertson *(Applied Physics)* B.S., University of Michigan 2012.

Ahmed Ibrahim Alshaia *(Electrical Engineering)* B.E., University of Edinburgh 2007.

Miguel André Aroca-Ouellette *(Electrical Engineering)* B.E., McGill University 2015.

Akshta Athawale *(Electrical Engineering)* B.Tech., Indian Institute of Technology Bombay 2013.

Louisa Taylor Avellar *(Mechanical Engineering)* B.S., University of California, Berkeley 2014.

Kangchen Bai *(Geophysics)* B.S., Nanjing University 2013.

Thomas Christopher Bohdanowicz *(Physics)* B.A.Sc., B.Math., University of Waterloo 2014.

Joseph John Douglas Bowkett *(Mechanical Engineering)* B.S., The University of Auckland 2014.

Joshua Harris Brake *(Electrical Engineering)* B.S., LeTourneau University 2013; M.S., 2014.

Jeremy Jean Brouillet *(Applied Physics)* B.A., Dartmouth College 2013.

Eric William Burkholder *(Chemical Engineering)* B.S., Cornell University 2014.

Kurtis Mickel Carsch *(Chemistry)* B.S., California Institute of Technology 2016.

Luciana Hartmann Paolillo Cendon *(Electrical Engineering)* B.E., Polytechnic University of Turin 2012; M.S., 2014.

Albert Chan *(Geophysics)* S.B., Massachusetts Institute of Technology 2001; M.S., Brooklyn College of the City University of New York 2004.

Jinqiang Chen *(Environmental Science and Engineering)* B.E., Politecnico di Torino 2011; B.E., Harbin Institute of Technology 2011.

Aaron Chew *(Physics)* B.S., California State University, Los Angeles 2014.

Hyunjun Cho *(Electrical Engineering)* B.S., Korea University 2007; M.S., Seoul National University 2009.

Benson Emmanuel Stevens Christalin *(Control and Dynamical Systems)* B.S., Tufts University 2009; M.S., 2011.

Jaebum Chung *(Electrical Engineering)* B.S., Cornell University 2013.

Michael Andrew Citrin *(Materials Science)* B.S.E., University of Pennsylvania 2014.

Colin Andrew Cook *(Medical Engineering)* B.A.Sc., University of Toronto 2012; M.S., Johns Hopkins University 2014.

Gerardo Cruz *(Control and Dynamical Systems)* B.S., University of Florida 2006.

Brooke Hillary Dallas *(Geology)* B.S., University of California, Davis 2011.

Blake Elliott Daniels *(Chemistry)* B.S., The University of Chicago 2013.

Master of Science continued

Sumanth Dathathri *(Mechanical Engineering)* B.Tech., M.Tech., Indian Institute of Technology Madras 2014.

Andre Fernando de Castro da Silva *(Mechanical Engineering)* Engenheiro Aeronáutico, Instituto Tecnológico de Aeronáutica 2010; M.S., 2013.

Hao Deng *(Electrical Engineering)* B.E., Zhejiang University 2014.

Christopher John Dougherty *(Aeronautics)* B.S., University of Southern California 2015.

Obinna Eruchalu *(Electrical Engineering)* B.S., New Jersey Institute of Technology 2013.

Vanessa Evoen *(Chemical Engineering)* B.S., University of California, Los Angeles 2010.

Seyed Mohammadreza Fatemi *(Electrical Engineering)* B.S., K. N. Toosi University of Technology 2011; M.S., Sharif University of Technology 2013.

Erika Figueroa Schibber *(Space Engineering)* Aeronautical Engineer, Universidad Tecnológica Nacional 2013.

Cody Enslin Finke *(Environmental Science and Engineering)* B.A., Carleton College 2012.

Katherine Irene Fisher *(Biology)* B.S., The College of William & Mary 2006.

Lila Forte *(Chemistry)* B.A., Lewis & Clark College 2009.

Matan Gal-Katziri *(Electrical Engineering)* B.Sc., Ben-Gurion University of the Negev 2010.

Jose Luis Garcia Reyes *(Geophysics)* Ingeniero, National Autonomous University of Mexico 2013.

Antonio Joaquin Garcia Suarez *(Space Engineering)* B.S., University of Seville 2013.

Adenike Monsurat Giwa *(Materials Science)* B.Sc., University of Ibadan 2010.

Joseph Michael Grappone Jr. *(Geophysics)* B.S., California Institute of Technology 2016.

Thibault Guillet *(Aeronautics)* Diplôme d'Ingénieur, École Polytechnique 2015.

Evan Drew Hall *(Physics)* B.A., The University of Chicago 2012.

Arian Hashemi Talkhooncheh *(Electrical Engineering)* B.S., Sharif University of Technology 2015.

Yingying He *(Behavioral and Social Neuroscience)* B.S., Tilburg University 2013; M.S., The London School of Economics and Political Science 2014.

Jinglin Huang *(Medical Engineering)* B.S., Smith College 2014.

Andrew William Janzen *(Electrical Engineering)* B.S., George Fox University 2014.

Jacob Edmund Jencson *(Astrophysics)* B.S., The Ohio State University 2014.

Silken Michelle Jones *(Aeronautics)* B.S.E., Princeton University 2015.

Anand Kumar *(Space Engineering)* B.Tech., Indian Institute of Space Science and Technology 2015.

Siddhant Kumar *(Aeronautics)* B.Tech., Indian Institute of Technology Delhi 2014.

Voon Hui Lai *(Geophysics)* B.A., University of California, Berkeley 2014.

Yu-Hung Lai *(Applied Physics)* B.S., National Taiwan University 2011.

Master of Science continued

Ali Sahin Lale *(Electrical Engineering)* B.S., Boğaziçi University 2015.
Hongjian Lan *(Electrical Engineering)* B.S., Peking University 2014.
Alicia Elaine Lanz *(Physics)* B.A., University of California, Berkeley 2005.
Joel Michael Lawson *(Aeronautics)* B.E., B.S., The University of Auckland 2015.
Ellen Leask *(Geology)* B.Sc., McGill University 2013.
Joonho Lee *(Chemistry)* B.S., Pohang University of Science and Technology 2013.
Liuchi Li *(Applied Mechanics)* B.S., Tongji University 2014.
Zheng Li *(Electrical Engineering)* B.E., Tsinghua University 2006; M.S., 2009.
Max Louis Lifson *(Materials Science)* B.A., Dartmouth College 2011.
Andrew Lim *(Chemistry)* B.S., University of California, Berkeley 2010.
Daodi Lu *(Mathematics)* B.S., Peking University 2011.
Alessandro Maggi *(Medical Engineering)* B.S., Università degli Studi di Milano 2007.
Alasdair Douglas Martin *(Social Science)* B.S., Arizona State University 2014.
Kelly Ann Weekley Mauser *(Applied Physics)* B.S., Colorado State University 2013.
Jenish C. Mehta *(Computer Science)* B.E., Birla Institute of Technology & Science, Pilani 2011.
Oscar Mickelin *(Mathematics)* B.Sc., KTH Royal Institute of Technology 2013; M.Sc., 2015.
Nathaniel Jackson Miller *(Electrical Engineering)* B.S., New Mexico Institute of Mining and Technology 2015.
David Reza Mittelstein *(Medical Engineering)* B.S., University of Southern California 2013.
Cibele Montez Halasz *(Electrical Engineering)* B.S., Stanford University 2014.
Jaeyun Moon *(Mechanical Engineering)* B.S., Georgia Institute of Technology 2014.
John Naviaux *(Environmental Science and Engineering)* B.A., University of California, Irvine 2012.
Mallory Claire Neet *(Aeronautics)* B.S., Purdue University 2015.
Ryan Cecil Ng *(Chemical Engineering)* B.S., University of California, Santa Barbara 2014.
Kien Trung Nguyen *(Civil Engineering)* B.E., Ho Chi Minh City University of Technology 2010.
Quinn Liebling Osha *(Electrical Engineering)* B.A., Occidental College 2015; B.S., California Institute of Technology 2015.
Haemin Paik *(Materials Science)* B.S., Korea Advanced Institute of Science and Technology 2011.
Georgia Theano Papadakis *(Applied Physics)* B.S., National Technical University of Athens 2012.
Prachi Singh Parihar *(Astrophysics)* A.B., Princeton University 2013.

Master of Science continued

Daniel Pastor Moreno *(Space Engineering)* Aeronautical Engineer, Universidad Politécnica de Madrid 2014; M.Sc., Cranfield University 2014.

Sonal Patel *(Biology)* S.B., Massachusetts Institute of Technology 2008.

Nicole Elise Peck *(Bioengineering)* B.S., Harvey Mudd College 2012.

Trien Phat Phan *(Chemical Engineering)* B.S., The University of Texas at Austin 2013.

Jason Aaron Pollack *(Physics)* A.B., Princeton University 2012.

Parham Porsandeh Khial *(Electrical Engineering)* B.Sc., Sharif University of Technology 2015.

Carlos Mauricio Portela G. *(Mechanical Engineering)* B.S., University of Southern California 2013; B.A., 2014.

