

CALIFORNIA INSTITUTE OF TECHNOLOGY



One Hundred Twenty-Sixth

*Commencement*

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June 12, 2020

126th Annual Commencement  
CALIFORNIA INSTITUTE OF TECHNOLOGY

*Friday, June 12, 2020*  
*10 a.m.*

# PROGRAM

“TO THE CALTECH CLASS OF 2020”	Friends of Caltech
WELCOME	Thomas F. Rosenbaum, Ph.D. <i>President</i> <i>Sonja and William Davidow Presidential Chair</i> <i>and Professor of Physics</i> <i>California Institute of Technology</i>
PRESIDING	David L. Lee, Ph.D. ’74 <i>Chair of the Board of Trustees</i> <i>California Institute of Technology</i>
LAST LESSONS Words of wisdom for the graduates	Caltech Alumni ( <i>see page 5</i> )
CONFERRING OF DEGREES	President Rosenbaum
PRESENTATION OF CANDIDATES FOR DEGREES	
For the Degree of Bachelor of Science	Kevin M. Gilmartin, Ph.D. <i>Dean of Undergraduate Students</i>
For the Degree of Master of Science	Douglas C. Rees, Ph.D. <i>Dean of Graduate Studies</i>
For the Degree of Doctor of Philosophy	
Biology and Biological Engineering	Stephen L. Mayo, Ph.D. ’88 <i>Division Chair</i>
Chemistry and Chemical Engineering	Dennis A. Dougherty, Ph.D. <i>Division Chair</i>
Engineering and Applied Science	Guruswami Ravichandran, Ph.D. <i>Division Chair</i>
Geological and Planetary Sciences	John P. Grotzinger, Ph.D. <i>Division Chair</i>

Humanities and Social Sciences	Jean-Laurent Rosenthal, Ph.D. '88 <i>Division Chair</i>
Physics, Mathematics and Astronomy	Fiona A. Harrison, Ph.D. <i>Division Chair</i>

ANNOUNCEMENT OF AWARDS AND  
CONCLUDING REMARKS

President Rosenbaum

MUSICAL SELECTION

“Fanfare” to <i>La Péri</i>	Paul Dukas
<i>Gaudeamus Igitur</i>	Traditional ( <i>lyrics on page 53</i> )
“Festive March” from <i>Tannhäuser</i>	Richard Wagner
“Coronation March” from <i>Le prophète</i>	Giacomo Meyerbeer
“Grand March” from <i>Aida</i>	Giuseppe Verdi
“Cortège de Bacchus” from <i>Sylvia</i>	Léo Delibes
<i>Hail CIT</i>	Manton Barnes, B.S. '21 arr. Raymond Burkhart ( <i>lyrics on page 55</i> )

*Music performed at the 2018 and 2019 commencement ceremonies by the Caltech Glee Club, Nancy Sulabian, M.M., conductor; and Convocation Brass, Percussion, and Organ Ensemble, Glenn D. Price, D.M.A., conductor; Leslie Deutsch (BS '76, MS '77, PhD '81), organ soloist and arranger.*

*Streaming of Caltech's 2020 commencement ceremony will begin shortly before 10 a.m. on Friday, June 12, at [commencement.caltech.edu/watch](https://commencement.caltech.edu/watch).*

*Follow along with the day's events on Facebook, Twitter, and Instagram. Share your photos and join the celebration by using #Caltech2020. (See page 56 for more information.)*



## LAST LESSONS

The work of Caltech students, scientists, and engineers resounds globally as well as personally. As the Institute prepares to welcome a new class into the extraordinary community of Caltech alumni, several members of this community offer advice, hard-won insight, and words of encouragement for Caltech's 2020 graduates to carry with them as they move on to face new challenges and opportunities.

**Kip S. Thorne (B.S. '62, Blacker)**

*Distinguished Alumnus*  
*Richard P. Feynman Professor of*  
*Theoretical Physics, Emeritus, Caltech*  
*Nobel Laureate in Physics, 2017*

**Christie Canaria (Ph.D. '08)**

*Caltech Alumni Association Board of*  
*Directors*  
*Program Director at NCI SBIR*  
*Development Center*

**France Córdoba (Ph.D. '79)**

*Distinguished Alumna*  
*Caltech Senior Trustee*  
*Former Director,*  
*National Science Foundation*

**Ann Stimmler Johnson**

**(B.S. '99, M.S. '00, Dabney)**  
*Caltech Trustee*  
*Co-Founder and Board Member*  
*of Interana, Inc.*

**Debra Dison Hall (B.S. '74, Ruddock)**

*SURF Board Life Member*  
*Partner, Allen Matkins*

**Bobby Johnson (B.S. '98, Page)**

*Principal Engineer, Twitter*  
*Co-Founder and Board Member*  
*of Interana, Inc.*

**Will Heltsley (B.S. '04, Blacker)**

*Vice President of Propulsion Engineering,*  
*SpaceX*

**Anthony Chong (B.S. '10, Ruddock)**

*Caltech Alumni Association Board of*  
*Directors*  
*CEO, IKASI*



## ABOUT CALTECH

Caltech, founded in 1891, is a world-renowned science and engineering institute that marshals some of the world's brightest minds and most innovative tools to address fundamental scientific questions and pressing societal challenges.

A Caltech education is notable for its rigorous curriculum, close collaborations with faculty, and small class sizes. Caltech students work toward undergraduate and graduate degrees alongside their intellectual equals in an academic environment that emphasizes interdisciplinary teamwork, critical thinking, mutual support, and a deep understanding of core concepts and principles across fields.

Students graduate from Caltech prepared to become world leaders in science, engineering, academia, industry, and public service. Graduates are well trained in their ability to identify, analyze, and solve challenging problems within and across science and engineering disciplines, and are prepared to apply and communicate their expertise broadly throughout their professional careers.

An independent, privately supported institution, Caltech manages the Jet Propulsion Laboratory (JPL) for NASA. Together with JPL, Caltech is Pasadena's largest employer and a source of programs that benefit the entire region. Caltech also owns and operates the Seismological Laboratory, more than 50 research centers and institutes, and a global network of astronomical observatories, including the Palomar and W. M. Keck observatories. In addition, the Institute co-founded and co-manages the Laser Interferometer Gravitational-wave Observatory (LIGO).

Caltech's faculty, students, postdoctoral scholars, and staff produce transformative breakthroughs in fields ranging from quantum science and engineering to bioinformatics to energy and sustainability. Caltech faculty and alumni have earned national and international recognition, including 39 Nobel Prizes.

We celebrate today the 454 graduates who will earn 207 bachelor's degrees, 101 master's degrees, and 146 doctoral degrees, and who will contribute to Caltech's impressive legacy and record of achievement around the world.



## CANDIDATES FOR DEGREES

### Bachelor of Science

Zafir Wei An Abou-Zamzam *Redlands, California* Computer Science  
Rita Beth Aksenfeld *Castaic, California* Chemistry and Biology (Minor)  
Thomas Dylan Alford *Dublin, Ohio* Physics and Computer Science (Minor)  
Margaret Audrey Anderson *Edwardsville, Illinois* Physics and History  
Alec Vincent Andrews *Folsom, California* Computer Science and Business, Economics, and Management  
Cecelia Jane Andrews† *Orinda, California* Biology  
Tristan Ang Tze Heng *Republic of Singapore* Computer Science  
Aaron Matthew Ayres *Tucson, Arizona* Applied and Computational Mathematics and Computer Science (Minor)  
Dushyant Yovan Badal *Belle-Rose, Mauritius* Physics  
Andrew Bai *Portland, Oregon* Applied and Computational Mathematics and Computer Science  
Roshan Singh Bal *Saratoga, California* Computer Science  
Leonardo David Balestri *Minneapolis, Minnesota* Mechanical Engineering and History  
Ayan Bandyopadhyay *San Jose, California* Computer Science  
Sebastian Bedoya† *Greenville, South Carolina* Computer Science  
Patricia Ann Beekman *Waxhaw, North Carolina* Computer Science  
Vivek Bharadwaj *Milpitas, California* Computer Science and Mathematics  
Harsh Girishbhai Bhundiya *Santa Fe, New Mexico* Mechanical Engineering and Aerospace Engineering (Minor)  
Alexandra Vadimovna Bodrova *Moscow, Russia* Mechanical Engineering  
Alexander Addison Bouman *West Lafayette, Indiana* Mechanical Engineering  
Madison Taylor Brady *Chardon, Ohio* Astrophysics  
Jesse Yu Cai *McLean, Virginia* Computer Science  
Philip McKenzie Carr *McLean, Virginia* Computer Science  
Ross Charles Carter *Boston, Massachusetts* Physics and Computer Science (Minor)  
Benjamin Charles Cassese *East Greenwich, Rhode Island* Planetary Science and History

† *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*

- Anuj Chadha *London, United Kingdom* Mechanical Engineering and Control and Dynamical Systems (Minor)
- Arlindo Chan Borges *Macau, People's Republic of China* Astrophysics
- Gabriella Christina Chan *Colleyville, Texas* Chemical Engineering (Environmental)
- Jonathan Kai Shun Chan *Hong Kong, PRC* Chemistry
- Sharon Tiffany Chen *Pleasanton, California* Computer Science
- Timothy Chen *Roslyn, New York* Mechanical Engineering
- Victor Linus Chen *Rowland Heights, California* Computer Science and Information and Data Sciences (Minor)
- Daniel Chica† *Houston, Texas* Physics
- Bhairav Peri Chidambaram *San Diego, California* Computer Science and Information and Data Sciences (Minor)
- Nicolas James Choquette *Torrance, California* Chemical Engineering (Process Systems)
- Sophia Lucille Coplin *Hailey, Idaho* Computer Science
- Sarah Josephine Crucilla *Armonk, New York* Geology
- Sunny Cui *Vancouver, Canada* Electrical Engineering and Information and Data Sciences (Minor)
- Samantha Estelle D'Costa *San Jose, California* Computer Science
- George Heros Daghljan *Altadena, California* Biology
- Sihui Dai *New Providence, New Jersey* Computer Science and Information and Data Sciences (Minor)
- Noelle Unyoung Davis *Fort Worth, Texas* Electrical Engineering
- Maria De Angelis *Santa Barbara, California* Computer Science
- Maximilien Fadi Debbas *Norfolk, Virginia* Physics
- Cayla Maria Dedrick *Carlsbad, California* Astrophysics and Geological and Planetary Sciences (Minor)
- Ramya Rajiv Deshpande *Knoxville, Tennessee* Bioengineering and Computer Science (Minor)
- Erica Kristiana Diaz *Wilmette, Illinois* Computer Science
- Amanda Hazel Dilmore *Lake Mary, Florida* Biology
- Dessie DiMino *Garden City, New York* Computer Science
- Jing Ding *Nanjing, People's Republic of China* Mathematics and Computer Science
- Stephanie Qiu Li Ding *Sydney, Australia* Computer Science
- Harel Dor *Sunnyvale, California* Applied Physics and Computer Science
- Kenny Duran† *Bronx, New York* Physics and Computer Science (Minor)
- Megan Lynne Durney *Escondido, California* Computer Science

