



121st Annual Commencement
CALIFORNIA INSTITUTE OF TECHNOLOGY

June 12, 2015



121st Annual Commencement
CALIFORNIA INSTITUTE OF TECHNOLOGY

Friday, June 12, 2015
10:00 a.m.

ACADEMIC PROCESSION

Chief Marshal

Warren C. Brown, Ph.D.

Marshals

Paul M. Bellan, Ph.D.

Geoffrey A. Blake, Ph.D.

Melany L. Hunt, Ph.D.

Diana L. Kormos-Buchwald, Ph.D.

Hugh D. Politzer, Ph.D.

Joseph E. Shepherd, Ph.D.

Daniel P. Weitekamp, Ph.D.

Faculty Officers

John M. Eiler, Ph.D.

Richard C. Flagan, Ph.D.

Kristine L. Haugen, Ph.D.

MARCHING ORDER

Candidates for the Degree of Bachelor of Science

Candidates for the Degree of Master of Science

Candidates for the Degree of Doctor of Philosophy

Faculty Officers

The Faculty

The Chairs of the Divisions

The Deans

The Vice Provosts

The Provost

The Vice Presidents

The Trustees

The Commencement Speaker

The President

The Chair of the Board of Trustees

PROGRAM

ORGAN PRELUDE	Leslie J. Deutsch, Ph.D.
PROCESSIONAL	The Caltech Convocation Brass and Percussion Ensemble <i>William W. Bing, M.M., Conductor</i>
PRESIDING	David L. Lee, Ph.D. <i>Chair of the Board of Trustees California Institute of Technology</i>
COMMENCEMENT SPEAKER	Genevieve Bell, Ph.D. <i>Vice President and Fellow Intel Corporation</i>
CHORAL SELECTION “Ode to Joy” excerpts from Symphony No. 9 by Ludwig van Beethoven; Arranged by Dr. Deutsch (<i>Translation on page 56.</i>)	The Caltech Glee Club, the Caltech Convocation Brass and Percussion Ensemble, and Organ <i>Nancy Sulahian, M.M., Conductor</i>
CONFERRING OF DEGREES	Thomas F. Rosenbaum, Ph.D. <i>President Sonja and William Davidow Presidential Chair and Professor of Physics California Institute of Technology</i>
PRESENTATION OF CANDIDATES FOR DEGREES	
For the Degree of Bachelor of Science	John O. Dabiri, Ph.D. <i>Dean of Undergraduate Students</i>
For the Degree of Master of Science	Joseph E. Shepherd, Ph.D. <i>Dean of Graduate Studies</i>

For the Degree of Doctor of Philosophy

Biology and Biological Engineering	Stephen L. Mayo, Ph.D. <i>Division Chair</i>
Chemistry and Chemical Engineering	Jacqueline K. Barton, Ph.D. <i>Division Chair</i>
Engineering and Applied Science	Ares J. Rosakis, Ph.D. <i>Division Chair</i>
Geological and Planetary Sciences	John P. Grotzinger, Ph.D. <i>Division Chair</i>
Humanities and Social Sciences	Jean-Laurent Rosenthal, Ph.D. <i>Division Chair</i>
Physics, Mathematics and Astronomy	B. Thomas Soifer, Ph.D. <i>Division Chair</i>

ANNOUNCEMENT OF AWARDS AND
CONCLUDING REMARKS

President Rosenbaum

ALMA MATER

“Hail CIT”

by Manton Barnes, B.S. ‘21
(*The audience may join in;
lyrics are on page 56.*)

The Caltech Glee Club, the Caltech
Convocation Brass and Percussion
Ensemble, and Organ

RECESSIONAL

The Caltech Convocation Brass
and Percussion Ensemble

Organ Postlude

“The Throop Institute March,”
composed by E. C. Kammermeyer
in 1900 for the Throop Institute
Guitar and Mandolin Society

Dr. Deutsch

*Live streaming of Caltech’s 2015 commencement ceremony will begin shortly before
10 a.m. on Friday, June 12, at www.caltech.edu.*

*Follow along with the day’s events on Facebook, Twitter, and Instagram. Share your photos
and join the celebration by using #Caltech2015. (See page 60 for more information.)*

ABOUT CALTECH

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

Since then, Caltech has grown to nearly 300 professorial faculty, more than 600 postdocs, more than 1,200 graduate students, and almost 1,000 undergraduates—all of whom expand human knowledge and advance society through bold, collaborative explorations and creative, intensive scholarship in fundamental and applied sciences and engineering. Caltech scholars have accelerated life-changing discoveries and transformed the fields of energy, medicine, geoscience, and astrophysics. They have earned 34 Nobel Prizes, seven Crafoord Prizes, 13 National Medals of Technology, and 58 National Medals of Science.

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

Caltech is a place where bold discoveries are possible—where visionary scholars advance the boundaries of knowledge. We celebrate today the 534 graduates who will earn 228 bachelor's degrees, 123 master's degrees, 1 engineer degree, and 182 Ph.D. degrees, and who will contribute to Caltech's impressive legacy and record of achievement around the world.

ABOUT THE SPEAKER

Cultural anthropologist Genevieve Bell is an expert on the intersection of culture and technology, and currently serves as a vice president at Intel Corporation and an Intel Fellow, a position that reflects the highest level of technical achievement within the company.

A native Australian, Bell is the daughter of an anthropologist mother and engineer father. She spent much of her childhood at her mother's field sites in northern and central Australia, experiencing different cultures and traditions, a background she credits with providing her with a keen interest in both trying to see the world through the eyes of others and in working to make the world a better place.

Bell came to the United States to study anthropology at Bryn Mawr College and then earned her master's degree and doctorate in cultural anthropology from Stanford University. She was a lecturer at Stanford before joining Intel in 1998. Bell notes that she found the opportunity at Intel intriguing because it offered her the chance to infuse information about the needs and aspirations of humans into the development process of transformative technologies.

Bell speaks frequently about the interaction of technology and culture and the potential for shaping our technological future in ways that take critical aspects of our humanity into consideration. She holds numerous patents for consumer electronics innovations and coauthored the book *Divining a Digital Future: Mess and Mythology in Ubiquitous Computing* (MIT Press, 2011) with computer scientist Paul Dourish.

In 2014, *Elle Magazine* named Bell one of their 13 most influential women in technology. She was the winner of the Anita Borg Institute's Women of Vision ABIE Award for Leadership in 2013, was elected to the Women in Technology International Hall of Fame in 2012, and was one of Fast Company's Most Influential Women in Technology 2010.

CANDIDATES FOR DEGREES

Bachelor of Science

Amir Abdolrahim Poorheravi* *San Diego, California* Mechanical Engineering
Juan Ignacio Adame *Sylmar, California* Mathematics
Belen Maria Alvarez Villalonga *Newton, Massachusetts* Chemical Engineering (Process Systems)
Keshav Amla *Chandler, Arizona* Mechanical Engineering
Sadaf Amouzegar* *Los Angeles, California* Computer Science
Da An* *Woodstock, Maryland* Physics
Phoebe Ann* *Irvine, California* Biology and English
Arun Somayaji Asundi* *Foster City, California* Chemical Engineering (Materials) and Business, Economics, and Management
Sharjeel Khalid Aziz *Houston, Texas* Computer Science
Karsyn Nicole Bailey* *Cary, North Carolina* Bioengineering and English
Alexander Ball* *Mount Prospect, Illinois* Physics and Computer Science (Minor)
Sophianna Roberts Banholzer* *Oak Park, Illinois* Physics
William Yuwei Bao *San Diego, California* Electrical Engineering
Alexander Ruben Barreiro† *Miami, Florida* Electrical Engineering
Ryan Patrick Batterman* *Salinas, California* Computer Science
Jonathan Paul Bayless* *Merritt Island, Florida* Electrical Engineering
Aleksander Bello* *Tirana, Albania* Computer Science
James Mac Bern* *Ventura, California* Mechanical Engineering and Computer Science (Minor) and Control and Dynamical Systems (Minor)
Kerry Nicole Betz* *Boulder, Colorado* Chemistry
Srinivasa Aditya Bhattaru* *Irving, Texas* Mechanical Engineering
Charles Preston Blakemore* *Salt Lake City, Utah* Physics
Eric James Bobrow* *Great Neck, New York* Physics
Sven Böemer* *Istanbul, Turkey* Physics and Computer Science
Ronnel Patrick Boettcher *Redding, California* Computer Science
Sarah Anne Brandsen† *Ankeny, Iowa* Physics
Sidney Douglas Buchbinder* *Marlboro, New Jersey* Electrical Engineering

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

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

Bachelor of Science continued

- Vivian Huang Buhler* *Irvine, California* Bioengineering and English
William Edward Bunting *Aldie, Virginia* Physics and Economics
Jennifer Rachel Caseres *Olathe, Kansas* Geochemistry
Ryan Thomas Casey* *Valencia, California* Computer Science
Doreen Chung-Yue Chan* *Huntingtown, Maryland* Chemistry
Tracey Chan* *Los Gatos, California* Bioengineering
Krishnan Chander* *Annandale, Virginia* Physics
James Chang *Newbury Park, California* Computer Science
Solomon Chang* *San Marino, California* Computer Science
Brad Chattergoon* *St. Augustine, Trinidad and Tobago* Applied and Computational Mathematics
and Business, Economics, and Management
Jianchi Chen* *Beijing, People's Republic of China* Electrical Engineering
Moya Peng Chen* *Vernon Hills, Illinois* Computer Science
Wen Min Chen* *Hawthorne, California* Biology
Lin Cheng* *Zhengzhou, People's Republic of China* Physics and Business, Economics, and
Management
Kaitlin Ann Ching* *Littleton, Colorado* Biology and English (Minor)
Linda Chio* *New York, New York* Chemical Engineering (Biomolecular)
Joseph I. Choi* *Aurora, Colorado* Computer Science
John Randall Christian* *Calabasas, California* Computer Science and Geology
Meng Shuen Chua* *Singapore, Republic of Singapore* Physics and History and Philosophy of
Science
Alexandru Cristian Cioc* *Ottawa Hills, Ohio* Computer Science and History (Minor)
Bridget Ann Connor* *Albuquerque, New Mexico* Chemistry
Cutter Adam Coryell* *Los Gatos, California* Physics
Timothy Qing Cui* *Lexington, Kentucky* Computer Science and Mathematics
Christopher Jeffrey Culpepper *Leonardtown, Maryland* Mechanical Engineering and Business,
Economics, and Management
Oliver Robert Pitt Curtiss *Hudson, Ohio* Applied and Computational Mathematics and
Economics
Lorinda Carol DaJose† *Riverside, California* Planetary Science
Joshua Charles Dale *Needham, Massachusetts* Computer Science
Poonim Nina Daya *Fayetteville, Georgia* Biology
Maxwell Gerald De Jong* *Rock Rapids, Iowa* Applied Physics
Daniel Aaron DeFelippis* *Lansdale, Pennsylvania* Astrophysics
Hannah Lin Dotson* *Southlake, Texas* Bioengineering and Computer Science (Minor)

Bachelor of Science continued

Victor Weiyu Duan* *Darien, Illinois* Computer Science
Matthew Chalfin Dughi *Miami, Florida* Computer Science
Emily Eva Ellsworth* *Lafayette, California* Computer Science and English (Minor)
Monica Kathryn Enlow *Surawnee, Georgia* Mechanical Engineering
Christopher Edward Estrada† *Calexico, California* Mathematics
Naoki Eto* *McAllen, Texas* Computer Science
Erin Elizabeth Evans* *Elm Grove, Wisconsin* Mechanical Engineering
Boyu Fan* *New City, New York* Mechanical Engineering
Ingrid Margaret Fiedler* *Goodrich, Michigan* Engineering and Applied Science (Computation and Neural Systems) and Computer Science (Minor)
Katherine Jennie Fisher* *Chapel Hill, North Carolina* Chemistry
Cedric Wen Flamant* *Saratoga, California* Physics
David Timothy Flicker* *San Diego, California* Computer Science
Laurence James Forshaw *Urbana, Ohio* Mathematics
Jared Nicholas Forte† *Lake Elsinore, California* Chemical Engineering (Biomolecular) and Philosophy (Minor)
Luke Stephen Frankiw* *Calgary, Canada* Bioengineering
Neelay Hitesh Fruitwala* *Houston, Texas* Physics
Joaquin T. Gabaldon *Albuquerque, New Mexico* Mechanical Engineering
Katharyn Elin Garcia *Phoenix, Arizona* Engineering and Applied Science (Computation and Neural Systems)
Rachel Michelle Gates† *Grass Valley, California* Engineering and Applied Science (Environmental Science and Engineering)
Udaya Bakhru Ghai* *Burr Ridge, Illinois* Computer Science
Harry Nathan Golash *Salalah, Oman* Mechanical Engineering
Samuel Gene Goldberg* *Lancaster, California* Physics
Emmett D. Goodman* *Briarcliff Manor, New York* Chemical Engineering (Materials) and Business, Economics, and Management
Benjamin L. Grabowski *Lake Forest Park, Washington* Electrical Engineering and Business Economics, and Management
Joseph Karl Greef *Boulder, Colorado* Computer Science
Mark Joseph Greenfield* *Cary, North Carolina* Mathematics
Alexander Evan Hartz* *Baltimore, Maryland* Applied Physics
Bryan Dawei He* *Clarence, New York* Computer Science
Monica He *Pewaukee, Wisconsin* Astrophysics and Geological and Planetary Sciences (Minor)
Richie Hernandez* *Lorton, Virginia* Mechanical Engineering