Kyupaeck Jeff Rah *(Mechanical Engineering)* B.S., Cornell University 2014.

Samuel Bruno Dwight Richerd *(Electrical Engineering)* B.S., Embry-Riddle Aeronautical University 2014.

Sherwood Andrew Richers III *(Physics)* B.A., University of Virginia 2012.

Andrew Beyer Robbins *(Materials Science)* B.S., Cornell University 2013.

Alejandro Robinson Cortés *(Social Science)* B.A., Centro de Investigación y Docencia Económicas 2013.

Fabien Royer *(Space Engineering)* B.S., Institut Supérieur de l'Aéronautique et de l'Espace 2014.

Dzhelil Sabahatin Rufat *(Applied Physics)* B.S.E., Princeton University 2007.

Keith Michael Russell *(Electrical Engineering)* B.S., University of California, Santa Barbara 2009.

Serim Ryou *(Electrical Engineering)* B.E., Korea University 2014.

Leah Sabbeth *(Geology)* B.S., University of Rochester 2013.

Arjun Sadanand *(Electrical Engineering)* B.S., Georgia Institute of Technology 2015.

Fariborz Salehi *(Electrical Engineering)* B.S., Sharif University of Technology 2015.

Jeremy Edward Sandler *(Biology)* B.S., University of Washington 2007.

William Joseph Schill *(Mechanical Engineering)* B.S., California State Polytechnic University, San Luis Obispo 2013.

Denise Marie Schmitz *(Astrophysics)* B.S., University of Washington 2014.

Maysam Shamai *(Aeronautics)* B.S., University of California, Irvine 2015.

Yanan Shao *(Electrical Engineering)* B.Eng., Nanjing University of Science and Technology 2015.

Gautham Pradeepkumar Sholingar *(Electrical Engineering)* B.S., University of Michigan 2015.

Rebekah Miriam Brawer Silva *(Chemistry)* B.S., Stanford University 2012.

Mannat Singh *(Electrical Engineering)* B.Tech., Indian Institute of Technology Bombay 2013.

Yichuan Song *(Aeronautics)* B.S., University of Notre Dame 2015.

Yapeng Su *(Chemical Engineering)* B.E., Tianjin University 2013.

Master of Science continued

Andre M Sukernik *(Electrical Engineering)* B.S., State University of New York at Stony Brook 2005; B.S., Lehigh University 2015.

Meaghan Christina Sullivan *(Biochemistry and Molecular Biophysics)* B.S., University of Southern California 2014.

Sushant Sundaresh *(Electrical Engineering)* B.S., University of California, Berkeley 2012.

Milad Taghavi Nezam Abad *(Electrical Engineering)* B.S., Sharif University of Technology 2013; M.S., University of Washington 2014.

Rachel Lauren Theios *(Astrophysics)* B.S., University of California, Los Angeles 2014.

Nancy Helen Thomas *(Planetary Science)* B.S., University of Washington 2014.

Simon Silvio Tödtli *(Aeronautics)* B.S., Swiss Federal Institute of Technology Zurich 2013; M.Sc., 2015.

Yury Tokpanov *(Applied Physics)* B.S., Moscow Institute of Physics and Technology 2011.

Abbas Davud Tutcuoglu *(Space Engineering)* M.S., École Centrale de Lyon 2014; M.E., Imperial College London 2015.

Chanel Alexis Valiente *(Environmental Science and Engineering)* B.S., University of California, Berkeley 2011.

George Gerald Vega Yon *(Social Science)* B.S., Adolfo Ibáñez University 2010; M.S., 2011.

Marcel Veismann *(Aeronautics)* B.S., Braunschweig University of Technology 2014.

Saumya Vij *(Electrical Engineering)* B.E., M.S., Birla Institute of Technology & Science, Pilani 2014.

Jialiu Wang *(Chemistry)* B.S., University of Science and Technology of China 2013.

Minfa Wang *(Electrical Engineering)* B.S., University of Southern California 2014.

Nicholas Conlan White *(Aeronautics)* A.B., Princeton University 2013.

Betty Ko Wong *(Electrical Engineering)* B.S., University of California, Berkeley 2010.

Zhi Yuan Wong *(Electrical Engineering)* B.A., University of Oxford 2015.

Di Wu *(Medical Engineering)* B.A.Sc., University of Toronto 2014.

Xiaolin Xu *(Materials Science)* B.S., University of Science and Technology 2014.

Dalia Sarah Yadegar *(Social Science)* B.A., University of California, Berkeley 2007; M.A., Columbia University 2011.

Qifan Yang *(Applied Physics)* B.S., Peking University 2013.

Shenghan Yao *(Electrical Engineering)* B.S., The University of Iowa 2014.

Daryl Wei Liang Yee *(Materials Science)* B.S., Imperial College London 2014.

Hikmet Yildiz *(Electrical Engineering)* B.S., Bilkent University 2015.

Brennan Marshall Young *(Electrical Engineering)* B.S., Rutgers, The State University of New Jersey 2015.

Ke Yu *(Aeronautics)* B.S., Peking University 2015.

Junlin Zhang *(Electrical Engineering)* B.E., Tsinghua University 2014.

Xinghao Zhou *(Materials Science)* B.S., University of Science and Technology of China 2013.

Doctor of Philosophy

DIVISION OF BIOLOGY AND BIOLOGICAL ENGINEERING

Aneesh Acharya *(Bioengineering)* B.S., Boston University 2010.
Thesis: Multiplexed Analysis of Diverse RNA Classes via Hybridization Chain Reaction.

Shijia Chen *(Cellular and Molecular Neurobiology)* B.S., University of California, Los Angeles 2007.
Thesis: Light Dependent Regulation of Sleep/Wake States by Prokineticin 2 in Larval Zebrafish.

Miao Cui *(Developmental Biology)* B.S., Nanjing University 2007.
Thesis: Refining Sea Urchin Developmental Gene Regulatory Network Models by Incorporating Wnt Signaling and Information Processed at the *hox11/13b* Locus.

Eric Matthew Erkenbrack *(Biology)* B.A., B.S., Tufts University 2008.
Thesis: Evolution of Developmental Gene Regulatory Networks in Echinoids.

Rachel P Galimidi *(Immunology)* B.A., University of Kansas 2005.
Thesis: Combating HIV with Novel Antibody Architectures.

Victoria Hsiao *(Bioengineering)* B.S., Franklin W. Olin College of Engineering 2010.
Thesis: Synthetic Circuits for Feedback and Detection in Bacteria.

Jocelyn Tammy Kim *(Biology)* B.A., University of Michigan 1999; M.D., 2005.
Thesis: The Innate Immune System in Dendritic Cell-Targeted Lentiviral Vector Immunization and Cell-to-Cell Transmission of HIV-1.

Daniel Leighton *(Biology)* B.S., California Institute of Technology 2010.
Thesis: Mating at Advanced Age: How Old Nematodes Modulate Pheromone Production to Attract Young Males.

Gustavo Rios *(Bioengineering)* B.S., University of California, Irvine 2009.
Thesis: Nanofabricated Neural Probe System for Dense 3-D Recordings of Brain Activity.

Rebecca Bloom Rojansky *(Biology)* B.S., Stanford University 2007.
Thesis: A Core Mitophagic Machinery Promotes Selective Degradation of Paternal Mitochondria in Mouse Embryos.

Adam Shai *(Bioengineering)* B.S., Cornell University 2009.
Thesis: The Physiology and Computation of Pyramidal Neurons.

Zachary Zhipeng Sun *(Molecular Biology and Biochemistry)* B.A., Harvard College 2008.
Thesis: An *in vitro* Biomolecular Breadboard for Prototyping Synthetic Biological Circuits.

Cory James Tobin *(Developmental Biology)* B.S., California Lutheran University 2007.
Thesis: Morphogenesis of the *Arabidopsis* Shoot Apical Meristem.

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*

Benjamin Robert Uy *(Developmental Biology)* B.A., Occidental College 2010.
Thesis: Insights into Neural Crest Evolution.

Brandon Christopher Wadas *(Biology)* B.S., M.S., Colorado State University 2008.
Thesis: Biochemical and Genetic Studies of the N-End Rule Pathway in Yeast and Mammals.

DIVISION OF CHEMISTRY AND CHEMICAL ENGINEERING

Brett Michael Babin *(Chemical Engineering)* B.S., University of Massachusetts Amherst 2009.
Thesis: Bioorthogonal Noncanonical Amino Acid Tagging for Selective Analysis of the *Pseudomonas aeruginosa* Proteome.

Jackson Kenai Blender Cahn *(Chemistry)* B.A., Whitman College 2010.
Thesis: Engineering, Predicting, and Understanding Nicotinamide Cofactor Specificity.

Jean-Luc Chaubard *(Chemistry)* B.S., State University of New York at Stony Brook 2009.
Thesis: Development of Chemoenzymatic Labeling Approaches for the Detection of Fucosylated Biomarkers.