## *Bachelor of Science continued*

- David Ballantyne Elliott *Salt Lake City, Utah* Electrical Engineering and Computer Science (Minor)
- David Ignacio Fager *Miami, Florida* Mathematics and Economics
- Michelle Elizabeth Fan *Rockville, Maryland* Computer Science
- Nicole Zhe-Jun Feng *Bethany, Connecticut* Applied and Computational Mathematics
- Ishani Ganguly *Bellevue, Washington* Engineering and Applied Science (Computation and Neural Systems) and Computer Science (Minor)
- Ian Abraham Garcia *North Hollywood, California* Electrical Engineering
- Dana Paige Gephart† *Reno, Nevada* Chemistry
- Claire Marie Goeckner-Wald *Plano, Texas* Computer Science
- Juan Felipe Gómez *Alpharetta, Georgia* Physics
- Gokul Gowri *Bothell, Washington* Bioengineering
- Marcel Lee Griffioen *Sarasota, Florida* Geophysics and Computer Science (Minor)
- Karen Guo *Phoenix, Arizona* Electrical Engineering and Computer Science (Minor)
- Tanvi Gupta *Frisco, Texas* Computer Science and Business, Economics, and Management
- Richard Thomas Hamel *Morris Plains, New Jersey* Mechanical Engineering
- Ariel Elizabeth Hasse-Zamudio *Wasilla, Alaska* Physics
- Dana He *Mercer Island, Washington* Bioengineering and Computer Science (Minor)
- Erik Emmanuel Herrera *Commerce, California* Mathematics
- Brendan Jackson Hollaway *Austin, Texas* Computer Science
- Sarah L Hou *Hawthorn Woods, Illinois* Biology
- Juliette May Hu *Albany, Georgia* Computer Science
- Tianyi Hu *Qingdao, People's Republic of China* Engineering and Applied Science
- Adrian Jiajin Huang *San Jose, California* Chemistry
- Zhong Qian Huang *Auckland, New Zealand* Mechanical Engineering
- Daniil Valentinovich Ilyin *Chicago, Illinois* Physics and Chemistry (Minor)
- Laura Gabriela Jaliff *New York, New York* Physics and Environmental Science and Engineering (Minor)
- Rupesh Jeyaram *Chelmsford, Massachusetts* Computer Science and Environmental Science and Engineering (Minor)
- Bret Robert Johnson *Carlsbad, California* Computer Science and Business, Economics, and Management
- Lewis Cameron Jones *Austin, Texas* Mechanical Engineering and Economics
- Bradley James Justice *El Cajon, California* Computer Science
- Anant Kale *Aurangabad, India* Physics and Computer Science (Minor)
- Karthik Vishwanath Karnik *Westborough, Massachusetts* Computer Science and Mathematics

## *Bachelor of Science continued*

Nivetha Karthikeyan *Marlboro, New Jersey* Computer Science and History  
Carl Heinrich Christian Keck *Middletown, Connecticut* Materials Science  
Jake Berenson Ketchum† *Redwood City, California* Mechanical Engineering  
Yeokyoung Kil *Cheonan-si, Republic of Korea* Electrical Engineering  
Hyunseong Linus Kim *Seongnamsi, Republic of Korea* Physics  
Katherine Knox† *Lake Mary, Florida* Materials Science  
David Edi Kornfeld *Denver, Colorado* Electrical Engineering  
Tim Krasnoperov *Pasadena, California* Computer Science  
Alex Andreas Krotz *San Diego, California* Chemistry  
Siddharth Sai Kurella *South Brunswick, New Jersey* Computer Science  
Maggie Michelle Lang *Derwood, Maryland* Physics  
Alexa Renee Lauinger *Ortonville, Michigan* Biology and Environmental Science and  
Engineering (Minor)  
Mei-Ling M Laues *Chicago, Illinois* Computer Science  
Madison Lee *Jacksonville, Florida* Electrical Engineering  
Thomas James Leing *Longmont, Colorado* Computer Science  
Alexander Thomas Lettenberger *Glen Ellyn, Illinois* Computer Science and Business,  
Economics, and Management  
Angela G. Li *Carlsbad, California* Computer Science  
Jieni Li *Shanghai, People's Republic of China* Computer Science and Information and Data  
Sciences (Minor)  
Lauren Li *Houston, Texas* Computer Science  
Crystal Liang *Issaquah, Washington* Computer Science and English (Minor)  
Ty Luna Limpasuvan *Myrtle Beach, South Carolina* Computer Science  
Nora Brooks Linzer *Evanston, Illinois* Physics  
Qianhe Liu *Prescott, Arizona* Chemical Engineering (Process Systems)  
Xiaoling Liu *Beijing, People's Republic of China* Physics  
Jade Livingston *Edgartown, Massachusetts* Biology  
Jacqueline Julia Lodman *Escondido, California* Physics  
Christopher Mitchell Long *Winter Park, Florida* Materials Science  
Alejandro Lopez† *Pembroke Pines, Florida* Chemical Engineering (Biomolecular)  
Sierra MacKenzie Lopezalles *Plainfield, Illinois* Biology and History  
Tiger Chen Lu *Shanghai, People's Republic of China* Astrophysics and Computer Science (Minor)  
John Bennett Mackay *New Scotland, New York* Applied and Computational Mathematics and  
Environmental Science and Engineering (Minor)  
Morgaine Innis Mandigo-Stoba *Mill Valley, California* Physics

## *Bachelor of Science continued*

Daniel Keat Kay Mark *Republic of Singapore* Physics and Mathematics  
Surya Mathialagan *Republic of Singapore* Mathematics and Computer Science  
Sudhi Mathur *Jaipur, India* Physics  
James Robert McLaughlin *Parkland, Florida* Computer Science  
Roberto Mercado *Sarasota, Florida* Computer Science  
Grant Gerald Messner *Lake Forest, Illinois* Physics  
Cathy Miao *Manhattan Beach, California* Computer Science  
Rebecca Anne Mikofsky *New York, New York* Materials Science  
Jayce Warren Miller *Homer, Alaska* Physics and Chemistry  
Kyung Hoi Min *Seoul, Republic of Korea* Biology and Computer Science  
Prinesh Kamal Mistry *San Diego, California* Mechanical Engineering  
Ziyan Mo *Portage, Michigan* Computer Science  
Antonio Monreal *Chihuahua, Mexico* Electrical Engineering  
Christopher Moon *Los Angeles, California* Mathematics  
Tanner Timothy Moore *Roseville, California* Mechanical Engineering and Aerospace  
Engineering (Minor)  
Alex Cristian Moraru *Southlake, Texas* Electrical Engineering and Business, Economics, and  
Management  
Siqiao Mu† *Ridgefield, Connecticut* Applied and Computational Mathematics  
Karthik Praveen Nair *Moscow, Russia* Computer Science  
Maitreyi Ajitkumar Nair *Houston, Texas* Computer Science  
Sasha Nanda *Dubai, United Arab Emirates* Physics  
Cherish Nie *Dublin, Ohio* Chemistry and Computer Science (Minor)  
Avery Jay Nielsen† *Wilmington, Delaware* Physics and Geological and Planetary Sciences  
(Minor)  
Andrew A. Ortegaray *Walnut, California* Mathematics and Physics  
William Parker Overman *Mechanicsville, Virginia* Mathematics and Computer Science  
Kayla Ann Owens *Honolulu, Hawaii* Planetary Science  
Angelina Pan *Toronto, Canada* Physics and Computer Science (Minor)  
Emily Sophia Pan *San Jose, California* Computer Science  
Hee Won Park *Seoul, Republic of Korea* Computer Science  
Grace Peng *San Ramon, California* Computer Science  
Cortland Knight Perry *New York, New York* Computer Science  
Karen Pham *Orange, California* Geology  
Samuel Louis Piascik *Madison, Wisconsin* Physics

## *Bachelor of Science continued*

- Eli Joshua Pinkus *Hastings-on-Hudson, New York* Computer Science and Business, Economics, and Management
- Olivia Carol Elizabeth Pomerenk *Bethesda, Maryland* Applied and Computational Mathematics and English (Minor)
- Nikhil Hegde Poole *Arcadia, California* Electrical Engineering and Computer Science (Minor)
- Harald Esko Jakob Putterman *Malibu, California* Physics
- Hamza Hussain Raniwala *Tracy, California* Applied Physics
- Skye Victoria Reese *Concord, New Hampshire* Electrical Engineering
- Alexander Capps Reeves *Ann Arbor, Michigan* Astrophysics and Mechanical Engineering
- Amrita Rhoads *Tempe, Arizona* Bioengineering
- Simon Kofoid Ricci *Chicago, Illinois* Physics
- Milan Sharma Roberson *West Chester, Pennsylvania* Physics and Computer Science (Minor)
- Alden Bienen Rogers *Vashon, Washington* Computer Science
- Michael Klaus Rupprecht† *Chicago, Illinois* Mathematics and Geology (Minor)
- Erika Emmanuelle Salzman *College Station, Texas* Materials Science
- Miranda Lee Schwacke *Johns Island, South Carolina* Materials Science
- Arnav Sharma *Levittown, New York* Computer Science and Philosophy (Minor)
- Maxwell Bernard Shen Molesky *Lexington, Massachusetts* Biology
- Helena Julie Shield *Mercer Island, Washington* Computer Science
- Woo Jun Shim *New York, New York* Biology and Chemistry (Minor)
- Tzarina Shoreh Afagh Shippee *La Jolla, California* Physics and Computer Science (Minor)
- David Joseph Shlivko *Holmdel, New Jersey* Physics
- Kapil Sinha *Salinas, California* Computer Science
- Tawny Yui-ning Sit *Roslyn, New York* Astrophysics
- Yanke Song *Xi'an, People's Republic of China* Applied and Computational Mathematics
- Connor Jonathan Soohoo *Redwood City, California* Computer Science and Information and Data Sciences (Minor)
- Carlos Humberto Sosa *Houston, Texas* Physics
- George Andreas Stathopoulos *Williamsburg, Virginia* Computer Science
- Sarah Catherine Steele *Richmond, Virginia* Physics
- Ariel Weiyong Stiber *Kenmore, Washington* Chemical Engineering (Materials) and English (Minor)
- Matthew David Strong† *Aurora, Colorado* Mechanical Engineering
- Alexandra Marie Stutt† *Brooklyn, New York* Mechanical Engineering
- Henry Calvin Sun *Arcadia, California* Computer Science
- Hsuan-Te (Miriam) Sun *Diamond Bar, California* Biology