Bachelor of Science continued

- Andrew James Hogue *Arroyo Grande, California* Computer Science
- Dhiraj Holden* *Fresno, California* Computer Science
- Timothy Philip Holland† *Hingham, Massachusetts* Computer Science
- Katherine Hooper *Sunnyvale, California* Engineering and Applied Science (Computation and Neural Systems)
- Daniel Weichieh Hsu* *Cupertino, California* Electrical Engineering
- Connie Lawwa Hsueh* *Palo Alto, California* Physics
- Benjamin Hu* *Alpharetta, Georgia* Applied and Computational Mathematics
- Rebecca Hu* *Richland, Washington* Biology
- Edward Huang* *Yorba Linda, California* Computer Science
- Xiangyi Huang* *Wuhan, People's Republic of China* Applied and Computational Mathematics and Mathematics and Business, Economics, and Management
- Madiha Hussain* *Lahore, Pakistan* Physics
- Muneeb Imtiaz* *Karachi, Pakistan* Mechanical Engineering and Business, Economics, and Management
- Ruchi Sudhir Jahagirdar *Longwood, Florida* Engineering and Applied Science (Computation and Neural Systems) and Business, Economics, and Management
- Adam Sean Jermyn* *Longmeadow, Massachusetts* Physics
- Muhammad Musab Jilani *Karachi, Pakistan* Electrical Engineering
- Zhaorong Jin* *Beijing, People's Republic of China* Mathematics
- Bryan Weston Joel *Bethesda, Maryland* Mechanical Engineering
- Robert Francis Johnson* *Philadelphia, Pennsylvania* Biology
- Jennifer Shizu Karolewski* *Davis, California* Chemistry and Geochemistry
- Derek Michael Kearney *Carlsbad, California* Mechanical Engineering
- Thomas Anderson Keller* *Mountain View, California* Computer Science
- Chung Eun Kim* *Daejeon, Republic of Korea* Computer Science
- Dae Hyun Kim* *Seoul, Republic of Korea* Computer Science
- Do Hee Kim *Hong Kong, People's Republic of China* Electrical Engineering
- Hannah Elizabeth Klion* *Indianapolis, Indiana* Physics and Computer Science (Minor)
- William S. Ko *Terre Haute, Indiana* Business, Economics, and Management and Computer Science (Minor)
- Justin Robert Koch* *Townsend, Delaware* Mechanical Engineering
- Daniel Lingjie Kong* *Chapel Hill, North Carolina* Physics and Computer Science (Minor)
- Ian Koss* *Fort Collins, Colorado* Engineering and Applied Science (Materials Science)
- Lev Viktorovich Krayzman* *Derwood, Maryland* Physics and Computer Science (Minor)
- Aaron Samantha Krupp *Needham, Massachusetts* Mechanical Engineering

Bachelor of Science continued

Katherine Qing Lai* *Englewood, Colorado* Electrical Engineering
Ryan Langman* *Palm Desert, California* Computer Science
Matthew James Lappin *Westminster, Maryland* Physics
Elizabeth Ann Lawler *Portland, Oregon* Engineering and Applied Science (Computation and Neural Systems)
Barclay J. Lee* *Shelby Township, Michigan* Bioengineering
Jong Yeon Lee* *Seoul, Republic of Korea* Physics and Mathematics
Katherine Jane Lee* *Hartford, Connecticut* Chemistry
Michelle Ji-Eun Lee* *Fullerton, California* Biology and English (Minor)
Cheng Ran Mathilda Li *Wuban, People's Republic of China* Computer Science
Eileen Jia Li* *Potomac, Maryland* Mathematics
Fanfei Li *Conyers, Georgia* Chemical Engineering (Process Systems)
Kevin Kainan Li* *Urbana, Illinois* Mathematics and Economics and Computer Science (Minor)
Andrew Xiao Liang* *Fremont, California* Electrical Engineering and Computer Science (Minor)
Wilton Edward Liano *Starkville, Mississippi* Mechanical Engineering
Chloe Ling* *Austin, Texas* Physics
Anna Liu* *Arlington, Texas* Bioengineering
Hui Liu* *Nanjing, People's Republic of China* Mathematics
Jonathan Hongkun Liu* *Pleasanton, California* Applied Physics
Ashley Regina Lo *San Diego, California* Mechanical Engineering
Catharine Wing Kwan Lo* *Singapore, Republic of Singapore* Mathematics and Physics and Philosophy (Minor)
Margaux Katherine Lopez* *Lewes, Delaware* Mechanical Engineering
Archan Baldevbhai Luhar *Medfield, Massachusetts* Computer Science
Genesis Lung *Lexington, Massachusetts* Bioengineering
James Francis Macdonald *Chicago, Illinois* Computer Science
Shalini Joshi Majumdar *Orinda, California* Mechanical Engineering
Allison Ysabel Maker *Huntsville, Alabama* Chemistry and Geological and Planetary Sciences (Minor)
Galina Vladimirovna Malakhova *Burbank, California* Mechanical Engineering
Michael John Malek *Chicago, Illinois* Mathematics and Computer Science (Minor)
Janani Mandayam Comar* *Downers Grove, Illinois* Biology
Jake Boleslaw Marcinek* *Chicago, Illinois* Mathematics
Eric Anthony Martin* *The Woodlands, Texas* Applied and Computational Mathematics and Computer Science

Bachelor of Science continued

Jacqueline Joy Masehi-Lano† *San Marino, California* Bioengineering
Jacqueline Avery Maslyn* *Cupertino, California* Chemical Engineering (Materials)
Ella Miriam Mathews *Mercer Island, Washington* Computer Science
Austin Philip Mayron *Delmar, New York* Chemical Engineering (Process Systems)
Kayla Marisa McCue* *La Cañada, California* Applied and Computational Mathematics
Harrison James Miller *Grand Prairie, Texas* Mechanical Engineering
Suraj Mirani Mirpuri *Nassau, Bahamas* Chemistry
Chiraag M Nataraj *Radnor, Pennsylvania* Mechanical Engineering and Aerospace Engineering
(Minor)
Lauren Lerong Niu* *Austin, Texas* Physics
Louis Bernard O'Bryan* *Salt Lake City, Utah* Computer Science
Juan Pablo Ocampo *Neiva, Colombia* Mechanical Engineering and Business, Economics, and
Management
Brian Chibueze Okoro *Chino, California* Economics and Computer Science (Minor)
Quinn Liebling Osha *Houston, Texas* Electrical Engineering
Arpit Panda* *Maple Grove, Minnesota* Bioengineering and Computer Science (Minor)
Jeong Joon Park* *Seoul, Republic of Korea* Computer Science
Nicholas E. Parker *Corpus Christi, Texas* Chemical Engineering (Materials)
Aleena Laxmi Patel* *Fairfax, California* Bioengineering
Eric Seth Pelz* *Boca Raton, Florida* Computer Science and Business, Economics, and
Management
Jeffrey Treyer Picard *Cameron Park, California* Physics
Alexander Maxwell Port *Denver, Colorado* Mathematics
Ellen Marie Price* *Gardendale, Alabama* Astrophysics
Shuyang Sue Qin* *Fort Lee, New Jersey* Biology
Brynan Ruinan Qiu* *Vernon Hills, Illinois* Electrical Engineering
Matthew David Queen *Sacramento, California* Mechanical Engineering
Misha Raffiee* *Reno, Nevada* Bioengineering and Business, Economics, and Management
Matthias Jelani Raives *San Rafael, California* Astrophysics
Meera Reghunathan* *Agoura Hills, California* Bioengineering
Stephanie Nicole Reynolds* *Tallahassee, Florida* Chemical Engineering (Materials)
Kexin Rong* *Nanjing, People's Republic of China* Computer Science
Connor Edwin Rosen* *Hillsborough, California* Chemistry
Nicholas Sandro Salzetta* *Chicago, Illinois* Physics
Alejandro Montserrat Sanchez Chavarria *San Carlos, California* Mechanical Engineering
Elizabeth Caldwell Schroder† *Mooresville, North Carolina* Electrical Engineering

Bachelor of Science continued

- Mehmet Şencan† *Istanbul, Turkey* Applied Physics
- Marec Serlin* *Bala Cynwyd, Pennsylvania* Physics
- Jacob Quinn Shenker* *Berkeley, California* Physics
- Emily Shih *Rockville, Maryland* Computer Science
- Natalie Melinda Shih *Laramie, Wyoming* Biology
- Corwin Shiu* *El Cerrito, California* Physics
- Haran Kumar Shiv Kumar* *New Delhi, India* Chemical Engineering (Process Systems) and Business, Economics, and Management
- Vighnesh Leonardo Shiv *Portland, Oregon* Computer Science
- Kiara Camille Da Silva Simpao *Millbrae, California* Chemical Engineering (Materials)
- Timothy S. Sinclair* *Albany, California* Chemistry
- Samuel Frank Szuflita* *Brooklyn, New York* Computer Science
- Stephanie Tan* *Pasadena, California* Chemical Engineering (Process Systems)
- Grace Yow-Zhong Tang *San Jose, California* Chemistry
- Nicolas John Tedeschi* *San Diego, California* Mathematics
- Michael Teng* *Clarendon Hill, Illinois* Computer Science
- Ruijie Darius Teo* *Singapore, Republic of Singapore* Chemistry
- Leslie Ann Timms *San Diego, California* Mechanical Engineering
- Lillian Jie Tong* *Little Rock, Arkansas* Bioengineering
- Christopher M. Tonge *Kent, Ohio* Chemistry
- Hueyru Tsai *Los Altos, California* Engineering and Applied Science (Computation and Neural Systems)
- Charles Lincoln Tschirhart* *Naperville, Illinois* Applied Physics and Chemistry
- Ratnalekha Venkata Naga Viswanadham *Cupertino, California* Applied and Computational Mathematics and Business, Economics, and Management
- Allika Rao Walvekar *Los Altos Hills, California* Computer Science
- Ann Miao Wang* *Rochester, New York* Physics
- Benjamin Wang* *Livingston, New Jersey* Biology
- Esha Wang *Peoria, Illinois* Applied and Computational Mathematics
- Lawrence Wang* *Apple Valley, Minnesota* Biology
- Max Li-Hua Wang* *Vienna, Virginia* Electrical Engineering
- Melissa Ling Wang* *Saint Louis, Missouri* Applied and Computational Mathematics
- Winnie Wei-Chieh Wang* *Brookline, Massachusetts* Mechanical Engineering and English (Minor)
- Carla Lim Watson *San Diego, California* Applied Physics
- Rochelle Ann Weber* *Bend, Oregon* Engineering and Applied Science (Materials Science)
- Nicholas Ryan Weil* *Houston, Texas* Physics and Computer Science
- Jake Lee Wellens* *Wynnewood, Pennsylvania* Mathematics

