124th Annual Commencement

CALIFORNIA INSTITUTE OF TECHNOLOGY

Friday, June 15, 2018
10:00 a.m.

ACADEMIC PROCESSION

Chief Marshal
Warren C. Brown, Ph.D.

Marshals
Shuki Bruck, Ph.D.
Richard C. Flagan, Ph.D.
Kevin M. Gilmartin, Ph.D.
Douglas C. Rees, Ph.D.
Maria Spiropulu, Ph.D.
Nai-Chang Yeh, Ph.D.

Faculty Officer
Richard M. Murray

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, Percussion, and Organ Ensemble *Glenn D. Price, D.M.A., Conductor*
Presiding	David L. Lee, Ph.D. *Chair of the Board of Trustees* *California Institute of Technology*
Commencement Speaker	U.S. Representative John Lewis *Civil Rights Leader*
Choral Selection "Gaudeamus Igitur" Traditional, Arranged by Dr. Deutsch *(Translation on page 61.)*	The Caltech Glee Club, the Caltech Convocation Brass, Percussion, and Organ Ensemble *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	Kevin M. Gilmartin, Ph.D. *Dean of Undergraduate Students*
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	Jacqueline K. Barton, Ph.D. *Division Chair*
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
Arranged by Raymond Burkhart
(The audience may join in; lyrics are on page 62.)
— The Caltech Glee Club, the Caltech Convocation Brass, Percussion, and Organ Ensemble

Recessional — The Caltech Convocation Brass, Percussion, and Organ Ensemble

Organ Postlude — Dr. Deutsch
"The Throop Institute March,"
composed by E. C. Kammermeyer
in 1900 for the Throop Institute
Guitar and Mandolin Society

Live streaming of Caltech's 2018 commencement ceremony will begin shortly before 10 a.m. on Friday, June 15, 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 #Caltech2018. (See page 64 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 joined forces to transform Throop into a world-class science and engineering research and education institution.

Since then, Caltech has grown to more than 300 professorial faculty, more than 600 postdoctoral scholars, more than 1,200 graduate students, and almost 1,000 undergraduates. Together this community of scholars, scientists, and engineers is expanding our understanding of the universe and inventing the technologies of the future, with research interests from quantum science and engineering to bioinformatics and the nature of life itself, from human behavior and economics to energy and sustainability.

Caltech is small but prizes excellence and ambition. The contributions of Caltech's faculty and alumni have earned national and international recognition, including 38 Nobel Prizes. The Institute manages the Jet Propulsion Laboratory (JPL) for NASA, sending probes to explore the planets of our solar system and quantify changes on our home planet; owns and operates large-scale research facilities such as the Seismological Laboratory and a global network of astronomical observatories, including the Palomar and W. M. Keck Observatories; and co-founded and co-manages LIGO, which, in 2016, observed gravitational waves for the first time.

For more than a century, Caltech has marshaled some of the world's brightest minds and most innovative tools to address fundamental scientific questions and pressing societal challenges. We celebrate today the 579 graduates who will earn 227 bachelor's degrees, 161 master's degrees, and 191 Ph.D. degrees, and who will contribute to Caltech's impressive legacy and record of achievement around the world.

ABOUT THE SPEAKER

John Lewis, a U.S. congressman and leader of the Civil Rights Movement, has dedicated his life to protecting human rights and securing civil liberties both through social movements and as an elected official.

"His example of intellectual courage matched by moral fortitude should inspire the Class of 2018 as they take their next steps forward in life," Caltech president Thomas F. Rosenbaum said in his announcement to the Caltech community, noting that Lewis's visit comes in the same year in which Caltech observes the anniversary of Dr. Martin Luther King Jr.'s 1958 visit to campus.

Lewis was first inspired to join the Civil Rights Movement as a young boy who saw the activism surrounding the Montgomery Bus Boycott and heard King speak on the radio. In 1963, as a student at Fisk University, Lewis became chairman of the Student Nonviolent Coordinating Committee, organizing lunch counter sit-ins and voter registration drives across the segregated South. He was the youngest of the Big Six leaders behind the 1963 March on Washington, the occasion of King's "I Have a Dream" speech, and, two years later, at age 25, led more than 600 peaceful protestors across the Edmund Pettus Bridge in Selma, Alabama. State troopers attacked the demonstrators, a brutal confrontation that would later be recognized as a turning point in the movement and in American history.

Lewis was elected to Congress in 1986 and has since then represented Georgia's Fifth Congressional District. More recently, his graphic novel trilogy, *March*, which documents the history of the Civil Rights Movement, has received awards including the American Library Association's Coretta Scott King Book Award and the National Book Award in Young People's Literature.

Lewis himself is the recipient of numerous honors including the John F. Kennedy Library Foundation's Profile in Courage Award and the Presidential Medal of Freedom.

CANDIDATES FOR DEGREES

Bachelor of Science

Carson Hamilton Adams *Draper, Utah* Physics
Gavy Aggarwal *Newark, Delaware* Computer Science
Avinash Agrawal *Pasadena, California* Electrical Engineering and Computer Science (Minor)
Junedh Mahesh Amrute *Auckland, New Zealand* Bioengineering
Phillip Guangning An *Teaneck, New Jersey* Computer Science
Ritwik Anand† *Bangalor, India* Applied and Computational Mathematics
Aaron William Anderson *Studio City, California* Mathematics
Sarah An-ning Antilla *Redondo Beach, California* Chemical Engineering (Materials)
Richard Antonello *Boca Raton, Florida* Computer Science and Philosophy
Fabio Kenji Arai *Sao Paulo, Brazil* Electrical Engineering
Naveen T. Arunachalam *Austin, Texas* Chemical Engineering (Process Systems)
Beatriz Shue-Yi Atsavapranee *Cabin John, Maryland* Bioengineering
Caroline Grace Atyeo *Parkland, Florida* Bioengineering
Henry Andrew Baer *Lafayette, California* Computer Science
Ashwin Balakrishna *Santa Clara, California* Electrical Engineering
William Henry Ballinger *Seattle, Washington* Mathematics
K'yal Rasean Bannister *Bushnell, Florida* Chemical Engineering (Process Systems)
Sam Alexander Bardwell-Evans *Aberdeen, Scotland* Mathematics
Victor Antonio Baules *Hyattsville, Maryland* Physics
Frederick Michael Berl *Scarsdale, New York* Physics
Marcus James Bintz *Camas, Washington* Physics
Arjun Bose *Brooklyn, New York* Computer Science
Alexander Nicholas Bourzutschky *Potomac, Maryland* Physics and Computer Science
Kabir Singh Brar† *Great Falls, Virginia* Computer Science
Alex Jose Brinson *Austin, Texas* Physics
Robin Alexandra Brown *North Potomac, Maryland* Mathematics and Business, Economics, and Management and Control and Dynamical Systems (Minor)
Ryan Thomas Burns *Turlock, California* Computer Science
Nina Krasnaya Butkovich *Blue Springs, Missouri* Chemical Engineering (Materials)
Sarah W. Cai *Livermore, California* Chemistry

† *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

Thomas Maxwell Chaffee *Sarasota, Florida* Geology and Environmental Science and Engineering (Minor)
Annie Hanna Chang *Sugar Land, Texas* Electrical Engineering
Chen Chang *Windsor, Canada* Computer Science
Advitheey Chelikani *Palatine, Illinois* Computer Science
Vinciane Wen-Xian Chen *Austin, Texas* Computer Science
Kathleen Anne Chinetti† *Aurora, Illinois* Physics
Sung Hoon Choi *Seoul, Republic of Korea* Electrical Engineering
Yunsang Choi *Torrance, California* Mechanical Engineering and Computer Science (Minor)
Timothy H. Chou *Seal Beach, California* Computer Science
Edward L. Chu *Rowland Heights, California* Mechanical Engineering and Aerospace Engineering (Minor)
Ya Lun Chuan *Vancouver, Canada* Mechanical Engineering
Andre Alexander Comella *Whitehouse Station, New Jersey* Mechanical Engineering
Daniel Joseph Cushey† *Cleveland, Ohio* Astrophysics
Roohi Dalal *Phoenix, Arizona* Astrophysics and History
Radmila Dancikova *North Andover, Massachusetts* Astrophysics
Artsroun Darbinian *Glendale, California* Electrical Engineering
Collin Jayanti Davda *Fort Worth, Texas* Chemistry
Anant H. Desai *Duluth, Georgia* Electrical Engineering and Computer Science
Uma Dingankar *El Dorado Hills, California* Electrical Engineering
Stephen Yang Dolbier *Gainesville, Florida* Engineering and Applied Science (Computation and Neural Systems)
Joseph Alexander Donermeyer *Homewood, Illinois* Computer Science
Anne Hobbs Dorsey† *Norfolk, Virginia* Engineering and Applied Science
Alison Marie Dugas *Glastonbury, Connecticut* Astrophysics
Cameron Elise Garner Earl *Mahomet, Illinois* Chemistry
Robert Kai-Ming Eng *Saratoga, California* Computer Science and History
Marlon Aundrae Facey *Coral Springs, Florida* Chemical Engineering (Process Systems) and Computer Science (Minor)
Jared Dane Filseth *Palo Alto, California* Physics
Devi Sribala Ganapathi *La Crescenta, California* Chemical Engineering (Materials)
Siva Kaushal Gangavarapu *Naperville, Illinois* Electrical Engineering
Paige Marie Gannon *Fort Benton, Montana* Chemistry
Amanda Gao *Provo, Utah* Chemical Engineering (Environmental) and English
Daniel Philipson Gawerc *Houston, Texas* Physics

Bachelor of Science continued

Mark Jia-Lun Gillespie *Westfield, New Jersey* Computer Science and Mathematics
Miguel Ángel González Campos *Miami, Florida* Chemical Engineering (Process Systems) and Environmental Science and Engineering (Minor)
Ashay Makarand Gore *Fort Collins, Colorado* Chemical Engineering (Process Systems)
Arjun Sanjay Goswami *Sugar Land, Texas* Physics
Stephanie Gu *Hacienda Heights, California* Chemical Engineering (Biomolecular)
Yi Gui *Princeton, New Jersey* Physics
Katherine Guo *Naperville, Illinois* Computer Science
Gloria Nayoung Ha *Baltimore, Maryland* Chemical Engineering (Biomolecular)
Christopher Moore Haack *New York City, New York* Computer Science
James Love Hamilton *Boca Raton, Florida* Mechanical Engineering
Ali Harb *Beirut, Lebanon* Economics and History (Minor)
Ashwin Krishnan Hari *Plano, Texas* Computer Science
Jacob Cole Harmon *Camdenton, Missouri* Computer Science
Alexei Harvard *Great Neck, New York* Mathematics
Kevin He *Glen Ellyn, Illinois* Physics and Computer Science (Minor)
Erich Noa Herzig *Ojai, California* Geophysics
Olivia Elizabeth Hindera *Austin, Texas* Biology
Alec Sai Ho *Vancouver, Washington* Chemical Engineering (Materials) and Computer Science (Minor)
Young Kyun Hong *Burbank, California* Biology
Caroline Howard *Atlanta, Georgia* Computer Science
Jenny Hsin *Chino Hills, California* Biology and English (Minor)
Ching-Yun Hsu *Kaohsiung, Taiwan (ROC)* Mathematics and Computer Science
Ida Huang *New York, New York* Electrical Engineering
Jason Huang *Brooklyn, New York* Electrical Engineering and Computer Science (Minor)
Stephanie Michaela Huard *Reston, Virginia* Biology and Philosophy
Oriel A. Humes *Seattle, Washington* Planetary Science
Nicholas Takeya Hutchins *Torrance, California* Bioengineering
Ryeen Fardeen Islam *Jamaica, New York* Business, Economics, and Management
Janice Hayun Jeon *Ladera Ranch, California* Bioengineering
Cynthia Beixi Jiang† *San Diego, California* Computer Science
Yiwei Jiang *Chicago, Illinois* Chemical Engineering (Biomolecular)
Bhavana Jonnalagadda *Folsom, California* Engineering and Applied Science (Computation and Neural Systems) and Computer Science (Minor)
Sachi Kamiya *Tokyo, Japan* Electrical Engineering