## *Bachelor of Science continued*

Jui-Hung Sun *Kaohsiung, Taiwan (ROC)* Electrical Engineering  
Bethany Anne Suter *Harrisonburg, Virginia* Physics  
Aidan Maxwell Swope *Kaneohe, Hawaii* Computer Science  
Kaitlyn Lee Takata *Honolulu, Hawaii* Biology  
Aditya Anwesh Telikicherla *Omaha, Nebraska* Electrical Engineering  
Gianmarco Guin Terrones *McLean, Virginia* Chemical Engineering (Process Systems)  
Narmada Gayatri Thayapran *Porterville, California* Biology  
Joseph Teferi Tilahun *San Jose, California* Computer Science  
Alicia Helen Tirone *Collierville, Tennessee* Physics  
Miha Valencic *Colleyville, Texas* Chemical Engineering (Materials)  
Tine Valencic *Colleyville, Texas* Physics  
Akshay Raju Vegesna *Bangalore, India* Applied and Computational Mathematics  
Vibha Vijayakumar *San Marcos, California* Computer Science  
Iman Ameneh Wahle *Portland, Oregon* Computer Science  
Eleanor Ann Walker *Minneapolis, Minnesota* Chemical Engineering (Process Systems)  
Sophie Jean Walton *Emerald Hills, California* Bioengineering and Information and Data  
Sciences (Minor)  
Allison Yiyun Wang *Sunnyvale, California* Mathematics  
Jessica Wang *Sammamish, Washington* Computer Science  
Pei (Betty) Wang† *Cerritos, California* Computer Science and Political Science  
Shuxian Wang *Falls Church, Virginia* Computer Science and English (Minor)  
Tina Siwan Wang *Oak Ridge, Tennessee* Computer Science  
Mackenzie Renée Wooten *Las Vegas, Nevada* Physics  
Craig Douglas Worley *McDonough, Georgia* Mechanical Engineering  
Asta Chen Wu *Sugar Land, Texas* Mechanical Engineering  
Helena Chen Wu *Allen, Texas* Computer Science  
Alexander Friedrich Wuschner *Farmington, Connecticut* Applied Physics  
Julia Xia *San Jose, California* Mechanical Engineering  
Theodore Sunny Yang *Columbia, Maryland* Chemical Engineering (Biomolecular) and  
Environmental Science and Engineering (Minor)  
Dennis Joseph Yatunin† *Brooklyn, New York* Physics and Computer Science  
Evan Chaoteh Yeh *Plano, Texas* Electrical Engineering  
Muhammad Akmal Younis *Miami, Florida* Computer Science and Information and Data  
Sciences (Minor)  
Evan Erwen Yu *Irvine, California* Mechanical Engineering

## *Bachelor of Science continued*

Kevin Justin Yu *Park Ridge, New Jersey* Computer Science and Business, Economics, and Management

Rona Yu *North Potomac, Maryland* Computer Science

Sean Shuangwei Yu *Bellevue, Washington* Mathematics

Hanwen Zhang *Beijing, People's Republic of China* Computation and Neural Systems

Manxuan Zhang† *Toronto, Canada* Astrophysics

Pamela Zhang *Gilroy, California* Computer Science

Xiaotian Zhang *Westport, Connecticut* Information and Data Sciences

Eric Li Zhao *San Ramon, California* Computer Science

Michelle Zhao *San Diego, California* Computer Science and Information and Data Sciences  
(Minor)

Angelica Zhou† *Vaughan, Canada* Planetary Science

Arjun Shivam Zutshi *Aurora, Illinois* Chemical Engineering (Process Systems)



## *Master of Science*

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- Garima Aggarwal (*Space Engineering*) B.Tech., Indian Institute of Space Science and Technology 2019.
- Hamidreza Akbari (*Applied Physics*) B.S., Sharif University of Technology 2014; M.S., 2017.
- Prithvi Akella (*Mechanical Engineering*) B.S., University of California, Berkeley 2018.
- Andrew James Akerson (*Mechanical Engineering*) B.Eng., University of Minnesota, Twin Cities 2016; M.S., 2018.
- Brayden Jeremy Aller (*Space Engineering*) B.Eng., Vanderbilt University 2019.
- Julie Camille André (*Aeronautics*) B.S., École Polytechnique 2018.
- Arianna Bernaldez Ayonon (*Chemistry*) B.S., San Diego State University 2017.
- Sarah Catherine Bevilacqua (*Chemistry*) B.S., Pennsylvania State University 2017.
- Purna Chandra Jagannadh Kumar Boddapati (*Mechanical Engineering*) B.Tech., Indian Institute of Technology Madras 2018.
- Xenia Mary Boyes (*Geology*) B.A., M.Sc., University of Cambridge 2018.
- Miles Chan (*Aeronautics*) B.S., Georgia Institute of Technology 2019.
- Benjamin K Chang (*Applied Physics*) B.S., National Tsing Hua University 2015; M.S., National Taiwan University 2017.
- Amylynn C. Chen (*Materials Science*) B.S., M.S., University of California, Los Angeles 2016.
- Karlming Chen (*Mathematics*) B.Sc., University of British Columbia 2013; M.A.Sc., University of Waterloo 2014.
- Shuqing Chen (*Electrical Engineering*) B.S., Rice University 2017.
- Quentin Michel Gilbert Chevalier (*Aeronautics*) M.Eng., École Polytechnique 2019.
- Changsoon Choi (*Electrical Engineering*) B.S., Korea University 2015; M.S., 2018.
- Sung Hoon Choi (*Electrical Engineering*) B.S., California Institute of Technology 2018.
- D.M. Sahangi Pulsarani Dassanayake (*Space Engineering*) B.Sc., University of Moratuwa 2018.
- James Christopher Deacon (*Electrical Engineering*) B.S., California Institute of Technology 2019.
- Weiting Deng (*Medical Engineering*) B.Eng., University of Science and Technology of China 2017.
- Niyati Ketan Desai (*Space Engineering*) S.B., Massachusetts Institute of Technology 2019.
- Heng Dong (*Environmental Science and Engineering*) B.Eng., Tsinghua University 2018.
- Alex Donzelli (*Applied Mechanics*) B.S., Università Politecnica delle Marche 2016.
- Kaleigh Lynnae Durst (*Chemical Engineering*) B.S., Arizona State University 2017.
- Irene Dutta (*Physics*) B.S., M.S., Indian Institute of Science Education and Research, Pune 2017.
- Haotian Fang (*Social Science*) B.S., University of California, Los Angeles 2014; M.S., Columbia University 2016.

## *Master of Science continued*

- Michael Tianyu Fang (*Applied Physics*) B.S., University of California, Santa Barbara 2015.
- Jingxing Gao (*Electrical Engineering*) B.E., Zhejiang University 2018.
- Sumit Goel (*Social Science*) B.Tech., Delhi Technological University 2015; M.S., Indian Statistical Institute 2017.
- Wen Gu (*Electrical Engineering*) B.S., Rensselaer Polytechnic Institute 2018.
- Zichen Gu (*Mechanical Engineering*) B.S., Nanjing University 2018.
- Peter John Gunnarson (*Aeronautics*) B.S., University of Virginia 2019.
- Andrew David Halleran (*Bioengineering*) B.S., The College of William & Mary 2016.
- Tanner David Harms (*Aeronautics*) B.S., University of Wyoming 2016; M.S., 2019.
- Sho Harvey (*Biochemistry and Molecular Biophysics*) B.S., University of Michigan, Ann Arbor 2016.
- Erin Jessica Hightower (*Geophysics*) B.A., Colorado College 2016.
- Benjamin L. Hoscheit (*Physics*) B.S., University of Wisconsin-Madison 2017.
- Yuting Huang (*Mechanical Engineering*) B.S., University of California, San Diego 2018.
- Feng Jiang (*Electrical Engineering*) B.E., Zhejiang University 2018.
- Muhammad Musab Jilani (*Medical Engineering*) B.S., California Institute of Technology 2015.
- Omar Kamal (*Mechanical Engineering*) B.A.Sc., University of Waterloo 2018.
- Sari Kerckhove (*Electrical Engineering*) B.Sc., Ghent University 2017; M.Sc., 2019.
- Brian Lee Kiwon Kim (*Mechanical Engineering*) B.S., Boston University 2018.
- Axl Xavier LeVan (*Chemistry*) B.S., Montana State University 2017.
- Matthew Murray Libersky (*Applied Physics*) B.S., Valparaiso University 2016.
- Diyi Liu (*Electrical Engineering*) B.S., Zhejiang University 2018.
- Wenzheng Liu (*Applied Physics*) B.S., University of Science and Technology of China 2018.
- Yuxin Liu (*Electrical Engineering*) B.E., The Australian National University 2017.
- Yangcheng Luo (*Environmental Science and Engineering*) B.S., Peking University 2018.
- Ying Luo (*Aeronautics*) B.Eng., The University of Sydney 2018.
- Lin Ma (*Electrical Engineering*) B.Eng., Nanyang Technological University 2016.
- Hayden S MacArthur (*Geophysics*) B.A., University of California, Berkeley 2018.
- Geoffrey Daniel Guillaume Magda (*Aeronautics*) M.S., École Polytechnique 2019.
- Sindhu Manchikanti (*Aeronautics*) B.Tech., Vellore Institute of Technology 2019.
- Nicholas Samuel McCarty (*Bioengineering*) B.S., The University of Iowa 2017.
- Emily Yishiuan Miaou (*Geochemistry*) B.S., California Institute of Technology 2018.
- Rigoberto Moncada Lopez (*Applied Mechanics*) B.Sc., Universidad Tecnológica Centroamericana 2009; M.Sc., Tohoku University 2012.
- Elliott P Mueller (*Geobiology*) B.S., Northeastern University 2017.
- Patricia Jewell Nance (*Chemistry*) B.S., Southern Methodist University 2017.

## *Master of Science continued*

- Nicholas Hao Nelsen (*Mechanical Engineering*) B.S., Oklahoma State University 2018.
- Alexander Charles Ogren (*Mechanical Engineering*) B.S., University of Wisconsin-Madison 2018.
- Corina Bianca Panda (*Mathematics*) A.B., Princeton University 2011; M.Sc., Leiden University 2013.
- Jinsoo Park (*Applied Physics*) B.S., Seoul National University 2016.
- Harrison Alexander Parker (*Environmental Science and Engineering*) B.S., University of California, San Diego 2014.
- Sergio Alexander Parra (*Geobiology*) B.S., Georgia Institute of Technology 2018.
- John Monroe Pederson (*Aeronautics*) B.S., Columbia University 2019.
- Saturnin Jean Patrick Pugno (*Electrical Engineering*) M.Eng., Imperial College London 2018.
- James Francis Ragan III (*Space Engineering*) B.S., University of Washington 2019.
- Shivam Dipak Raikundalia (*Electrical Engineering*) Sc.B., Brown University 2018.
- Nikhil Ranganathan (*Space Engineering*) B.S., Cornell University 2019.
- Gregory David Roberts (*Applied Physics*) B.S., University of California, Berkeley 2014.
- Ellen Trim Robo (*Geophysics*) A.B., Harvard College 2016.
- Juliet Ryan-Davis (*Geology*) B.A., Middlebury College 2013.
- Eva Linghan Scheller (*Geology*) B.Sc., University of Copenhagen 2017.
- Donner Thomas Schoeffler (*Aeronautics*) B.S., Loyola Marymount University 2019.
- Sha Sha (*Electrical Engineering*) B.S., Tsinghua University 2018.
- Haotian Sheng (*Electrical Engineering*) B.S., University of California, San Diego 2018.
- Shawn JiaXiang Sheng (*Electrical Engineering*) B.A.Sc., University of Waterloo 2019.
- Clare Emilie Elmendorf Singer (*Environmental Science and Engineering*) B.A., The University of Chicago 2018.
- Carl Raymond Swindle (*Geology*) B.S., University of California, Santa Barbara 2018.
- Yuqing Tang (*Physics*) B.S., University of Waterloo 2015.
- Jacqueline Rose Tawney (*Aeronautics*) B.S., Drexel University 2018.
- Jiaobing Tu (*Medical Engineering*) B.Eng., Imperial College London 2017.
- Ankit Verma (*Electrical Engineering*) B.Tech., Indian Institute of Space Science and Technology 2019.
- Fernando Joaquin Villafuerte (*Materials Science*) B.A., Hunter College of the City University of New York 2017.
- Tian Wang (*Physics*) B.S., Shandong University 2012; M.S., University of Calgary 2014.
- John Stephen Weeks IV (*Mechanical Engineering*) B.S.E., University of Michigan, Ann Arbor 2018.