Bachelor of Science continued

- Caroline Andrea Werlang* *Houston, Texas* Chemical Engineering (Biomolecular)
- Connor K. Wilson† *Republic, Washington* Engineering and Applied Science (Computation and Neural Systems)
- Chatarin Wong-u-railertkun *Bangkok, Thailand* Astrophysics
- Benjamin Wu* *Yorba Linda, California* Applied and Computational Mathematics
- Cheng (Teresa) Xu *Santa Monica, California* Business, Economics, and Management
- Jing J. Xu* *Mountain View, California* Biology
- Jade Yu Yang* *Westford, Massachusetts* Computer Science
- Kevin Han Yang* *Los Altos, California* Computer Science
- Perren Yang *San Diego, California* Geochemistry and Computer Science (Minor)
- Stacy Kate Yeh* *University Place, Washington* Computer Science and Business, Economics, and Management
- Hwan Seung Yeo* *Daegu, Republic of Korea* Computer Science
- Kevin Yin* *San Marino, California* Mathematics
- Patrick Wai-Kit Yiu* *San Gabriel, California* Electrical Engineering and Business, Economics, and Management
- Madeleine Kendall Youngs* *Santa Monica, California* Applied and Computational Mathematics
- Allen Yu *Henderson, Nevada* Mathematics and Economics
- Paul Zhang* *Great Neck, New York* Computer Science
- Yichi Zhang* *Omaha, Nebraska* Computer Science
- Evan Zhao * *Clarence Center, New York* Chemical Engineering (Biomolecular) and Business, Economics, and Management
- Kevin Zhao* *Naperville, Illinois* Applied and Computational Mathematics
- Andy J. Zhou* *Slidell, Louisiana* Electrical Engineering
- Danielle Zhu* *San Antonio, Texas* Electrical Engineering
- Yuqi Zhu *Shanghai, People's Republic of China* Applied Physics
- Linus L. Ziemba *Livonia, Michigan* Electrical Engineering

Master of Science

- Anish Agarwal (*Computer Science*) B.S., California Institute of Technology 2013.
- Catherine Michelle Alvarez (*Environmental Science and Engineering*) B.A., University of Colorado at Boulder 2013.
- Dana Eklund Anderson (*Planetary Science*) B.S., University of Michigan, Ann Arbor 2012.
- Heather Audesirk (*Chemistry*) B.S., Harvey Mudd College 2011.
- Antoine Barizien (*Aeronautics*) B.S., École Polytechnique 2013.
- Kevin Julien Bonnet (*Space Engineering*) B.S., Institut Supérieur de l'Aéronautique et de l'Espace 2013.
- Stephen Kramer Brand (*Chemical Engineering*) B.S., Northwestern University 2012.
- Nina Budaeva (*Physics*) B.S., California Institute of Technology 2013.
- Peter Benjamin Buhler (*Planetary Science*) B.S., California Institute of Technology 2012.
- Kayla Nicole Busby (*Chemistry*) B.S., University of California, San Diego 2012.
- John Kenneth Buyco (*Civil Engineering*) B.S., Harvey Mudd College 2013.
- Juan Pablo Cardenas (*Mechanical Engineering*) B.S., California Institute of Technology 2013.
- Finn Carlsvi (*Space Engineering*) B.S., Embry-Riddle Aeronautical University 2014.
- Kin Chan (*Physics*) B.S., Rutgers, The State University of New Jersey 2013.
- Christopher Wayne Chatellier (*Space Engineering*) B.S., United States Military Academy 2009.
- Chien-Chang Kyle Chen (*Physics*) B.S., University of Illinois at Urbana-Champaign 2011.
- Tzu-Chieh Chou (*Electrical Engineering*) B.S., National Taiwan University 2014.
- Justin Daniel Cohen (*Physics*) B.S., University of Florida 2009.
- Tales de Barros Caldas (*Electrical Engineering*) Engenheiro Eletrônico, Instituto Tecnológico de Aeronáutica 2003.
- Chandru Dhandapani (*Aeronautics*) B.Tech., Indian Institute of Technology, Madras 2014.
- Javier Mauricio Gonzalez Duarte (*Physics*) S.B., Massachusetts Institute of Technology 2010.
- Gina Elizabeth Duggan (*Astrophysics*) B.S., University of California, Santa Barbara 2013.
- Jordan Nathaniel Dykes (*Chemical Engineering*) B.S., Rensselaer Polytechnic Institute 2013.
- Marcelo Ariel Fernández (*Social Science*) Licenciado, Pontificia Universidad Católica Argentina 2010.
- Serena Ferraro (*Space Engineering*) B.S., Università degli Studi di Napoli Federico II 2008; M.S., 2011.
- Kevin Robert Fiedler (*Physics*) B.S., University of Colorado at Boulder 2011.
- Patrick Daniel Fischer (*Planetary Science*) B.S., The University of Iowa 2013.
- Michael Cameron Floyd (*Materials Science*) B.S., University of California, Berkeley 2011.
- David Conwell Foor (*Electrical Engineering*) B.S., Texas A&M University 2005.

Master of Science continued

- Katherine Theresa Fountaine (*Chemical Engineering*) B.S., University of California, Santa Barbara 2010.
- Nikola Georgiev (*Mechanical Engineering*) B.E., University of Edinburgh 2013.
- Gregory Paul Harlow (*Chemistry*) B.S., University of Oregon 2013.
- Luke Deane Harrison (*Chemical Engineering*) B.S., Brigham Young University 2012.
- Magnus Albert Haw (*Applied Physics*) B.S., University of British Columbia 2012.
- Jane Elizabeth Herriman (*Materials Science*) B.S., Carnegie Mellon University 2011.
- Ying-Yu Ho (*Physics*) S.B., Massachusetts Institute of Technology 2012.
- Kangping Hu (*Electrical Engineering*) B.S., Boston University 2013.
- Cecilia Huertas Cerdeira (*Aeronautics*) Ingeniero, Universidad Politécnica de Madrid 2014; École Nationale Supérieure de Mécanique et d'Aérotechnique 2014.
- Yuewei Lucy Ji (*Chemical Engineering*) S.B., Massachusetts Institute of Technology 2012.
- Jingjing Jiang (*Materials Science*) B.S., Nanjing University 2013.
- Dongwan Kim (*Applied Physics*) B.S., Seoul National University 2005; M.S., 2008.
- Taeyong Kim (*Electrical Engineering*) B.S., Yonsei University 2013.
- Yonghui Kim (*Electrical Engineering*) B.S., Yonsei University 2011; M.S., 2013.
- Deepan Kishore Kumar (*Electrical Engineering*) B.E., Birla Institute of Technology and Science, Pilani 2014.
- Pushkar Kopparla (*Planetary Science*) B.Tech., Indian Institute of Technology, Delhi 2011; M.S., Swiss Federal Institute of Technology in Zurich 2013.
- Katerina Marie Korch (*Chemistry*) B.S., Juniata College 2012.
- Christophe Leclerc (*Space Engineering*) B.E., École Polytechnique de Montréal 2014.
- Jong Yeon Lee (*Physics*) B.S., California Institute of Technology 2015.
- Matthew Gregory Leibowitz (*Aeronautics*) B.S., University at Buffalo, The State University of New York 2013.
- Dunzhu Li (*Geophysics*) B.S., Peking University 2008; M.S., 2010.
- Lu (Lydia) Li (*Electrical Engineering*) B.E., Beijing University of Posts and Telecommunications 2014.
- Nicole Renate Lingner (*Physics*) A.A., Santa Monica College 2007; B.A., University of California, Berkeley 2008.
- Joseph John Lydon II (*Materials Science*) B.S., University of Pennsylvania 2010.
- Yiran Ma (*Geophysics*) B.S., Nanjing University 2010.
- Henry Livingston Macdonald (*Mathematics*) B.Sc., Victoria University of Wellington 2010.
- Huajun Mai (*Environmental Science and Engineering*) B.E., Tsinghua University 2013.
- Shupin Mao (*Electrical Engineering*) B.E., Zhejiang University 2013.

Master of Science continued

- Hilary Rose Martens (*Geophysics*) B.A., The University of Montana 2008; M.Sc., University College London 2009; M.Phil., University of Cambridge 2010.
- Sean Michael Meenehan (*Applied Physics*) B.S., Harvey Mudd College 2008.
- Nicolas Meirhaeghe (*Space Engineering*) B.S., Institut Supérieur de l'Aéronautique et de l'Espace 2013.
- Evan Tsugio Miyazono (*Applied Physics*) B.S., Stanford University 2010; M.S., 2011.
- Isak Mottelson (*Mathematics*) B.Sc., M.S., University of Copenhagen 2012.
- Prineha Narang (*Applied Physics*) B.S., Drexel University 2011.
- Abigail Marie Nاستان (*Planetary Science*) B.S., The University of Montana 2013.
- Pranav Nath (*Space Engineering*) B. Tech, Indian Institute of Space Science and Technology 2015.
- Lucas Núñez (*Social Science*) Licence, Universidad Torcuato Di Tella 2009; M.A., 2013.
- Ahmad K. Omar (*Chemical Engineering*) B.S., The University of Texas at Austin 2013.
- Donal Brendan O'Sullivan (*Astrophysics*) B.S., National University of Ireland, Maynooth 2013.
- Yamei Ou (*Electrical Engineering*) B.E., Tsinghua University 2014.
- Kirsti Mari Pajunen (*Space Engineering*) B.S., Milwaukee School of Engineering 2014.
- Cristian Ignacio Peña Herrera (*Physics*) Bachelor, Universidad Técnica Federico Santa María 2010; Master, 2011.
- Edward MacLeod Perkins (*Biology*) B.A., Skidmore College 2004.
- Gregory Paul Philpot (*Space Engineering*) B.S., Arizona State University 2014.
- Nicholas James Porubsky (*Chemical Engineering*) B.S., University of Wisconsin-Madison 2013.
- Jason Brian Price (*Geology*) B.S., The University of the South 1998; M.S., Colorado School of Mines 2004.
- Yutao Qi (*Biochemistry and Molecular Biophysics*) B.E., Sichuan University of Science and Engineering 2006; M.S., Tsinghua University 2010.
- Harish Ravi (*Physics*) B.Tech., Indian Institute of Technology, Madras 2010.
- Grant Newton Remmen (*Physics*) B.S., University of Minnesota, Twin Cities 2012.
- Xiaoqi Ren (*Computer Science*) B.S., Tsinghua University 2012.
- Trisha Ann Hisae Roberson (*Geophysics*) B.S., University of British Columbia 2013.
- Arbis Rojas (*Biology*) B.S., University of California, Riverside 2003; M.D., University of California, Los Angeles 2009.
- Xiaozhou Ruan (*Environmental Science and Engineering*) B.S., Ocean University of China 2013.
- Ingmar Akira Saberi (*Physics*) A.B., Princeton University 2011.
- Travis Stratton Schlappi (*Chemical Engineering*) B.S., Brigham Young University 2011.
- Kristy Lynn Schlueter (*Aeronautics*) B.S., University of Notre Dame 2008; M.S., University of Maryland, College Park 2013.
- Léopold Cyrus Raoul Marie Shaabani Ardali (*Aeronautics*) B.S., École Polytechnique 2013.

Master of Science continued

- Kevin Shen (*Chemical Engineering*) B.S., Yale College 2011.
- Natalia Viatcheslavovna Solomatova (*Geophysics*) B.S., University of California, Los Angeles 2012.
- Christopher Spalding (*Planetary Science*) B.S., University of Cambridge 2013.
- Michael Kristian Srien (*Chemical Engineering*) B.S., University of Minnesota, Twin Cities 2012.
- Allison Leigh Strom (*Astrophysics*) B.S., The University of Arizona 2010.
- Pengfei Sui (*Social Science*) B.S., Renmin University of China 2011.
- Yujie Tang (*Electrical Engineering*) B.S., Tsinghua University 2013.
- Ruijie Darius Teo (*Chemistry*) B.S., California Institute of Technology 2015.
- Ottman A. Tertuliano (*Materials Science*) B.S., Columbia University 2013.
- Nathan Hoover Thomas (*Materials Science*) B.A., Amherst College 2013.
- Luis Phillippe Costa Ferreira Tosi (*Mechanical Engineering*) B.S., Cornell University 2009; M.S., 2010.
- Dylan Douglas Tozier (*Materials Science*) B.A., B.S., Rice University 2013.
- Ho-Cheng Tsai (*Materials Science*) B.S., National Tsing Hua University, 2006; M.S., National Chiao Tung University 2009.
- Stephanie Tsuei (*Control and Dynamical Systems*) B.S., California Institute of Technology 2012.
- Jan Clark Van Bruggen (*Electrical Engineering*) B.S., University of California, Los Angeles 2014.
- Jean-Christophe Veilleux (*Aeronautics*) B.E., Laval University 2012; M.S., 2014.
- Vidyasagar Vidyasagar (*Aeronautics*) M.Eng., Imperial College London 2014.
- Giuliana Augusta Viglione (*Environmental Science and Engineering*) B.S., Columbia University 2013.
- Yaakov Vilenchik (*Applied Physics*) B.Sc., Tel Aviv University 2008.
- Jean-Pierre Voropaieff (*Space Engineering*) B.S., École Polytechnique 2013.
- Yuchen Wang (*Electrical Engineering*) B.S., Peking University 2013.
- Nicholas Joseph Weadock (*Materials Science*) B.S., University of Maryland, College Park 2013.
- Michael Anthony Webb (*Chemical Engineering*) B.S., University of California, Berkeley 2011.
- Samantha Stricklin Wilson (*Materials Science*) B.S., Stanford University 2009.
- Ian Wong (*Planetary Science*) B.A., Princeton University 2012.
- Ningjia Wu (*Electrical Engineering*) B.E., Tsinghua University 2013.
- Yong Yi Wu (*Chemical Engineering*) B.S., University of Virginia 2012.
- Xi Xi (*Environmental Science and Engineering*) B.E., National University of Singapore 2013.
- Nicole Wang Xu (*Bioengineering*) B.S.E., University of Pennsylvania 2014.
- Nelson Javier Yanes (*Aeronautics*) B.S., University of Maryland, College Park 2014.
- Chae-Reem Yang (*Materials Science*) B.S., University of California, Berkeley 2013.