Bachelor of Science continued

Andrew Eun Kyu Kang *Victoria, Canada* Computer Science
David Christopher Kawashima *Studio City, California* Computer Science
Matthew Douglas Kempster *Sacramento, California* Computer Science and Mathematics
Kun Ho Kim *Seoul, Republic of Korea* Computer Science
Matthew Long Klucher *San Mateo, California* Electrical Engineering
Gillian Baron Kopp *Boulder, Colorado* Physics
Joel Leonard Kosmatka† *Encinitas, California* Mechanical Engineering
Giacomo Kiernan Koszegi *Peoria, Arizona* Physics
Nikhil Krishnan† *Philadelphia, Pennsylvania* Applied and Computational Mathematics
Ian Bruce Kuehne *New Orleans, Louisiana* Computer Science
Anita Sumati Kulkarni *San Diego, California* Physics
Neil Ashwin Kumar *San Diego, California* Electrical Engineering
Peter Jan Kundzicz *Skokie, Illinois* Computer Science
Lokbondo Kung *Weston, Florida* Computer Science
Abirami Kurinchi-Vendhan *Parsippany, New Jersey* Electrical Engineering
Shari Rika Kuroyama *Manhattan Beach, California* Computer Science
Stephanie Ka Yu Kwan *Brooklyn, New York* Physics
Karim Qurban Lakhani *Douglasville, Georgia* Chemical Engineering (Environmental)
Brian Lee *Livingston, New Jersey* Computer Science
Joon Hee Lee *Irvine, California* Computer Science
Richard B. Lee *Temecula, California* Electrical Engineering
Wen-Hua Lee† *Taipei, Taiwan (ROC)* Chemical Engineering (Biomolecular)
William Garrison Levine *Columbus, Ohio* Physics and Planetary Science
Jessica Du Li *Pleasanton, California* Biology and History
Amanda Ying Lin *Bloomington, Indiana* Mechanical Engineering and English (Minor)
Hanzhi Lin *Potomac, Maryland* Computer Science and Business, Economics, and Management
Sierra Jacqueline Lincoln *Woodside, California* Computer Science
Zachary Gabriel Lipel *Tarzana, California* Chemical Engineering (Process Systems)
Phillip Liu *Scarsdale, New York* Biology
Sandra Qi-Jun Liu *Eugene, Oregon* Mechanical Engineering
Timothy Samuel Liu *Granger, Indiana* Electrical Engineering
Ethan Valerian Lo *Palo Alto, California* Computer Science
Peter Carlton Lommen† *Forest Grove, Oregon* Engineering and Applied Science (Materials Science)
Parker Ryan Lowe *Alexandria, Virginia* Physics
Catherine Yue Ma *Miramar, Florida* Computer Science

Bachelor of Science continued

Yuan Ma *Cary, North Carolina* Electrical Engineering and Computer Science (Minor)
Mason Gordon MacDougall *La Mirada, California* Astrophysics and Geological and Planetary Sciences (Minor)
Francesco Joseph Macagno *San Diego, California* Computer Science
Kyle Blanchard Martin† *Verona, Wisconsin* Biology
Richard May *Guilford, Connecticut* Chemical Engineering (Materials)
Christopher Ryan McCarren *Fayetteville, Arkansas* Mechanical Engineering and Structural Mechanics (Minor)
Alexander Heinz Meiburg *Santa Barbara, California* Mathematics and Physics
Mayra Eliza Melendez *Salinas, California* Mechanical Engineering
Nicholas Alexander Meyer *Fullerton, California* Physics and Computer Science (Minor)
Emily Yishiuan Miaou *College Station, Texas* Chemical Engineering (Biomolecular) and Geological and Planetary Sciences (Minor)
Tyler James Middleton *Evergreen, Colorado* Electrical Engineering
Jiseon Min *Cheongju-si, Republic of Korea* Physics
Catalina-Ana Miritescu *Fundulea, Romania* Astrophysics
Anvita Mishra *Lincoln, California* Bioengineering
Sarang Mittal *Johns Creek, Georgia* Applied Physics
Amulya Mohan *Holden, Massachusetts* Computer Science
Jisoo Mok *Daejeon, Republic of Korea* Electrical Engineering
Daniel Molina *Kissimmee, Florida* Physics
Aadith Moorthy *Palm Harbor, Florida* Materials Science and Computer Science
Rachael Jean Morton *Oxford, Ohio* Computer Science
Eric Roger Moseley *Wenatchee, Washington* Astrophysics
Tristan George Murphy *San Diego, California* Geology and History
Zane Alexander Murphy *Philadelphia, Pennsylvania* Biology
Suraj Nair *San Ramon, California* Computer Science
Anusha Mehul Nathan *Ellicott City, Maryland* Bioengineering
Noah Trent Nelson *Salt Lake City, Utah* Computer Science
Aishwarya Nene *San Jose, California* Chemistry
Rachel Hin Ying Ng *Millbrae, California* Bioengineering
Sandra Kairui Ning *Thousand Oaks, California* Computer Science
Willis Cooper O'Leary *Portland, Oregon* Chemical Engineering (Materials)
Tynan Isaiah Ochse *Rapid City, South Dakota* Mathematics
Pedro Elias Ojeda *Monteria, Colombia* Bioengineering
Masaharu Ono *Tenafly, New Jersey* Computer Science

Bachelor of Science continued

Ciara Mary Ordner *Niceville, Florida* Chemistry
Jeffrey David Orenstein *Oakland, California* Mechanical Engineering
Sarah Alexis Pearce *Lancaster, Pennsylvania* Bioengineering
Allison Nicole Penn† *Lake Bluff, Illinois* Mechanical Engineering
Tyler Matthew Perez *Fruita, Colorado* Planetary Science
Avikar Periwal *Potomac, Maryland* Physics
Preethi Kasthuri Periyakoil *Campbell, California* Computer Science
Eduardo Plascencia *Chicago, Illinois* Mechanical Engineering and Aerospace Engineering (Minor)
Zachary Thomas Polizzi *Weddington, North Carolina* Computer Science
Nikhita Hegde Poole *Arcadia, California* Biology
David Eric Qu *Columbia, South Carolina* Computer Science
Anshul Asawa Ramachandran *Cupertino, California* Computer Science and Chemistry
Kavya Ramakrishnan *Palo Alto, California* Computer Science
Meera Tapasya Ramakrishnan *Boston, Massachusetts* Mechanical Engineering and Business, Economics, and Management
Vishveshwar Ramanathan Subramanian *Melbourne, Australia* Mechanical Engineering
Preston Niels Rasmussen *Ormond Beach, Florida* Mathematics
Gregory Vitalyevich Rassolov *Columbia, South Carolina* Chemistry and Computer Science (Minor)
Anushka Rau *Naperville, Illinois* Electrical Engineering
Namita Ravi *Milpitas, California* Physics
Peter Ian James Renn† *Hamden, Connecticut* Mechanical Engineering
William Rieger *McLean, Virginia* Physics
Robert Warren Robertson *Blossom, Texas* Physics
Carly Ellen Robison *Saratoga, California* Computer Science
Camilo Andres Saavedra *Bogotá, Colombia* Electrical Engineering and Computer Science (Minor)
Drew Sobel Schaffer *San Antonio, Texas* Physics
William Charles Schmidt *Pasadena, California* Bioengineering and History
Joseph Edward Schneider *Lexington, Kentucky* Chemistry and History
Tara Anjali Shankar *Irvine, California* Computer Science
Ankita Sharma *Toronto, Canada* Electrical Engineering
Ruoqi Shen *Nanjing, People's Republic of China* Computer Science
Thomas Robert Sheridan *Slingerlands, New York* Chemistry
Dennis Joonbo Shim *Irvine, California* Electrical Engineering

Bachelor of Science continued

Kevin Shu *Wilton, Connecticut* Mathematics and Computer Science
Emma Rachel Shupper *Pasadena, California* Mechanical Engineering
Ayaana Patel Sikora *Glendale, California* Computer Science and Business, Economics, and Management
Anusha Sinha *Chatham, New Jersey* Computer Science
Rita Frances Sonka *The Woodlands, Texas* Physics and Computer Science (Minor)
Jalex Stark *Odessa, Florida* Mathematics
Spencer David Strumwasser *Carlsbad, California* Computer Science
Paul Andrew Suffoletta† *Danville, California* Mechanical Engineering
Garret Chee-Anth Sullivan *Memphis, Tennessee* Electrical Engineering
Gabrielle Sara Tender *Bethesda, Maryland* Chemistry
Kisha Gautami Thayapran *Porterville, California* Biology
Narmada Gayatri Thayapran† *Porterville, California* Biology
Anish Rohan Thilagar *Hollis, New Hampshire* Computer Science and Mathematics
Julian Czernia Thomassie *Arlington, Virginia* Mechanical Engineering
Boyu Tong *Fremont, California* Computer Science and Business, Economics, and Management
Nicholas Trank *Anaheim, California* Physics and Computer Science (Minor)
Daniel Andres Valles *Weston, Florida* Chemistry
Eugene Richard Vaughan IV *Mission, Texas* Chemical Engineering (Process Systems)
Malavika Venkatesan *Bothell, Washington* Computer Science and History (Minor)
Ruomeng Wan *People's Republic of China* Chemistry
Audrey Sujean Wang *Dracut, Massachusetts* Applied and Computational Mathematics and Computer Science (Minor)
Beiyi Wang *Chino Hills, California* Electrical Engineering
Erin Rilu Wang *Auburn, California* Biology
Michelle Wang *Rowland Heights, California* Electrical Engineering
Shen Ting Irene Wang *Cupertino, California* Computer Science
Yuankun Wang *Beaverton, Oregon* Physics
David James Watson *Fort Collins, Colorado* Mechanical Engineering and Structural Mechanics (Minor) and Aerospace Engineering (Minor)
Laura Rose Watson *Seattle, Washington* Geobiology
Matthew Adam Locke Weidner *Topton, Pennsylvania* Mathematics and Computer Science (Minor)
Lucille Arlene Wells *Brussels, Belgium* Chemistry
Anna Winnicki *Honolulu, Hawaii* Electrical Engineering
Kelly Yi-Li Woo *Rancho Palos Verdes, California* Electrical Engineering

Bachelor of Science continued

David Wu *Houston, Texas* Electrical Engineering
Yeyuan Xin *Newtown, Pennsylvania* Physics
Yixiao Yan *Shanghai, People's Republic of China* Planetary Science
Sherrie Yang *Pittsburgh, Pennsylvania* Mechanical Engineering
Grace Yao *Buena Park, California* Electrical Engineering
Kevin Chen Ye *Thousand Oaks, California* Computer Science
Samuel Weiliang Yee *Singapore, Singapore* Physics and Geological and Planetary Sciences (Minor)
Brian Mitchell Zdeb *Chicago, Illinois* Mechanical Engineering and Geological and Planetary Sciences (Minor)
Max Zhan† *Lexington, Kentucky* Physics and Computer Science (Minor)
Celia Yuxin Zhang *Gainesville, Florida* Applied and Computational Mathematics and Computer Science (Minor)
Tiffany Leshan Zhang *Irvine, California* Chemical Engineering (Biomolecular)
Albert Zhao *Saratoga, California* Computer Science
Christopher Hao Zhen *Chapel Hill, North Carolina* Chemical Engineering (Biomolecular)
Licheng Richard Zhu *Chicago, Illinois* Physics
Haojie Zhuang *Miami, Florida* Mechanical Engineering and Aerospace Engineering (Minor)
Vincent Zhuang *Portland, Oregon* Computer Science

Master of Science

Peter Ahnn *(Materials Science)* B.S., University of Virginia 2016.

Benyamin Allahgholizadeh Haghi *(Electrical Engineering)* B.S., Sharif University of Technology 2016.

Eric Ryan Ambrose *(Mechanical Engineering)* B.S., Georgia Institute of Technology 2013.

Ivan Charles Amies *(Electrical Engineering)* B.S., University of Michigan, Ann Arbor 2016.

Anthony Joseph Ardizzi *(Applied Physics)* B.Sc., University of Toronto 2015.

Lucas Benoit--Maréchal *(Space Engineering)* B.E., École Polytechnique 2016.

Christopher David Bochenek *(Astrophysics)* B.A., The University of Chicago 2016.

Mouâdh Bouayad *(Space Engineering)* M.S., Institut Supérieur de l'Aéronautique et de l'Espace 2018.

Pakpoom Buabthong *(Materials Science)* B.S., University of Illinois at Urbana-Champaign 2015.

Emrecan Buyurucu *(Social Science)* B.S., Middle East Technical University 2014.

Jorge Alberto Castillo Castellanos *(Geophysics)* B.S., Universidad Autónoma de Nuevo León 2013.

Katie Marie Chan *(Chemistry)* B.S., University of California, Davis 2014.

Avinash Chandra *(Space Engineering)* B.Tech., Indian Institute of Space Science and Technology 2017.

Anthony Yuhan Chen *(Chemistry)* B.S., University of California, Berkeley 2015.

Yikai Chen *(Mechanical Engineering)* B.Eng., Tongji University 2006.

Alexander Youngsoo Choi *(Mechanical Engineering)* B.S., University of Connecticut 2016.

Sydney Lea Corona *(Materials Science)* B.S., Saint Mary's College of California 2016.

Matthew Steven Curtis *(Chemical Engineering)* B.S., The Pennsylvania State University 2013.

Lucia Belen De Rose *(Applied Physics)* B.S., Bates College 2016.