Kangway V Chuang *(Chemistry)* B.S., California Institute of Technology 2010.
Thesis: A Total Synthesis of (+)-Ryanodol.

Andrew James Clark *(Chemistry)* B.A., Pepperdine University 2010.
Thesis: Delivery of Targeted Nanoparticles across the Blood-Brain Barrier Using a Detachable Targeting Ligand.

Matthew Mitchell Coggon *(Chemical Engineering and Environmental Science and Engineering)* B.S., University of Massachusetts Amherst 2010; M.S., California Institute of Technology 2012.
Thesis: Field and Laboratory Studies of the Formation and Composition of Atmospheric Organic Aerosol.

Sidney E Creutz *(Chemistry)* S.B., Massachusetts Institute of Technology 2010.
Thesis: Design, Synthesis, and Study of Novel Platforms for Iron-N_2 Chemistry and Photoinduced, Copper-mediated C-N Bond Formation.

Jason Michael Crowley *(Chemistry)* B.S., University of Connecticut 2010.
Thesis: Resolution of the Band Gap Prediction Problem for Materials Design.

Andrew M. Davenport *(Biochemistry and Molecular Biophysics)* Sc.B., Brown University 2008.
Thesis: The Molecular Basis of Lysine Acetylation: Addition, Removal, and Recognition.

Leah G. Dodson *(Chemistry)* B.S., Case Western Reserve University 2010.
Thesis: Gas Phase Spectroscopy and Kinetics of Atmospheric Radicals.

Lawrence Joseph Dooling *(Chemical Engineering)* B.S., University of Pennsylvania 2008; M.S., California Institute of Technology 2011.
Thesis: Programming Molecular Association and Viscoelastic Behavior in Protein Hydrogels.

Doctor of Philosophy *continued*

Guy Anthony Edouard *(Chemistry)* A.B., Harvard College 2010.
Thesis: Late Transition Metals Supported by Aryl Ethers and Phenoxides Bearing Pendant Phosphines: Mechanistic Insights Relevant to Ether C-O Bond Cleavage.

Carissa Nicole Eisler *(Chemical Engineering)* B.S., University of California, Los Angeles 2010; M.S., California Institute of Technology 2014.
Thesis: Photonic and Device Design Principles for Ultrahigh-Efficiency (>50%), Spectrum-Splitting Photovoltaics.

Vanessa Evoen *(Chemical Engineering)* B.S., University of California, Los Angeles 2010.
Thesis: Electrocatalysis in Solid Acid Fuel Cell Electrodes.

Jacob Thomas Good *(Chemistry)* B.S., University of California, Riverside 2009.
Thesis: Design and Applications of a Decade-Spanning Terahertz Frequency Comb Spectrometer: Doppler-limited Rotational Spectroscopy of Methanol and Methanol-OD.

Michael Andrew Grodick *(Chemistry)* B.S., Case Western Reserve University 2009.
Thesis: DNA-mediated Charge Transport Signaling within the Cell.

Christopher Keating Haley *(Chemistry)* B.S., New York University 2010.
Thesis: Aryne Reactions in the Synthesis of Heterocyclic Molecules.

Seojung Han *(Chemistry)* B.S., Sogang University 2008; M.S., 2010.
Thesis: I. Synthetic Studies toward the Total Synthesis of Polycyclic Natural Products – Communesin F, Perophoramidine and Ineleganolide II. Nickel Catalyzed Intramolecular C–O Bond Formation.

Justin Travis Henthorn *(Chemistry)* B.S., Ohio University 2010.
Thesis: Molybdenum-quinonoid Complexes: Synthesis, Characterization, and Reactivity.

Kyle Tadashi Horak *(Chemistry)* B.A., Cornell University 2010.
Thesis: The Design and Synthesis of Transition Metal Complexes Supported by Non-innocent Ligand Scaffolds for Small Molecule Activation.

Naeem Shahab Husain *(Biochemistry and Molecular Biophysics)* B.A., B.S., The University of Texas at Austin 2009.
Thesis: Mapping mRNA and Protein Expression with High Signal-to-Background in Diverse Organisms.

Nathaniel Thomas Kadunce *(Chemistry)* B.A., Oberlin College 2011.
Thesis: Development of Ni-Catalyzed Asymmetric Reductive Cross-Coupling Reactions.

Boyu Li *(Chemistry)* B.S., Peking University Health Science Center 2009; M.S., 2011.
Thesis: Ring/Chain versus Network: Architecture Induced by Self-versus Pairwise-Association of Telechelic Polymers.

Yufan Liang *(Chemistry)* B.S., Peking University 2010.
Thesis: Applications of Nickel-Catalyzed Cross-Coupling Methods in the Synthesis of Organofluorine Compounds.

Doctor of Philosophy *continued*

Davide Lionetti *(Chemistry)* B.S., University of Notre Dame 2009.
Thesis: Heterometallic Complexes as Models of Enzymatic Active Sites.

Fan Liu *(Chemistry)* B.S., Zhejiang University 2009.
Thesis: Classical Force Field Simulations of Biological Processes and Quantum Chemical Computations of Homogeneous Catalysts.

Eric Lubeck *(Biochemistry and Molecular Biophysics)* B.A., Hampshire College 2009.
Thesis: Towards *in situ* Single Cell Systems Biology.

Thomas Farid Martinez *(Biochemistry and Molecular Biophysics)* S.B., Massachusetts Institute of Technology 2009.
Thesis: Investigations of Pyrrole-Imidazole Polyamide Effects on DNA Replication.

Renee Catherine McVay *(Chemical Engineering)* B.S., Texas A&M University 2011; M.S., California Institute of Technology 2014.
Thesis: Modeling the Effect of Vapor Wall Deposition on the Formation of Secondary Organic Aerosol in Chamber Studies.

Adam Christopher Nielander *(Chemistry)* B.S., University of Virginia 2009.
Thesis: Chemical and Electrochemical Behavior of Graphene-Covered Silicon Photoanodes.

Gwen Ellen Owens *(Biochemistry and Molecular Biophysics)* B.S., Cornell University 2007.
Thesis: Biochemical and Biophysical Characterization of Huntingtin.

Dorothy Weichi Pan *(Chemistry)* B.S., Stanford University 2010.
Thesis: Development of a Cationic Mucic Acid Polymer-Based Nanoparticle siRNA Delivery System.

Kathryn A Pérez *(Chemistry)* A.S., The Art Institute of Fort Lauderdale 2005; B.S., Florida International University 2010.
Thesis: Structural and Biochemical Characterization of Ligand Bound States of the FeMo-cofactor of Nitrogenase.

Michael Robert Post *(Chemistry)* B.A., Washington University in St. Louis 2011.
Thesis: Agonist Binding Studies at Two Subtypes of the Nicotinic Acetylcholine Receptor Involved in Parkinson's Disease and Addiction.

Brendan Liam Quigley *(Chemistry)* B.A., Trinity College Dublin 2010.
Thesis: Understanding Selectivity and Activity in Z-selective Metathesis with Cyclometallated Ru-based Catalysts.

Meera Rao *(Biochemistry and Molecular Biophysics)* B.A., M.S., University of Pennsylvania 2010.
Thesis: Mechanisms of Regulation and Fidelity in Tail-Anchored Membrane Protein Targeting.

Clinton Joseph Regan *(Chemistry)* B.S., The University of Texas at Austin 2009.
Thesis: Photochemical Strategies to Decage Organic Compounds.

Doctor of Philosophy *continued*

Jonathan Daniel Rittle *(Chemistry)* B.S., The Pennsylvania State University 2010.
Thesis: Proton-Coupled Reduction of N_2 Facilitated by Molecular Fe Complexes.

Joel Edward Schmidt *(Chemical Engineering)* B.C.E., M.S., University of Dayton 2011.
Thesis: Imidazolium-Based Organic Structure Directing Agents for the Synthesis of Microporous Materials.

Helen Muriel Segal *(Chemistry)* Sc.B., Brown University 2010.
Thesis: Electrochemical Methods to Study Iron-Sulfur Cluster Proteins.

Oliver Syed Shafaat *(Biochemistry and Molecular Biophysics)* B.S., The University of Chicago 2010.
Thesis: Temporal Control of Ion Channel Activation.

Matthew Reed Shaner *(Chemical Engineering)* B.S., University of California, Santa Barbara 2010; M.S., California Institute of Technology 2013.
Thesis: An Experimental and Technoeconomic Study of Silicon Microwire Arrays for Fuel Production Using Solar Energy.

Alexander Muir Sutherland *(Chemistry)* B.S., University of California, Davis 2009.
Thesis: Technology for Single Cell Protein Analysis in Immunology and Cancer Prognostics.

Daniel Aaron Thomas *(Chemistry)* B.S., University of North Carolina at Chapel Hill 2010.
Thesis: Chemical Reaction Dynamics of the Liquid/Vapor Interface Studied by Mass Spectrometry.

Connie Yuan-Ying Wang *(Chemistry)* B.S., Yale University 2010.
Thesis: Understanding Co-translational Protein Targeting and Lithium Dendrite Formation through Free Energy Simulations and Coarse-Grained Models.