*Master of Science continued*

- Helen E. Wexler (*Civil Engineering*) B.Arch., Bezalel Academy of Arts and Design 2016.  
Steven Andrew Wood (*Applied Physics*) B.S., Temple University 2018.  
Lue Wu (*Applied Physics*) B.S., Tsinghua University 2016.  
Yu Wu (*Electrical Engineering*) B.E., Nanjing University 2018.  
Liting Xiao (*Physics*) B.A., University of Virginia 2015.  
Changhao Xu (*Medical Engineering*) B.S., Fudan University 2018.  
Bryan Yuqun Yao (*Electrical Engineering*) B.S., The University of Texas at Austin 2019.  
Jin Yan Yeo (*Electrical Engineering*) B.Eng., National University of Singapore 2019.  
Sarah Soojin Zeichner (*Geochemistry*) B.S., The University of Chicago 2016.  
Xueyue Zhang (*Applied Physics*) B.Eng., Tsinghua University 2017.  
Yi Zhang (*Environmental Science and Engineering*) B.S., The College of William & Mary 2018.  
Yongliang Zhang (*Physics*) B.S., Peking University 2014.

## *Doctor of Philosophy*

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### DIVISION OF BIOLOGY AND BIOLOGICAL ENGINEERING

Said R. Bogatyrev (*Bioengineering*) M.D., I.M. Sechenov First Moscow State Medical University 2007.

Thesis: Development of Analytical Tools and Animal Models for Studies of Small-Intestine Dysbiosis.

Griffin Daniel Chure (*Biochemistry and Molecular Biophysics*) A.S., Utah State University 2009; B.S., University of Utah 2013.

Thesis: The Molecular Biophysics of Evolutionary and Physiological Adaptation.

Arash Farhadi (*Bioengineering*) B.A.Sc., University of Waterloo 2011; M.S., University of Toronto 2014.

Thesis: Acoustic Reporter Genes for Noninvasive Imaging of Cellular Function.

Zhannetta V. Gugel (*Neurobiology*) B.S., University of Pittsburgh 2014.

Thesis: Effects of Sensory Experience on Early Stages of Olfactory Processing in the Fruit Fly.

Mikhail Henning Hanewich-Hollatz (*Bioengineering*) B.A.Sc., University of Waterloo 2011.

Thesis: Conditional Guide RNAs: Programmable Conditional Regulation of CRISPR/Cas Function via Dynamic RNA Nanotechnology.

Janis Karan Hesse (*Computation and Neural Systems*) B.S., Freie Universität Berlin 2011.

Thesis: Neural Construction of Conscious Perception.

Robert Francis Johnson (*Bioengineering*) B.S., California Institute of Technology 2015.

Thesis: Formal Design and Analysis for DNA Implementations of Chemical Reaction Networks.

Erik Bradley Jue (*Bioengineering*) B.S., University of California, Los Angeles 2014.

Thesis: Improved Tools for Point-of-Care Nucleic Acid Amplification Testing.

Dong-Wook Kim (*Computation and Neural Systems*) B.S., Pohang University of Science and Technology 2008; M.S., University of Science and Technology 2010.

Thesis: Multimodal Analysis of Cell Types in a Hypothalamic Node Controlling Social Behavior in Mice.

Sangjun Lee (*Neurobiology*) B.S., Gwangju Institute of Science and Technology 2014; M.S., California Institute of Technology 2019.

Thesis: The Neural Basis of Sodium Appetite.

*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*

- Adam Patrick Neumann (*Bioengineering*) B.S., Cornell University 2009; M.E., 2010.  
Thesis: Towards Single Molecule Imaging Using Nanoelectromechanical Systems.
- Sofia Agustina Quinodoz (*Molecular Biology and Biochemistry*) A.B., Princeton University 2013.  
Thesis: Higher-Order RNA and DNA Hubs Shape Genome Organization in the Nucleus.
- Sripriya Ravindra Kumar (*Biology*) B.Tech., Anna University, Chennai 2010; M.S., University of Illinois at Chicago 2012.  
Thesis: Engineering Vectors for Non-Invasive Gene Delivery to the Central Nervous System Using Multiplexed-CREATE.
- Kurt Michael Reichermeier (*Biology*) M.D., Justus Liebig University Giessen 2014.  
Thesis: Quantitative Characterization of Composition and Regulation of Cullin-RING Ubiquitin Ligases.
- Scott Harrison Saunders (*Microbiology*) B.S., The University of Georgia 2014.  
Thesis: Mechanisms of Phenazine-Mediated Extracellular Electron Transfer by *Pseudomonas aeruginosa*.
- John Warren Lenzi Thompson (*Cellular and Molecular Neurobiology*) B.S., University of Minnesota, Twin Cities 2012.  
Thesis: Chemical Tools for Studying O-GlcNAc Glycosylation at the Systems Level.
- Bryan B. Yoo (*Cellular and Molecular Neurobiology*) B.S., Stanford University 2010.  
Thesis: Host-Microbe Interactions Impacting and Mediated by Nervous Systems.
- Dhruv Sergio Zocchi (*Neurobiology*) B.S., University of California, San Diego 2013.  
Thesis: Processing at Primary Chemosensory Neurons.

## DIVISION OF CHEMISTRY AND CHEMICAL ENGINEERING

- Zainab Ahmed Al-Saihati (*Chemistry*) B.S., The University of Texas at Austin 2012.  
Thesis: C(sp<sup>3</sup>)-H Activation *via* Dehydrogenation of Cyclic and Heterocyclic Alkanes by Single-Site Iridium Pincer Ligated Complexes.
- Eric John Alexy (*Chemistry*) B.S., North Carolina State University 2015.  
Thesis: Development of Enantioselective Transition-Metal Catalyzed Allylic Alkylation Methodologies.
- Katherine Irene Brugman (*Biochemistry and Molecular Biophysics*) B.S., University of California, Berkeley 2012.  
Thesis: *pezo-1* function in *Caenorhabditis elegans*.
- Matthew J. Chalkley (*Chemistry*) B.S., Yale University 2013.  
Thesis: Proton-Coupled Electron Transfer in Nitrogen Fixation.

## *Doctor of Philosophy continued*

- Kai Chen (*Chemistry*) B.S., Zhejiang University 2012.  
Thesis: Expanding the Catalytic Repertoire of Heme proteins as Carbene Transferases to Access Diverse Molecular Structures.
- Hunter Cole Davis Ozawa (*Chemistry*) B.A., The University of Chicago 2013.  
Thesis: Mechanistic Insights for Magnetic Imaging and Control of Cellular Function.
- Meaghan Marie Deegan (*Chemistry*) B.A., Dartmouth College 2014.  
Thesis: Small Molecule Reactivity of Trisphosphine-supported Iron and Cobalt Complexes.
- Sarah Anne Del Ciello (*Chemistry*) B.S., The University of Chicago 2013.  
Thesis: Kinetic Studies of Hydrogen Oxidation by Cobaloximes and Synthesis, Spectroscopy and Boronation of a New Heteroleptic Ruthenium Cyanide Complex.
- Javier Fajardo Jr. (*Chemistry*) B.S., University of California, Riverside 2013.  
Thesis: Transition Metal Complexes for Challenging Reductive Transformations: From Nitrogen Fixation Catalysts to Photoreductants.
- Chengcheng Fan (*Biochemistry and Molecular Biophysics*) B.S., University of California, Los Angeles 2012.  
Thesis: Structure, Function, and Application of Bacterial ABC Transporters.
- Sean SL Feng (*Chemistry*) B.S., University of California, Irvine 2015.  
Thesis: Development of a Modular Strategy Towards the Total Synthesis of (+)-Pleuromutilin and Progress Towards the Synthesis of (-)-Merrilactone A.
- Elizabeth Lee Goldstein (*Chemistry*) B.A., Coe College 2014.  
Thesis: Synthesis of Enantioenriched (Poly)Fluorinated Building Blocks, 2,2-Disubstituted Pyrrolidines and [7,7]Paracyclophanes.
- Nina Xiao Gu (*Chemistry*) A.B., Harvard College 2014.  
Thesis: Synthesis, Characterization, and Reactivity of Thiolate-Supported Metalloradicals.
- Nathanael Allen Hirscher (*Chemistry*) B.S., University of Virginia 2014.  
Thesis: Investigation of Ethylene Tetramerization Catalysis from Structurally-Defined Organochromium Compounds.
- Yonil Jung (*Biochemistry and Molecular Biophysics*) B.S., University of Illinois at Urbana-Champaign 2012.  
Thesis: Neurons that Control Social States in *Drosophila melanogaster*.
- Rachel Ann Krueger (*Chemistry*) B.A., Mount Holyoke College 2013.  
Thesis: Theoretical Characterization of Aromatic Exciplex Fluorescence.
- Kyu Hyun Lee (*Biochemistry and Molecular Biophysics*) B.A., Pomona College 2011.  
Thesis: Visual Computations in the Superior Colliculus.