Kishalay De *(Astrophysics)* B.S., Indian Institute of Science 2016.

Benjamin Edmund DeMario *(Planetary Science)* B.S., Georgia Institute of Technology 2015; B.S., 2016.

Saba Devdariani *(Social Science)* B.A., Ivane Javakhishvili Tbilisi State University 2012; M.S., 2014.

Vasilije Dobrosavljevic *(Geophysics)* B.S., Yale University 2016.

Dillon Zhejun Dong *(Astrophysics)* B.A., Pomona College 2015.

Austin Ryan Dulaney *(Chemical Engineering)* B.S., The University of Texas at Austin 2016.

Florentine Mary Eloundou-Nekoul *(Social Science)* B.A., Cornell University 2014.

MohammadSadegh Faraji-Dana *(Electrical Engineering)* M.A.Sc., University of Waterloo 2014.

Vinicius Thaddeu dos Santos Ferreira *(Applied Physics)* B.A., M.S., University of Pennsylvania 2015.

Master of Science *continued*

Austin Covey Fikes *(Electrical Engineering)* B.S., Harvey Mudd College 2016.

Filippos Filippitzis *(Mechanical Engineering)* Diplom, University of Thessaly 2016.

Matthew Theodore Fishman *(Physics)* B.S., Cornell University 2012.

Lindsey Anne Gailmard *(Social Science)* B.A., University of California, Berkeley 2012; M.P.P., The University of Chicago 2014.

Rachel Gehlhar *(Mechanical Engineering)* B.S., University of St. Thomas 2016.

Rebecca Denise Glaudell *(Physics)* B.S., University of Illinois at Urbana-Champaign 2014.

Bradley James Gorsline *(Chemistry)* A.B., Princeton University 2015.

Anchal Gupta *(Applied Physics)* B.Tech., Indian Institute of Technology Bombay 2016.

John Harmon *(Applied Mechanics)* B.S., The University of Texas at Austin 2016.

Matthew Thomas Hartley *(Physics)* B.S., University of Arkansas 2014.

Alistair Thompson Hayden *(Geology)* M.A., Boston University 2012.

Liyin He *(Environmental Science and Engineering)* B.S., Nanjing University 2016.

Kira Rose Headrick *(Space Engineering)* S.B., Harvard College 2017.

Kari Ellena Hernandez *(Chemical Engineering)* B.S., The University of Arizona 2015.

Benjamin Riley Herren *(Materials Science)* B.S., Boise State University 2016.

Shu Yu Ho *(Physics)* B.S., National Taiwan Normal University 2009; M.S., National Taiwan University 2011.

Katrina Lynn Hui *(Environmental Science and Engineering)* S.B., Massachusetts Institute of Technology 2016.

Sai Sharan Injeti *(Mechanical Engineering)* B.Tech., M.Tech., Indian Institute of Technology Madras 2016.

Daniel Irwin Jamison V *(Electrical Engineering)* B.S., Northeastern University 2016.

April Ann Jauhal *(Biology)* B.S., University of California, Berkeley 2015.

Zhiyang Jin *(Medical Engineering)* B.S., Nanjing University 2017.

Siraput Jongaramrungruang *(Environmental Science and Engineering)* B.A., M.Sc., University of Cambridge 2015.

Akshay Joshi *(Aeronautics)* B.Tech., Indian Institute of Technology Madras 2017.

Shilpa Joy *(Mechanical Engineering)* B.Tech., Indian Institute of Technology Madras 2016.

Jiljo Kaithaparampil Moncy *(Electrical Engineering)* B.Tech., Indian Institute of Space Science and Technology 2017.

Mahmoud Kalaee *(Applied Physics)* B.S., Sharif University of Technology 2011.

Nikita Kamraj *(Astrophysics)* M.Sc., Imperial College London 2016.

Preston Cosslett Kemeny *(Geochemistry)* A.B., Princeton University 2015.

Kathleen Marie Kennedy *(Materials Science)* B.S., Columbia University 2016.

Anupama Q. Khan *(Chemistry)* B.A., Princeton University 2012.

Master of Science *continued*

Jae Hong Kim *(Physics)* B.S., State University of New York at Stony Brook 2013.

Kisoo Kim *(Social Science)* B.A., Rice University 2015.

Camilla Maria Kjeldbjerg *(Chemical Engineering)* B.Sc., Technical University of Denmark 2016.

Weimeng Kong *(Chemical Engineering)* B.S., Harvey Mudd College 2015.

Kevin Andreas Korner *(Mechanical Engineering)* B.S., University of California, Berkeley 2016.

William Wei-Ting Kuo *(Electrical Engineering)* B.S., National Chiao Tung University 2016.

Hyounghan Kwon *(Electrical Engineering)* B.S., Seoul National University 2016.

Stacy Larochelle *(Geophysics)* B.Eng., McGill University 2016.

Jay Mathew Lawhorn *(Physics)* S.B., Massachusetts Institute of Technology 2015.

Marcus Kuok Kuan Lee *(Mechanical Engineering)* B.S.E., Princeton University 2015.

Zachary Jordan Lee *(Electrical Engineering)* B.S., John Brown University 2016.

Nicha Leethochawalit *(Astrophysics)* B.S., The University of Chicago 2013.

Xinjie Lei *(Electrical Engineering)* B.S., Purdue University 2016.

Jarvis Li *(Applied Physics)* B.S., California Institute of Technology 2014.

Qilin Li *(Electrical Engineering)* B.Eng., The University of Hong Kong 2016.

Songtai Li *(Applied Physics)* S.B., Massachusetts Institute of Technology 2016.

Dong Liang *(Electrical Engineering)* B.E., Tsinghua University 2016.

Sujung Lim *(Geobiology)* B.S., University of Washington 2008; M.S., 2012.

Xinran Liu *(Chemical Engineering)* B.S., Rice University 2015.

Xinyan Liu *(Chemical Engineering)* B.S., National University of Singapore 2014.

Brian Wei Chee Low *(Electrical Engineering)* B.Eng., University College London 2017.

Xinghui Lu *(Electrical Engineering)* B.E., Zhejiang University 2016.

Yue Lu *(Electrical Engineering)* B.E., Zhejiang University 2016.

Gregory Scott MacCabe *(Physics)* B.S., University of North Carolina at Chapel Hill 2013.

Shaun Cohn Maguire *(Control and Dynamical Systems)* M.S., Stanford University 2008.

Stephen R Markham *(Planetary Science)* B.A., Cornell University 2016.

Conor Martin *(Space Engineering)* B.S., University at Buffalo, The State University of New York 2017.

Kai Matsuka *(Space Engineering)* B.S., University of California, Los Angeles 2016.

Tristan James McKinney *(Physics)* B.S., University of California, Berkeley 2011.

Connor Glenn McMahan *(Mechanical Engineering)* S.B., Massachusetts Institute of Technology 2016.

Kyle Shuhert Metcalfe *(Geobiology)* B.A., Pomona College 2014.

Michael Thomas O'Connell *(Space Engineering)* B.S., University of Illinois at Urbana-Champaign 2017.

Master of Science *continued*

Stefan Thomas Omelchenko *(Materials Science)* B.S., The Pennsylvania State University 2012.

Emile Kazuo Oshima *(Aeronautics)* B.S.E., Princeton University 2017.

Torkom Pailevanian *(Electrical Engineering)* B.S., California Institute of Technology 2016.

Alexandra Atlee Phillips *(Geochemistry)* B.A., University of California, Santa Barbara 2015.

Ethan Marcus Pickering *(Mechanical Engineering)* B.S., M.S., Case Western Reserve University 2016.

Nickolas H. Pilgram *(Applied Physics)* B.S., California State Polytechnic University, San Luis Obispo 2015.

Michael Stanley Prijatelj *(Applied Physics)* B.S., Carnegie Mellon University 2016.

Jin Qian *(Materials Science)* B.S., Rice University 2014.

Ye Qiu *(Electrical Engineering)* B.S., Georgia Institute of Technology 2016.

Ashwin Narayan Ram *(Bioengineering)* B.S., University of California, San Diego 2007; M.D., University of Michigan, Ann Arbor 2011.

Narravula Harshavardhan Reddy *(Aeronautics)* B.Tech., Indian Institute of Technology Guwahati 2015.

Jacob Paul Reher *(Mechanical Engineering)* B.S., University of Nebraska, Lincoln 2013.

Ryan Dillon Ribson *(Chemistry)* B.S., University of Rochester 2014.

Benjamin Pierre Riviere *(Aeronautics)* B.S., Stanford University 2017.

Matteo Ruggero Ronchi *(Computer Science)* B.E., University of Siena 2010; M.S., 2012.

Lee Jesse Rosenthal *(Astrophysics)* B.S., Haverford College 2015.

Joseph Yeefay Ruan *(Mechanical Engineering)* B.S., Purdue University 2016.

Leslie Nicole Ryan *(Chemistry)* B.S., University of California, San Diego 2012.

Cecilia Brooke Sanders *(Planetary Science)* A.B., Harvard College 2016.

Lee Michael Saper *(Geology)* Sc.B., Brown University 2012.

Kuang-Ming Shang *(Medical Engineering)* B.S., National Taiwan University 2017.

Saransh Sharma *(Electrical Engineering)* B.Tech., Indian Institute of Technology Kharagpur 2017.

Boqiang Shen *(Applied Physics)* B.S., Peking University 2015.

Naijian Shen *(Aeronautics)* B.Sc., The University of Melbourne 2014; M.Sc., 2016.

Ruofei Shen *(Electrical Engineering)* B.E., Shanghai Jiao Tong University 2016.

Jiajun Shi *(Electrical Engineering)* B.A., Amherst College 2015.

Hao-Jan Shue *(Electrical Engineering)* B.S., Carnegie Mellon University 2016.

Jin Sima *(Electrical Engineering)* B.E., Tsinghua University 2013; M.E., 2016.

Angad Singh *(Mathematics)* B.S., Purdue University 2014.

Ashmeet Singh *(Physics)* M.S., Indian Institute of Technology Roorkee 2015.

Master of Science *continued*

Jean Sebastien Alexandre Spratt *(Space Engineering)* B.A., Vassar College 2016.
Gautam Dutta Stroscio *(Chemistry)* B.S., The University of Chicago 2014.
Di Jia Su *(Electrical Engineering)* B.A.Sc., University of British Columbia 2016.
Guochao Sun *(Astrophysics)* B.S., University of California, Los Angeles 2015.
Tianlei Sun *(Electrical Engineering)* B.S., University of California, San Diego 2016.
Jeremy Chi-Pang Tran *(Chemistry)* A.S., Green River College 2012; B.S., University of Washington 2015.
Samantha Kathleen Trumbo *(Planetary Science)* B.A., Cornell University 2013; M.S., University of California, San Diego 2015.
Hiroyasu Tsukamoto *(Space Engineering)* B.S., Kyoto University 2017.
Min-Feng Tu *(Physics)* B.S., National Tsing Hua University 2010.
Kanthasamy Ubamanyu *(Space Engineering)* B.Sc., University of Moratuwa 2016.
Pooja Verma *(Electrical Engineering)* B.Tech., Delhi Technological University 2014.
Kevin Vu *(Environmental Science and Engineering)* B.S., The City College of New York 2016.
Nicole Lisa Wallack *(Planetary Science)* B.S., University at Albany, The State University of New York 2016.
Minwo Wang *(Electrical Engineering)* B.S., University of Massachusetts Amherst 2017.
Alexandra Justine Welch *(Applied Physics)* B.S., Stanford University 2016.
Alexander Huai-Cheng Wen *(Space Engineering)* B.A., B.S., University of California, Berkeley 2013.
Daniel Davis Winker *(Electrical Engineering)* B.S., University of Virginia 2016.
Pakorn Wongwaitayakornkul *(Applied Physics)* B.A., B.S., Rice University 2014.
Parker Ryan Wray *(Electrical Engineering)* B.S., The University of Texas at Austin 2015.
Zachary Wu *(Chemical Engineering)* B.S., Cornell University 2015.
Emily Ann Wyatt *(Chemical Engineering)* B.S., Stanford University 2011.
Lei Xia *(Electrical Engineering)* B.S., University of Wisconsin-Madison 2016.
Lealia Li Xiong *(Medical Engineering)* S.B., Massachusetts Institute of Technology 2015.
Fangyi Xu *(Social and Decision Neuroscience)* B.S., The College of William & Mary 2016.
Shuo Yang *(Geophysics)* B.S., University of Science and Technology of China 2016.
Yiran Yang (Isabella) *(Medical Engineering)* B.S., Rice University 2017.
Hongnian Yu *(Electrical Engineering)* B.S., University of California, Irvine 2016.
Wesley Minlai Yu *(Aeronautics)* B.S., The University of Texas at Austin 2017.
Dandan Zhang *(Geophysics)* B.A., University of California, Berkeley 2009.
Haolu Zhang *(Mechanical Engineering)* B.S., University of Michigan, Ann Arbor 2016.
Mali Zhang *(Social Science)* B.S., Davidson College 2011.
Ruru Zhang *(Electrical Engineering)* B.E., Zhejiang University 2016.