Master of Science continued

Danlei Yang (*Electrical Engineering*) B.E., Tsinghua University 2013.

Qianhaozhe You (*Electrical Engineering*) B.E., Tsinghua University 2013.

Chenxi Zhang (*Electrical Engineering*) B.E., Tsinghua University 2013.

Jun Zhang (*Social Science*) B.S., Nanjing University of Science and Technology 2008.

Xiyue Zhang (*Environmental Science and Engineering*) B.S., University of Washington 2012.

Timur Zhiyentayev (*Chemistry*) B.S., M.S., Lomonosov Moscow State University 2009.

Engineer

Sinchul Yeom (*Materials Science*) B.S., Seoul National University 2005; M.S., University of California, Los Angeles 2006.

Doctor of Philosophy

DIVISION OF BIOLOGY AND BIOLOGICAL ENGINEERING

Alysia Ashley Ahmed (*Molecular Biology and Biochemistry*) B.S., University of California, Irvine 2010.

Thesis: Structural Characterization of Pro-Inflammatory and Anti-Inflammatory Immunoglobulin G Fc Proteins.

John David Bagert (*Bioengineering*) B.S., Johns Hopkins University 2008.

Thesis: Quantitative, Time-Resolved Proteomic Analysis using Bio-Orthogonal Non-Canonical Amino Acid Tagging.

Emmanuel Lorenzo Cornejo de los Santos (*Bioengineering*) S.B., Massachusetts Institute of Technology 2009.

Thesis: Expanding the Toolkit for Synthetic Biology: Frameworks for Native-like Non-natural Gene Circuits.

Avni Vasant Gandhi (*Biology*) B.S., St. Xavier's College 2006; M.S., Tata Institute of Fundamental Research 2008.

Thesis: The Regulation of Sleep and Circadian Rhythms: The Role of Melatonin and Adenosine in Zebrafish.

Alma Mariam Gharib (*Biology*) B.S., University of California, San Diego 2006; M.A., Columbia University 2012.

Thesis: Visual Behavior and Preference Decision-Making in Response to Faces in High-Functioning Autism.

Srimoyee Ghosh (*Developmental Biology*) B.S., The University of Texas at Austin 2009.

Thesis: Establishing the *C. elegans* Uterine Seam Cell (utse) as a Novel Model for Studying Cell Behavior.

Mark David Goldberg (*Biology*) B.S., University of California, Riverside 2004; M.S., California State University, Los Angeles 2008; M.S., California Institute of Technology 2011.

Thesis: Development of Microfluidic Devices with the Use of Nanotechnology to Aid in the Analysis of Biological Systems Including Membrane Protein Separation, Single Cell Analysis and Genetic Markers.

Margaret Ching Wai Ho (*Biology*) B.S., Harvey Mudd College 2008.

Thesis: Discovery of Active *cis*-Regulatory Elements and Transcription Factor Footprints in Nematodes using Functional Genomics Approaches.

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

- Naomi Kreamer (*Biochemistry and Molecular Biophysics*) B.S., University of Minnesota, Twin Cities 2007.
Thesis: Ferrous Iron Sensing and Responding in *Pseudomonas aeruginosa*.
- Rod Lim (*Integrative Neurobiology*) B.S., University of California, San Diego 2008; M.S., California Institute of Technology 2013.
Thesis: How Resources Control Aggression in *Drosophila*.
- Justin Liu (*Cellular and Molecular Neurobiology*) B.S., Stanford University 2007.
Thesis: Development and Function of Sleep Regulatory Circuits in Zebrafish.
- Arnav Mehta (*Immunology*) B.S., Duke University 2008.
Thesis: MicroRNA-132 is a Physiological Regulator of Hematopoietic Stem Cell Function and B-cell Development.
- Timothy Francis Miles (*Molecular Biology and Biochemistry*) B.S., Haverford College 2008.
Thesis: Binding Site Structure and Stoichiometry in Serotonin Type 3 Receptors.
- Ruzbeh Mosadeghi (*Biology*) B.S., University of California, San Diego 2008.
Thesis: Mechanistic Dissection of the Cop9 Signalosome's Deneddylation Activity on Cullin-RING Ligases.
- Rell Lin Parker (*Cellular and Molecular Neurobiology*) B.A., University of California, Berkeley 2006.
Thesis: Lynx1 Modulation of Nicotinic Acetylcholine Receptors.
- Jessica Nicole Ricci (*Biology*) B.S., Rutgers, The State University of New Jersey 2010.
Thesis: Constraining the Interpretation of 2-Methylhopanoids through Genetic and Phylogenetic Methods.
- Zakary Sean Singer (*Computation and Neural Systems*) B.S., University of California, San Diego 2008.
Thesis: Metastability and Dynamics of Stem Cells: From Direct Observations to Inference at the Single Cell Level.
- Jerzy Olgierd Szablowski (*Bioengineering*) S.B., Massachusetts Institute of Technology 2009.
Thesis: Biological Activity of Pyrrole-Imidazole Polyamides *in vivo*.
- Nathanie Alna Trisnadi (*Biology*) B.A., University of California, Berkeley 2007.
Thesis: Regulation of Gastrulation through Dynamic Patterning in the *Drosophila* Embryo.
- Vikas Trivedi (*Bioengineering*) B.Tech., Indian Institute of Technology, Kanpur 2010.
Thesis: From Molecules to Organs: Microscopy and Multi-Scale Nature of Development.
- Teagan Rose Wall (*Computation and Neural Systems*) B.A., B.S., The University of Arizona 2010; M.S., California Institute of Technology 2014.
Thesis: Effects of TI-299423 on Neuronal Nicotinic Acetylcholine Receptors.

Doctor of Philosophy continued

- Timothy Milton Wannier (*Molecular Biology and Biochemistry*) B.A., B.S., University of Pennsylvania 2005.
Thesis: Computationally Guided Monomerization of Red Fluorescent Proteins of the Class *Anthozoa*.
- Alexandre Webster (*Molecular Biology and Biochemistry*) B.S., University of California, Santa Barbara 2007.
Thesis: Mechanisms of Transposable Element Repression by Piwi Proteins in the piRNA Pathway of *Drosophila* Germ Cells.
- Yunji Wu (*Molecular Biology and Biochemistry*) S.B., Massachusetts Institute of Technology 2009.
Thesis: Structural Characterizations of the Dimeric Anti-HIV Antibody 2G12 and the HIV-2 Envelope Glycoprotein.
- John Yong (*Biology*) B.S., The Chinese University of Hong Kong 2007.
Thesis: Dynamics and Heterogeneity of Gene Expression and Epigenetic Regulation at the Single-Cell Level.

DIVISION OF CHEMISTRY AND CHEMICAL ENGINEERING

- Peter Chukwudi Agbo (*Chemistry*) B.S., University of California, Berkeley 2009.
Thesis: Development of Metalloenzyme Dioxxygen Reduction Cathodes.
- Marco Alberto Allodi (*Chemistry and Physics*) A.B., Hamilton College 2008.
Thesis: On Ultrafast Time-Domain TeraHertz Spectroscopy in the Condensed Phase: Linear Spectroscopic Measurements of Hydrogen-Bond Dynamics of Astrochemical Ice Analogs and Nonlinear TeraHertz Kerr Effect Measurements of Vibrational Quantum Beats.
- Anna Ruth Arnold (*Chemistry*) B.A., St. Olaf College 2008.
Thesis: Investigations of DNA-Mediated Protein Oxidation.
- Taylor Arnold Barnes (*Chemistry*) B.S., Middle Tennessee State University 2009.
Thesis: Development and Application of Embedding Methods for the Simulation of Large Chemical Systems.
- Thinh Quoc Bui (*Chemistry*) B.S., Emory University 2009.
Thesis: Cavity Enhanced Spectroscopies for Applications of Remote Sensing, Chemical Kinetics and Detection of Radical Species.
- Alan Hayden Cherney (*Chemistry*) B.S., University of Illinois at Urbana-Champaign 2010.
Thesis: Development of Nickel-Catalyzed Asymmetric Reductive Cross-Coupling of Benzylic Electrophiles.

Doctor of Philosophy continued

- Robert Allen Craig II (*Chemistry*) B.S., Davidson College 2010.
Thesis: Progress toward the Enantioselective Total Synthesis of Ineleganolide and the Polycyclic Norcembranoid Diterpenes and Construction of the Ineleganoloids.
- Ximena Da Silva Tavares (*Chemistry*) A.A., Miami Dade College 2006; B.S., Florida Atlantic University 2008.
Thesis: Binding Studies of Neuronal Nicotinic Acetylcholine Receptors Expressing Unnatural Amino Acids.
- Tristan William Day (*Chemical Engineering and Environmental Science and Engineering*) B.S., The University of Arizona 2009; M.S., California Institute of Technology 2011.
Thesis: Superionic Noble Metal Chalcogenide Thermoelectrics.
- Mark Austin Deimund (*Chemical Engineering*) B.S., Texas A&M University 2010; M.S., University of Cambridge 2012; M.S., California Institute of Technology 2014.
Thesis: I. Nickel-Exchanged Zincosilicate Catalysts for the Oligomerization of Propylene and II. Organic SDA-Free Catalysts for the Methanol-to-Olefins Reaction.
- Christopher Cheney Farwell (*Chemistry*) B.S., University of California, Santa Barbara 2008; M.S., 2010.
Thesis: Engineering and Characterization of Cytochrome P450 Enzymes for Nitrogen-Atom Transfer Reactions.
- Henry Fong (*Chemistry*) B.S., University of California, Berkeley 2009.
Thesis: Metallaboratrane Facilitated E-H Bond Activation and Hydrogenation Catalysis.
- Katherine T. Fountaine (*Chemical Engineering*) B.S., University of California, Santa Barbara 2010.
Thesis: Mesoscale Optoelectronic Design of Wire-Based Photovoltaic and Photoelectrochemical Devices.
- Amy Hau Yu Fu (*Chemical Engineering*) B.S., Johns Hopkins University 2009; M.S., California Institute of Technology 2012.
Thesis: Mitigating Scarring and Inflammation during Corneal Wound Healing using Nanofiber-Hydrogel Scaffolds.
- Ariel Lesa Furst (*Chemistry*) B.S., The University of Chicago 2010.
Thesis: DNA-Mediated Charge Transport Devices for Protein Detection.
- Zachary Michael Conway Gibbs (*Chemical Engineering*) B.S., M.S., University of Colorado at Boulder 2009.
Thesis: Band Engineering in Thermoelectric Materials using Optical, Electronic, and Ab-Initio Computed Properties.
- Jonathan Robert Gordon (*Chemistry*) Sc.B., Brown University 2008.
Thesis: Applications of a Concise and General Strategy for the Syntheses of Transtaganolide and Basiliolide Natural Products.