## *Doctor of Philosophy continued*

- Jiaming Li (*Chemistry*) B.S., Zhejiang University 2014.  
Thesis: Concise Total Syntheses of Delta<sup>12</sup>-Prostaglandin J Natural Products Using Stereoretentive Metathesis.
- Xinran Liu (*Chemical Engineering*) B.S., Rice University 2015; M.S., California Institute of Technology 2018.  
Thesis: Cell-Selective Proteomic Profiling in Complex Biological Systems.
- Elizabeth Margaret Lunny (*Chemistry*) B.S., Providence College 2012.  
Thesis: High-Resolution Photoacoustic Spectroscopy of the Oxygen A-Band.
- Brendon James McNicholas (*Chemistry*) B.S., University of California, Berkeley 2014.  
Thesis: New Electrolytic Media and Methods for Energy Storage and Conversion.
- Ryan Cecil Ng (*Chemical Engineering and Materials Science*) B.S., University of California, Santa Barbara 2014; M.S., California Institute of Technology 2016.  
Thesis: Nanophotonic Phenomena in Dielectric Photonic Crystals.
- Nicholas James Porubsky (*Chemical Engineering*) B.S., University of Wisconsin-Madison 2013; M.S., California Institute of Technology 2015.  
Thesis: Enhanced Algorithms for Analysis and Design of Nucleic Acid Reaction Pathways.
- David Phillip Schuman (*Chemistry*) B.S., University of Wisconsin-Madison 2014.  
Thesis: Development and Mechanistic Investigation of Potassium *tert*-Butoxide Catalyzed C–H Silylation.
- Lars Josef Schwan (*Chemistry*) B.S., Uppsala Universitet 2015.  
Thesis: Electronic Structures of Perfunctionalized Dodecaborate Clusters.
- Rebekah Miriam Brawer Silva (*Chemistry*) B.S., Stanford University 2012; M.S., California Institute of Technology 2016.  
Thesis: Attributes of the [4Fe4S] Cofactor Coordinated by UvrC, a DNA Repair Enzyme.
- Bradley Ross Silverman (*Chemical Engineering*) B.S., Georgia Institute of Technology 2013.  
Thesis: Protein-Mediated Colloidal Assembly.
- Yapeng Su (*Chemical Engineering and Systems Biology*) B.E., Tianjin University 2013; M.S., California Institute of Technology 2016.  
Thesis: Resistance is Futile: Physical Science, Systems Biology and Single-Cell Analysis to Understanding the Plastic and Heterogeneous Nature of Melanoma and Their Role in Non-Genetic Drug Resistance.
- Shuai Wang (*Biochemistry and Molecular Biophysics*) B.S., Wuhan University 2011.  
Thesis: Co-translational Protein Targeting and Insertion by SecA.
- Sara Jean Weaver (*Chemistry*) B.A., Barnard College 2012.  
Thesis: Visualizing Small Proteins with the cryoEM Platform and the Structure of the *Vibrio cholerae* Type IV Competence Pilus Secretin PilQ.



## *Doctor of Philosophy continued*

Austin Cameron Wright (*Chemistry*) B.S., Pennsylvania State University 2014.

Thesis: Evolving Strategies Toward the Synthesis of Curcusone C.

Dmitriy Vladimirovich Zhukov (*Chemical Engineering*) B.S., The University of Texas at Austin 2012.

Thesis: Facilitating Miniaturized Bioanalytical Assays in Microfluidic Devices.

### DIVISION OF ENGINEERING AND APPLIED SCIENCE

Ehsan Abbasi (*Electrical Engineering*) B.Sc., Sharif University of Technology 2014; M.S., California Institute of Technology 2016.

Thesis: Universality Laws and Performance Analysis of the Generalized Linear Models.

Theodore Glenn Albertson (*Applied Physics*) B.S., University of Michigan 2012; M.S., California Institute of Technology 2016.

Thesis: Simulations of Conic Cusp Formation, Growth, and Instability in Electrified Viscous Liquid Metals on Flat and Curved Surfaces.

Jason Paul Allmaras (*Applied Physics*) B.S., Yale University 2014; M.S., California Institute of Technology 2017.

Thesis: Modeling and Development of Superconducting Nanowire Single-Photon Detectors.

Harpreet Singh Arora (*Applied Physics*) B.Tech., M.Tech., Indian Institute of Technology Bombay 2014; M.S., California Institute of Technology 2019.

Thesis: Superconductivity in Graphene Hetero-Structures: From Fundamental Physics to Functional Devices.

Manuel Bedrossian (*Medical Engineering*) B.S., University of California, Riverside 2015; M.S., California Institute of Technology 2017.

Thesis: A Novel Digital Holographic Microscope (DHM) to Investigate and Characterize Microbial Motility in Extreme Aquatic Environments.

Joseph John Douglas Bowkett (*Mechanical Engineering*) B.S., The University of Auckland 2014; M.S., California Institute of Technology 2016.

Thesis: Functional Autonomy Techniques for Manipulation in Uncertain Environments.

Neal Ryan Brodnik (*Materials Science*) B.S., Northwestern University 2014.

Thesis: Fracture and Toughening of Brittle Structures with Designed Anisotropy.

Utkan Onur Candogan (*Electrical Engineering*) B.S., Bilkent University 2013; M.S., California Institute of Technology 2014.

Thesis: Convex Relaxations for Graph and Inverse Eigenvalue Problems.

## *Doctor of Philosophy continued*

- Wen-Hui Cheng (*Materials Science*) B.S., National Cheng Kung University 2011; M.S., 2013.  
Thesis: Towards High Solar to Fuel Efficiency: From Photonic Design, Interface Study, to Device Integration.
- Hyunjun Cho (*Electrical Engineering*) B.S., Korea University 2007; M.S., Seoul National University 2009; M.S., California Institute of Technology 2016.  
Thesis: Real-Time Biosensing and Energy Harvesting on Human Body.
- Michael Andrew Citrin (*Materials Science*) B.S.E., University of Pennsylvania 2014; M.S., California Institute of Technology 2016.  
Thesis: Nanomechanical Properties of Electrodeposited Li and Fabrication of 3D Architected Cathodes for Li-Based Batteries.
- Andrea Wei Coladangelo (*Computing and Mathematical Sciences*) B.A., University of Oxford 2014; M.A., University of Cambridge 2015.  
Thesis: Quantum Correlations, Certifying Quantum Devices, and the Quest for Infinite Entanglement.
- Ioana Craiciu (*Applied Physics*) B.S., University of Waterloo 2014; M.S., California Institute of Technology 2017.  
Thesis: Quantum Storage of Light Using Nanophotonic Resonators Coupled to Erbium Ion Ensembles.
- Michael William Cvitkovic (*Computing and Mathematical Sciences*) B.A., Carleton College 2013.  
Thesis: Deep Learning in Unconventional Domains.
- Sumanth Dathathri (*Computing and Mathematical Sciences*) B.Tech., M. Tech., Indian Institute of Technology Madras 2014; M.S., California Institute of Technology 2016.  
Thesis: Scalable Synthesis and Verification: Towards Reliable Autonomy.
- Ahmed Douik (*Electrical Engineering*) B.A., University of Tunis 2010; Eng., Tunisia Polytechnic School 2013; M.S., King Abdullah University of Science and Technology 2015.  
Thesis: Riemannian Optimization for Convex and Non-Convex Signal Processing and Machine Learning Applications.
- Michael Tianyu Fang (*Applied Physics*) B.S., University of California, Santa Barbara 2015.  
Thesis: Suspended Trace Air-gap Resonators for Low Loss Superconducting Circuits.
- Agustin Gabriel Fernandez Lado (*Applied and Computational Mathematics*) Licenciatura, Universidad de Buenos Aires 2014.  
Thesis: Wave-Scattering by Periodic Media.
- Serena Ferraro (*Space Engineering*) B.S., Università degli Studi di Napoli Federico II 2008; M.S., 2011; M.S., California Institute of Technology 2015.  
Thesis: Topology Optimization and Failure Analysis of Deployable Thin Shells with Cutouts.

## *Doctor of Philosophy continued*

- Erika Figueroa Schibber (*Space Engineering*) Aeronautical Engineer, Universidad Tecnológica Nacional 2013; M.S., California Institute of Technology 2016.  
Thesis: High-Cycle Dynamic Cell Fatigue with Applications to Oncotripsy.
- Antonio Joaquín García Suárez (*Aeronautics and Applied and Computational Mathematics*) B.S., University of Seville 2013; M.S., California Institute of Technology 2016.  
Thesis: Application of Path-Independent Integrals to Soil-Structure Interaction.
- Emmanuel Garza Gonzalez (*Applied and Computational Mathematics*) B.S., Tecnológico de Monterrey 2013.  
Thesis: Boundary Integral Equation Methods for Simulation and Design of Photonic Devices.
- Thomas Gurriet (*Mechanical Engineering*) M.S., Georgia Institute of Technology 2015; Diplôme d'ingénieur, Arts et Métiers ParisTech 2016.  
Thesis: Applied Safety Critical Control.
- Jane Elizabeth Herriman (*Materials Science*) B.S., Carnegie Mellon University 2011; M.S., California Institute of Technology 2015.  
Thesis: Phonon Thermodynamics and Elastic Behavior of GaN and GaAs at High Temperatures and Pressures.
- De Huang (*Applied and Computational Mathematics*) B.S., Peking University 2015.  
Thesis: Positive Definite Matrices: Compression, Decomposition, Eigensolver, and Concentration.
- Jinglin Huang (*Medical Engineering*) B.S., Smith College 2014; M.S., California Institute of Technology 2016.  
Thesis: Investigations of Different Methods to Promote Drug Mixing in the Eye.
- Hoang Minh Le (*Computing and Mathematical Sciences*) B.A., Bucknell University 2007.  
Thesis: New Frameworks for Structured Policy Learning.
- Christophe Leclerc (*Space Engineering*) B.E., École Polytechnique de Montréal 2014; M.S., California Institute of Technology 2015.  
Thesis: Mechanics of Ultra-Thin Composite Coilable Structures.
- Matthew Gregory Leibowitz (*Aeronautics*) B.S., University at Buffalo, The State University of New York 2013; M.S., California Institute of Technology 2015.  
Thesis: Hypervelocity Shock Tunnel Studies of Blunt Body Aerothermodynamics in Carbon Dioxide for Mars Entry.
- Liuchi Li (*Applied Mechanics and Applied and Computational Mathematics*) B.S., Tongji University 2014; M.S., California Institute of Technology 2016.  
Thesis: Linking Micro-Structure to Macro-Behavior of Granular Matter: From Flowing Heterogeneously to Morphing Adaptively.

## *Doctor of Philosophy continued*

- Yu Xian Lim (*Electrical Engineering*) B.S., M.S., Stanford University 2011.  
Thesis: L-Band Multi-Polarization Radar Scatterometry over Global Forests: Modelling, Analysis, and Applications.
- Li Lin (*Medical Engineering*) B.E., Tianjin University 2011; M.S., University of Pennsylvania 2013.  
Thesis: Photoacoustic Tomography: From Bench to Bedside.
- Yang Liu (*Computation and Neural Systems*) B.E., Tsinghua University 2013.  
Thesis: From Restoring Human Vision to Enhancing Computer Vision.
- I-Te Lu (*Materials Science and Physics*) B.S., National Chiao Tung University 2010; M.S., 2012.  
Thesis: First-Principles Calculations of Electron-Defect Interactions and Defect-Limited Charge Transport.
- Xingsheng Luan (*Applied Physics*) B.S., Nanjing University 2012; M.S., Columbia University 2013.  
Thesis: Towards Atom Assembly on Nanophotonic Structures with Optical Tweezers.
- Jie Luo (*Applied Physics*) B.S., The University of Hong Kong 2014; M.S., California Institute of Technology 2019.  
Thesis: Integrating Quantum Optical and Superconducting Circuits with Quantum Acoustics for Scalable Quantum Network and Computation.
- Kimberley Ann Mac Donald (*Mechanical Engineering*) B.S., M.S., University of Miami 2014; M.S., California Institute of Technology 2017.  
Thesis: Three-dimensional Quantitative Visualization for Mechanics of Discontinuous Materials.
- Ryan Scott Marshall (*Applied Physics*) B.S., University of California, Berkeley 2014; M.S., California Institute of Technology 2017.  
Thesis: Developing Plasma Spectroscopy and Imaging Diagnostics to Understand Astrophysically-Relevant Plasma Experiments: Megameters, Femtometers, and Everything in Between.
- Ryan Michael McMullen (*Aeronautics*) B.S., The Ohio State University 2013; M.S., California Institute of Technology 2014; M.S., École Polytechnique 2015.  
Thesis: Aspects of Reduced-Order Modeling of Turbulent Channel Flows: From Linear Mechanisms to Data-Driven Approaches.
- Anna Mitskovets (*Applied Physics*) B.S., Belarusian State University 2012; M.S., Karlsruhe Institute of Technology 2014; M.S., Aix-Marseille Université 2014; M.S., California Institute of Technology 2019.  
Thesis: Using DNA Origami to Create Hybrid Nanophotonic Architectures for Single-Photon Emitters.