Master of Science *continued*

Shiyu Zhang *(Social Science)* B.A., Claremont McKenna College 2016.
Michael Zhang *(Astrophysics)* A.B., Princeton University 2014.
Zhewei Zhang *(Applied Physics)* B.A., Peking University 2015.
Zhicai Zhang *(Physics)* B.S., Tsinghua University 2015.
Zongjun Zheng *(Electrical Engineering)* B.S., Rice University 2016.
Minyan Zhong *(Geophysics)* B.S., Peking University 2015.
Fengyu Zhou *(Electrical Engineering)* B.E., Tsinghua University 2016.
Hao Zhou *(Mechanical Engineering)* B.E., Peking University 2016.
Jian Zhu *(Electrical Engineering)* B.S.E., Shanghai Jiao Tong University 2016.

Doctor of Philosophy

DIVISION OF BIOLOGY AND BIOLOGICAL ENGINEERING

Michael Jacob Abrams *(Biology)* B.A., Williams College 2011.
Thesis: Self-repair and Sleep in Jellyfish.

Stephanie Loos Barnes *(Bioengineering)* B.S., Boise State University 2011.
Thesis: Decoding the Regulatory Genome: Quantitative Analysis of Transcriptional Regulation in *Escherichia coli*.

Claire Nicole Bedbrook *(Bioengineering)* B.S., University of California, Berkeley 2011.
Thesis: Engineering Novel Rhodopsins for Neuroscience.

Nathan Maurice Belliveau *(Bioengineering)* B.A.Sc., University of Waterloo 2010.
Thesis: Quantitative Dissection of the Allosteric and Sequence-Dependent Regulatory Genome in *E. coli.*

Chun-Kan Chen *(Molecular Biology and Biochemistry)* B.S., National Taiwan University 2010; M.S., University of Southern California 2013.
Thesis: Revealing the Mechanism of Xist-Mediated Silencing.

Jaron Taylor Colas *(Computation and Neural Systems)* B.S., Massachusetts Institute of Technology 2011.
Thesis: Value-Based Decision Making and Learning as Algorithms Computed by the Nervous System.

Gilberto Desalvo *(Biology)* B.S., University of California, Santa Barbara 2007.
Thesis: Transcriptional Enhancer Activity of Biochemically Marked Genomic Elements.

Gregory Paul Donaldson *(Microbiology)* B.S., University of Maryland, College Park 2011.
Thesis: Colonization of the Intestinal Surface by Indigenous Microbiota.

Matthew Leroy Gethers III *(Bioengineering)* S.B., Massachusetts Institute of Technology 2009; B.A., University of Oxford 2011.
Thesis: Therapeutic Opportunities and Approaches to Sequence Control for Nucleic Acids.

Yong-Jun Lin *(Computation and Neural Systems)* B.Sc., National Taiwan University 2005; M.Sc., 2007.
Thesis: Human Duration Perception Mechanisms in the Subsecond Range: Psychophysics and Electroencephalography Investigations.

Gita Mahmoudabadi *(Bioengineering)* B.S., Georgia Institute of Technology 2011.
Thesis: Virology by the Numbers: A Quantitative Exploration of Viral Energetics, Genomics, and Ecology.

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*

Nagarajan Nandagopal *(Bioengineering)* B.A., Williams College 2009.
Thesis: New Capabilities of the Notch Signaling Pathway.

Ravi David Nath *(Biology)* B.A., Vanderbilt University 2012.
Thesis: The Evolutionary Construction of Sleep.

Jin Park *(Bioengineering)* A.B., Harvard College 2008.
Thesis: Circuits of Dynamically Interacting Sigma Factors in Single Cells.

Philip Fai Petersen *(Biology)* B.S., California State Polytechnic University, Pomona 2010; M.S., 2011.
Thesis: Engineering Molecular Self-assembly and Reconfiguration in DNA Nanostructures.

Alicia Kathryn Rogers *(Molecular Biology and Biochemistry)* B.S., Baylor University 2011.
Thesis: Mechanisms of Transcriptional Silencing by the Nuclear Piwi Protein in Drosophila Germ Cells.

Luke Stuart Urban *(Computation and Neural Systems)* S.B., Massachusetts Institute of Technology 2009; M.Eng., 2010.
Thesis: An Electrophysiological Study of Voluntary Movement and Spinal Cord Injury.

Jonathan Exiquio Valencia *(Developmental Biology)* B.S., University of California, Los Angeles 2007.
Thesis: The Developmental Organization of Regulatory States in the Sea Urchin Larva.

Carey Yuzhe Zhang *(Bioengineering)* B.S., University of Southern California 2013.
Thesis: Partially Mixed Selectivity and Parietal Cortex.

DIVISION OF CHEMISTRY AND CHEMICAL ENGINEERING

Tonia Sarah Ahmed *(Chemistry)* B.S., West Virginia University 2013.
Thesis: Achieving High Stereoselectivity in Ruthenium-Catalyzed Olefin Metathesis Reactions for Organic and Polymer Synthesis.

Jun Myun Ahn *(Chemistry)* B.S., University of British Columbia 2013.
Thesis: Copper Carbazolides in Photoinduced C-N Couplings.

Allison Emi Akagi *(Chemistry)* B.A., Lewis & Clark College 2009; M.A., National Louis University 2011.
Thesis: The Biosynthesis of Ascarosides in *Caenorhabditis elegans*.

Renee Justine Arias *(Biochemistry and Molecular Biophysics)* B.S., University of Oregon 2012.
Thesis: Examination of Selenium Incorporation and Product Formation in the Nitrogenase FeMo-cofactor.

Kevin Mitchell Barraza *(Chemistry)* B.S., Stanford University 2010.
Thesis: The Study of the Stepwise Hydroxyl Radical-Mediated Oxidation of Alkyl Surfactants at the Air-Water Interface.

Doctor of Philosophy *continued*

Phillip Leon Bartels *(Chemistry)* B.S., The University of Chicago 2011.
Thesis: Elucidating the Role of 4Fe-4S Clusters in DNA Replication and Repair Proteins.

Kelly Suzanne Burke *(Chemistry)* A.S., Emory University 2010; B.S., 2012.
Thesis: Visualizing mRNA Translation *in situ* in Single Cells.

Trixia Marie Buscagan *(Chemistry)* B.A., B.S., University of California, Irvine 2011.
Thesis: Transition Metals as Catalysts for Cross-Coupling and Dinitrogen Fixation.

Joshua A. Buss *(Chemistry)* B.A., Claremont McKenna College 2012.
Thesis: Molybdenum para-Terphenyl Diphosphine Complexes.

Paul Brandon Carroll *(Chemistry)* B.S., Emory University 2009.
Thesis: Laboratory and Astronomical Rotational Spectroscopy.

Alice B. Chang *(Chemistry)* B.A., Columbia University 2013.
Thesis: Synthesis and Self-Assembly of Bottlebrush Block Polymers: Molecular Architecture and Materials Design.

Matthew Robert Davis *(Chemistry)* B.S., Tufts University 2012.
Thesis: Computational Studies of Noncovalent Interactions in Ligand-Gated Ion Channels and Synthesis and Characterization of Red and Near Infrared Cyanine Dyes.

Trevor James Del Castillo *(Chemistry)* B.S., University of Florida 2012.
Thesis: The Quest for Electrocatalytic Nitrogen Fixation with a Molecular Catalyst and What We Learned Along the Way.

Julian Peter Edwards *(Chemistry)* B.A., University of Colorado at Boulder 2011.
Thesis: Cyclic Polyolefins via Ring-Expansion Metathesis Polymerization.

Elizabeth Hwang Jensen *(Biochemistry and Molecular Biophysics)* B.S., University of Maryland, College Park 2009.
Thesis: Elucidating the Role of *O*-GlcNAc Glycosylation in Neurobiology and Neurodegeneration.

Jungwoo Kim *(Chemistry)* B.A., Cornell University 2010; M.S., The University of Chicago 2011.
Thesis: Microfluidic Analysis in Patient Biopsies: Toward Precision Medicine for Glioblastoma Multiforme.

William Peter Letsou *(Chemistry)* B.S., The University of Chicago 2011.
Thesis: Noncommutative Biology: Sequential Regulation of Complex Networks and Connected Matter.

JingXin Liang *(Chemistry)* B.S., Temple University 2011.
Thesis: Interrogating the Structural Landscape of Malaria Biomarkers with Epitope Targeted Peptide Capture Agents.

Michael Yang Lichterman *(Chemistry)* B.S., University of California, Berkeley 2011.
Thesis: Analysis of Metal-Oxide Protected Photoelectrochemical Systems for Water Splitting.

Doctor of Philosophy *continued*

Victor Wei-Dek Mak *(Chemistry)* B.S., University of California, Irvine 2012.

Thesis: Development of Synthetic Strategies for the Total Synthesis of *ent*-Kauranoid and Diterpenoid Alkaloid Natural Products.

Kevin James Marshall *(Chemical Engineering)* B.S., University of Nevada, Reno 2012.

Thesis: The Hydrodynamics of Active Particles Inside of a Porous Container and the Galerkin Boundary Element Discretization of Stokes Flow.

Stephen Sandell Marshall *(Chemistry)* B.S., Emory University 2012.

Thesis: Improvement of Integral Membrane Protein Expression via Optimization of Simulated Integration Efficiency.

Benjamin David Matson *(Chemistry)* B.S., University of Washington 2012.

Thesis: Interplay of Proton Transfer, Electron Transfer and Proton-Coupled Electron Transfer in Transition Metal Mediated Nitrogen Fixation.

Camille Zandra McAvoy *(Chemistry)* S.B., Massachusetts Institute of Technology 2012.

Thesis: Harnessing Biological Tools of Protein Transport and Catalysis.

Amy Michelle McCarthy *(Chemistry)* B.S., University of California, Berkeley 2012.

Thesis: Advancing the Protein-Catalyzed Capture Agent Technology to New Frontiers.

Gregory Martin Miller *(Chemistry)* B.S., University of California, Berkeley 2011.

Thesis: Eph Receptor Clustering by Chondroitin Sulfate Inhibits Axon Regeneration.

Mark Allen Nesbit *(Chemistry)* B.S., University of Illinois at Urbana-Champaign 2012.

Thesis: Iron, Cobalt, and Nickel Metalloboranes: Reactivity, Catalysis, N_2 Activation and Stabilization of Reactive N_2Hx Ligands.

Phong Thanh Nguyen *(Biochemistry and Molecular Biophysics)* B.S., Vietnam National University, Ho Chi Minh City 2007.

Thesis: Structural and Functional Characterization of the *Escherichia coli* MetNI Methionine Transporter.

Michiel Jacobus Maria Niesen *(Chemistry)* B.S., Eindhoven University of Technology 2008; M.S., 2009.

Thesis: Coarse-Grained Simulation Approaches for Protein Integration and Translocation via the Sec Translocon.

Doctor of Philosophy *continued*

Elizabeth O'Brien *(Chemistry)* B.A., University of Pennsylvania 2012.
Thesis: Redox Signaling in Eukaryotic DNA Replication and Repair.

Tanvi S. Ratani *(Chemistry)* B.S., University of Michigan, Ann Arbor 2012.
Thesis: Photoinduced, Copper-Catalyzed C-N and C-C Bond Formation and Photocatalytic Co-Mediated Nitrite Reduction to N_2O: Reactivity and Mechanism.

Travis Stratton Schlappi *(Chemical Engineering)* B.S., Brigham Young University 2011; M.S., California Institute of Technology 2015.
Thesis: Improving the Speed and Performance of Point-of-Care Diagnostics with Microfluidics.

Linhan Shen *(Chemistry)* B.S., Montana State University 2011.
Thesis: Cavity Ring-Down and Multi-Pass Spectroscopies for Methane Source Attribution and Chemical Kinetics Studies.

Samantha Elizabeth Shockley *(Chemistry)* B.S., The University of Chicago 2012.
Thesis: Development of Stereoselective Iridium-Catalyzed Allylic Alkylation Methods.

Shannon Elizabeth Stone *(Chemistry)* Sc.B., Brown University 2010.
Thesis: Cell-Selective Chemoproteomics for Biological Discovery.

Niklas Bjarne Thompson *(Chemistry)* B.S., The University of Chicago 2013.
Thesis: A Synthetic Nitrogenase: Insights into the Mechanism of Nitrogen Fixation by a Single-Site Fe Catalyst.

Daniel Anthony Torelli *(Chemistry)* B.S., University of North Carolina at Chapel Hill 2013.
Thesis: The Discovery of Novel Materials for the Electrocatalytic Reduction of Carbon Dioxide.