Doctor of Philosophy continued

- Harry Benjamin Gristick (*Biochemistry and Molecular Biophysics*) B.S., Indiana University of Pennsylvania 2006.
Thesis: Investigating the Role of the Get3-Get4/Get5 Interaction during Tail-Anchor Protein Targeting.
- Xun Wendy Gu (*Chemical Engineering and Materials Science*) B.S., University of California, Berkeley 2009; M.S., California Institute of Technology 2014.
Thesis: Strength, Deformation and Fracture in Metallic Nanostructures.
- Qijun Hong (*Chemistry*) B.S., Fudan University 2009.
Thesis: Methods for Melting Temperature Calculation.
- Chinenye Abiodun Idigo (*Biochemistry and Molecular Biophysics*) B.S., M.S., Emory University 2008.
Thesis: Structural and Biophysical Characterization of Variants of the Mechanosensitive Channel of Large Conductance (MscL).
- Jacob Steven Kanady (*Chemistry*) B.S., University of California, Irvine 2009.
Thesis: Models of the Oxygen-Evolving Complex of Photosystem II.
- JeenJoo Sophia Kang (*Chemistry*) A.B., Harvard College 2005.
Thesis: Targeting DNA Repeat Sequences with Py-Im Polyamides.
- Madeleine Eileen Kieffer (*Chemistry*) B.A., Wellesley College 2010.
Thesis: New Catalytic Methods for the Preparation of Tryptophans and Pyrroloindolines: Total Synthesis of (+)-Naseezazines A and B and (-)-Aspergilazine A.
- Andrea Kirkpatrick (*Chemistry*) B.S., Duke University 2007.
Thesis: Computational Predictions of G Protein-Coupled Receptor Structures and Binding Sites.
- Joshua S. Kretchmer (*Chemistry*) B.S., University of California, Berkeley 2009.
Thesis: Direct Simulation of Proton-Coupled Electron Transfer Reaction Dynamics and Mechanisms.
- Yan Choi Lam (*Chemistry*) S.B., Massachusetts Institute of Technology 2008.
Thesis: Synthesis, Oxidation and Photophysics of Perfluoroborated Tetrakis(pyrophosphito) diplatinate (II) and Density Functional Theory (DFT) Study of Electrochemical CO₂ Reduction by Mn Catalysts.
- Chung Whan Lee (*Chemistry*) B.S., Seoul National University 2007; M.S., 2009.
Thesis: Progress toward the Total Synthesis of Curcusone C and Mechanistic Elucidation of an Unexpected Rearrangement.
- Yiyang Liu (*Chemistry*) B.S., Peking University 2010.
Thesis: Palladium-Catalyzed Decarboxylative and Decarbonylative Transformations in the Synthesis of Fine and Commodity Chemicals.

Doctor of Philosophy continued

- Christopher Bruno Marotta (*Chemistry*) B.S., Rensselaer Polytechnic Institute 2010.
Thesis: Structure-Function Studies of Nicotinic Acetylcholine Receptors using Selective Agonists and Positive Allosteric Modulators.
- Brett Andrew McGuire (*Chemistry*) B.S., University of Illinois at Urbana-Champaign 2009.
Thesis: Time-Domain TeraHertz Spectroscopy and Observational Probes of Prebiotic Interstellar Gas and Ice Chemistry.
- Jane Ni (*Chemistry*) B.A.Sc., University of Toronto 2009.
Thesis: Development of Asymmetric Protonation Reactions for the Synthesis of Indoline Alkaloids.
- Joshua Joseph Pacheco (*Chemical Engineering*) B.S., University of Colorado at Boulder 2009.
Thesis: New Catalysts for the Renewable Production of Monomers for Bioplastics.
- Corey Michael Reeves (*Chemistry*) B.A., Columbia University 2010.
Thesis: Strategies for the Stereoselective Synthesis of Carbon Quaternary Centers via Transition Metal-Catalyzed Alkylation of Enolate Compounds.
- Kathryn Nicole Schaefer (*Biochemistry and Molecular Biophysics*) B.S., Mount St. Mary's College 2008.
Thesis: DNA-Mediated Oxidation of Transcription Factor p53.
- Katherine Ann Schilling (*Chemistry*) B.S., California State University, Northridge 2010.
Thesis: Secondary Organic Aerosol Composition Studies using Mass Spectrometry.
- Sandy Suseno (*Chemistry*) B.S., University of California, Berkeley 2008.
Thesis: Homo- and Heteronuclear Transition Metal Complexes Supported by Multinucleating Ligands.
- Andrew Chih-Kae Wang (*Chemistry*) B.S., University of California, Berkeley 2009.
Thesis: Investigating the Role of *O*-GlcNAc Glycosylation in Neurodegeneration.
- Haoxuan Wang (*Chemistry*) B.S., Fudan University 2010.
Thesis: Enantioselective Total Synthesis of Diketopiperazine-Containing Natural Products: (-)-Lansai B, (+)-Nocardioazines A and B, and (-)-Acetylpoaranotin.
- Rui Wang (*Chemical Engineering*) B.S., Zhejiang University 2005; M.S., 2008.
Thesis: Effects of Self Energy of the Ions on the Double Layer Structure and Properties at the Dielectric Interface.
- Alyson Gloria Weidmann (*Chemistry*) B.A., Columbia University 2010.
Thesis: Biological Activity of Rhodium Metalloinsertors and the Design of Bifunctional Conjugates.
- Raymond Andrew Weitekamp (*Chemistry*) A.B., Princeton University 2010.
Thesis: Multifunctional Materials: Bottom-up & Top-down.

Doctor of Philosophy continued

Zachary Kimble Wickens (*Chemistry*) B.A., Macalester College 2010.

Thesis: Manipulating Selectivity and Reactivity in Palladium-Catalyzed Oxidation Reactions.

Hai Xiao (*Chemistry and Physics*) B.S., Tsinghua University 2006; M.S., 2008.

Thesis: First Principles Based Multiparadigm Modeling of Electronic Structures and Dynamics.

DIVISION OF ENGINEERING AND APPLIED SCIENCE

Zachary Howard Aitken (*Mechanical Engineering*) B.S., The University of Texas at Austin 2009; M.S., California Institute of Technology 2012.

Thesis: Effect of Microstructural Interfaces on the Mechanical Response of Crystalline Metallic Materials.

Asghar Aryanfar (*Mechanical Engineering*) B.S., Sharif University of Technology 2009; M.S., California Institute of Technology 2010.

Thesis: Dendrites Inhibition in Rechargeable Lithium Metal Batteries.

Aristotelis Asimakopoulos (*Electrical Engineering*) B.S., California Institute of Technology 1997; M.S., Stanford University 1998.

Thesis: Macroscopically Dissipative Systems with Underlying Microscopic Dynamics: Properties and Limits of Measurement.

Chirranjeevi Balaji Gopal (*Materials Science*) B.Tech., Indian Institute of Technology, Madras 2009; M.S., California Institute of Technology 2011.

Thesis: *Ab-initio* and Experimental Techniques for Studying Non-Stoichiometry and Oxygen Transport in Mixed Conducting Oxides.

Neal Phillip Bitter (*Aeronautics*) B.S., Milwaukee School of Engineering 2010; M.S., California Institute of Technology 2011.

Thesis: Stability of Hypervelocity Boundary Layers.

David Ross Brown (*Applied Physics*) S.B., Massachusetts Institute of Technology 2007; M.S., California Institute of Technology 2012.

Thesis: Phase Transition Thermoelectrics of Mixed Ion-Electron Conducting Chalcogenides.

Dennis M. Callahan (*Materials Science*) B.S., Northeastern University 2008.

Thesis: Nanophotonic Light Trapping in Thin Solar Cells.

Chieh-feng Chang (*Electrical Engineering*) B.S., National Taiwan University 2001; M.S., University of California, Los Angeles 2005; M.S., California Institute of Technology 2010.

Thesis: Wafer-Scalable Fabrication of Metal Nanostructures for Plasmonics-Assisted Biomedical Sensing Applications.

Doctor of Philosophy continued

- Vedran Coralic (*Mechanical Engineering*) B.S., University of Illinois at Urbana-Champaign 2007; M.S., California Institute of Technology 2008.
Thesis: Simulation of Shock-Induced Bubble Collapse with Application to Vascular Injury in Shockwave Lithotripsy.
- Max Anton Cubillos-Moraga (*Applied and Computational Mathematics*) B.S., University of Maryland, College Park 2006; M.S., California Institute of Technology 2011.
Thesis: General-Domain Compressible Navier-Stokes Solvers Exhibiting Quasi-Unconditional Stability and High Order Accuracy in Space and Time.
- Kaushik Dasgupta (*Electrical Engineering*) B.Tech., M.Tech., Indian Institute of Technology, Kharagpur 2008; M.S., California Institute of Technology 2010.
Thesis: Self-Healing Techniques for RF and mm-Wave Transmitters and Receivers.
- Ran Duan (*Electrical Engineering*) B.E., Nanyang Technological University 2008.
Thesis: Instrumentation for Kinetic-Inductance-Detector-Based Submillimeter Radio Astronomy.
- Eyal En Gad (*Electrical Engineering*) B.S., Technion - Israel Institute of Technology 2008; M.S., California Institute of Technology 2012.
Thesis: Rewriting Schemes for Flash Memory.
- James Spencer Fakonas (*Applied Physics*) B.S., Northwestern University 2008.
Thesis: Quantum Interference and Entanglement of Surface Plasmons.
- Vahe Gabuchian (*Aeronautics*) B.S., University of California, Irvine 2007; M.S., California Institute of Technology 2008.
Thesis: Experimental Investigation of Thrust Fault Rupture Mechanics.
- Lingwen Gan (*Electrical Engineering and Applied and Computational Mathematics*) B.Eng., Tsinghua University 2010; M.S., California Institute of Technology 2012.
Thesis: Distributed Load Control in Multiphase Radial Networks.
- Marcella Mary Gomez (*Mechanical Engineering*) B.S., University of California, Berkeley 2008; M.S., California Institute of Technology 2011.
Thesis: On the Role of Delays in Biological Systems: Analysis and Design.
- Carlos Roberto González Palacios (*Electrical Engineering*) B.S., Universidad de los Andes 2007; M.S., California Institute of Technology 2012.
Thesis: Optimal Data Distributions in Machine Learning.
- Chao Han (*Electrical Engineering*) B.E., Tsinghua University 2007; M.S., 2010; M.S., California Institute of Technology 2012.
Thesis: Wide Field-of-View Microscopes and Endoscopes for Time-Lapse Imaging and High-Throughput Screening.

Doctor of Philosophy continued

- Laura Anne Harrison (*Computation and Neural Systems*) B.A., Scripps College 2009.
Thesis: Real-World Social Cognition: Context Effects in Face and Threat Processing.
- Stefanie Heyden (*Applied Mechanics*) Diploma, Ruhr-University Bochum 2010; M.S., California Institute of Technology 2011.
Thesis: Micromechanical Damage and Fracture in Elastomeric Polymers.
- Andreas Hoenselaar (*Computation and Neural Systems*) Intermediate Diploma, University of Tübingen 2005; Sc.M., Brown University 2007.
Thesis: The Structure of Hippocampal Activity during REM Sleep.
- Andrew Peter Homyk (*Electrical Engineering and Applied Physics*) B.S., California Institute of Technology 2003; M.S., 2009.
Thesis: Scalable Methods for Deterministic Integration of Quantum Emitters in Photonic Crystal Cavities.
- Srivatsan Hulikal (*Mechanical Engineering*) B.Tech., Indian Institute of Technology, Madras 2009; M.S., California Institute of Technology 2011.
Thesis: Collective Behavior of Asperities as a Model for Friction and Adhesion.
- Chenguang Ji (*Materials Science*) B.S., Tsinghua University 2009; M.S., California Institute of Technology 2011.
Thesis: Design of Antenna-Coupled Lumped-Element Titanium Nitride KIDs for Long-Wavelength Multi-Band Continuum Imaging.
- Dongyang Kang (*Electrical Engineering and Computational Science and Engineering*) B.S., Peking University 2009; M.S., California Institute of Technology 2010.
Thesis: MEMS for Diabetic Retinopathy.
- Henry Kozachkov (*Applied Physics*) B.A., New York University 2006; M.S., California Institute of Technology 2011.
Thesis: Modifying Bulk Metallic Glasses: Composites and Configurational States.
- Alexander Grey Krause (*Applied Physics*) B.A., Boston University 2009; M.S., California Institute of Technology 2014.
Thesis: Acceleration Sensing, Feedback Cooling, and Nonlinear Dynamics with Nanoscale Cavity-Optomechanical Devices.
- Keng-Wit Lim (*Applied Mechanics*) B.Eng., University of Wales 1999; M.S., North Carolina State University 2003; M.S., California Institute of Technology 2011.
Thesis: Discrete Modeling of Granular Media: A NURBS-based Approach.
- Esperanza Crystal Linares Guerrero (*Mechanical Engineering*) B.E., National Autonomous University of Mexico 2006; M.S., California Institute of Technology 2008.
Thesis: Experimental Study on Inertial Effects in Liquid-Solid Flows.