Michael Anthony Webb *(Chemical Engineering)* B.S., University of California, Berkeley 2011; M.S., California Institute of Technology 2015.
Thesis: Path-integral and Coarse-graining Strategies for Complex Molecular Phenomena.

Kai P. Yuet *(Chemical Engineering)* S.B., Massachusetts Institute of Technology 2009; M.S., California Institute of Technology 2012.
Thesis: Tools for Spatiotemporally Specific Proteomic Analysis in Multicellular Organisms.

DIVISION OF ENGINEERING AND APPLIED SCIENCE

Vinamra Agrawal *(Mechanical Engineering)* B.Tech., Indian Institute of Technology Kanpur 2011; M.S., California Institute of Technology 2012.
Thesis: Shock Wave Propagation in Composites and Electro-thermomechanical Coupling of Ferroelectric Materials.

Doctor of Philosophy *continued*

Eldar Akhmetgaliyev *(Applied and Computational Mathematics)* B.S., Moscow Institute of Physics and Technology 2007; M.S., 2009.
Thesis: Fast Numerical Methods for Mixed, Singular Helmholtz Boundary Value Problems and Laplace Eigenvalue Problems - with Applications to Antenna Design, Sloshing, Electromagnetic Scattering and Spectral Geometry.

Thomas F. Allen *(Mechanical Engineering)* B.S., University of California, Berkeley 2005; M.S., California Institute of Technology 2011.
Thesis: Two and Three Finger Caging of Polygons and Polyhedra.

Jeffrey Scott Amelang *(Mechanical Engineering and Computational Science and Engineering)* B.S., Brigham Young University 2009; M.S., California Institute of Technology 2011.
Thesis: A Fully-nonlocal Energy-based Formulation and High-performance Realization of the Quasicontinuum Method.

Daniel Borsodi Araya *(Aeronautics)* B.S., Texas A&M University 2008; M.S., 2011; M.S., California Institute of Technology 2012.
Thesis: Aerodynamics of Vertical-axis Wind Turbines in Full-scale and Laboratory-scale Experiments.

Manan Arya *(Space Engineering)* B.S., University of Toronto 2011; M.S., California Institute of Technology 2012.
Thesis: Packaging and Deployment of Large Planar Spacecraft Structures.

Saurabh Bajaj *(Materials Science)* B.Tech., Vellore Institute of Technology 2008; M.S., Texas A&M University 2010.
Thesis: Phase Diagrams and Defect Thermodynamics to Devise Doping Strategies in Lead Chalcogenide Thermoelectric Materials and Its Alloys.

Yazan Nicola Billeh *(Computation and Neural Systems)* B.E., Imperial College London 2009; M.S., University of Michigan 2011.
Thesis: Functional, Clustered, Feedforward, and Mesoscale Brain Networks.

Brock Douglas Bobbitt *(Mechanical Engineering)* B.A., Wheaton College 2011; B.S., University of Illinois at Urbana-Champaign 2011; M.S., California Institute of Technology 2013.
Thesis: Small Scale Turbulence in High Karlovitz Number Premixed Flames.

Ana Maii Brown *(Applied Physics)* B.S., Stanford University 2010; M.S., California Institute of Technology 2014.
Thesis: Classical and Quantum Effects in Plasmonic Metals.

Hayden Andrew Burgoyne *(Space Engineering)* B.S., Harvard College 2011; M.S., California Institute of Technology 2012.
Thesis: Dynamics of Granular Crystals with Elastic-Plastic Contacts.

Doctor of Philosophy *continued*

Wuhan Desmond Cai *(Electrical Engineering)* B.S., Cornell University 2009; M.S., California Institute of Technology 2013.
Thesis: Electricity Markets for the Smart Grid: Networks, Timescales, and Integration with Control.

Yingrui (Ray) Chang *(Mechanical Engineering and Computational Science and Engineering and Applied and Computational Mathematics)* B.E., Tongji University 2009; M.S., Carnegie Mellon University 2009; M.S., California Institute of Technology 2012.
Thesis: A Continuum Model for Slip-Twinning Interactions in Magnesium and Magnesium Alloys.

Bo Chen *(Computation and Neural Systems)* B.S., Simon Fraser University 2008; M.S., University of British Columbia 2010.
Thesis: Quantum of Vision.

Christopher Tien Chen *(Materials Science)* B.S., Northwestern University 2009.
Thesis: Heteroepitaxy of Group IV and Group III-V Semiconductor Alloys on Si for Photovoltaic Applications.

David Zhaoyue Chen *(Materials Science)* B.S., The University of Texas at Austin 2011.
Thesis: Atomic-level Structure and Deformation in Metallic Glasses.

Jeesoon Choi *(Mechanical Engineering)* B.S., Seoul National University 2010; M.S., California Institute of Technology 2012.
Thesis: Unsteady Aerodynamics and Optimal Control of an Airfoil at Low Reynolds Number.

Naomi Cristina Coronel *(Materials Science)* S.B., Massachusetts Institute of Technology 2009.
Thesis: Earth-Abundant Zinc-IV-Nitride Semiconductors.

Stephanie Alexandra Coronel *(Aeronautics)* B.S., The University of Texas at Arlington 2009; M.S., California Institute of Technology 2010.
Thesis: Thermal Ignition using Moving Hot Particles.

Niccolo Cymbalist *(Aeronautics)* B.Eng., Concordia University 2011; M.S., California Institute of Technology 2012.
Thesis: Mixing, Chemical Reactions, and Combustion in Supersonic Flows.

Laura Anne De Lorenzo *(Applied Physics)* B.A., Dartmouth College 2010; M.S., California Institute of Technology 2014.
Thesis: Optomechanics with Superfluid Helium-4.

Abel Bermie Roberto Dizon *(Civil Engineering)* B.S., University of California, Los Angeles 2011; M.S., California Institute of Technology 2013.
Thesis: A Hybrid-Parallel Framework for the Nonlinear Seismic Analysis of Very Tall Buildings.

Doctor of Philosophy *continued*

Reeve Dunne *(Mechanical Engineering)* B.S., Tufts University 2010; M.S., California Institute of Technology 2012.

Thesis: Dynamic Stall on Vertical Axis Wind Turbine Blades.

Simon Dunne *(Computation and Neural Systems)* B.A., Trinity College Dublin 2009.

Thesis: Neural and Hormonal Systems Underlying Human Reward-Seeking Behavior.

Subrahmanyam Duvvuri *(Aeronautics)* B.Tech., Indian Institute of Technology Madras 2010; M.S., California Institute of Technology 2011.

Thesis: Non-Linear Scale Interactions in a Forced Turbulent Boundary Layer.

Hal S. Emmer *(Materials Science)* B.S., University of Pennsylvania 2009; M.S., California Institute of Technology 2011.

Thesis: Paths towards High Efficiency Silicon Photovoltaics.

Masoud Farivar *(Electrical Engineering)* B.S., Sharif University of Technology 2009; M.S., California Institute of Technology 2013.

Thesis: Optimization and Control of Power Flow in Distribution Networks.

Quoc Bao Nguyen Ha *(Applied Physics)* B.A., Lawrence University 2007; M.S., California Institute of Technology 2010.

Thesis: Plasma Loop and Strapping Field Dynamics: Reproducing Solar Eruptions in the Laboratory.

Roarke William Horstmeyer *(Electrical Engineering)* B.S., Duke University 2006; S.M., Massachusetts Institute of Technology 2011.

Thesis: Computational Microscopy: Turning Megapixels into Gigapixels.

Chengyun Hua *(Mechanical Engineering)* B.S., University of Michigan 2011; M.S., California Institute of Technology 2012.

Thesis: Exploring Thermal Phonon Transport from Atomic to Macroscopic Scales for Energy Conversion and Management.

Peter Shek-Ho Hung *(Applied Physics)* B.S., California Institute of Technology 2008; M.S., 2012.

Thesis: Advanced Applications of Nanoelectromechanical Systems.

Ryan Colt Hurley *(Applied Mechanics)* B.S., University of Maryland, College Park 2011; M.S., California Institute of Technology 2012.

Thesis: Force Chains, Friction, and Flow: Behavior of Granular Media across Length Scales.

Kishore Jaganathan *(Electrical Engineering)* B.Tech., Indian Institute of Technology Madras 2010; M.S., California Institute of Technology 2011.

Thesis: Convex Programming-based Phase Retrieval: Theory and Applications.

Mooseok Jang *(Electrical Engineering)* B.S., Korea Advanced Institute of Science and Technology 2009.

Thesis: Optical Phase Conjugation and Its Applications in Biology.

Doctor of Philosophy *continued*

Christopher George Janover *(Civil Engineering)* B.E., M.E.., The Cooper Union for the Advancement of Science and Art 2010; M.S., California Institute of Technology 2013.
Thesis: SteelConverter & Caltech VirtualShaker: Rapid Nonlinear Cloud-Based Structural Model Conversion and Analysis.