Kathleen Tiffany Upton *(Chemistry)* B.S., University of Evansville 2011.
Thesis: Analysis and Characterization of Titan Aerosol Simulants by Mass Spectrometry.

Yong Yi Wu *(Chemical Engineering)* B.S., University of Virginia 2012; M.S., California Institute of Technology 2015.
Thesis: Engineering Biosynthetic Pathways in Cell-Free Systems for Sustainability and Chemical Innovation.

Emily Ann Wyatt *(Chemical Engineering)* B.S., Stanford University 2011.
Thesis: Targeted Nanoparticle Delivery of Therapeutics across the Blood-Brain and Blood-Tumor Barriers to Breast Cancer Brain Metastases.

Kuang-Wei Yang *(Chemistry)* B.S., National Taiwan University 2009.
Thesis: Synthesis, NMR Solution Structure, and Neuritogenic Activity of Chondroitin Sulfate D and E.

Theodore Joseph Zwang *(Chemistry)* B.A., Pomona College 2011.
Thesis: Magnetic Field Effects and Biophysical Studies on DNA Charge Transport and Repair.

Doctor of Philosophy *continued*

DIVISION OF ENGINEERING AND APPLIED SCIENCE

Dave Aasen *(Applied Physics)* B.S., McGill University 2011.
Thesis: Super Pivotal Categories, Fermion Condensation, and Fermionic Topological Phases.

Behrooz Abiri *(Electrical Engineering)* B.Sc., Sharif University of Technology 2008; M.A.S., University of Toronto 2011; M.S., California Institute of Technology 2012.
Thesis: Silicon Integrated Arrays: From Microwave to IR.

Louisa Taylor Avellar *(Mechanical Engineering)* B.S., University of California, Berkeley 2014; M.S., California Institute of Technology 2016.
Thesis: Observations of Failure Phenomena in Periodic Media.

Ania-Ariadna Baetica *(Control and Dynamical Systems)* B.A., Princeton University 2012.
Thesis: Design, Analysis, and Computational Methods for Engineering Synthetic Biological Networks.

Noah Oakley Braun *(Aeronautics and Applied and Computational Mathematics)* B.S., North Carolina State University 2013; M.S., California Institute of Technology 2014.
Thesis: An LES and RANS Study of the Canonical Shock-Turbulence Interaction.

Daniel James Brooks *(Applied Physics)* B.S., Cornell University 2012; M.S., California Institute of Technology 2017.
Thesis: Computational Investigation of Ionic Diffusion in Polymer Electrolytes for Lithium-Ion Batteries.

Nicholas Burali *(Mechanical Engineering)* Laurea, Sapienza Università di Roma 2010; Laurea Magistrale, 2013; M.S., California Institute of Technology 2014.
Thesis: Towards *a priori* Models for Differential Diffusion in Turbulent Non-Premixed Flames.

Matthew Ryan Burkhardt *(Mechanical Engineering)* B.S., University of Washington 2011; M.S., California Institute of Technology 2014.
Thesis: Dynamic Modeling and Control of Spherical Robots.

John Kenneth Buyco *(Civil Engineering and Computational Science and Engineering)* B.S., Harvey Mudd College 2013; M.S., California Institute of Technology 2015.
Thesis: Improving Seismic Collapse Risk Assessments of Steel Moment Frame Buildings.

Niangjun Chen *(Computer Science)* B.A., University of Cambridge 2011; M.S., California Institute of Technology 2014.
Thesis: Online Algorithms: from Prediction to Decision.

Victoria Fay Chernow *(Materials Science)* A.B., Harvard College 2011; M.S., California Institute of Technology 2014.
Thesis: Design, Fabrication, and Characterization of 3D Nanolattice Photonic Crystals for Bandgap and Refractive Index Engineering.

Doctor of Philosophy *continued*

Gabriela de Oliveira Penna Tavares *(Computation and Neural Systems)* B.E., Pontifical Catholic University of Rio de Janeiro 2011; M.S., Imperial College London 2012.
Thesis: Computation and Comparison of Value Signals in Simple Perceptual and Economic Choices.

Nicholas Gang Dou *(Mechanical Engineering)* S.B., Massachusetts Institute of Technology 2012; M.S., California Institute of Technology 2014.
Thesis: Thermal Transport in Three-Dimensional Nanoarchitected Materials.

Michael Cameron Dawley Floyd *(Materials Science)* B.S., University of California, Berkeley 2011; M.S., California Institute of Technology 2015.
Thesis: Development of Ferromagnetic Metallic Glasses into Low Loss Power Transformer Cores.

Anthony Thomas Fragoso *(Aeronautics)* B.S., Yale University 2013; M.S., California Institute of Technology 2014.
Thesis: Egospace Motion Planning Representations for Micro Air Vehicles.

Ilana Batya Gat *(Aeronautics)* B.S., New York University 2013; M.S., California Institute of Technology 2014.
Thesis: Investigations of Incompressible Variable-Density Turbulence in an External Acceleration Field.

Marcello Gori *(Aeronautics)* B.E., Sapienza Università di Roma 2007; M.S., California Institute of Technology 2012.
Thesis: Laboratory Investigation of Shear Ruptures: Supersonic Propagation and Nucleation by Fluid Injection.

Andres Jared Goza *(Mechanical Engineering)* B.S., Rice University 2011; M.S., California Institute of Technology 2013.
Thesis: Numerical Methods for Fluid-Structure Interaction, and Their Application to Flag Flapping.

Morgane Anne Marie Grivel *(Aeronautics)* B.S., University of Maryland, College Park 2011; M.S., California Institute of Technology 2012; M.Sc., École Polytechnique 2013.
Thesis: On the Effect of Large-Scale Patterned Wettability on Contact Line Hydrodynamics.

Mark Harfouche *(Electrical Engineering)* B.S., University of Toronto 2011; M.S., California Institute of Technology 2012.
Thesis: The Coherence Collapse Regime of High-Coherence Si/III-V Lasers and the Use of Swept Frequency Semiconductor Lasers for Full Field 3D Imaging.

Doctor of Philosophy *continued*

Magnus Albert Haw *(Applied Physics)* B.S., University of British Columbia 2012; M.S., California Institute of Technology 2015.
Thesis: Experimental and Numerical Studies of Cavities, Flows, and Waves in Arched Flux Ropes.

Andrew Taylor Hoff *(Materials Science)* B.S., Andrews University 2011.
Thesis: Understanding the Origin of Glass Forming Ability of Metallic Glasses.

Yu Horie *(Electrical Engineering)* B.E., The University of Tokyo 2010; M.E., 2012.
Thesis: Controlling the Flow of Light Using High-Contrast Metastructures.

Jingjing Jiang *(Materials Science and Computer Science)* B.S., Nanjing University 2013; M.S., California Institute of Technology 2015.
Thesis: Interfacial and Stability Studies of Photocathodes for Hydrogen Evolution.

William Maxwell Jones *(Electrical Engineering)* B.S., California Institute of Technology 2010; M.S., 2013.
Thesis: Nanoscale Field Emission Devices.

Stephen Dongmin Kang *(Materials Science)* B.S., Seoul National University 2007; M.S., 2009.
Thesis: Charge Transport Analysis Using the Seebeck Coefficient-Conductivity Relation.

Reid Yoshio Kawamoto *(Applied Mechanics)* B.S., University of Southern California 2012; M.S., California Institute of Technology 2014.
Thesis: The Avatar Paradigm in Granular Materials.

Dennis Sungtae Kim *(Materials Science)* B.S., University of Massachusetts Amherst 2011.
Thesis: Silicon Revisited: Understanding Pure Phonon Anharmonicity and the Effects on Thermophysical Properties.

Dongwan Kim *(Applied Physics)* B.S., Seoul National University 2005; M.S., 2008; M.S., California Institute of Technology 2015.
Thesis: Frequency Noise Control of Heterogeneous Si/III-V Lasers.

Trenton Thomas Kirchdoerfer *(Aeronautics)* B.S., University of Wisconsin-Madison 2006; M.S., 2008; M.S., California Institute of Technology 2014.
Thesis: Data Driven Computing.

Ramya Korlakai Vinayak *(Electrical Engineering)* B.Tech., Indian Institute of Technology Madras 2011; M.S., California Institute of Technology 2013.
Thesis: Graph Clustering: Algorithms, Analysis and Query Design.

Christopher James Kucharczyk *(Materials Science)* B.S., Stanford University 2011; M.S., California Institute of Technology 2014.
Thesis: High-throughput Characterization of Solid Oxide Fuel Cell Cathode Materials.

Yoke Peng Leong *(Control and Dynamical Systems)* B.S., M.S., Northwestern University 2012.
Thesis: Optimal Controller Synthesis for Nonlinear Systems.

Doctor of Philosophy *continued*

Ben A. Lin *(Bioengineering)* B.S., University of California, Berkeley 1996.
Thesis: Ultrasound Speckle Image Velocimetry: Studies on System Performance and Application to Cardiovascular Fluid Dynamics.

Chun-Lin Liu *(Electrical Engineering)* B.S., National Taiwan University 2010; M.S., 2012.
Thesis: Sparse Array Signal Processing: New Array Geometries, Parameter Estimation, and Theoretical Analysis.

John Vickery Lloyd *(Materials Science)* B.S., M.S., Drexel University 2010.
Thesis: Optoelectronic Design and Prototyping of Spectrum-Splitting Photovoltaics.

Shi Luo *(Materials Science)* B.Eng., National University of Singapore 2012.
Thesis: Microstructural Effects on Diffusion and Mechanical Properties in Different Material Systems.

Kazuki Maeda *(Mechanical Engineering)* B.E., The University of Tokyo 2013; M.S., California Institute of Technology 2014.
Thesis: Simulation, Experiments, and Modeling of Cloud Cavitation with Application to Burst Wave Lithotripsy.

Alessandro Maggi *(Medical Engineering and Aerospace)* B.S., Università degli Studi di Milano 2007; M.S., California Institute of Technology 2016.
Thesis: Three-dimensional Nano-architected Materials as Platforms for Designing Effective Bone Implants.

Eloïse Sophie Hélène Marteau *(Applied Mechanics)* B.S., École Polytechnique Fédérale de Lausanne 2010; M.S., California Institute of Technology 2014.
Thesis: Laboratory Studies of Granular Materials Under Shear: From Avalanches to Force Chains.

Nathan Koon-Hung Martin *(Aeronautics)* B.S., Rice University 2013; M.S., California Institute of Technology 2014.
Thesis: Analysis of Flapping Propulsion: Comparison, Characterization, and Optimization.

Anthony Thomas Massari *(Civil Engineering)* B.S., New Jersey Institute of Technology 2007; M.S., University of California, Berkeley 2008; M.S., California Institute of Technology 2014.
Thesis: Achieving Higher Fidelity Building Response through Emerging Technologies and Analytical Techniques.

Arturo José Mateos Arrieta *(Aeronautics)* B.S., Texas A&M University 2013; M.S., California Institute of Technology 2014.
Thesis: Tensile Failure and Fracture of Three-Dimensional Brittle Nanolattices.

Juri Minxha *(Computation and Neural Systems)* Sc.B., Brown University 2010; Sc.M., 2011.
Thesis: Single-Neuron Correlates of Visual Object Representation in the Human Brain: Effects of Attention, Memory, and Choice.

Doctor of Philosophy *continued*

Ryan McKay Monroe *(Electrical Engineering)* B.S., Georgia Institute of Technology 2011; M.S., California Institute of Technology 2014.
Thesis: Gigahertz Bandwidth and Nanosecond Timescales: New Frontiers in Radio Astronomy Through Peak Performance Signal Processing.

Matthew Gregory Newman *(Aeronautics)* S.B., Harvard College 2013; M.S., California Institute of Technology 2014.
Thesis: On the Kinetics of Materials of Geophysical Interest.

Xiaoyue Ni *(Materials Science)* B.S., Marietta College 2012.
Thesis: Probing Microplastic Deformation in Metallic Materials.

Dong Yoon Oh *(Applied Physics)* B.S., California Institute of Technology 2011; M.S., 2014.
Thesis: Integrated Nonlinear Photonic Devices.

Georgia Theano Papadakis *(Applied Physics)* B.S., National Technical University of Athens 2012; M.S., California Institute of Technology 2016.
Thesis: Optical Response in Planar Heterostructures: From Artificial Magnetism to Angstrom-Scale Metamaterials.

Xiaoqi Ren *(Computer Science)* B.S., Tsinghua University 2012; M.S., California Institute of Technology 2015.
Thesis: Optimizing Resource Management in Cloud Analytics Services.

Kevin Thomas Rosenberg *(Aeronautics)* B.S., University of Florida 2012; M.S., California Institute of Technology 2013.
Thesis: Resolvent-based Modeling of Flows in a Channel.