Doctor of Philosophy continued

- Joseph John Lydon II (*Materials Science*) B.S., University of Pennsylvania 2010.
Thesis: Nonlinear Effects in Granular Crystals with Broken Periodicity.
- Alborz Mahdavi (*Bioengineering*) B.A.Sc., University of Toronto 2004; M.Sc., 2006.
Thesis: Synthetic Biology Tools for Targeted Incorporation of Non-Canonical Amino Acids into Cellular Proteins.
- Wei Mao (*Electrical Engineering*) B.E., Tsinghua University 2004; M.E., 2007; M.S., California Institute of Technology 2009.
Thesis: Information-theoretic Studies and Capacity Bounds: Group Network Codes and Energy Harvesting Communication Systems.
- Gemma Ellen Mason (*Applied and Computational Mathematics*) B.S., University of Canterbury 2006; C.A.S.M., University of Cambridge 2007.
Thesis: Full and Model-Reduced Structure-Preserving Simulation of Incompressible Fluids.
- Lisa Mary Mauger (*Applied Physics*) B.S., Colorado School of Mines 2007; M.S., California Institute of Technology 2010.
Thesis: The Phonon Thermodynamics of Iron and Cementite.
- Cheikh Oumar Mbengue (*Aeronautics*) B.S., United States Military Academy at West Point 2006; M.S., University of Oxford 2008; M.S., California Institute of Technology 2011.
Thesis: Storm Track Response to Perturbations in Climate.
- Daniel Ciarán McNamee (*Computation and Neural Systems*) B.A., Trinity College Dublin 2007; M.S., 2010.
Thesis: Neural and Computational Representations of Decision Variables.
- Sean Michael Meenehan (*Applied Physics*) B.S., Harvey Mudd College 2008.
Thesis: Cavity Optomechanics at Millikelvin Temperatures.
- Ramses Mourhatch (*Civil Engineering*) B.S., The University of Texas at Austin 2008; M.S., California Institute of Technology 2009.
Thesis: Quantifying Earthquake Collapse Risk of Tall Steel Braced Frame Buildings using Rupture-to-Rafters Simulations.
- Mandheerej Singh Nandra (*Electrical Engineering*) B.A.Sc., University of Toronto 2005; M.S., California Institute of Technology 2007.
Thesis: Microelectrode Implants for Spinal Cord Stimulation in Rats.
- Prineha Narang (*Applied Physics*) B.S., Drexel University 2011.
Thesis: Light-matter Interactions in Semiconductors and Metals: From Nitride Optoelectronics to Quantum Plasmonics.
- Xin Ning (*Aerospace*) B.Eng., Beihang University 2009; M.S., California Institute of Technology 2010.
Thesis: Imperfection Insensitive Thin Shells.

Doctor of Philosophy continued

- Samet Oymak (*Electrical Engineering*) B.S., Bilkent University 2009; M.S., California Institute of Technology 2011.
Thesis: Convex Relaxation for Low-Dimensional Representation: Phase Transitions and Limitations.
- Alex Hao-Yu Pai (*Electrical Engineering*) B.S., University of California, Berkeley 2009; M.S., California Institute of Technology 2011.
Thesis: Sensing and Actuation from Biology to Electronics.
- Mayank Raj (*Electrical Engineering*) B.Tech., Indian Institute of Technology, Kanpur 2008; M.S., California Institute of Technology 2009.
Thesis: Injection Locked Clocking and Transmitter Equalization Techniques for Chip to Chip Interconnects.
- Michael Brian Rauls (*Mechanical Engineering*) B.S., University of California, Los Angeles 2010; M.S., California Institute of Technology 2012.
Thesis: Shock Wave Behavior of Heterogeneous Materials.
- Boris Revechki (*Computation and Neural Systems*) B.S., New York University 2008.
Thesis: Neural Prosthetics and Parietal Cortex.
- Bruno Savard (*Aerospace*) B.S.E., École Polytechnique de Montréal 2011; M.E., Institut Supérieur de l'Aéronautique et de l'Espace 2011; M.S., California Institute of Technology 2012.
Thesis: Characterization and Modeling of Premixed Turbulent *n*-Heptane Flames in the Thin Reaction Zone Regime.
- Hemanth Siriki (*Civil Engineering*) B.Tech., Indian Institute of Technology, Madras 2008; M.S., California Institute of Technology 2009.
Thesis: Quantifying Collapse Risk of Tall Steel Moment Frame Building using Rupture-to-Rafters Simulations.
- Niranjan Srinivas (*Computation and Neural Systems*) M.S., Indian Institute of Technology, Kanpur 2008.
Thesis: Programming Chemical Kinetics: Engineering Dynamic Reaction Networks with DNA Strand Displacement.
- John Bradley Steeves (*Aerospace*) B.S., University of Saskatchewan 2010; M.S., California Institute of Technology 2011.
Thesis: Multilayer Active Shell Mirrors.
- Noelle Rebecca Barry Stiles (*Computation and Neural Systems*) B.S., University of Southern California 2009.
Thesis: Behavioral and fMRI Measures of Crossmodal Plasticity Induced by Auditory Sensory Substitution.

Doctor of Philosophy continued

- Nicolette Jean Sullivan (*Computation and Neural Systems*) B.A., Miami University 2002; M.A., The University of Chicago 2007.
Thesis: The Neural Computational Basis of Self-Control Success and Failure.
- Ramathasan Thevamaran (*Mechanical Engineering*) B.Sc., University of Peradeniya 2008; M.S., California Institute of Technology 2010.
Thesis: Rate and Microstructure Effects on the Dynamics of Carbon Nanotube Foams.
- Ho-Cheng Tsai (*Materials Science and Physics*) B.S., National Tsing Hua University 2006; M.S., National Chiao Tung University 2009.
Thesis: Quantum Mechanics Studies of Fuel Cell Catalysts and Proton Conducting Ceramics with Validation by Experiment.
- Robert Ezra Usiskin (*Materials Science*) B.A., Stanford University 2002; M.S., 2004.
Thesis: Surface Activity and Bulk Defect Chemistry of Solid Oxide Fuel Cell Cathodes.
- Swetha Veeraraghavan (*Civil Engineering*) B.Tech., Indian Institute of Technology, Madras 2009; M.S., California Institute of Technology 2010.
Thesis: Toppling Analysis of Precariously Balanced Rocks under Earthquake Excitation.
- Yaakov Vilenchik (*Applied Physics*) B.Sc., Tel Aviv University 2008.
Thesis: Narrow-Linewidth Si/III-V Lasers: A Study of Laser Dynamics and Nonlinear Effects.
- Xin C. Wang (*Mechanical Engineering*) S.B., Massachusetts Institute of Technology 2009; M.S., California Institute of Technology 2010.
Thesis: A Variational Framework for Spectral Discretization of the Density Matrix in Kohn-Sham Density Functional Theory.
- Samantha Stricklin Wilson (*Materials Science*) B.S., Stanford University 2009.
Thesis: Zn-VI/Cu₂O Heterojunctions for Earth-Abundant Photovoltaics.
- Charles Stanley Wojnar (*Aeronautics*) B.S., University of Illinois at Urbana-Champaign 2010; M.S., California Institute of Technology 2011.
Thesis: Exploring the Kinetics of Domain Switching in Ferroelectrics for Structural Applications.
- Chih-Kai Yang (*Materials Science*) B.S., National Tsing Hua University 2004; M.S., 2006.
Thesis: An Exploration of Perovskite Materials for Thermochemical Water Splitting.
- Xiang Zhai (*Applied Physics and Applied and Computational Mathematics*) B.S., Tsinghua University 2009; M.S., University of California, San Diego 2010.
Thesis: Experimental, Numerical and Analytical Studies of the MHD-driven Plasma Jet, Instabilities and Waves.
- Xuan Zhang (*Environmental Science and Engineering*) B.S., Beijing Normal University 2007; M.S., Peking University 2010.
Thesis: Investigation of Fundamental Processes Governing Secondary Organic Aerosol Formation in Laboratory Chambers.

Doctor of Philosophy continued

DIVISION OF GEOLOGICAL AND PLANETARY SCIENCES

Kangwoo Cho (*Environmental Science and Engineering*) B.S., Seoul National University 2004;

M.S., 2006.

Thesis: Wastewater Electrolysis Cell for Environmental Pollutants Degradation and Molecular Hydrogen Generation.

Jena Elaine Johnson (*Geobiology*) Sc.B., Brown University 2009.

Thesis: Manganese: Minerals, Microbes, and the Evolution of Oxygenic Photosynthesis.

Fathima Rifkha Kameel (*Environmental Science and Engineering*) M.S., Kent State University

2009; M.S., California Institute of Technology 2012.

Thesis: Oxidation of Volatile Organic Compounds in Aqueous Solution and at the Air-water Interface of Aqueous Microdroplets.

Joshua Andrew Kammer (*Planetary Science*) B.A., Texas A&M University 2010; M.S., California

Institute of Technology 2013.

Thesis: Analyses of Planetary Atmospheres Across the Spectrum: From Titan to Exoplanets.

Sebastian Hermann Kopf (*Geobiology*) B.S., Jacobs University 2008; S.M., Massachusetts

Institute of Technology 2010.

Thesis: From Lakes to Lungs: Assessing Microbial Activity in Diverse Environments.

Ajay Brian Sanjay Limaye (*Planetary Science*) B.A., University of California, Berkeley 2007; M.S.,

California Institute of Technology 2010.

Thesis: Valley Evolution by Meandering Rivers.

Alison Martha Piasecki (*Geology*) S.B., Massachusetts Institute of Technology 2009; M.S.,

California Institute of Technology 2011.

Thesis: Site-Specific Isotopes in Small Organic Molecules.

Kathryn Marie Stack Morgan (*Geology*) B.A., Williams College 2008; M.S., California Institute

of Technology 2011.

Thesis: Reconstructing Past Depositional and Diagenetic Processes through Quantitative Stratigraphic Analysis of the Martian Sedimentary Rock Record.

Erika McGoldrick Swanson (*Geology*) S.B., Massachusetts Institute of Technology 2007; S.M.,

2008.

Thesis: Structural and Clumped-Isotope Constraints on the Mechanisms of Displacement along Low-Angle Detachments.

Adam Waszczak (*Planetary Science*) B.A., Cornell University 2009.

Thesis: Solar System Small Body Demographics with the Palomar Transient Factory Survey.

Doctor of Philosophy continued

Dongzhou Zhang (*Geophysics*) B.S., Peking University 2008; M.S., California Institute of Technology 2010.

Thesis: Applications of Nuclear Resonant Scattering to Further Our Understanding of Earth's Interior.

DIVISION OF HUMANITIES AND SOCIAL SCIENCES

Kyle Ian Carlson (*Behavioral and Social Neuroscience*) B.A., The University of Memphis 2006; M.S., California Institute of Technology 2013.

Thesis: Three Essays on Economics and Information Shocks.

Matthew C. Chao (*Social Science*) B.A., Dartmouth College 2006; M.S., California Institute of Technology 2013.

Thesis: How Behavioral Economics Can Shape Firm Strategy and Public Policy: Lessons from the Field and Laboratory.

Jonathan Neil Chapman (*Social Science*) B.A., University of Cambridge 2005; M.S., California Institute of Technology 2012.

Thesis: Death or Taxes? The Political Economy of Sanitation Expenditure in Nineteenth-Century Britain.

Khai Xiang Chiong (*Social Science*) B.A., University of Cambridge 2010; M.S., California Institute of Technology 2012.

Thesis: Essays in Social and Economic Networks.

Geoffrey Worth Fisher (*Behavioral and Social Neuroscience*) B.A., Cornell University 2010.

Thesis: Value Estimation and Comparison in Multi-Attribute Choice.

Jaclyn Kimble (*Social Science*) B.A., Yale College 2009; M.S., California Institute of Technology 2011.