Alex Xavier Jerves Cobo *(Applied Mechanics and Applied and Computational Mathematics)* Civil Engineer, Universidad de Cuenca 2006; Magister, Universidad Politécnica Salesiana 2009; M.S., California Institute of Technology 2011.
Thesis: Microscopic Origin of Macroscopic Strength in Granular Media: A Numerical and Analytical Approach.

Vanessa Danielle Jonsson *(Control and Dynamical Systems)* B.S., University of Southern California 2006; M.A., 2007.
Thesis: Robust Control of Evolutionary Dynamics.

Georg Kaltenboeck *(Materials Science)* B.S., California Institute of Technology 2009.
Thesis: Investigation of Capacitive Discharge Heating of Metallic Glasses.

Gokcan Karakus *(Civil Engineering)* B.S., Boğaziçi University 2007; M.S., California Institute of Technology 2008.
Thesis: Real-Time Bayesian Analysis of Ground Motion Envelopes for Earthquake Early Warning.

Hyun-Sik Kim *(Materials Science)* B.A., M.S., University of Cambridge 2006.
Thesis: Thermoelectric Properties of Bismuth Antimony Telluride Alloys.

Simon Lapointe *(Aeronautics)* B.Ing., Laval University 2010; M.Sc., 2012; M.S., California Institute of Technology 2013.
Thesis: Simulation of Premixed Hydrocarbon Flames at High Turbulence Intensities.

Sebastian Liska *(Aeronautics)* B.S., Duke University 2008; M.S., California Institute of Technology 2009.
Thesis: Fast Lattice Green's Function Methods for Viscous Incompressible Flows on Unbounded Domains.

Yang Liu *(Electrical Engineering)* B.E., Shandong University 2011; M.S., California Institute of Technology 2012.
Thesis: Novel Parylene Filters for Biomedical Applications.

Zhao Liu *(Electrical Engineering)* B.S., Tsinghua University 2009; M.S., California Institute of Technology 2010.
Thesis: Electromyographic Signal Processing with Application to Spinal Cord Injury.

Scott Carlton Livingston *(Control and Dynamical Systems)* B.S., The University of Tennessee, Knoxville 2009.
Thesis: Incremental Control Synthesis for Robotics in the Presence of Temporal Logic Specifications.

Doctor of Philosophy *continued*

Monica Paola Martinez Ortiz *(Mechanical Engineering)* B.S., Universidad Nacional Autónoma de México 2010; M.S., California Institute of Technology 2012.
Thesis: Fluid Transport by Aggregations of Small Swimming Organisms.

Nikolai Matni *(Control and Dynamical Systems)* B.A.Sc., University of British Columbia 2008; M.Sc., 2010.
Thesis: Distributed Optimal Control of Cyber-Physical Systems: Controller Synthesis, Architecture Design and System Identification.

Jomela Chen-Chen Meng *(Aeronautics)* B.S., Arizona State University 2009; M.S., California Institute of Technology 2010.
Thesis: Numerical Simulations of Droplet Aerobreakup.

Lucas Rosendo Meza *(Mechanical Engineering)* B.S., University of California, Los Angeles 2011; M.S., California Institute of Technology 2013.
Thesis: Design, Fabrication and Mechanical Property Analysis of 3D Nanoarchitected Materials.

Utkarsh Mital *(Applied Mechanics)* B.Tech., Veermata Jijabai Technological Institute 2010; M.S., California Institute of Technology 2011.
Thesis: Understanding Micro- and Macro-Mechanics of Soil Liquefaction — A Necessary Step for Field-Scale Assessment.

Sarah Louise Mitchell *(Mechanical Engineering)* B.E., The University of Auckland 2012; M.S., California Institute of Technology 2014.
Thesis: Topology Optimization of Silicon Anode Structures for Lithium-Ion Battery Applications.

Stephanie Jane Mitchell *(Space Engineering)* B.E., The University of Auckland 2008; M.E., 2009; M.S., California Institute of Technology 2011.
Thesis: Metaconcrete: Engineered Aggregates for Enhanced Dynamic Performance.

Lauren Christine Montemayor *(Aeronautics)* S.B., Massachusetts Institute of Technology 2010; M.S., California Institute of Technology 2011.
Thesis: Fabrication, Characterization, and Deformation of 3D Structural Meta-Materials.

Panagiotis Philippos Natsiavas *(Mechanical Engineering)* Diploma, Aristotle University of Thessaloniki 2012; M.S., California Institute of Technology 2013.
Thesis: Stability of Electrode-Electrolyte Interfaces during Charging in Lithium Batteries.

Xiaoze Ou *(Electrical Engineering)* B.E., Zhejiang University 2011; M.S., California Institute of Technology 2013.
Thesis: Computational Microscopy: Breaking the Limit of Conventional Optics.

Ivan I Papusha *(Control and Dynamical Systems)* B.S., M.S., Stanford University 2011.
Thesis: Robustness, Adaptation, and Learning in Optimal Control.

Doctor of Philosophy *continued*

Soyoung Park *(Computation and Neural Systems)* B.S., California Institute of Technology 2009.
Thesis: Connectivity and Function of the Primate Insula.

Qiuyu Peng *(Electrical Engineering)* B.E., Shanghai Jiao Tong University 2011; M.S., California Institute of Technology 2013.
Thesis: Distributed Control and Optimization for Communication and Power Systems.

Brandon Scott Runnels *(Mechanical Engineering)* B.S., New Mexico Institute of Mining and Technology 2011; M.S., California Institute of Technology 2012.
Thesis: A Model for Energy and Morphology of Crystalline Grain Boundaries with Arbitrary Geometric Character.

Saman Saeedi *(Electrical Engineering)* B.Sc., Sharif University of Technology 2010; M.S., California Institute of Technology 2011.
Thesis: Holistic Design in High-speed Optical Interconnects.

Britton Alan Sauerbrei *(Computation and Neural Systems)* B.A., The University of Chicago 2009.
Thesis: Firing Patterns of Cerebellar Purkinje Cells during Locomotion and Sleep.

Bryan Eric Schmidt *(Aeronautics)* B.S., Case Western Reserve University 2011; M.S., California Institute of Technology 2012.
Thesis: On the Stability of Supersonic Boundary Layers with Injection.

Krishna Shankar *(Mechanical Engineering)* B.S., University of Illinois at Urbana-Champaign 2011; M.S., California Institute of Technology 2012.
Thesis: Kinematics and Local Motion Planning for Quasi-static Whole-body Mobile Manipulation.

Amanda M Shing *(Materials Science)* S.B., Massachusetts Institute of Technology 2008; M.S., California Institute of Technology 2013.
Thesis: Development of Zn-IV-Nitride Semiconductor Materials and Devices.

Yinglu Tang *(Materials Science)* B.E., Beihang University 2008; M.S., California Institute of Technology 2014.
Thesis: Thermoelectric Skutterudites: Why and How High zT Can Be Achieved.

Matthew David Thill *(Electrical Engineering)* B.S., California Institute of Technology 2009; M.S., 2012.
Thesis: Algebraic Techniques in Coding Theory: Entropy Vectors, Frames, and Constrained Coding.

Christos Thrampoulidis *(Electrical Engineering and Applied and Computational Mathematics)* Diploma, University of Patras 2011; M.S., California Institute of Technology 2012.
Thesis: Recovering Structured Signals in High Dimensions via Non-Smooth Convex Optimization: Precise Performance Analysis.

Yulia Tolstova *(Materials Science)* S.B., Massachusetts Institute of Technology 2010.
Thesis: Cu_2O Heterojunction Photovoltaics.

Doctor of Philosophy *continued*

Aaron S. Towne *(Mechanical Engineering)* B.S., University of Wisconsin-Madison 2009; M.S., California Institute of Technology 2010.
Thesis: Advancements in Jet Turbulence and Noise Modeling: Accurate One-way Solutions and Empirical Evaluation of the Nonlinear Forcing of Wavepackets.

Sally June Tracy *(Materials Science)* B.A., Occidental College 2008; M.S., California Institute of Technology 2011.
Thesis: Polaron Hopping in Olivine Phosphates Studied by Nuclear Resonant Scattering.

Hsieh-Chen Tsai *(Mechanical Engineering)* B.S., National Taiwan University 2006; M.S., 2008.
Thesis: Numerical Investigation of Vertical-Axis Wind Turbines at Low Reynolds Number.

Aaron Jacob Weinstein *(Applied Physics)* Sc.B., Brown University 2009.
Thesis: Quantum Electromechanics with Two Tone Drive.

Wen Yan *(Mechanical Engineering)* B.S., Tsinghua University 2011; M.S., California Institute of Technology 2012.
Thesis: Dynamics of Chemically Active Suspensions.

Enoch Ho-Yee Yeung *(Control and Dynamical Systems)* B.S., Brigham Young University 2010.
Thesis: Reverse Engineering and Quantifying Context Effects in Synthetic Gene Networks.

Seungil You *(Control and Dynamical Systems and Applied and Computational Mathematics)* B.S., Seoul National University 2011.
Thesis: A Direct Approach to Robustness Optimization.