## *Doctor of Philosophy continued*

- David Reza Mittelstein (*Medical Engineering*) B.S., University of Southern California 2013; M.S., California Institute of Technology 2016.  
Thesis: Modifying Ultrasound Waveform Parameters to Control, Influence, or Disrupt Cells.
- Jaeyun Moon (*Mechanical Engineering*) B.S., Georgia Institute of Technology 2014; M.S., California Institute of Technology 2016.  
Thesis: Thermal Conduction in Amorphous Materials and the Role of Collective Excitations.
- Kien Trung Nguyen (*Civil Engineering*) B.E., Ho Chi Minh City University of Technology 2010; M.E., 2012; M.S., California Institute of Technology 2016.  
Thesis: Reduced-Order Model for Dynamic Soil-Pipe Interaction Analysis.
- Tomoyuki Oniyama (*Mechanical Engineering*) B.E., Keio University 2015; M.S., California Institute of Technology 2017.  
Thesis: Shock Compression of Molybdenum Single Crystals to High Stresses.
- Kirsti Mari Pajunen (*Space Engineering*) B.S., Milwaukee School of Engineering 2014; M.S., California Institute of Technology 2015.  
Thesis: Dynamics of Lightweight Tensegrity-Inspired Metamaterials Fabricated with 3D-Printing.
- Kyupaeck Jeff Rah (*Mechanical Engineering*) B.S., Cornell University 2014; M.S., California Institute of Technology 2016.  
Thesis: Derivation of Realistic Forcing Schemes to Reproduce Turbulent Characteristics of Round Jets on Centerline.
- Hengjiang Ren (*Electrical Engineering*) B.S., Nanyang Technological University 2013; M.S., California Institute of Technology 2017.  
Thesis: Cavity Optomechanics for Hybrid Quantum Systems.
- Matteo Ruggero Ronchi (*Computer Science*) B.E., University of Siena 2010; M.S., 2012; M.S., California Institute of Technology 2018.  
Thesis: Vision for Social Robots: Human Perception and Pose Estimation.
- William Joseph Schill (*Mechanical Engineering*) B.S., California State Polytechnic University, San Luis Obispo 2013; M.S., California Institute of Technology 2016.  
Thesis: Variational and Multiscale Modeling of Amorphous Silica Glass.
- Yang Shen (*Applied Physics and Computer Science*) B.S., University of Science and Technology of China 2014.  
Thesis: Phonon Anharmonicity at the Limits of Perturbation Theory.
- Armeen Taeb (*Electrical Engineering*) B.S., University of Colorado at Boulder 2013; M.S., California Institute of Technology 2014.  
Thesis: Latent-Variable Modeling: Algorithms, Inference, and Applications.

## *Doctor of Philosophy continued*

- Thibaud Talon (*Space Engineering*) Diplome d'Ingenieur, École Polytechnique 2013; M.S., California Institute of Technology 2014.  
Thesis: Surface Reconstruction from Distributed Angle Measurement.
- Melissa Midori Tanner (*Mechanical Engineering*) S.B., Massachusetts Institute of Technology 2009; M.S., California Institute of Technology 2011.  
Thesis: Tethered Motion Planning for a Rappelling Robot.
- Yury Tokpanov (*Applied Physics and Computer Science*) B.S., Moscow Institute of Physics and Technology 2011; M.S., California Institute of Technology 2016.  
Thesis: Towards Next Generation of Optoelectronics: From Quantum Plasmonics and 2D Materials to Advanced Optimization Techniques of Nanophotonic Devices.
- Andrey Vyatskikh (*Medical Engineering*) B.S., M.S., Bauman Moscow State Technical University 2013; M.S., Skolkovo Institute of Science and Technology 2015; M.S., California Institute of Technology 2017.  
Thesis: Additive Manufacturing of 3D Nano-Architected Metals and Ceramics.
- Chuting Wang (*Applied Physics*) B.S., Keio University 2014.  
Thesis: On-chip Photonic Devices for Coupling to Color Centers in Silicon Carbide.
- Pakorn Wongwaitayakornkul (*Applied Physics*) B.A., B.S., Rice University 2014; M.S., California Institute of Technology 2018.  
Thesis: Dynamics of an Arched Magnetically-Twisted Current-Carrying Plasma.
- Nelson Javier Yanes (*Aeronautics*) B.S., University of Maryland, College Park 2014; M.S., California Institute of Technology 2015.  
Thesis: Ultraviolet Radiation of Hypervelocity Stagnation Flows and Shock/Boundary-Layer Interactions.
- Daryl Wei Liang Yee (*Materials Science*) B.S., Imperial College London 2014; M.S., California Institute of Technology 2016.  
Thesis: Additive Manufacturing of 3D Functional Materials: From Surface Chemistry to Combustion-Derived Materials.
- Young Dae Yoon (*Applied Physics*) B.S., Imperial College London 2014; M.S., California Institute of Technology 2017.  
Thesis: Probing the Progression, Properties, and Progenies of Magnetic Reconnection.

## DIVISION OF GEOLOGICAL AND PLANETARY SCIENCES

- Dana Eklund Anderson (*Planetary Science*) B.S., University of Michigan, Ann Arbor 2012; M.S., California Institute of Technology 2015.  
Thesis: Tracking Volatile Elements in Protoplanetary Disks and on Planetary Surfaces.

## *Doctor of Philosophy continued*

- Austin John Chadwick (*Geology*) B.S., University of California, Los Angeles 2013.  
Thesis: Mechanics of River Avulsions on Lowland River Deltas.
- Cody Enslin Finke (*Environmental Science and Engineering*) B.A., Carleton College 2012; M.S., California Institute of Technology 2016.  
Thesis: An Experimental and Economic Analysis of Electrochemical Technologies to Reduce Greenhouse Gas Emissions.
- Voon Hui Lai (*Geophysics*) B.A., University of California, Berkeley 2014; M.S., California Institute of Technology 2016.  
Thesis: Seismic Waveform Modeling of Natural Hazards and Sharp Structural Boundaries.
- Ellen Kathleen Leask (*Geology*) B.Sc., McGill University 2013; M.S., California Institute of Technology 2016.  
Thesis: Investigating the Evolution of Surface Water on Mars through Spectroscopy of Secondary Minerals.
- Peter E. Martin (*Geochemistry*) B.A., Wesleyan University 2014.  
Thesis: Detection and Analysis of Martian Low-Temperature Geochemistry.
- John David Naviaux (*Environmental Science and Engineering*) B.A., University of California, Irvine 2012; M.S., California Institute of Technology 2016.  
Thesis: Chemical and Physical Mechanisms of Calcite Dissolution in Seawater.
- Brigitte Lee Rooney (*Environmental Science and Engineering*) B.S., University of Colorado at Boulder 2015.  
Thesis: Modeling the Impact of Biomass Combustion on Atmospheric Aerosol.
- Nathaniel Thomas Stein (*Planetary Science*) A.B., Washington University in St. Louis 2015; M.S., California Institute of Technology 2017.  
Thesis: Investigation of Past Habitable Environments through Remote Sensing of Planetary Surfaces.
- Yanzhe Zhu (*Environmental Science and Engineering*) B.S., Washington University in St. Louis 2014; M.S., California Institute of Technology 2017.  
Thesis: 3D Microfluidics for Environmental Pathogen Detection and Single-Cell Phenotype-to-Genotype Analysis.

## DIVISION OF THE HUMANITIES AND SOCIAL SCIENCES

- Seo-young Silvia Kim (*Social Science*) B.A., Seoul National University 2014; M.S., California Institute of Technology 2017.  
Thesis: Three Essays in the Dynamics of Political Behavior.

## *Doctor of Philosophy continued*

Vadim Vadimovich Martynov (*Social Science*) B.M., National Research University Higher School of Economics 2015; M.S., California Institute of Technology 2017.

Thesis: Essays on Social Learning and Networks.

Song Qi (*Social and Decision Neuroscience*) B.S., University of Electronic Science and Technology of China 2014; M.A., Columbia University 2016.

Thesis: Decision Making under Threat: An Ecological Framework.

Alejandro Robinson Cortés (*Social Science*) B.A., Centro de Investigación y Docencia Económicas 2013; M.S., California Institute of Technology 2016.

Thesis: Essays on Market Design and Industrial Organization.

## DIVISION OF PHYSICS, MATHEMATICS AND ASTRONOMY

Thomas Alfred Callister III (*Physics*) B.A., Carleton College 2013.

Thesis: Searching for the Astrophysical Gravitational-Wave Background and Prompt Radio Emission from Compact Binaries.

Yu-An Chen (*Physics*) S.B., Massachusetts Institute of Technology 2015.

Thesis: Exact Bosonization in All Dimensions: The Duality Between Fermionic and Bosonic Phases of Matter.

Aaron Chew (*Physics*) B.S., California State University, Los Angeles 2014; M.S., California Institute of Technology 2016.

Thesis: Enriching Majorana Zero Modes.

Tejas Makarand Deshpande (*Applied Physics*) B.E., McGill University 2011.

Thesis: Development of Tools for Probing Order in Single Crystals Using Electron and Photon Spectroscopy.

Gina Elizabeth Duggan (*Astrophysics*) B.S., University of California, Santa Barbara 2013; M.S., California Institute of Technology 2015.

Thesis: Signatures of the  $r$ -process in Ancient Stellar Populations Using Barium Abundances.

Ivanna Escala (*Astrophysics*) B.S., University of California, San Diego 2015; M.S., California Institute of Technology 2017.

Thesis: Elemental Abundances in the Local Group: Tracing the Formation History of the Great Andromeda Galaxy.

Matthew David Giesler (*Physics*) B.S., California State University, Fullerton 2013.

Thesis: Probing the Nature of Black Holes with Gravitational Waves.

Chen-Chih Hsu (*Physics*) B.S., National Taiwan University 2006; M.S., 2008.

Thesis: Physics and Applications of Graphene-based Nanostructures and Nano-meta Materials.