Maria Sakovsky *(Space Engineering)* B.S., University of Toronto 2013; M.S., California Institute of Technology 2014.
Thesis: Design and Characterization of Dual-Matrix Composite Deployable Space Structures.

Theresa Ann Saxton-Fox *(Mechanical Engineering)* S.B., Massachusetts Institute of Technology 2012; M.S., California Institute of Technology 2013.
Thesis: Coherent Structures, Their Interactions, and Their Effects on Passive Scalar Transport and Aero-Optic Distortion in a Turbulent Boundary Layer.

Natalie Sarah Ann Schaal *(Mechanical Engineering and Geophysics)* B.S., University of Portland 2011; M.S., California Institute of Technology 2014.
Thesis: Modeling of Nucleation and Dynamic Rupture on Heterogeneous Frictional Interfaces with Applications to Foreshocks.

Jason Robert Schlup *(Aeronautics)* B.S., Kansas State University 2011; M.S., 2013; M.S., California Institute of Technology 2014.
Thesis: Numerical Investigations of Transport and Chemistry Modeling for Lean Premixed Hydrogen Combustion.

Doctor of Philosophy *continued*

Karthik Iyengar Seetharam *(Applied Physics)* B.S., Duke University 2011.
Thesis: Thermalization in Periodically-Driven Interacting Quantum Systems.

Michelle Caroline Sherrott *(Materials Science)* B.S., M.S., University of Pennsylvania 2012.
Thesis: Active Infrared Nanophotonics in van der Waals Materials.

Dingyi Sun *(Mechanical Engineering)* Sc.B., Brown University 2012; M.S., California Institute of Technology 2014.
Thesis: Proliferation of Twinning in Metals: Application to Magnesium Alloys.

Anandh Swaminathan *(Control and Dynamical Systems)* S.B., Massachusetts Institute of Technology 2011.
Thesis: Application, Computation, and Theory for Synthetic Gene Circuits.

Sean Pearson Symon *(Aeronautics)* B.S., University of Maryland, College Park 2012; M.S., California Institute of Technology 2013.
Thesis: Reconstruction and Estimation of Flows Using Resolvent Analysis and Data-Assimilation.

Ishan Tembhekar *(Mechanical Engineering)* B.Tech., Indian Institute of Technology Gandhinagar 2012; M.S., California Institute of Technology 2014.
Thesis: The Fully Nonlocal, Finite-Temperature, Adaptive 3D Quasicontinuum Method for Bridging Across Scales.

Srikanth Venkata Tenneti *(Electrical Engineering)* B.Tech., Indian Institute of Technology Bombay 2012; M.S., California Institute of Technology 2014.
Thesis: The Nested Periodic Subspaces: Extensions of Ramanujan Sums for Period Estimation.

Dylan Douglas Tozier *(Materials Science)* B.A., B.S., Rice University 2013; M.S., California Institute of Technology 2015.
Thesis: Cathode Design for High Energy Molten Salt Lithium-Oxygen Batteries.

Kiyoul Yang *(Electrical Engineering)* B.S., Korea Advanced Institute of Science and Technology 2008; M.S., 2010; M.S., California Institute of Technology 2012.
Thesis: Integrated Ultra-high-Q Nonlinear Photonic Platform for On-chip Optoelectronic Systems.

Lucy Yin *(Civil Engineering and Applied and Computational Mathematics)* B.S., University of Toronto 2012; M.S., California Institute of Technology 2014.
Thesis: Reducing Latencies in Earthquake Early Warning.

Xinghao Zhou *(Materials Science and Computer Science)* B.S., University of Science and Technology of China 2013; M.S., California Institute of Technology 2016.
Thesis: Performance and Stability Optimization of Solar Fuel Devices.

Doctor of Philosophy *continued*

DIVISION OF GEOLOGICAL AND PLANETARY SCIENCES

Daniel Craig Bowden *(Geophysics)* B.S., University of California, San Diego 2010.

Thesis: The Propagation and Amplification of Surface Waves.

Peter Benjamin Buhler *(Planetary Science)* B.S., California Institute of Technology 2012; M.S., 2015.

Thesis: Measuring and Modeling the Interplay between Planetary Orbits, Interiors, Surfaces, and Atmospheres.

Jennifer Buz *(Geology)* S.B., Massachusetts Institute of Technology 2010; M.S., 2011.

Thesis: Macro Mars to Micro Mars: Mapping Minerals and Magnetization.

Clément Antoine François Cid *(Environmental Science and Engineering)* B.S., M.S., École Normale Supérieure de Lyon 2011; M.S., California Institute of Technology 2014.

Thesis: Development, Implementation, and Improvements on an Effective Electrochemical Wastewater Treatment and Recycling Unit as a Sustainable Sanitation Solution for the Developing World.

Sophia Katharine Vizza Hines *(Geochemistry)* B.A., Carleton College 2011.

Thesis: Glacial Ocean Dynamics: Insight from Deep-Sea Coral Reconstructions and a Time-Dependent Dynamical Box Model.

Pushkar Kopparla *(Planetary Science)* B.Tech., Indian Institute of Technology Delhi 2011; M.S., Swiss Federal Institute of Technology Zurich 2013; M.S., California Institute of Technology 2015.

Thesis: Exoplanetary Atmospheric Characterization Using Polarimetry and Other Radiative Transfer Modeling Problems.

Max Kaufmann Lloyd *(Geochemistry)* B.A., Amherst College 2012.

Thesis: Clumped and Intramolecular Isotopic Perspectives on the Behavior of Organic and Inorganic Carbon in the Shallow Crust and Deep Biosphere.

Yingdi Luo *(Geophysics)* B.S., University of Science and Technology of China 2010.

Thesis: Earthquake Moment-Area Scaling Relations and the Effect of Fault Heterogeneity on Slow to Fast Earthquake Slip.

Huajun Mai *(Environmental Science and Engineering)* B.E., Tsinghua University 2013; M.S., California Institute of Technology 2015.

Thesis: Scanning Electrical Mobility Methods for Aerosol Characterization.

Stephen Michael Perry *(Geophysics)* B.S., Cornell University 2011; M.S., California Institute of Technology 2014.

Thesis: Analyzing Stress Change and Energy Budget of Earthquakes through Physics-based Modeling.

Doctor of Philosophy *continued*

Danielle Piskorz *(Planetary Science)* S.B., Massachusetts Institute of Technology 2011; M.S., California Institute of Technology 2014.
Thesis: Exploring Exoplanets' Spectroscopic Secrets: Clues on the Migration and Formation of Hot Jupiters.

Theodore Michael Present *(Geochemistry)* B.S., The Pennsylvania State University 2011; M.S., California Institute of Technology 2014.
Thesis: Controls on the Sulfur Isotopic Composition of Carbonate-Associated Sulfate.

Daven Patel Quinn *(Geology)* B.S., University of North Carolina at Chapel Hill 2011; M.S., California Institute of Technology 2014.
Thesis: The Regional Structural Geology of Earth and Mars.

John Christopher Rollins *(Geophysics)* B.S., University of Southern California 2011.
Thesis: Using Heterogeneous 3D Earth Models to Constrain Interseismic and Postseismic Deformation in Southern California and Nepal.

Christopher Spalding *(Planetary Science)* B.S., University of Cambridge 2013; M.S., California Institute of Technology 2015.
Thesis: The Primordial Origin and Dynamical Sculpting of Close-In Planetary System Architectures.

Ho-Hsuan Wei *(Environmental Science and Engineering)* B.S., National Taiwan University 2010; M.S., 2012; M.S., California Institute of Technology 2014.
Thesis: Dynamics of Seasonally-Varying Tropical Convergence Zones.

Ian Yu Wong *(Planetary Science)* B.A., Princeton University 2012; M.S., California Institute of Technology 2015.
Thesis: Probing the Trojan-Hilda-KBO Connection: An Empirical Test of Dynamical Instability Models of Solar System Evolution.

Michael L. Wong *(Planetary Science)* B.A., University of California, Berkeley 2012; M.S., California Institute of Technology 2014.
Thesis: A Planetary Perspective of Life.

Xiyue Zhang *(Environmental Science and Engineering)* B.S., University of Washington 2012; M.S., California Institute of Technology 2015.
Thesis: Dynamics of Resolved Polar Clouds.

DIVISION OF THE HUMANITIES AND SOCIAL SCIENCES

Ryo Adachi *(Social and Decision Neuroscience)* B.E., The University of Tokyo 2009; M.S., 2011; M.S., California Institute of Technology 2013.
Thesis: Computational and Neural Mechanisms Underlying Decision-Making in Humans.

Jun Chen *(Social Science)* B.S., Hunan University 2008; M.S., Weizmann Institute of Science 2013.
Thesis: Essays on Early-stage Financing and Firm Behavior.

Doctor of Philosophy *continued*

Marcelo Ariel Fernandez *(Social Science)* Licenciado, Pontificia Universidad Católica Argentina 2010; M.S., California Institute of Technology 2015.
Thesis: Essays in Market Design.

Lucas Núñez *(Social Science)* Licence, Universidad Torcuato Di Tella 2009; M.A., 2013; M.S., California Institute of Technology 2015.
Thesis: Unobserved Heterogeneity in Observational Studies of Political Behavior.

Li Song *(Social Science)* B.S., Peking University 2012; M.S., California Institute of Technology 2014.
Thesis: Three Essays on Mechanism Design.

Pengfei Sui *(Social Science)* B.S., Renmin University of China 2011; M.S., California Institute of Technology 2015.
Thesis: Essays on Investor Beliefs and Asset Pricing.

Mali Zhang *(Social Science)* B.S., Davidson College 2011.
Thesis: Information and Strategic Decision-Making in the Oil and Gas Industry: An Empirical Assessment.

DIVISION OF PHYSICS, MATHEMATICS AND ASTRONOMY

Dustin James Anderson *(Physics)* B.A., Carleton College 2012; M.S., California Institute of Technology 2017.
Thesis: Inclusive Searches for Supersymmetry at sqrt(s) = 13 TeV Using Razor Kinematic Variables, and Data Scouting Using the CMS Trigger System.

Anthony Leo Bartolotta *(Physics)* B.S., Carnegie Mellon University 2012.
Thesis: The Union of Quantum Field Theory and Non-equilibrium Thermodynamics.

Marta Levesque Bryan *(Astrophysics)* A.B., Harvard College 2012; M.S., California Institute of Technology 2014.
Thesis: Lurking in the Shadows: Wide-Separation Gas Giants as Tracers of Planet Formation.

Chun Jun (Charles) Cao *(Physics)* B.S., University of British Columbia 2013.
Thesis: Towards a Theory of Quantum Gravity Through Geometrization of Quantum Mechanics.

Daniel Shuteh Chao *(Physics and Computer Science)* B.S., California Institute of Technology 2009.
Thesis: Measuring $R(D^{(*)})$ *for* $\beta(B \to D^{(*)}\tau\nu_\tau)$ Using Semileptonic Tags and τ Decays to Hadrons.

Aidan Émile Chatwin-Davies *(Physics)* B.Math., University of Waterloo 2011; M.Math., 2013.
Thesis: Gravity Informed.

Ruiyuan Chen *(Mathematics)* B.S., University of British Columbia 2013.
Thesis: Definability and Classification of Equivalence Relations and Logical Theories.

Doctor of Philosophy *continued*

Brett Durcan Cornell *(Physics)* A.B., Harvard College 2008.
Thesis: A Dark Matter Search Using the Final SuperCDMS Soudan Dataset and the Development of a Large-Format, Highly-Multiplexed, Athermal-Phonon-Mediated Particle Detector.

Trevor Justin David *(Astrophysics)* B.A., Vassar College 2009; M.S., California Institute of Technology 2013.
Thesis: On the Evolutionary Pathways of Stars and Extrasolar Planets.

Matthew Theodore Fishman *(Physics)* B.S., Cornell University 2012.
Thesis: Development of Tensor Network Algorithms for Studying Classical and Quantum Many-Body Systems.

Dávid Guszejnov *(Physics)* B.S., Budapest University of Technology and Economics 2011; M.S., 2013.
Thesis: On the Origin of Scales and Scaling Laws in Star Formation.

Siqi He *(Mathematics)* B.S., Peking University 2013.
Thesis: The Kapustin-Witten Equations with Singular Boundary Conditions.

Serin Hong *(Mathematics)* B.S., M.S., Stanford University 2009; M.S., California Institute of Technology 2011.
Thesis: On Hodge-Newton Reducible Local Shimura Data of Hodge Type.

Howard Hui *(Physics)* B.S., Oregon State University 2010.
Thesis: Measuring the Polarization of the Cosmic Microwave Background with BICEP3.

Nicholas R Hunter-Jones *(Physics)* S.B., Massachusetts Institute of Technology 2011; M.S., Imperial College London 2012.
Thesis: Chaos and Randomness in Strongly-Interacting Quantum Systems.