Changhong Zhao *(Electrical Engineering)* B.E., Tsinghua University 2010; M.S., California Institute of Technology 2012.
Thesis: Real-Time Load-Side Control of Electric Power Systems.

Sinan Zhao *(Electrical Engineering)* B.S., Peking University 2009; M.S., California Institute of Technology 2010.
Thesis: Advanced Monte Carlo Simulation and Machine Learning for Frequency Domain Optical Coherence Tomography.

DIVISION OF GEOLOGICAL AND PLANETARY SCIENCES

David Hamilton Case *(Geochemistry)* B.A., Washington University in St. Louis 2010; M.S., California Institute of Technology 2013.
Thesis: Carbonate-Associated Microbial Ecology at Methane Seeps: Assemblage Composition, Response to Changing Environmental Conditions, and Implications for Biomarker Longevity.

Jinqiang Chen *(Environmental Science and Engineering)* B.E., Politecnico di Torino 2011; B.E., Harbin Institute of Technology 2011.
Thesis: Dynamics of the East Asian Summer Monsoon in Present and Future Climates.

Doctor of Philosophy *continued*

Junle Jiang *(Geophysics and Computational Science and Engineering)* B.S., Peking University 2009; M.S., California Institute of Technology 2011.
Thesis: Probabilistic Imaging and Dynamic Modeling of Earthquake Source Processes.

Anne Louise Laraia *(Environmental Science and Engineering)* B.S., University of Massachusetts Lowell 2010; M.S., California Institute of Technology 2012.
Thesis: Observations and Modeling of Tropical Planetary Atmospheres.

Dunzhu Li *(Geophysics and Computational Science and Engineering)* B.S., Peking University 2008; M.S., 2010; M.S., California Institute of Technology 2015.
Thesis: Some Advances in Computational Geophysics: Seismic Wave and Inverse Geodynamic Modeling.

Yiran Ma *(Geophysics and Computational Science and Engineering)* B.S., Nanjing University 2010; M.S., California Institute of Technology 2015.
Thesis: Imaging the Earth with Ambient Noise and Earthquakes.

Jeffrey James Marlow *(Geobiology)* B.A., Washington University in St. Louis 2007.
Thesis: Physical, Metabolic, and Energetic Investigations of Methane-metabolizing Microbial Communities.

Hilary Rose Martens *(Geophysics and Planetary Science)* B.A., The University of Montana 2008; M.Sc., University College London 2009; M.Phil., University of Cambridge 2010; M.S., California Institute of Technology 2015.
Thesis: Using Earth Deformation Caused by Surface Mass Loading to Constrain the Elastic Structure of the Crust and Mantle.

Brent Morton Minchew *(Geophysics)* B.S., The University of Texas at Austin 2008; M.S., 2010.
Thesis: Mechanics of Deformable Glacier Beds.

Miki Nakajima *(Planetary Science and Computational Science and Engineering)* B.A., Tokyo Institute of Technology 2007; M.S., California Institute of Technology 2013.
Thesis: Origin of the Earth and Moon.

Megan Eve Newcombe *(Geology)* B.A., M.Sc., University of Cambridge 2009; M.S., California Institute of Technology 2011.
Thesis: Solubility and Diffusivity of Water in Lunar Basalt, and Chemical Zonation in Olivine-Hosted Melt Inclusions.

Jeffrey Paul Prancevic *(Geology)* B.A., University of California, Berkeley 2009.
Thesis: Sediment Mobility in Steep Channels and the Transition to Landsliding.

Morgan Reed Raven *(Environmental Science and Engineering)* B.A.S., Stanford University 2006; M.S., 2007.
Thesis: Organic Matter Sulfurization in the Modern Ocean.

Doctor of Philosophy *continued*

Joel Simon Scheingross *(Geology)* B.A., B.S., University of California, Berkeley 2007; M.S., California Institute of Technology 2012.
Thesis: Mechanics of Sediment Transport and Bedrock Erosion in Steep Landscapes.

Kirsten Leigh Siebach *(Geology)* B.A., Washington University in St. Louis 2011.
Thesis: Formation and Diagenesis of Sedimentary Rocks in Gale Crater, Mars.

Sarah Pearl Slotznick *(Geobiology)* S.B., Massachusetts Institute of Technology 2009; M.S., California Institute of Technology 2012.
Thesis: Coupling Textural, Magnetic, and Modeling Techniques to Understand Precambrian Paleoenvironments.

Francis Joseph Sousa *(Geology)* B.S., University of California, Davis 2009; M.A., Columbia University 2010; M.S., California Institute of Technology 2014.
Thesis: Tectonics of Central and Eastern California, Late Cretaceous to Modern.

Victoria Louise Stevens *(Geology)* M.Sc., University of Cambridge 2011; M.S., California Institute of Technology 2014.
Thesis: Reconciling Geodetic Strain and Seismicity Rate with Frequency-Magnitude Relation of the Largest Earthquakes.

Zhan Su *(Planetary Science)* B.S., University of Science and Technology of China 2010.
Thesis: High-Latitude Ocean Convection and Gyre Dynamics.

Zhihong Tan *(Environmental Science and Engineering)* B.S., Peking University 2009; M.S., California Institute of Technology 2013.
Thesis: Simulations and Mechanisms of Subtropical Low-cloud Response to Climate Change.

Elizabeth Trembath-Reichert *(Geobiology)* B.A., Barnard College 2008; M.S., California Institute of Technology 2013.
Thesis: Molecular and Geochemical Insights into Microbial Life Centimeters to Kilometers below the Seafloor.

Robert Christopher Wills *(Environmental Science and Engineering)* B.S., University of California, Berkeley 2011; M.S., California Institute of Technology 2013.
Thesis: Stationary Eddies and Zonal Variations of the Global Hydrological Cycle in a Changing Climate.

DIVISION OF HUMANITIES AND SOCIAL SCIENCES

Yifei Huang *(Social Science)* B.S., Central University of Finance and Economics 2009; M.A., Columbia University 2011.
Thesis: Essays in Economic History and Applied Microeconomics.

Taisuke Imai *(Social Science)* B.A., The University of Tokyo 2007; M.A., 2009.
Thesis: Essays in Revealed Preference Theory and Behavioral Economics.

Doctor of Philosophy *continued*

Sergio Montero *(Social Science)* B.A., Centro de Investigación y Docencia Económicas 2010; M.S., California Institute of Technology 2013.
Thesis: Essays in Econometrics and Political Economy.

Samantha Louise Myers *(Social Science)* B.A., The University of Queensland 2007; M.S., California Institute of Technology 2012.
Thesis: Three Essays on Inequality and Political Economy.

Gideon Nave *(Computation and Neural Systems)* B.Sc., Technion - Israel Institute of Technology 2009; M.Sc., 2011.
Thesis: Mechanisms Underlying Economic Choice.

Euncheol Shin *(Social Science)* B.A., B.S., Yonsei University 2009; M.S., California Institute of Technology 2012.
Thesis: Essays on Social Networks and Political Economy.

Gerelt Tserenjigmid *(Social Science)* B.A., The University of Tokyo 2011; M.S., California Institute of Technology 2013.
Thesis: Essays in Behavioral Decision Theory.

Qiaoxi Zhang *(Social Science)* B.S., The University of Hong Kong 2011; M.S., California Institute of Technology 2013.
Thesis: Three Essays on Information Economics.

DIVISION OF PHYSICS, MATHEMATICS AND ASTRONOMY

Sirio Belli *(Astrophysics)* Laurea, Università di Bologna 2008; Laurea Magistrale, 2010; M.S., California Institute of Technology 2013.
Thesis: Deep Near-Infrared Spectroscopy of High-Redshift Galaxies: the Physical Growth of Passive Systems.

Michael Edward Beverland *(Physics)* B.A., M.Sc., University of Cambridge 2009.
Thesis: Toward Realizable Quantum Computers.

Timothy Dobson Blasius *(Physics)* B.S., University of Michigan 2010; M.S., California Institute of Technology 2014.
Thesis: Optomechanical Inertial Sensors and Feedback Cooling.

Michael Bottom *(Astrophysics)* B.A., Columbia University 2008.
Thesis: Two Roads to Planet Detection.

Elizabeth Caryn Bullard *(Physics)* S.B., Massachusetts Institute of Technology 2005.
Thesis: Optimization of NEMS for Frequency Shift Sensing Applications.

Doctor of Philosophy *continued*

Yi Cao *(Astrophysics)* B.S., Tsinghua University 2008; M.S., 2011.
Thesis: Cosmic Explosions: Observations of Infant Hydrogen-Free Supernovae towards an Understanding of Their Parent Systems.

William Elbridge Chickering *(Physics)* B.A., University of California, Berkeley 2005.
Thesis: Thermopower in Two-Dimensional Electron Systems.

Wei-Hsun Lin *(Physics)* B.S., National Tsing Hua University 2005; M.S., 2007.
Thesis: Dynamic Characterization of Micro-Particle Systems.