## *Doctor of Philosophy continued*

- Jonathon Robert Hunacek (*Physics*) B.S., University of Michigan 2013; M.S., California Institute of Technology 2017.  
Thesis: TIME: A Millimeter-Wavelength Grating Spectrometer Array for [CII] / CO Intensity Mapping.
- William Thornton Ireland (*Physics*) B.S., University of North Carolina at Chapel Hill 2013.  
Thesis: A Quantitative and High-Throughput Approach to Gene Regulation in *Escherichia coli*.
- Joseph Kramer Iverson (*Physics*) B.A., The University of Chicago 2014.  
Thesis: Aspects of Fault-Tolerant Quantum Computation.
- Jacob Edmund Jencson (*Astrophysics*) B.S., The Ohio State University 2014; M.S., California Institute of Technology 2016.  
Thesis: Hunting for Hidden Explosions: Exploring the Transient Infrared Sky with the *Spitzer Space Telescope*.
- Corina Bianca Panda (*Mathematics*) A.B., Princeton University 2011; M.Sc., Leiden University 2013.  
Thesis: Generalizations of a Theorem of Hecke.
- Andrei Cosmin Pohoata (*Mathematics*) A.B., Princeton University 2014.  
Thesis: Extremal Results in and out of Additive Combinatorics.
- Ashmeet Singh (*Physics*) M.S., Indian Institute of Technology Roorkee 2015; M.S., California Institute of Technology 2018.  
Thesis: Quantum Mechanical Vistas on the Road to Quantum Gravity.
- Rachel Lauren Theios (*Astrophysics*) B.S., University of California, Los Angeles 2014; M.S., California Institute of Technology 2016.  
Thesis: Leveraging the Rest-Ultraviolet and Rest-Optical Spectra of Star-Forming Galaxies at Redshifts  $2 < z < 3$ .
- Samaporn Tinyanont (*Astrophysics*) B.S., Harvey Mudd College 2015; M.S., California Institute of Technology 2017.  
Thesis: Insights Into Stellar Explosions From Infrared Light.
- Pooya Vahidi Ferdowsi (*Mathematics*) B.Sc., Ferdowsi University of Mashhad 2013; M.S., University of Cambridge 2014.  
Thesis: Strongly Amenable Groups, Choquet-Deny Groups, and the Infinite Conjugacy Class Property.
- Luciena Xiao Xiao (*Mathematics*) B.A., University of Notre Dame 2015.  
Thesis: On the Hecke Orbit Conjecture for PEL Type Shimura Varieties.
- Jize Yu (*Mathematics*) B.S., National University of Singapore 2015.  
Thesis: The Integral Coefficient Geometric Satake Equivalence in Mixed Characteristic and its Arithmetic Applications.

*Doctor of Philosophy continued*

Yongliang Zhang (*Physics and Computer Science*) B.S., Peking University 2014.

Thesis: Information Scrambling in Quantum Many-Body Systems.

Chengzhe Zhou (*Physics*) B.S., University of Rochester 2012.

Thesis: Collection of Solved Nonlinear Problems for Remote Shaping and Patterning of Liquid Structures on Flat and Curved Substrates by Electric and Thermal Fields.

## 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

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

2020 *Sunny Cui, Nivetha Karthikeyan*

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

This award, established by the Board of Trustees, is in memory of Frederick W. Hinrichs, Jr., who served for more than 20 years as dean and professor at Caltech. In remembrance of his honor, courage, and kindness, the annual award is given to the senior (or seniors) who, throughout their 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.

2020 *Allison Yiyun Wang, Alexander Friedrich Wuschner*

### GEORGE W. HOUSNER PRIZE FOR ACADEMIC EXCELLENCE AND ORIGINAL RESEARCH

This 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 given in any year. This prize is made possible by a gift from the late George W. Housner, Carl F Braun Professor of Engineering, Emeritus.

2020 *Allison Yiyun Wang*

### MILTON AND FRANCIS CLAUSER DOCTORAL PRIZE

This prize is given 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.

2020 *Kai Chen*

*The previous four prizes are announced at the commencement ceremony.*

### ADVOCATING CHANGE TOGETHER (ACT) AWARD

Given by the Caltech Y, this 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.

2017 *Jinglin Huang*

### AMORI DOCTORAL PRIZE IN CMS

Established in 2017 by Michael Amori (MS '07), this prize honors outstanding dissertations in the computing and mathematical sciences during the current academic year. Awardees are selected by a committee of computing and mathematical sciences faculty each spring.

2020 *Hoang Minh Le*

### APOSTOL AWARD FOR EXCELLENCE IN TEACHING IN MATHEMATICS

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

2015, 2016 *Corina Bianca Panda*

2016, 2019 *Andrei Cosmin Pohoata*

### CHARLES D. BABCOCK AWARD

Voted on by members of the aeronautics faculty, this award is given to a graduate student whose achievements in teaching or other assistance to students have made a significant contribution to the aeronautics department.

2018 *Erika Figueroa Schibber*

2020 *Jacqueline Rose Tawney*

### ROBERT P. BALLE CALTECH MATHEMATICS SCHOLARS AWARD

This award is given to the mathematics major finishing their senior year who has demonstrated the most outstanding performance in mathematics courses completed in the student's time at Caltech.

2020 *Allison Yiyun Wang*

### WILLIAM F. BALLHAUS PRIZE

This prize recognizes aeronautics students for outstanding doctoral dissertations.

2020 *Ryan Michael McMullen*

#### THE BHANSALI FAMILY PRIZE IN COMPUTER SCIENCE

Established in 2001 by Vineer Bhansali (B.S. '87, M.S. '87) in memory of his grandfather, Mag Raj Bhansali, this prize is given 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.

2020 *Sibui Dai*

#### BHANSALI FAMILY DISSERTATION PRIZE IN COMPUTER SCIENCE

Established in 2018 by Vineer Bhansali (B.S. '87, M.S. '87) in memory of his grandfather, Mag Raj Bhansali, this prize is 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.

2020 *Andrea Wei Coladangelo*

#### RICHARD G. BREWER PRIZE IN PHYSICS

This prize recognizes a freshman with the most interesting solutions to the Physics 11 "hurdles," demonstrating intellectual promise and creativity at the very beginning of their Caltech education.

2017 *Daniel Keat Kay Mark*

#### ROLF D. BUHLER MEMORIAL AWARD IN AERONAUTICS

This award is given to an aeronautics student for outstanding academic achievement in the master's program.

2020 *Julie Camille André, Donner Thomas Schoeffler*

#### FRITZ B. BURNS PRIZE IN GEOLOGY

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

2019 *Benjamin Charles Cassese*

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

This prize is given to a Ph.D. candidate for an outstanding doctoral dissertation in applied mathematics or pure mathematics.

2020 *Agustin Gabriel Fernandez Lado*

2020 *Armeen Taeb*

#### BONNIE CASHIN PRIZE FOR IMAGINATIVE THINKING

Awarded annually, this prize is given to the entering freshman who wrote the most imaginative essays in the application for their freshman admission.

2016 *Sarah Josephine Crucilla, Alexandra Marie Stutt*

#### CENTENNIAL PRIZE FOR THE BEST THESIS IN MECHANICAL AND CIVIL ENGINEERING

This prize, awarded annually to a Ph.D. candidate in applied mechanics, civil engineering, or mechanical engineering, is given to a student 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.

2020 *William Joseph Schill*

#### RICHARD BRUCE CHAPMAN MEMORIAL AWARD

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

2020 *Chengzhe Zhou*

#### ROBERT F. CHRISTY PRIZE FOR AN OUTSTANDING SENIOR IN THEORETICAL PHYSICS

This prize is awarded annually to a senior who has demonstrated excellence in theoretical physics through research and/or coursework. Established in 2018, this prize honors the memory of Robert F. Christy, former provost and professor of theoretical physics at Caltech.

2020 *Xiaoling Liu*

#### ROBERT F. CHRISTY PRIZE FOR AN OUTSTANDING DOCTORAL THESIS IN THEORETICAL PHYSICS

This prize is given annually to a student who has produced an outstanding thesis in theoretical physics. Established in 2018, this prize honors the memory of Robert F. Christy, former provost and professor of theoretical physics at Caltech.

2020 *Matthew David Giesler*

#### DONALD S. CLARK MEMORIAL AWARD

This award is given 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.

2019 *Sunny Cui, Noelle Unyoung Davis*

#### DONALD COLES PRIZE IN AERONAUTICS

This prize is given 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.

2020 *Thibaud Talon*

#### FRANCE A. CÓRDOVA GRADUATE STUDENT FUND

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

2019 *Ivanna Ashley Escala, Tombrello Scholar*

#### DEANS' CUP

This award is 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.

2020 *Megan Lynne Durney, Amrita Rhoads, Bethany Anne Suter*

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

This prize, awarded annually, recognizes 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).

2020 *Manuel Bedrossian*

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

This prize, awarded annually, recognizes 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).

2020 *Adam Patrick Neumann*

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

This prize, awarded annually, recognizes 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).

2020 *Antonio Joaquín García Suárez*

#### DORIS EVERHART SERVICE AWARD

This 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 the community as a whole, and who has, in addition, exhibited care and concern for the welfare of students on a personal basis. The award was established in 1999 by Martin and Sally Ridge in honor of Doris Everhart.

2020 *Rupesh Jeyaram*

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

This prize is awarded to the graduating Ph.D. candidate in biology who has produced the most outstanding doctoral thesis for the past year.

2020 *Sofía Agustina Quinodoz*

#### RICHARD FEYNMAN PRIZE IN THEORETICAL PHYSICS

This prize is awarded to a senior on the basis of excellence in theoretical physics.

2020 *Daniel Keat Kay Mark*

#### HAREN LEE FISHER MEMORIAL AWARD IN JUNIOR PHYSICS

This award recognizes a junior physics major who demonstrates the greatest promise of future contributions in physics.

2019 *Xiaoling Liu, Daniel Keat Kay Mark*



#### HENRY FORD II SCHOLAR AWARD

This award recognizes either the engineering student with the best academic record at the end of the third year of undergraduate study or the engineering student with the best first-year record in the graduate program.

2018 *Shuqing Chen*

2019 *Alexandra Vadimovna Bodrova, Timothy Chen, Harel Dor, Zhong Qian Huang, James Robert McLaughlin, Nikhil Hegde Poole, Yanke Song, Jui-Hung Sun, Hanwen Zhang*

#### JACK E. FROEHLICH MEMORIAL AWARD

This award, established by the family and friends of the late Jack E. Froehlich (B.S. '47, M.S. '48, Ph.D. '50), who did his undergraduate and graduate work at Caltech and was later the project manager for Explorer I for the Jet Propulsion Laboratory, provides an award to a junior in the upper 5 percent of their class who shows outstanding promise for a creative professional career. The student is selected by the deans and the Undergraduate Academic Standards and Honors Committee.

2019 *Xiaoling Liu*

#### BARRY M. GOLDWATER SCHOLARSHIP

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

2018 *Amanda Hazel Dilmore*

2019 *Juan Felipe Gómez, Gokul Gowri*

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

This prize, awarded annually by a committee of social science faculty, rewards outstanding performance and creativity by an undergraduate who has completed one of the social science options. The prize was established by Susan G. Davis in recognition of David M. Grether's contributions to econometrics and experimental economics and his service to the Division of the Humanities and Social Sciences.

2020 *David Ignacio Fager*

#### THE LUCY GUERNSEY SERVICE AWARD

This award is 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.

2020 *Iman Ameneh Wable*

#### HANS G. HORNUNG PRIZE

This prize is 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.