Gahye Jeong *(Mathematics and Computational Science and Engineering)* B.S., Seoul National University 2013.
Thesis: Self-Gluing Formula of the Monopole Invariant and its Application on Symplectic Structures.

Anna Kómár *(Physics)* B.S., Budapest University of Technology and Economics 2011; M.S., 2013.
Thesis: Quantum Computation and Information Storage in Quantum Double Models.

Petr Kravchuk *(Physics)* B.S., Saint Petersburg State Polytechnical University 2013.
Thesis: Spin in Conformal Field Theory.

Aleksander Marek Kubica *(Physics)* Licence, University of Warsaw 2011.
Thesis: The ABCs of the Color Code: A Study of Topological Quantum Codes as Toy Models for Fault-Tolerant Quantum Computation and Quantum Phases of Matter.

Doctor of Philosophy *continued*

Alicia Elaine Lanz *(Physics)* B.A., University of California, Berkeley 2005; M.S., California Institute of Technology 2016.
Thesis: Studying the Extragalactic Background Light with the Second Cosmic Infrared Background ExpeRiment, CIBER-2.

Jonas Lippuner *(Physics)* B.Sc., University of Manitoba 2012.
Thesis: r-Process Nucleosynthesis in Neutron Star Mergers with the New Nuclear Reaction Network SkyNet.

Xiangcheng Ma *(Physics)* B.S., University of Science and Technology of China 2013.
Thesis: Understanding Galaxy Formation and Evolution with Realistic Simulations.

Shaun Cohn Maguire *(Control and Dynamical Systems)* B.A., University of Southern California 2007; M.S., Stanford University 2008.
Thesis: The Spectral Theory of Multiboundary Wormholes.

Tristan James McKinney *(Physics)* B.S., University of California, Berkeley 2011.
Thesis: The Effective Field Theory of Fermi Surfaces in the Vicinity of Van Hove Singularities.

Connor George Walmsley Meehan *(Mathematics)* B.S., University of British Columbia 2012; M.S., University of Toronto 2013.
Thesis: Definable Combinatorics of Graphs and Equivalence Relations.

Abhilash Mishra *(Astrophysics)* B.S., Fergusson College, Pune 2008.
Thesis: The Low-Frequency Frontier: Cosmology with Future 21cm Experiments.

Elena Murchikova *(Physics)* Diploma, Lomonosov Moscow State University 2007.
Thesis: Astrophysical Applications of Quantum Mechanics.

Belinda Heyun Pang *(Physics)* B.S., Cornell University 2011.
Thesis: Theoretical Foundations for Quantum Measurement in a General Relativistic Framework.

Siying Peng *(Physics)* B.S., Texas A&M University 2011.
Thesis: 2D and 3D Photonic Crystals: Synthesis, Characterization and Topological Phenomenon.

Daniel Stephen Pershey *(Physics)* A.B., Harvard College 2011.
Thesis: Measurement of ν_e Appearance and ν_μ Disappearance Neutrino Oscillations with the NOvA Experiment.

Eric Antonio Quintero *(Physics)* S.B., Massachusetts Institute of Technology 2010.
Thesis: Improving the Performance and Sensitivity of Gravitational Wave Detectors.

Sherwood Andrew Richers III *(Physics)* B.A., University of Virginia 2012; M.S., California Institute of Technology 2016.
Thesis: Neutrino Radiation Transport and Other Topics in High Energy Density Astrophysics.

Doctor of Philosophy *continued*

Sujeet Kumar Shukla *(Physics)* B.Tech., Indian Institute of Technology Delhi 2010.
Thesis: Tensor Network Representation of Many-Body Quantumstates and Unitary Operators.

Allison Leigh Strom *(Astrophysics)* B.S., The University of Arizona 2010; M.S., California Institute of Technology 2015.
Thesis: Unveiling the Physical Conditions in Star-Forming Galaxies at the Peak of Galaxy Assembly.

Yishu Wang *(Physics)* B.E., Tsinghua University 2013; M.S., The University of Chicago 2014.
Thesis: Antiferromagnetic Quantum Phase Transitions: Continuous Tuning and Direct Probes of Competing States.

Ke Ye *(Physics)* B.S., Peking University 2013.
Thesis: A Symphony of Supersymmetry and Geometry: Invariants, Dualities and Chiral Rings.

Nicole Yunger Halpern *(Physics)* B.A., Dartmouth College 2011; M.Sc., University of Waterloo 2013.
Thesis: Quantum Steampunk: Quantum Information, Thermodynamics, Their Intersection, and Applications Thereof Across Physics.

Stephan Tao Zheng *(Physics)* B.Sc., Utrecht University 2009; M.Sc., 2011; M.A., University of Cambridge 2012.
Thesis: Exploiting Structure for Scalable and Robust Deep Learning.

PRIZES AND AWARDS

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

MABEL BECKMAN PRIZE

The Mabel Beckman Prize is given in memory of Mrs. Beckman's many years of commitment to Caltech's educational and research programs. The prize is awarded to an undergraduate woman or women who, upon completion of her junior or senior year at Caltech, have achieved academic excellence and demonstrated outstanding leadership skills, a commitment to personal excellence, good character, and a strong interest in the Caltech community.

2018 Roohi Dalal, Aishwarya Nene

FREDERIC W. HINRICHS, JR., MEMORIAL AWARD

This award, established by the Board of Trustees, is in memory of the man who served for more than 20 years as dean and professor at Caltech. In remembrance of his honor, courage, and kindness, the award bearing his name is made annually to the senior or seniors who, throughout his or her undergraduate years, made the greatest contribution to the student body and whose qualities of character, leadership, and responsibility have been outstanding. At the discretion of the dean, more than one award may be made in any year. This award, presented at commencement, consists of a cash prize and a certificate.

2018 Stephanie Michaela Huard, Timothy Samuel Liu

GEORGE W. HOUSNER PRIZE FOR ACADEMIC EXCELLENCE AND ORIGINAL RESEARCH

The George W. Housner prize is given annually to a senior or seniors in the upper 20 percent of their class who have demonstrated excellence in scholarship and in the preparation of an outstanding piece of original scientific research. The students are selected by the deans and the Undergraduate Academic Standards and Honors Committee. At the discretion of the deans, more than one award may be made in any year. The prize, presented at commencement, consists of a cash award and a certificate. This prize is made possible by a gift from the late George W. Housner, Carl F Braun Professor of Engineering, Emeritus.

2018 Matthew Adam Locke Weidner, Samuel Weiliang Yee

MILTON AND FRANCIS CLAUSER DOCTORAL PRIZE

Awarded to a Ph.D. candidate whose thesis is judged by a committee of the Faculty Board to exhibit significant new work, ingenuity, and originality, and to have the greatest potential to open new avenues of human thought and endeavor.

Name of recipient to be announced at commencement.

The previous four prizes 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.

2016 Phillip Guangning An, Katherine Guo

APOSTOL AWARD FOR EXCELLENCE IN TEACHING IN MATHEMATICS

Named in honor of Tom Apostol, who taught at Caltech for over 50 years, the award recognizes excellence in teaching by graduate and undergraduate teaching assistants in mathematics.

2014 Connor George Walmsley Meehan

2016 Serin Hong

2018 Angad Singh

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.

2015 Ilana Batya Gat

2017 Maria Sakovsky

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.

2017 *Ching-Yun Hsu*

WILLIAM F. BALLHAUS PRIZE

Awarded to aeronautics students for outstanding doctoral dissertations.

2018 *Marcello Gori, Maria Sakovsky*

ERIC TEMPLE BELL UNDERGRADUATE MATHEMATICS RESEARCH PRIZE

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

2017 *William Henry Ballinger, Ching-Yun Hsu, Tynan Isaiah Ochse, Matthew Adam Locke Weidner*

THE BHANSALI FAMILY 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 (B.S. '87, M.S. '87) in memory of his grandfather, Mag Raj Bhansali.

2018 *Ching-Yun Hsu, Jalex Stark*

BHANSALI FAMILY DISSERTATION PRIZE IN COMPUTER SCIENCE

The Bhansali Family Dissertation Prize in Computer Science was established in 2018 by Vineer Bhansali (B.S. '87, M.S. '87) in memory of his grandfather, Mag Raj Bhansali. The prize and honorarium are given to honor outstanding dissertations in computer science, broadly defined, during the current academic year. Awardees are selected by a committee of computer science faculty each spring.

2018 *Xiaoqi Ren*

AMASA BISHOP SUMMER STUDY ABROAD PRIZE

Awarded to one or more freshmen, sophomores, or juniors 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.

2012 *Radmila Dancikova*

2015 *Daniel Philipson Gawerc, Ida Huang*

2017 *Phillip Guangning An*

RICHARD G. BREWER PRIZE IN PHYSICS

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

2014 *Ian Bruce Kuehne*

ROLF D. BUHLER MEMORIAL AWARD IN AERONAUTICS

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

2018 *Emile Kazuo Oshima, Naijian Shen*

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.

2018 *Theresa Ann Saxton-Fox*

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.

2018 Morgane Anne Marie Grivel, Kazuki Maeda, Jason Robert Schlup

BEN P.C. CHOU DOCTORAL PRIZE IN IST

The Ben P.C. Chou Doctoral Prize recognizes outstanding doctoral dissertations in the broad area of information science and technology. The prize was established by his wife, June, and his son, Scott (B.S. '86), as a lasting tribute to Ben's lifetime dedication to the pursuit of scholarly research and foregoing personal gain in favor of always doing the right thing for society.

2018 Chun-Lin Liu

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.

2017 Vinciane Wen-Xian Chen, Timothy Samuel Liu

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.

2018 Nathan Koon-Hung Martin

FRANCE A. CORDOVA GRADUATE STUDENT FUND

The Cordova Fund provides resources for one to three graduate students annually to support research-related expenses. Preference shall be given to student(s) studying broadly in areas in which professors Gerry Neugebauer, Gordon Garmire, and Thomas Tombrello made contributions. Each awardee shall be recognized as either a Neugebauer, Garmire, or Tombrello Scholar.

2017 Brett Cornell, Gerry Neugebauer Scholar

2018 Nicha Leethochawalit, Gerry Neugebauer Scholar

DEANS' CUP AND STUDENT LIFE AWARDS

These two awards are presented to undergraduates whose concern for their fellow students has been demonstrated by their persistent efforts to improve the quality of undergraduate life and by effective communication with members of the faculty and administration.

2017 *Roohi Dalal; Deans' Cup*

2017 *Preethi Kasthuri Periyakoil; Student Life*

2018 *Sarah W. Cai, Tristan George Murphy, Anusha Mehul Nathan, Gabriel Sara Tender; Deans' Cup*

2018 *William Garrison Levine, Grace Yao; Student Life*

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).

2018 *Xiaoqi Ren*

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. This prize is made possible by a gift from Anna Kokkalis Demetriades and Sterge T. Demetriades (Eng. '58).

2018 *Claire Nicole Bedbrook*

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).

2018 *Nicholas Gang Dou*

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. This prize is made possible by a gift from Anna Kokkalis Demetriades and Sterge T. Demetriades (Eng. '58).

2018 Daniel Craig Bowden

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.

2016 Kari Ellena Hernandez

EVERHART DISTINGUISHED GRADUATE STUDENT LECTURER AWARD

The Everhart Lecture Series is a forum to encourage interdisciplinary interaction among graduate students and faculty, to share ideas about recent research developments, and to recognize the exemplary presentation skills and research ability of selected awardees.

2017 Andres Jared Goza, Nagarajan Nandagopal

DORIS EVERHART SERVICE AWARD

The Doris Everhart Service Award is given 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 made possible by Sally V. Ridge and was established to honor Doris Everhart.

2018 Anne Hobbs Dorsey

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.

2018 Gregory Paul Donaldson

HAREN LEE FISHER MEMORIAL AWARD IN JUNIOR PHYSICS

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

2017 Alexander Nicholas Bourzutschky

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.

2018 Sunash Sharma

JACK E. FROEHLICH MEMORIAL AWARD

The family and friends of the late Jack E. Froehlich, who did his undergraduate and graduate work at Caltech and was later the project manager for Explorer I for the Jet Propulsion Laboratory, established a prize fund that provides an award of $1,500 to a junior in the upper 5 percent of his or her class who shows outstanding promise for a creative professional career. The recipient is selected by the deans and the Undergraduate Academic Standards and Honors Committee.

2017 Ching-Yun Hsu

BARRY M. GOLDWATER SCHOLARSHIP

The Barry Goldwater Scholarship and Excellence in Education Foundation was established to serve as a living memorial to honor the lifetime work of Senator Barry Goldwater, who served his country for 56 years as a soldier and statesman, including 30 years in the U.S. Senate. The Goldwater Scholarship Program, one of the oldest and most prestigious scholarships in the natural sciences, engineering, and mathematics in the United States, seeks to identify and support college sophomores and juniors who show exceptional promise of becoming this nation's next generation of research leaders in these fields.