Swarnima Manohar *(Astrophysics)* B.S., University of Southern California 2008; M.S., California Institute of Technology 2010.
Thesis: Lurking in ULIRGs: Molecular Gas in Local Merging Galaxies.

Debaleena Nandi *(Physics)* B.Sc., Jadavpur University 2005; M.S., Indian Institute of Science 2008.
Thesis: Coulomb Drag and Tunneling Studies in Quantum Hall Bilayers.

Maria Monica Nastasescu *(Mathematics)* A.B., Princeton University 2011.
Thesis: Nonvanishing of L-functions for GL(n).

Tejaswi Venumadhav Nerella *(Physics)* M.Sc., Indian Institute of Technology Kanpur 2010.
Thesis: The Astrophysics of Strongly Interacting Systems.

Xiang Ni *(Mathematics)* B.S., Nankai University 2007.
Thesis: Rota-Baxter Algebras, Renormalization on Kausz Compactifications and Replicating of Binary Operads.

Du Pei *(Physics)* B.S., Peking University 2011.
Thesis: 3d-3d Correspondence for Seifert Manifolds.

Seth Robert Siegel *(Physics)* B.S., University of Michigan 2009.
Thesis: A Multiwavelength Study of the Intracluster Medium and the Characterization of the Multiwavelength Sub/millimeter Inductance Camera.

Gaurav Sinha *(Mathematics)* M.Sc., Indian Institute of Technology Kanpur 2011.
Thesis: Blackbox Reconstruction of Depth Three Circuits with Top Fan-in Two.

Bogdan Stoica *(Physics)* A.B., Princeton University 2011.
Thesis: Boundary Relative Entropy as Quasilocal Energy: Positive Energy Theorems and Tomography.

Paraj Titum *(Physics)* M.S., Indian Institute of Technology Kanpur 2010.
Thesis: Disorder Driven Transitions in Non-Equilibrium Quantum Systems.

David Joseph Yeaton-Massey *(Physics)* B.A., University of California, Berkeley 2007.
Thesis: Cryogenic Silicon Optical Reference Cavities.

Foo Yee Yeo *(Mathematics)* B.S., Imperial College London 2009; M.S., University of Cambridge 2010.
Thesis: *l*-adic Cohomology of the Dual Lubin-Tate Tower via the Exterior Power.

PRIZES AND AWARDS

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

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.

2016 Bianca Arielle Lepe

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.

2016 Catherine Elizabeth Jamshidi, Nicholas Benjamin Schiefer

GEORGE W. HOUSNER AWARD

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

2016 Nicholas Benjamin Schiefer

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.

ADVOCATING CHANGE TOGETHER (ACT) AWARD

The Caltech Y ACT Award allows students to learn about a global, national, or local issue by immersing themselves with activists working on a cause over the summer and then challenges them to educate others by creating and leading programs designed to raise awareness on campus the following year.

2015 *Amanda M. Shing*

2016 *Vansh Kumar*

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.

2013 *Maria Monica Nastasescu*

2015 *Maria Monica Nastasescu*

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.

2012 *Jeffrey Scott Amelang*

2013 *Subrahmanyam Duvvuri*

2014 *Manan Arya*

2015 *Manan Arya*

ROBERT P. BALLES 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.

2015 *Tian Nie, Laura Hui-Shin Shou*

WILLIAM F. BALLHAUS PRIZE

Awarded to aeronautics students for outstanding doctoral dissertations.

2016 Hayden Andrew Burgoyne

ERIC TEMPLE BELL UNDERGRADUATE MATHEMATICS RESEARCH PRIZE

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

2016 Tian Nie

BHANSALI PRIZE IN COMPUTER SCIENCE

Awarded to an undergraduate student for outstanding research in computer science in the current academic year. Awardees are selected by a committee of computer science faculty. (The award was established in 2001 by Vineer Bhansali (BS, MS 1987 Physics) in memory of his grandfather, Mag Raj Bhansali.)

2015 William Michael Hoza

2016 Nicholas Benjamin Schiefer

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.

2014 Grace Anne Leishman

ROLF D. BUHLER MEMORIAL AWARD IN AERONAUTICS

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

2009 Sebastian Liska Cabrera

2016 Thibault Guillet, Nicholas Conlan White

FRITZ B. BURNS PRIZE IN GEOLOGY

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

2016 Alice Jamie Marie Ghislaine Michel

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.

2014 Nicholas Benjamin Schiefer

2015 Calli Christine Meyer, Grace Eunhye Park, Nicholas Benjamin Schiefer

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

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

2016 Eldar Akhmetgaliyev

CENTENNIAL PRIZE FOR THE BEST THESIS IN MECHANICAL AND CIVIL ENGINEERING

Awarded each year to a candidate for the degree of Doctor of Philosophy in applied mechanics, civil engineering, or mechanical engineering whose doctoral thesis is judged to be the most original and significant by a faculty committee appointed annually by the executive officer for mechanical and civil engineering. This prize was established with gifts from alumni following the Mechanical Engineering Centennial Celebration in 2007.

2016 Chengyun Hua

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.

2016 Simon Lapointe, Jomela Chen-Chen Meng

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.

2015 Paul Byron Dieterle, Catherine Elizabeth Jamshidi

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.

2016 Subrahmanyam Duvvuri

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.

2015 Robert Maxwell Anderson, Deans' Cup
Bianca Arielle Lepe, Deans' Cup
Nicholas Benjamin Schiefer, Deans' Cup

2016 Margaret Ann Lee, Deans' Cup
Anthony Zhang, Deans' Cup
Ann Tai Chen, Student Life and Master's
Galen Forrest Gao, Student Life and Master's
Stephanie Wong, Student Life and Master's

DEMETRIADES-TSAFKA-KOKKALIS PRIZE IN 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.

2016 Yinglu Tang, Changhong Zhao

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.

2016 Rachel P Galimidi

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.

2016 Gustavo Rios

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.

2016 Junle Jiang

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.

2012 Matthew Reed Shaner

EVERHART DISTINGUISHED GRADUATE STUDENT LECTURER AWARD

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

2015 Carissa Nicole Eisler, Roarke William Horstmeyer

2016 Nikolai Matni

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.

2016 Nima Badizadegan

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.

2016 Rachel P Galimidi

RICHARD P. FEYNMAN PRIZE IN THEORETICAL PHYSICS

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

2016 Samuel Francis Savitz

HAREN LEE FISHER MEMORIAL AWARD IN JUNIOR PHYSICS

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

2015 Sarah Brandsen

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.

2015 Taokun Zheng

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.

2015 Laksh Bhasin, Paul Byron Dieterle

BARRY M. GOLDWATER SCHOLARSHIP

The Scholarship Program honoring Senator Barry Goldwater was designed to foster and encourage outstanding students to pursue careers in the fields of mathematics, the natural sciences, and engineering. The Goldwater Scholarship is the premier undergraduate award of its type in these fields.

2015 Paul Byron Dieterle

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.

2016 Peter Shek-Ho Hung, Dorothy Weichi Pan

GEORGE W. AND BERNICE E. GREEN MEMORIAL PRIZE

Awarded annually to an undergraduate student in any class for original research, an original paper or essay, or other evidence of creative scholarship beyond the normal requirements of specific courses. The student is selected by the deans and the Undergraduate Academic Standards and Honors Committee.

2016 Kurtis Mickel Carsch

DAVID M. GRETHER 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.

2016 Ellora Sarkar

THE LUCY GUERNSEY SERVICE AWARD

Awarded to one or two students who have provided exceptional service to the Caltech Y and/or the community, are involved with service projects, have demonstrated leadership in community and volunteer service efforts, and who exemplify a spirit of service.

2015 Melissa Claire Chang, Emil Timergalievich Khabiboulline, Vansh Kumar

2016 Peter Shek-Ho Hung

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.

2015 Kurtis Mickel Carsch, Sylvia Katherine Hurlimann

ALEXANDER P. AND ADELAIDE F. HIXON PRIZE FOR WRITING

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

2013 Aman Agarwal

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.

2016 Niccolo Cymbalist

BIBI JENTOFT-NILSEN MEMORIAL AWARD

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

2015 *Grace Anne Leishman*

2016 *Amarise Noelle Little*

SCOTT RUSSELL JOHNSON GRADUATE DISSERTATION PRIZE IN MATHEMATICS

Awarded for the best graduate dissertation in mathematics.

2016 *Maria Monica Nastasescu*

SCOTT RUSSELL JOHNSON PRIZE FOR EXCLLENCE AS A FIRST-YEAR GRADUATE STUDENT

This prize is awarded for excellence in first-year graduate research.

2012 *Maria Monica Nastasescu*

SCOTT RUSSELL JOHNSON PRIZE FOR EXCELLENCE IN GRADUATE STUDIES

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.

2014 *Maria Monica Nastasescu*

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.

2016 *Tian Nie, Laura Hui-Shin Shou*

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.