Thesis: The Voting Rights Act, Shelby County, and Redistricting: Improving Estimates of Racially Polarized Voting in a Multiple-Election Context.

Matthew Luke Kovach (*Social Science*) B.A., University of California, Santa Barbara 2010; M.S., California Institute of Technology 2012.

Thesis: Essays in Behavioral Decision Theory.

Allyson Leigh Pellissier (*Social Science*) B.A., Rhodes College 2010; M.S., California Institute of Technology 2012.

Thesis: At Your Convenience: Facilitating Voting and Registration.

Kirill Pogorelskiy (*Social Science*) B.S., R.Y. Alekseev Nizhny Novgorod State Technical University 2007; M.S., State University Higher School of Economics 2009; M.S., California Institute of Technology 2012.

Thesis: Essays on Correlated Equilibrium and Voter Turnout.

Doctor of Philosophy continued

DIVISION OF PHYSICS, MATHEMATICS AND ASTRONOMY

Vernon Hampden Chaplin (*Physics*) B.A., Swarthmore College 2007.

Thesis: Battery-Powered RF Pre-Ionization System for the Caltech Magnetohydrodynamically-Driven Jet Experiment: RF Discharge Properties and MHD-Driven Jet Dynamics.

Yi Chen (*Physics*) S.B., Massachusetts Institute of Technology 2008.

Thesis: Extraction of CP Properties of the H(125) Boson Discovered in Proton-Proton Collisions at $\sqrt{s} = 7$ and 8 TeV with the CMS Detector at the LHC.

Yi-Ju Chen (*Physics*) B.S., National Taiwan University 2008.

Thesis: The Mechanical Genome in Regulation and Infection.

Liubomir Chiriac (*Mathematics*) B.S., Princeton University 2010.

Thesis: Special Frobenius Traces in Galois Representations.

Justin Daniel Cohen (*Physics*) B.S., University of Florida 2009.

Thesis: Fiber-Optic Integration and Efficient Detection Schemes for Optomechanical Resonators.

Vaclav Cvicek (*Physics*) A.B., Princeton University, 2007; M.S., California Institute of Technology 2009.

Thesis: Structure Prediction of G-Protein Coupled Receptors.

Nakul Dawra (*Mathematics*) B.A., Cornell University 2010.

Thesis: On the Link Floer Homology of L -space Links.

Jennifer Clair Driggers (*Physics*) B.S., University of Washington 2008.

Thesis: Noise Cancellation for Gravitational Wave Detectors.

Ross Filip Elliot (*Mathematics*) A.B., Princeton University 2008; M.A.St., University of Cambridge 2010.

Thesis: Topological Strings, Double Affine Hecke Algebras, and Exceptional Knot Homology.

Sin Tsun Edward Fan (*Mathematics*) B.S., The Chinese University of Hong Kong 2007; M.S., 2009.

Thesis: On the Construction of Higher étale Regulators.

Krzysztof Findeisen (*Astrophysics*) B.A., Cornell University 2007.

Thesis: New Insights from Aperiodic Variability of Young Stars.

Scott Davidson Geraedts (*Physics*) B.Sc., McMaster University 2010.

Thesis: Numerical Studies of Topological Phases.

Akihisa Goban (*Physics*) B.S., The University of Tokyo 2007; M.S., 2009.

Thesis: Strong Atom-Light Interactions along Nanostructures: Transition from Free-Space to Nanophotonic Interfaces.

Doctor of Philosophy continued

Casey John Handmer (*Physics*) B.S., The University of Sydney 2009.

Thesis: Gauge Invariant Spectral Cauchy Characteristic Extraction of Gravitational Waves in Computational General Relativity.

Victor Kasatkin (*Mathematics*) B.S., St. Petersburg State University 2007; M.S., 2010.

Thesis: Some Constructions, Related to Noncommutative Tori; Fredholm Modules and the Beilinson–Bloch Regulator.

Shu Ping Lee (*Physics*) B.S., National Taiwan University 2008.

Thesis: Signatures of Topological Superconductors.

Daiqi Linghu (*Mathematics and Computer Science*) B.S., University of Science and Technology of China 2010; M.S., California Institute of Technology 2014.

Thesis: Chains of Non-regular de Branges Spaces.

Jing Luan (*Physics*) B.S., Peking University 2008.

Thesis: Toward Understanding Multiple Astrophysical Phenomena.

Denis V. Martynov (*Physics*) B.S., Moscow Institute of Physics and Technology 2010.

Thesis: Lock Acquisition and Sensitivity Analysis of aLIGO Interferometers.

Kunal Prakash Mooley (*Astrophysics*) B.S., Fergusson College 2008; M.S., Indian Institute of Technology, Bombay 2009.

Thesis: Exploring the Dynamic Radio Sky: The Search for Slow Transients with the VLA.

Alexander Robert Mott (*Physics*) S.B., Massachusetts Institute of Technology 2009.

Thesis: Search for Higgs Boson Production beyond the Standard Model using the Razor Kinematic Variables in pp Collisions at 8 TeV and Optimization of Higgs Boson Identification using a Quantum Annealer.

Richard Alexander Norte (*Physics*) B.S., Stanford University 2007.

Thesis: Nanofabrication for On-Chip Optical Levitation, Atom-Trapping, and Superconducting Quantum Circuits.

Matthew Aaron Schenker (*Astrophysics*) B.A., Dartmouth College 2009.

Thesis: Did Galaxies Reionize the Universe?

Leo Pound Singer (*Physics*) B.S., University of Maryland, College Park 2009.

Thesis: The Needle in the 100 deg² Haystack: The Hunt for Binary Neutron Star Mergers with LIGO and Palomar Transient Factory.

Brian Paul Skinner (*Mathematics*) B.Sc., M.Sc., University of Toronto 2008; M.S., California Institute of Technology 2014.

Thesis: Logarithmic Potential Theory on Riemann Surfaces.

Doctor of Philosophy continued

Grant Paul Teply (*Physics*) B.A., University of Wisconsin-Madison 2009; M.S., California Institute of Technology 2012.

Thesis: Measurement of the Polarization of the Cosmic Microwave Background with the BICEP2 and *Keck Array* Telescopes.

Ryan Francis Trainor (*Astrophysics*) B.S., University of California, Irvine 2008; M.S., California Institute of Technology 2010.

Thesis: Faint Galaxies in the Megaparsec-Scale Environments of Hyperluminous QSOs at Redshifts $2 < Z < 3$.

Emma Edwina Wollman (*Physics*) B.A., Swarthmore College 2009.

Thesis: Quantum Squeezing of Motion in a Mechanical Resonator.

Ke Zhang (*Astrophysics*) B.S., Beijing Normal University 2005; M.S., 2008.

Thesis: Volatiles in Protoplanetary Disks.

PRIZES AND AWARDS

Prizes and awards are listed only for those students receiving degrees in 2015, and include prizes and awards received by them in previous years.

MABEL BECKMAN PRIZE

Awarded to an undergraduate woman upon completion of her junior or senior year in recognition of demonstrated academic and personal excellence, contributions to the Institute community, and outstanding qualities of character and leadership.

2015 Karsyn Nicole Bailey

FREDERIC W. HINRICHS, JR., MEMORIAL AWARD

Awarded to the seniors who, in the opinion of the undergraduate deans, have made the greatest undergraduate contribution to the welfare of the student body and whose qualities of leadership, character, and responsibility have been outstanding.

2015 Adam Sean Jermyn

GEORGE W. HOUSNER AWARD

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

2015 Adam Sean Jermyn

MILTON AND FRANCIS CLAUSER DOCTORAL PRIZE

Awarded to the Ph.D. candidate whose research is judged to exhibit the greatest degree of originality as evidenced by its potential for opening up new avenues of human thought and endeavor as well as by the ingenuity with which it has been carried out.

Name of recipient to be announced at commencement.

The prizes above are announced at the commencement ceremony.

ADVOCATING CHANGE TOGETHER (ACT) AWARD

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

2013 Janani Mandayam Comar

APOSTOL AWARD FOR EXCELLENCE IN TEACHING IN MATHEMATICS

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

2012 Ross Filip Elliot

2013 Nakul Dawra

2014 Liubomir Chiriac

2015 Liubomir Chiriac

CHARLES D. BABCOCK AWARD

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

2012 Xin Ning

2013 John Bradley Steeves

2014 Charles Stanley Wojnar

ROBERT P. BALLE CALTECH MATHEMATICS SCHOLARS AWARD

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

2014 Jake Boleslaw Marcinek, Jake Lee Wellens

WILLIAM F. BALLHAUS PRIZE

Awarded to aeronautics students for outstanding doctoral dissertations.

2015 *Neal Phillip Bitter, Xin Ning*

ERIC TEMPLE BELL UNDERGRADUATE MATHEMATICS RESEARCH PRIZE

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

2014 *Mark Joseph Greenfield*

2015 *Zhaorong Jin, Jake Boleslaw Marcinek*

BHANSALI PRIZE IN COMPUTER SCIENCE

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

2015 *Bryan Dawei He*

AMASA BISHOP SUMMER STUDY ABROAD PRIZE

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

2013 *Juan Ignacio Adame, Margaux Katherine Lopez*

RICHARD G. BREWER PRIZE IN PHYSICS

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

2011 *Jacob Quinn Shenker*

2012 *Charles Lincoln Tschirhart*

ROLF D. BUHLER MEMORIAL AWARD IN AERONAUTICS

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

2010 *Xin Ning*

2011 *Neal Phillip Bitter*

2015 *Léopold Cyrus Raoul Marie Shaabani Ardali, Chandru Dhandapani*

FRITZ B. BURNS PRIZE IN GEOLOGY

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

2014 *Madeleine Kendall Youngs*

CALTECH ALUMNI ASSOCIATION SPIRIT AWARD

Commemorates extraordinary activities by Caltech undergraduate students, graduate students, and postdoctoral scholars who best exemplify the spirit, tradition, and values of Caltech. This Award is given only when the Association finds that exceptional activities have occurred which merit this special recognition.

2014 *Hannah Lin Dotson, Justin Robert Koch, Jeffrey Treyer Picard, Connor Edwin Rosen*

2015 *Justin Robert Koch, Jeffrey Treyer Picard*

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

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

2015 *Max Anton Cubillos-Moraga*

BONNIE CASHIN PRIZE FOR IMAGINATIVE THINKING

Awarded each year to the entering freshman who has written the most imaginative essays in the Application for Freshman Admission.

2012 *Jacqueline Avery Maslyn*

CENTENNIAL PRIZE FOR THE BEST THESIS IN MECHANICAL AND CIVIL ENGINEERING

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

2015 Keng Wit Lim, Michael Brian Rauls

RICHARD BRUCE CHAPMAN MEMORIAL AWARD

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

2015 Vedran Coralic

DONALD S. CLARK MEMORIAL AWARD

Awarded to two juniors in recognition of service to the campus community and academic excellence. Preference is given to students in the Division of Engineering and Applied Science and to those in Chemical Engineering.

2014 Karsyn Nicole Bailey, Alexander Evan Hartz

THE DONALD COLES PRIZE IN AERONAUTICS

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

2015 John Bradley Steeves, Charles Stanley Wojnar

DEANS' CUP AND STUDENT LIFE AND MASTER'S AWARDS

Two awards, selected by the deans, the director of student life, and the master of student houses, presented to undergraduates whose concern for their fellow students has been demonstrated by persistent efforts to improve the quality of undergraduate life and by effective communication with members of the faculty and administration.

- 2014 *James Mac Bern, Student Life and Master's*
Ritchie Hernandez, Student Life and Master's
Bryan Weston Joel, Student Life and Master's
Justin Robert Koch, Student Life and Master's
Connor Edwin Rosen, Student Life and Master's
- 2015 *Mark Joseph Greenfield, Deans' Cup*
Erin Elizabeth Evans, Student Life and Master's
Connor Edwin Rosen, Student Life and Master's

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

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

- 2015 *Lingwen Gan*

DEMETRIADES-TSAFKA-KOKKALIS PRIZE IN BIOTECHNOLOGY OR RELATED FIELDS

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

- 2015 *Alborz Mahdavi*

DEMETRIADES-TSAFKA-KOKKALIS PRIZE IN NANOTECHNOLOGY OR RELATED FIELDS

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

2015 *Niranjan Srinivas*

CONSTANTIN G. ECONOMOU MEMORIAL PRIZE

Awarded to a chemical engineering graduate student distinguished by outstanding research accomplishments and exemplary attitude while fulfilling candidacy requirements for the Ph.D. degree.