2017 Aadith Moorthy

GRADUATE DEANS' AWARD

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

2018 Alicia Elaine Lanz, Emily Ann Wyatt

GEORGE W. AND BERNICE E. GREEN MEMORIAL PRIZE

The George W. and Bernice E. Green Memorial Prize was established in 1963 with contributions given in memory of George W. Green, who for 15 years served on the staff of the Caltech business office and was vice president for business affairs from 1956 to 1962. The prize of $1,500 is 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.

2018 Willis Cooper O'Leary

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 exemplify a spirit of service.

2017 Sherwood Andrew Richers III

2018 Amy Michelle McCarthy

ARIE J. HAAGEN-SMIT MEMORIAL AWARD

The Arie J. Haagen-Smit Memorial Award was established in 1977 to honor the memory of the pioneering bioorganic chemist who discovered the chemical constituents of smog. Dr. Haagen-Smit was a member of the Caltech faculty for 40 years, and his family and friends have arranged for a prize of $750 to be given at the end of the sophomore or junior year to a student in biology or chemistry who has shown academic promise and who has made recognized contributions to Caltech. The selection is made by a committee of representatives from the biology and chemistry divisions, and the deans.

2017 Gabrielle Sara Tender

ALEXANDER P. AND ADELAIDE F. HIXON PRIZE FOR WRITING

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

2015 Arjun Sanjay Goswami

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.

2018 Marcello Gori

PATRICK HUMMEL AND HARRY GRAY TRAVEL FUND

The Patrick Hummel and Harry Gray Travel Fund was established as a joint gift from Carla and Paul Hummel, Patrick Hummel, and Shirley and Harry Gray, Arnold O. Beckman Professor of Chemistry and Founding Director of the Beckman Institute. The endowed fund supports undergraduate travel opportunities that promote professional and leadership development and broadens students' perspectives as engaged, responsible citizens of the world.

2018 Katherine Guo, Ching-Yun Hsu, Stephanie Ka Yu Kwan, Yeyuan Xin

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.

2018 Miguel Ángel González Campos

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 Serin Hong

SCOTT RUSSELL JOHNSON GRADUATE DISSERTATION PRIZE IN MATHEMATICS

Awarded for the best graduate dissertation in mathematics.

2018 Ruiyuan Chen, Serin Hong

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.

2018 William Henry Ballinger

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.

2018 Avinash Chandra

R.K. KAR AWARD FOR RESEARCH IN PHYSICS

The R.K. Kar Award for Research in Physics will be awarded annually to an outstanding graduate student who is exceptional in their physics studies and research (emphasis on condensed matter physics).

2017 Yishu Wang

D. S. KOTHARI PRIZE IN PHYSICS

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

2018 Gillian Baron Kopp, Rita Frances Sonka

MARGIE LAURITSEN LEIGHTON PRIZE

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

2016 Anita Sumati Kulkarni

JOHN O. LEDYARD PRIZE FOR GRADUATE RESEARCH IN SOCIAL SCIENCE

The prize rewards the best second-year paper by a graduate student in Social Science or Social and Decision Neuroscience. The prize was established 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.

2015 Marcelo Ariel Fernandez

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.

2018 Sarah W. Cai

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.

2018 Nicholas Trank

WOMEN MENTORING WOMEN HELEN MCBRIDE OUTSTANDING MENTEE AWARD

Recipient has demonstrated a sincere desire to succeed as a student and is committed to her personal development, open and willing to learn from her mentor and receptive to advice and counsel, worked with her mentor to establish realistic goals, and demonstrated a commitment to carrying them out.

2018 Stephanie Ka Yu Kwan

GORDON MCCLURE MEMORIAL COMMUNICATIONS PRIZE IN HISTORY

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

2018 Tara Anjali Shankar

THE HERBERT NEWBY MCCOY AWARD

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

2018 Joshua A. Buss, Alice B. Chang

MARY A. EARL MCKINNEY PRIZE IN PROSE FICTION

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

2018 Timothy Samuel Liu

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.

2018 James Love Hamilton

MERCK INDEX AWARD

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

2018 Sarah W. Cai, Ruomeng Wan

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.

2018 Janice Hayun Jeon, Gillian Baron Kopp, Phillip Liu, Rachael Jean Morton

RODMAN W. PAUL HISTORY PRIZE

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

2018 Tristan George Murphy

DR. NAGENDRANATH REDDY BIOLOGICAL SCIENCES THESIS PRIZE

Awarded to the graduating female Ph.D. candidate in the Division of Biology and Biological Engineering who has produced the most outstanding thesis in the biological sciences for the past year.

2018 Claire Nicole Bedbrook

HERBERT J. RYSER MEMORIAL SCHOLARSHIP

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

2016 William Henry Ballinger, Ching-Yun Hsu, Matthew Adam Locke Weidner

2017 Sam Alexander Bardwell-Evans

SANPIETRO TRAVEL PRIZE

Awarded to one or more sophomores, juniors, or seniors to fund an adventurous and challenging summer travel experience that expands the recipients' cultural horizons and knowledge of the world.

2015 Laura Rose Watson

2016 Amanda Ying Lin, Licheng Richard Zhu

2017 Roohi Dalal, Ciara Mary Ordner

2018 Sara W. Cai, David Christopher Kawashima, Anushka Rau

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.

2018 Willis Cooper O'Leary, Gabrielle Sara Tender

ELEANOR SEARLE PRIZE IN LAW, POLITICS, AND INSTITUTIONS

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

2015 Kevin Shu

2018 Roohi Dalal

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.

2017 Ilana Batya Gat

DR. FRED SHAIR AWARD FOR PROGRAMMING

The Dr. Fred Shair Award is given to individuals who stand out as strong supporters of programs that increase the diversity and pluralism in practice at Caltech. Dr. Shair was a member of the chemical engineering faculty. One of his great accomplishments and contributions to the campus was the creation of the Summer Undergraduate Research Fellowships (SURF) program in 1979. He later included high-achieving students from campuses across the country in an effort to support equity in access to Caltech's research communities.

2018 William Charles Schmidt

RENUKA D. SHARMA AWARD

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

2016 Ruomeng Wan

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.

2016 *Phillip Guangning An, Kathleen Anne Chinetti, Ching-Yun Hsu, Anusha Sinha*

2017 *Yiwei Jiang, Licheng Richard Zhu, Mason Gordon MacDougall, Katherine Guo, Kavya Ramakrishnan*

JOHN STAGER STEMPLE MEMORIAL PRIZE IN PHYSICS

The Stemple Prize is awarded annually to a graduate student in physics for outstanding progress in research as demonstrated by an excellent performance on the oral Ph.D. candidacy exam.

2014 *Siying Peng*

2017 *Petr Kravchuk*

2018 *Xiangcheng Ma*

R. BRUCE STEWART PRIZE FOR EXCELLENCE IN TEACHING

The Stewart Prize is awarded annually to a graduate teaching assistant in physics who demonstrates, in the broadest sense, unusual ability, creativity, and innovation in undergraduate and graduate classroom or laboratory teaching.

2018 *Anthony Leo Bartolotta*

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.

2018 *Amanda Ying Lin*

FRANK TERUGGI MEMORIAL AWARD

The Frank Teruggi Memorial Award was established in 1998 by friends and classmates of the late Frank Teruggi, a Caltech undergraduate who was murdered in Chile in 1973, during the military coup led by Augusto Pinochet. The annual award of $500 honors the spirit of Frank's life, especially "in the areas of Latin American Studies, radical politics, creative radio programming, and other activities aimed at improving the living conditions of the less fortunate."

2017 Miguel Ángel González Campos

MORGAN WARD PRIZE

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

2016 Ching-Yun Hsu, Preston Niels Rasmussen

CHARLES AND ELLEN WILTS PRIZE

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

2018 Behrooz Abiri

FREDRICK J. ZEIGLER MEMORIAL AWARD

The Fredrick J. Zeigler Memorial Award was established in 1989 to honor Fredrick J. Zeigler, a member of the class of 1976 and an applied mathematics major. The award, which carries a cash prize of $2,500, is given to a pure or applied mathematics student in his or her sophomore or junior year. The award recognizes excellence in scholarship as demonstrated in class activities or in the preparation of an original paper or essay in any subject area, and is selected by the faculty in pure and applied mathematics.

2016 Celia Yuxin Zhang

2017 William Henry Ballinger

ACADEMIC REGALIA AT CALTECH

The symbolism in the academic regalia worn by graduates at commencement dates back many centuries. Although some aspects of the costume vary among academic institutions, many basic elements are similar. The cap or mortarboard is based on the medieval biretta worn by scholars and artists. The gown's cut and velvet trimming indicate academic rank. The doctoral hood may display the academic field of the wearer's degree and the institution from which it was received. In addition, tassels, cords, and medallions denote various honors awarded by the institution or academic societies.

At commencement, the assortment of colors in academic regalia is on full display. Faculty members are adorned in robes, the colors of which correspond to the scholar's *alma mater*. However, at the time of graduation, most Ph.D. recipients are draped in doctoral hoods that are trimmed in blue velvet, signifying a doctor of philosophy degree, and lined in the colors of the institution conferring the degree.

Caltech graduates receiving a doctorate wear Caltech's signature blue velvet cap, robes trimmed in blue velvet with orange piping, and a blue velvet doctoral hood lined in a chevron pattern of orange and white. Those receiving a bachelor's or master's degree wear a simple black gown and a black mortarboard or cap.

In addition to these traditional items, an undergraduate may also choose to wear a colored stole to the graduation ceremony. While orange stoles denote Caltech pride, other colors may be chosen to represent a distinct element of the Institute's student culture: the undergraduate's house affiliation.

Student houses serve as small communities, or large families, within the broader campus culture, supporting members throughout their academic careers

at the Institute. There are currently eight undergraduate houses at Caltech: **Avery, Blacker, Dabney, Fleming, Lloyd, Page, Ricketts,** and **Ruddock**.

- A ***white stole or a purple and white tassel*** designates **Avery House**; Avery's house color is white.
- A ***silver stole or a black and white tassel*** designates **Blacker House**; Blacker's house color is black.
- A ***green stole or tassel*** designates **Dabney House**; Dabney's house color is green.
- A ***red stole or tassel*** designates **Fleming House**; Fleming's house color is red.
- A ***gold stole or a yellow and white tassel*** designates **Lloyd House**; Lloyd's house color is gold.
- A ***blue stole or tassel*** designates **Page House**; Page's house color is blue.
- A ***maroon stole or tassel*** designates **Ricketts House**; Ricketts's house color is maroon.
- A ***navy blue stole or tassel*** designates **Ruddock House**; Ruddock's house color is navy blue.

GAUDEAMUS IGITUR

Some verses of this anthem go back to 13th-century France, where they appear in a Latin hymn on the transitory nature of life. By the middle of the 18th century, students at German universities had combined the original medieval verses with new ones—including the opening verse that begins *Gaudeamus igitur, juvenes dum sumus* ("Let us rejoice, therefore, while we are young")—to create a song that celebrated youth and the student life, in all of its highbrow (and lower-brow) aspects. In the mid-19th century, the song crossed the Atlantic to Yale, where still more verses were added for use at academic ceremonies.

Since then, *Gaudeamus* has become an academic standard, sung around the world at graduations and other university ceremonies. Verses have been added, or subtracted, for different occasions; the song has been translated into many different languages, sometimes faithfully, sometimes quite imaginatively.

The verses used here (which have been translated below as closely as possible from the Latin into English) combine the youthful energy and irreverent attitude toward authority that characterize Caltech students with a ringing endorsement of the academic enterprise to which they are devoted. They celebrate the Institute and the community of scholars past, present, and future who have done and will continue to do its work.

Gaudeamus igitur	Let us rejoice, therefore,
Iuvenes dum sumus.	While we are young.
Post iucundam iuventutem	After a pleasant youth
Post molestam senectutem	After a troubling old age
Nos habebit humus.	The earth will have us.
Ubi sunt qui ante nos	Where are they who, before us,
In mundo fuere?	Were in the world?
Vadite ad superos	Go to the heavens
Transite in inferos	Cross over into the infernal regions
Hos si vis videre.	If you wish to see them.
Vivat academia!	Long live the academy!
Vivant professores!	Long live the professors!
Vivat membrum quodlibet;	Long live each student;
Vivant membra quaelibet;	Long live the whole community;
Semper sint in flore.	For ever may they flourish!
Alma Mater floreat,	May our Alma Mater flourish,
Quae nos educavit;	Who taught us;
Caros et commilitones,	Who gathered together
Dissitas in regiones	Dear ones and comrades,
Sparsos, congregavit	Scattered in remote places.

Translation: Warren C. Brown

HAIL CIT

(Caltech alma mater)

arranged by Raymond Burkhart

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 2018.

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 24,000 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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