2020 *Thibaud Talon*

#### PATRICK HUMMEL AND HARRY GRAY TRAVEL FUND

Established as a joint gift from Carla and Paul Hummel, Patrick Hummel, and Shirley and Harry Gray, Caltech's 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 broaden students' perspectives as engaged, responsible citizens of the world.

2020 *Rita Beth Aksenfeld, Iman Ameneh Wable*

#### BIBI JENTOFT-NILSEN MEMORIAL AWARD

This award recognizes a junior or senior who exhibits outstanding qualities of leadership and who actively contributes to the quality of student life at Caltech.

2020 *Juan Felipe Gómez*

#### SCOTT RUSSELL JOHNSON PRIZE FOR EXCELLENCE IN GRADUATE STUDIES

This prize is 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.

2017 *Andrei Cosmin Pohoata, Luciena Xiao Xiao*

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

This prize is awarded for the best graduate dissertation in mathematics.

2020 *Pooya Vahidi Ferdowsi, Andrei Cosmin Pohoata*

#### KALAM PRIZE FOR AEROSPACE ENGINEERING

This prize, made possible by Dr. Abdul Kalam, the 11th president of India and an aerospace engineer, is 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.

2020 *Garima Aggarwal, James Francis Ragan III*

#### R.K. KAR AWARD FOR RESEARCH IN PHYSICS

This award is given annually to an outstanding graduate student who is exceptional in their physics studies and research (emphasis on condensed matter physics).

2018 *Tejas Makarand Deshpande*

#### DR. JAMES KING JR. STUDENT DIVERSITY AWARD

This award recognizes individuals who stand out as strong supporters of diversity within the Caltech student body. The award is named in honor of Dr. King, who was the first African American to receive a Ph.D. from Caltech in chemical physics (at that time it was chemistry and physics), and was the assistant laboratory director at JPL. Dr. King had a reputation for mentoring students and encouraged diversity in the Caltech student body.

2020 *Dessie DiMino, Nivetha Karthikeyan*

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

This prize is awarded to a graduating senior in physics who has produced an outstanding research project during the year.

2020 *Harald Esko Jakob Putterman*

#### MARGIE LAURITSEN LEIGHTON PRIZE

This prize is awarded to one or two undergraduate women who are majoring in physics or astrophysics, and who have demonstrated academic excellence.

2018 *Margaret Audrey Anderson, Madison Taylor Brady*

#### JOHN O. LEDYARD PRIZE FOR GRADUATE RESEARCH IN SOCIAL SCIENCE

This prize, awarded annually by a committee of social science faculty, 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.

2017 *Alejandro Robinson Cortés*

#### MARI PETERSON LIGOCKI '81 MEMORIAL AWARD

This award is given to a student who has improved the quality of student life at Caltech through their personal character.

2020 *Dessie DiMino*

#### GORDON MCCLURE MEMORIAL COMMUNICATIONS PRIZE

This prize is awarded to one or more undergraduate students for excellence in essay writing in three subjects: English, history, and philosophy.

2018 *Maitreyi Ajitkumar Nair, English*

2018 *Jonathan Kai Shun Chan, Philosophy*

2019 *Crystal Liang, English*

2019 *George Heros Daghlian, History*

2020 *Karen Pham, History*

#### THE HERBERT NEWBY McCOY AWARD

This award is given to one or more chemistry doctoral students for outstanding contributions to the science of chemistry.

2020 *Matthew J. Chalkley, Kai Chen, Yapeng Su*

#### MARY A. EARL MCKINNEY PRIZE IN POETRY AND PROSE FICTION

This prize is awarded to one or more undergraduate students for excellence in writing in two categories: poetry and prose fiction.

2017, 2020 *Karen Pham, Poetry*

2019 *Maria De Angelis, Poetry*

#### MECHANICAL ENGINEERING AWARD

This award recognizes a B.S. candidate 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.

2020 *Asta Chen Wu*

#### MERCK INDEX AWARD

This award is given to one or more graduating students who have demonstrated outstanding achievement in the field of chemistry.

2020 *Cherish Nie*

#### JAMES MICHELIN SCHOLARSHIP

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

2018 *Karen Pham*

2020 *Sarah Josephine Crucilla*

#### ROBERT L. NOLAND LEADERSHIP AWARD

This award is given to one or more 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.

2019 *Rupesh Jeyaram*

2020 *Noelle Unyoung Davis, Karen Pham, Erika Emmanuelle Salzman*

#### RODMAN W. PAUL HISTORY PRIZE

This prize recognizes a junior or senior who has displayed an unusual interest in and talent for history.

2019 *Nivetha Karthikeyan*

2020 *Margaret Audrey Anderson*

#### DR. NAGENDRANATH REDDY BIOLOGICAL SCIENCES THESIS PRIZE

This prize is awarded to the female Ph.D. candidate in the Division of Biology and Biological Engineering who has produced the most outstanding thesis in the biological sciences during the past year.

2020 *Sofia Agustina Quinodoz*

#### HOWARD REYNOLDS MEMORIAL PRIZE IN GEOLOGY

This prize is awarded to a sophomore or junior who demonstrates the potential to excel in the field of geology and who actively contributes to the quality of Caltech student life.

2018 *Sarah Josephine Crucilla*

2019 *Karen Pham*

#### RESIDENTIAL EXPERIENCE LEADERSHIP AWARD

This award recognizes leaders who made a significant impact on Caltech students' lives during their collective four-year Caltech career and/or during a particularly difficult situation or circumstance, like COVID-19.

2020 *Sarah Josephine Crucilla, Mei-Ling M Laures, Helena Julie Shield*

#### HERBERT J. RYSER MEMORIAL SCHOLARSHIP

This scholarship is awarded to undergraduate students for academic excellence, preferably in mathematics.

2019 *Erik Emmanuel Herrera*

2020 *Allison Yiyun Wang*

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

Established in 1999 by friends and colleagues to honor Eleanor Searle, the Caltech professor who had the distinction of being the first woman at the Institute to receive a named professorship, this prize is awarded annually to an undergraduate or graduate student whose work in history or the social sciences exemplifies Searle's interests in the use of power, government, and law.

2019 *Rona Yu*

2020 *Leonardo David Balestri, Nivetha Karthikeyan*

#### ERNEST E. SECHLER MEMORIAL AWARD IN AERONAUTICS

This award recognizes 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 *Thibaud Talon*

#### 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.

2020 *Margaret Audrey Anderson, Miranda Lee Schwacke*

#### RENUKA D. SHARMA AWARD

This award recognizes a sophomore chemistry major for outstanding performance during their freshman year.

2018 *Jonathan Kai Shun Chan*

### C. S. SHASTRY PRIZE

This prize is awarded to a sophomore Ph 11 alumnus, majoring in physics, to provide support for a summer research project conducted at Caltech. The winner is chosen based on passion, curiosity, and demonstrated ability.

2018 *Dennis Joseph Yatunin*

### DON SHEPARD AWARD

This award is given to one or more 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.

2018 *Noelle Unyoung Davis*

### HALLETT SMITH PRIZE

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

2019 *Brendan Jackson Hollaway*

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

This awards program recognizes and rewards exceptional students who exemplify leadership, perseverance, scholarship, service, and innovation.

2011 *Katherine Knox*

### R. BRUCE STEWART PRIZE FOR EXCELLENCE IN TEACHING

This 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 *Ashmeet Singh*

#### STUDENT RESIDENTIAL LIFE AWARD

This award is 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.

2019 *Amrita Rhoads, Helena Julie Shield, Sarah Catherine Steele, Alicia Helen Tirone, Alex Friedrich Wuschner*

2020 *Adrian Jiajin Huang, Rupesh Jerayam, Jade Livingstone*

#### TAUSSKY-TODD MATHEMATICS PRIZE FUND

This prize provides support to a female undergraduate math major for a summer experience to enrich their mathematical education.

2018 *Allison Yiyun Wang*

2019 *Surya Mathialagan*

#### THOMAS A. TISCH PRIZE FOR UNDERGRADUATE TEACHING IN COMPUTING AND MATHEMATICAL SCIENCES

The Undergraduate Teaching in CMS Awards were established in 2016 with a gift from Microsoft and then endowed through the generosity of Thomas A. Tisch (BS '61). The prize and honorarium are awarded to an undergraduate student for outstanding teaching and course development in computing and mathematical sciences. Awardees are selected by a committee of CMS faculty members.

2020 *Vivek Bharadwaj*

#### MORGAN WARD PRIZE

This prize is awarded to a freshman or sophomore who submits the best problems and solutions in mathematics.

2018 *William Parker Overman*

#### FREDRICK J. ZEIGLER MEMORIAL AWARD

This award recognizes an outstanding sophomore or junior in pure or applied mathematics for their excellence in scholarship as demonstrated in class activities or in the preparation of an original paper or essay in any subject area.

2019 *Allison Yiyun Wang*





# Caltech | Alumni

Congratulations, Caltech's 2020 graduates! We are honored to welcome you to the global community of more than 24,000 Caltech alumni and to have you as the newest members of the Caltech Alumni Association (CAA). For more than 100 years, Caltech alumni have made a profound and positive impact on the world. We are confident you will do the same, and we know that future Techers will be inspired by your achievements. Your Caltech degree provides you a place among and access to one of the most accomplished alumni networks in the world. Wherever you go, in whatever life stage you find yourself, your fellow alumni will always be there to support you. The CAA will keep you in touch with this vibrant community and help you realize the full potential of your extended Caltech family, personally and professionally. Your Caltech alumni community is proud of you and all that you have accomplished, especially in the face of such unprecedented challenges. We encourage you to get involved with the CAA and stay connected to your fellow Techers. Please visit [alumni.caltech.edu](http://alumni.caltech.edu) to see what the CAA can provide for you.

Chris Bryant (BS '95)  
President, Board of Directors  
Caltech Alumni Association  
[alumni.caltech.edu](http://alumni.caltech.edu)

## 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.

Caltech graduates receiving a doctorate wear a black velvet cap, robes trimmed in blue velvet, 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 the undergraduate's residential affiliation.

There are currently eight undergraduate houses at Caltech (**Avery**, **Blacker**, **Dabney**, **Fleming**, **Lloyd**, **Page**, **Ricketts**, and **Ruddock**), and three undergraduate residences (**Bechtel**, **Braun**, and **Marks**).

- The students of the **Bechtel**, **Braun**, and **Marks** residences who affiliate with a house may choose to wear that house's tassel or stole.
- 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 (LET US REJOICE, THEREFORE)

The song *Gaudeamus igitur* has become an academic standard, sung around the world at graduations and other university ceremonies. 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 now famous opening verse that begins *Gaudeamus igitur, iuvenes 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, verses have been added or subtracted for different occasions. The song also has been translated into many different languages, sometimes faithfully, sometimes quite imaginatively.

The verses below (which have been translated as closely as possible from Latin into English) combine the youthful energy and irreverent attitude towards authority that characterize Caltech students with a ringing endorsement of the academic enterprise to which they are devoted. The verses 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 by Warren C. Brown, Convocations Chair*



## **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.





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We invite you to celebrate and honor our 2020 graduates. Post your well-wishes, words of wisdom, and congratulations with #Caltech2020 on Twitter and Instagram.