2016 *Abbas Davud Tutcuoglu*

D. S. KOTHARI PRIZE IN PHYSICS

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

2016 Jun Ho Son

MARGIE LAURITSEN LEIGHTON PRIZE

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

2014 Chien-Yi Chang, Cassidy Yang

JOHN O. LEDYARD PRIZE FOR GRADUATE RESEARCH IN SOCIAL SCIENCE

The prize rewards the best third-year paper by a graduate student in Social Science or Behavioral Neuroscience. The prize is funded by Susan G. Davis in recognition of John O. Ledyard's dedication to developing graduate students as independent researchers and his service to the Division of the Humanities and Social Sciences. The prize is awarded annually by a committee of social science faculty.

2012 Taisuke Imai

2014 Gerelt Tserenjigmid

LIBRARY FRIENDS' SENIOR THESIS PRIZE

This prize was established by the Friends of the Caltech Libraries in 2010 to recognize senior theses that exemplify research and the effective use of library information resources. The thesis is an extensive, independent written work produced during the senior year, usually within a senior thesis course series. The University Librarian and the Friends of the Caltech Libraries oversee evaluation and make recommendations to the Undergraduate Academic Standards and Honors Committee for final selection. An oral presentation may be requested. At the discretion of the Friends of the Caltech Libraries, more than one award, or none, may be made in any year.

2016 Ayush Gupta

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.

2016 Nicholas Farrell Zolman

GORDON MCCLURE MEMORIAL COMMUNICATIONS PRIZE

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

2016 William Michael Hoza

THE HERBERT NEWBY MCCOY AWARD

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

2016 Jackson Kenai Blender Cahn, Yufan Liang, Jonathan Daniel Rittle, Michael Anthony Webb

MARY A. EARL MCKINNEY PRIZE IN LITERATURE

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

2015 Anthony Fu Chen

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.

2016 Robert Maxwell Anderson, Edward Demharter Fouad

MERCK INDEX AWARD

Awarded to one or more graduating students who have demonstrated outstanding achievement in the field of chemistry.

2016 Sylvia Katherine Hurlimann, Samuel Francis Savitz

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.

2016 *Robert Maxwell Anderson, Matthew Yoshimi Cedeno, Paul Byron Dieterle, Megan Jane Keehan*

HERBERT J. RYSER MEMORIAL SCHOLARSHIPS

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

2015 *Tian Nie*

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.

2014 *Emil Timergalievich Khabiboulline, Vansh Kumar, Alexander Charles Pien, Jean-Alexandre Turban*

2015 *Aashrita Mangu*

2016 *Monica Shaojin Li, Valerie Bernice Pietrasz*

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.

2016 *Kurtis Mickel Carsch*

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 Aerospace Laboratories of the California Institute of Technology). Preference is given to students working in structural mechanics.

2015 *Hayden Andrew Burgoyne, Niccolo Cymbalist*

RENUKA D. SHARMA AWARD

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

2014 Kurtis Mickel Carsch

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.

2013 Alina Tiffany Hwang, Nancy Yahan Wen

2014 Esther Du, Grace Eunhye Park, Juliet (Ye) Su, Jean-Alexandre Turban

HALLETT SMITH PRIZE

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

2015 Chaitanya Lakshmidhar Malladi

PENELOPE W. AND E. ROE STAMPS IV LEADERSHIP SCHOLAR AWARDS PROGRAM

The Stamps Leadership Scholarship Program recognizes and rewards exceptional students who exemplify leadership, perseverance, scholarship, service, and innovation.

2012 Emil Timergalievich Khabiboulline (2012–2016)

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.

2015 Bogdan Stoica

PAUL STUDENSKI MEMORIAL FUND

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.

2013 Theodore Johann Shaw Wilkening

2015 Alice Jamie Marie Ghislaine Michel

FRANK TERUGGI MEMORIAL AWARD

Awarded to an undergraduate student whose activities, especially in the areas of Latin American studies, radical politics, and creative radio programming, are aimed at improving living conditions of the less fortunate.

2014 Vansh Kumar

2015 Emil Timergalievich Khabiboulline

CHARLES AND ELLEN WILTS PRIZE

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

2016 Roarke William Horstmeyer

FREDERICK J. ZEIGLER MEMORIAL AWARD

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

2014 William Michael Hoza, Tian Nie

2015 Laura Hui-Shin Shou

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's Ninth Symphony excerpt, after the poem "An die Freude" ("Ode To Joy") by Johann Christoph Friedrich von Schiller (1759–1805)

Freude, schöner Götterfunken	Joy, beautiful spark of the gods
Tochter aus Elysium,	Daughter of Elysium,
Wir betreten feuertrunken,	We enter, drunk with fire,
Himmlische, dein Heiligtum!	Heavenly one, your sanctuary!
Deine Zauber binden wieder	Your magic reunites
Was die Mode streng geteilt;	What custom strictly divided.
Alle Menschen werden Brüder,	All men will become brothers,
Wo dein sanfter Flügel weilt.	Where your gentle wing rests.

Wem der große Wurf gelungen,	Whoever has had the great fortune
Eines Freundes Freund zu sein;	To be a friend's friend,
Wer ein holdes Weib errungen,	Whoever has married a beloved wife,
Mische seinen Jubel ein!	Let him mix in his jubilation!
Ja, wer auch nur eine Seele	Indeed, whoever can call even one soul
Sein nennt auf dem Erdenrund!	His own on this round earth!
Und wer's nie gekonnt, der stehle	And whoever was never able to, must creep
Weinend sich aus diesem Bund!	Tearfully away from this band!

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.

Caltech Alumni Association

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

For more than 100 years, Caltech's alumni have gone forward from this day to have a profound and 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 2016.

Your Caltech degree offers you a place among and access to one of the most accomplished alumni networks of any institution. The Caltech Alumni Association will help you stay in touch with fellow graduates and—with more than 23,000 graduates around the world—help you realize the full potential of your extended family, personally and professionally.

Your Caltech alumni community is proud of you. We welcome you to the quest of exploration and innovation and we pledge our support as you create your own positive legacy in the world.

Dave Tytell (BS '99)

President, Board of Directors
Caltech Alumni Association
www.alumni.caltech.edu

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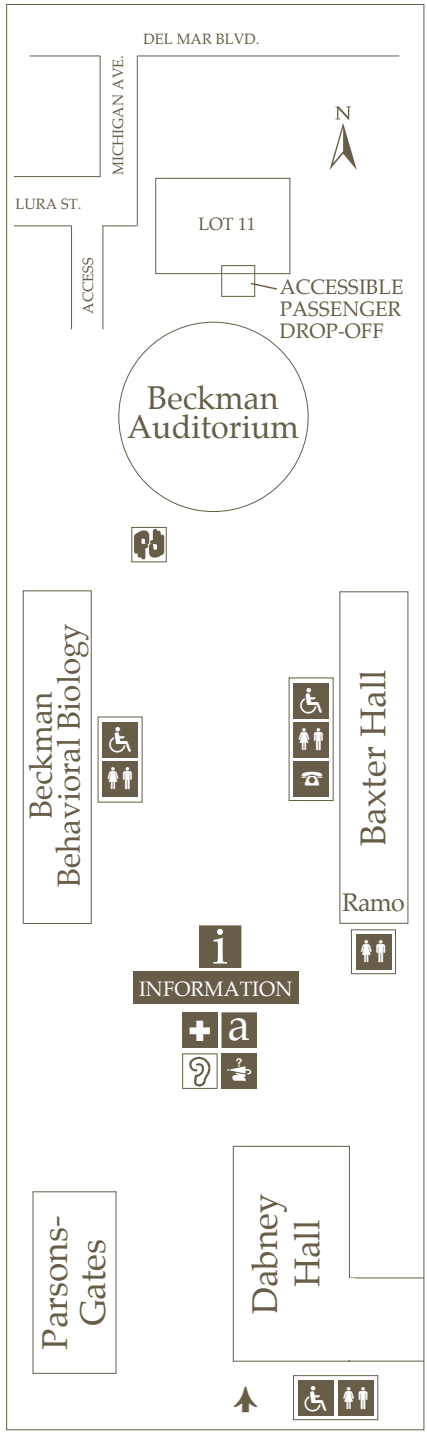

SERVICES FOR COMMENCEMENT GUESTS

PUBLIC TELEPHONES are available in Baxter Hall.

RESTROOMS are available in Baxter Hall, Beckman Behavioral Biology, Dabney Hall, and Ramo.

FIRST AID SERVICES are available at the information booth.

LOST AND FOUND items may be reported and/or claimed at the information booth.

ATHENAEUM luncheon tickets will be on sale at the information booth from 8 to 10 a.m.

ACCESSIBLE SERVICES

ASSISTIVE LISTENING DEVICES are available at the information booth. A driver's license or state-issued ID card is required.

LARGE-TYPE PROGRAMS (abridged) are available at the information booth.

AMERICAN SIGN LANGUAGE (ASL) interpreters are stationed at the front left of the ceremony seating area.

ACCESSIBLE SEATING is located on the east side of the mid-section ceremony seating area.

ACCESSIBLE RESTROOMS are located on the first floors of Dabney Hall, Baxter Hall, and Beckman Behavioral Biology.

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.