2010 *Rui Wang*

2011 *Amy Hau Yu Fu*

EVERHART DISTINGUISHED GRADUATE STUDENT LECTURER AWARD

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

2014 *Brett Andrew McGuire*

DORIS EVERHART SERVICE AWARD

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

2015 *Allika Rao Walvekar*

LAWRENCE L. AND AUDREY W. FERGUSON PRIZE

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

2015 *Sebastian Hermann Kopf*

RICHARD P. FEYNMAN PRIZE IN THEORETICAL PHYSICS

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

2015 *Jong Yeon Lee*

HAREN LEE FISHER MEMORIAL AWARD IN JUNIOR PHYSICS

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

2014 *Adam Sean Jermyn*

2015 *Sarah Anne Brandsen*

HENRY FORD II SCHOLAR AWARD

Awarded either to the engineering student with the best academic record at the end of the third year of undergraduate study, or to the engineering student with the best first-year record in the graduate program.

2014 *Dae Hyun Kim*

JACK E. FROEHLICH MEMORIAL AWARD

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

2014 *Adam Sean Jermyn*

BARRY M. GOLDWATER SCHOLARSHIP

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

2014 *Adam Sean Jermyn, Charles Lincoln Tschirhart, Ann Miao Wang*

GRADUATE DEANS' AWARD FOR OUTSTANDING COMMUNITY SERVICE

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

2015 *Robert Allen Craig II, Lisa Mary Mauger*

GEORGE W. AND BERNICE E. GREEN MEMORIAL PRIZE

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

2015 *Kerry Nicole Betz, Boyu Fan*

DAVID M. GRETHER PRIZE IN SOCIAL SCIENCE

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

2015 *Jacob Quinn Shenker*

THE LUCY GUERNSEY SERVICE AWARD

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

2012 *Lisa Mary Mauger*

ARIE J. HAAGEN-SMIT MEMORIAL AWARD

Awarded to a sophomore or junior in biology or chemistry who has shown academic promise and who has made recognized contributions to Caltech.

2014 *Bridget Ann Connor*

ALEXANDER P. AND ADELAIDE F. HIXON PRIZE FOR WRITING

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

2012 *Charles Lincoln Tschirhart*

HANS G. HORNUNG PRIZE

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

2015 *Bruno Savard*

SCOTT RUSSELL JOHNSON PRIZE FOR EXCELLENCE IN GRADUATE STUDIES

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

2013 *Liubomir Chiriac*

SCOTT RUSSELL JOHNSON UNDERGRADUATE MATHEMATICS PRIZE

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

2015 *Zhaorong Jin, Jake Boleslaw Marcinek*

KALAM PRIZE FOR AEROSPACE ENGINEERING

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

2015 *Jean-Pierre Voropaieff*

D. S. KOTHARI PRIZE IN PHYSICS

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

2015 *Adam Sean Jermyn*

MARGIE LAURITSEN LEIGHTON PRIZE

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

2013 *Connie Lawwa Hsueh*

JOHN O. LEDYARD PRIZE FOR GRADUATE RESEARCH IN SOCIAL SCIENCE

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

2013 *Jonathan Neil Chapman, Khai Xiang Chiong*

2015 *Marcelo Ariel Fernández*

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.

2015 *Kerry Nicole Betz, Adam Sean Jermyn*

MARI PETERSON LIGOCKI ('81) MEMORIAL AWARD

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

2015 *Justin Robert Koch*

MECHANICAL ENGINEERING AWARD

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

2015 *Justin Robert Koch*

THE HERBERT NEWBY MCCOY AWARD

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

2015 *Marco Alberto Allodi, Thinh Quoc Bui, Jacob Steven Kanady, Zachary Kimble Wickens*

MARY A. EARL MCKINNEY PRIZE IN LITERATURE

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

2013 *Vivian Huang Buhler*

2014 *Anna Liu*

MERCK INDEX AWARD

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

2015 *Linda Chio*

JAMES MICHELIN SCHOLARSHIP

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

2015 *Jennifer Rachel Caseres, John Randall Christian*

ROBERT L. NOLAND LEADERSHIP SCHOLARSHIP

Awarded to undergraduate students who exhibit qualities of outstanding leadership, which are most often expressed as personal actions that have helped other people and that have inspired others to fulfill their capabilities.

2015 *Phoebe Ann, Wen Min Chen, Alexander Evan Hartz, Connor Edwin Rosen*

HERBERT J. RYSER MEMORIAL SCHOLARSHIPS

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

2014 *Zhaorong Jin, Jake Boleslaw Marcinek, Jake Lee Wellens*

SAN PIETRO TRAVEL PRIZE

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

2013 *Ingrid Margaret Fiedler, Samuel Frank Szuflita*

2015 *Linda Chio, Nicholas John Tedeschi*

RICHARD P. SCHUSTER MEMORIAL PRIZE

Awarded to one or more juniors or seniors in chemistry or chemical engineering on the basis of financial need and academic promise.

2015 *Timothy S. Sinclair*

ERNEST E. SECHLER MEMORIAL AWARD IN AERONAUTICS

Awarded to an aeronautics student who has made the most significant contribution to the teaching and research efforts of GALCIT (Graduate Aeronautical Laboratories of the California Institute of Technology). Preference is given to students working in structural mechanics.

2014 *Neal Phillip Bitter, John Bradley Steeves*

RENUKA D. SHARMA AWARD

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

2013 *Ruijie Darius Teo*

DON SHEPARD AWARD

Awarded to students who would find it difficult, without additional financial help, to engage in extracurricular and cultural activities. The recipients are selected on the basis of their capacity to take advantage of and to profit from these activities rather than on the basis of their scholastic standing.

2012 *Vivian Huang Bubler, Lin Cheng, Margaux Katherine Lopez*

2014 *Janani Mandayam Comar*

2015 *Erin Elizabeth Evans, Connor Edwin Rosen, Corwin Shiu*

HALLETT SMITH PRIZE

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

2012 *Charles Lincoln Tschirhart*

2013 *Vivian Huang Bubler*

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

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

2014 *Harrison James Miller, Corwin Shiu*

JOHN STAGER STEMPLE MEMORIAL PRIZE IN PHYSICS

Awarded to a graduate student in physics for outstanding progress in research as demonstrated by an excellent performance on the oral Ph.D. candidacy examination.

2013 *Alexander R. Mott*

PAUL STUDENSKI MEMORIAL FUND

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

2014 *Margaux Katherine Lopez*

CHARLES AND ELLEN WILTS PRIZE

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

2015 *Samet Oymak, Carlos Roberto González Palacios*

FREDERICK J. ZEIGLER MEMORIAL AWARD

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

2013 *Zhaorong Jin, Benjamin Wu*

THE MEANING OF ACADEMIC DRESS

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

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

"Of particular interest is the cap or mortarboard. In the form of the biretta, it was the peculiar sign of the master. Its use has now spread far beyond that highly select group to school girls and choir boys and even to the nursery school. *Sic transit* . . .

"The gown, of course, is the basic livery of the scholar, with its clear marks of rank and status—the pointed sleeves of the bachelor, the oblong sleeves of the master, the full sleeves and velvet trimmings of the doctor. The doctors, too, may depart from basic black and break out into many colors—Harvard crimson or Yale blue or the scarlet splash of Oxford.

"Color is the very essence of the hood: color in the main body to identify the university; color perhaps in the binding to proclaim the subject of the degree—orange for engineering, gold for science, the baser copper for economics, white for arts and letters, green for medicine, purple for law, scarlet for theology, and so on.

"With this color and symbolism, which is medieval though mutated, we stage our brief moment of pageantry, paying homage to that ancient community of scholars in whose shadow we stand, and acknowledging our debt to the university as one of the great institutional constructs of the Middle Ages."

ODE TO JOY

*Text of Beethoven Ninth Symphony excerpt, after the poem "An die Freude" ("To Joy")
by Johann Christoph Friedrich von Schiller (1759–1805)*

Freude, schöner Götterfunken

Joy, beautiful spark of the gods

Tochter aus Elysium,

Daughter of Elysium,

Wir betreten feuertrunken,

We enter, drunk with fire,

Himmlische, dein Heiligtum!

Heavenly one, your sanctuary!

Deine Zauber binden wieder

Your magic reunites

Was die Mode streng geteilt;

What custom strictly divided.

Alle Menschen werden Brüder,

All men will become brothers,

Wo dein sanfter Flügel weilt.

Where your gentle wing rests.

Wem der große Wurf gelungen,

Whoever has had the great fortune

Eines Freundes Freund zu sein;

To be a friend's friend,

Wer ein holdes Weib errungen,

Whoever has married a beloved wife,

Mische seinen Jubel ein!

Let him mix in his jubilation!

Ja, wer auch nur eine Seele

Indeed, whoever can call even one soul

Sein nennt auf dem Erdenrund!

His own on this round earth!

Und wer's nie gekonnt, der stehle

And whoever was never able to, must creep

Weinend sich aus diesem Bund!

Tearfully away from this band!

HAIL CIT

(Caltech alma mater)

by Manton Barnes, B.S. '21

In Southern California with grace and splendor bound,
Where the lofty mountain peaks look out to lands beyond,
Proudly stands our Alma Mater, glorious to see;
We raise our voices proudly, hailing, hailing thee.
Echoes ringing while we're singing over land and sea,
The halls of fame resound thy name, noble CIT.



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

For more than 100 years, Caltech's alumni have gone forward from this day to have a profound and positive impact in the world. We know this year's class will do the same, and that future Techers will be inspired by the achievements of the Class of 2015.

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

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

Lee Fisher (BS '78)

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

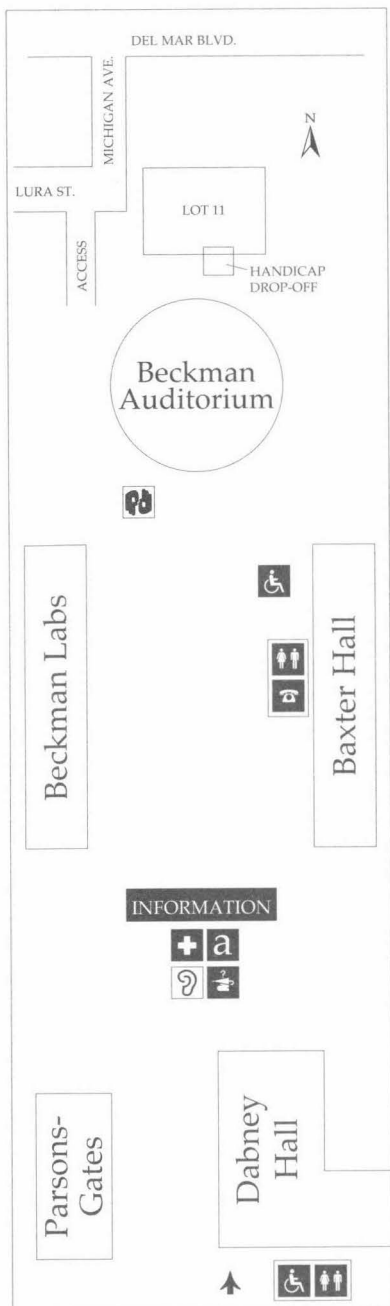


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Include #Caltech2015 in your posts, and visit caltech.edu/commencement2015 for a wrap-up of the day's events.








SERVICES FOR COMMENCEMENT GUESTS

-  PUBLIC TELEPHONES are available in Baxter Hall.
-  RESTROOMS are available in Baxter Hall, Beckman Labs, and Dabney Hall.
-  FIRST AID SERVICES are available at the information booth.
-  LOST AND FOUND items may be reported and /or claimed at the information booth.

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

SPECIAL SERVICES FOR PERSONS WITH DISABILITIES

-  ASSISTIVE LISTENING DEVICES are available at the information booth. A driver's license or state-issued ID card is required.
-  LARGE-TYPE PROGRAMS (abridged) are available at the information booth.
-  AMERICAN SIGN LANGUAGE (ASL) interpreters are stationed at the west front of the ceremony seating area.
-  PEOPLE WHO USE WHEELCHAIRS, and their guests, will find a special section near the east front of the ceremony seating area.
-  RESTROOMS ACCESSIBLE TO PEOPLE WHO USE WHEELCHAIRS are located on the first floors of Dabney Hall and Baxter Hall.

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