Trustees, Administration, Faculty



OFFICERS

Kent Kresa, Chairman David L. Lee, Vice Chairman

Jean-Lou Chameau, President Edward M. Stolper, Provost

Dean W. Currie

Vice President for Business and Finance

Charles Elachi

Vice President and Director, Jet Propulsion Laboratory

Peter D. Hero

Vice President for Development and Institute

Relations Sharon E. Patterson

Associate Vice President for

Finance and Treasurer

Scott Richland

Chief Investment Officer

Anneila I. Sargent

Vice President for Student Affairs

Victoria D. Stratman

General Counsel

Mary L. Webster Secretary

BOARD OF TRUSTEES

Trustees

(with date of first election)

Robert C. Bonner (2008)

Senior Partner

Sentinel HS Group, L.L.C.

Brigitte M. Bren (2009)

John E. Bryson (2005)

Chairman and CEO (Retired)

Edison International

Jean-Lou Chameau (2006)

President

California Institute of Technology

Milton Chang (2005)

Managing Director

Incubic Venture Capital

John S. Chen (2008)

Chairman, CEO, and President Sybase, Inc.

Robert B. Chess (2006)

Chairman

Nektar Therapeutics

Lounette M. Dyer (1998)

Gilad I. Elbaz (2008)

Founder Factual Inc.

William T. Gross (1994)

Chairman and Founder

Idealab

Frederick J. Hameetman (2006) Chairman

Cal American

Robert T. Jenkins (2005)

Peter D. Kaufman (2008)

Chairman and CEO

Glenair, Inc.

Jon Faiz Kayyem (2006) CEO

Osmetech PLC

Louise Kirkbride (1995)

Board Member

State of California Contractors

State License Board

Ion B. Kutler (2005) Chairman and CEO

Admiralty Partners, Inc.

Louis J. Lavigne Jr. (2009)

Management Consultant

Lavigne Group

David Li Lee (2000)

Managing General Partner Clarity Partners, L.P.

York Liao (1997)

Managing Director

Winbridge Company Ltd.

Alexander Lidow (1998)

EPC Corporation

Ronald K. Linde (1989)

Independent Investor

Chair, The Ronald and Maxine

Linde Foundation

Founder/Former CEO

Envirodyne Industries, Inc.

Shirley M. Malcom (1999)

Director, Education and Human Resources Programs

American Association for the

Advancement of Science Deborah McWhinney (2007)

President

Citi Personal Wealth Management

Citigroup, Inc.

Richard Merkin, M.D. (2009)

Founder and CEO

Heritage Provider Network

Vice Chairman and CEC The TCW Group, Inc. Donald W. Tang (2005) CEO CSIP Group Charles R. Trimble (2002)

Founder and Former CEO Trimble Navigation Ltd. Lewis W. van Amerongen (2004) LvA Enterprises, Inc.

Gayle E. Wilson (1995)

Nonprofit Consultant

Jay S. Wintrob (2007)

President and CEO

AIG Domestic Life and Retirement
Services, Inc.

Suzanne H. Woolsey (2006)

Corporate Governance Consultant

Senior Trustees

(with date of first election and date of election as Senior Trustee)

Gordon M. Binder (1995, 2007)

Managing Director

Coastview Capital

Harold Brown (1969, 1999)

President Emeritus

Counselor

Center for Strategic and
International Studies (CSIS)

William H. Davidow (1996, 2007) Founding Partner Mohr Davidow Ventures

Thomas E. Everhart (1998, 2004)

President Emeritus

California Institute of Technology

Arthur I. Coldernia (1905, 2007)

Arthur L. Goldstein (1995, 2007) Chairman and CEO (Retired) Ionics, Inc.

Sidney Harman (2010)

Founder and Chairman Emeritus

Harman International Industries, Inc.

Shirley M. Hufstedler (1975, 1997)

Senior Of Counsel

Morrison & Foerster
Bobby R. Inman (1989, 2003)
Professor, Lyndon B. Johnson
Centennial Chair in National Policy
The University of Texas at Austin

Kent Kresa (1994, 2010) Chairman Emeritus

Northrop Grumman Corporation
A. Michael Lipper (2005, 2007)

President and CEO
Lipper Advisory Services, Inc.

Stanley R. Rawn Jr. (1974, 2000)

Private Investor

Stewart A. Resnick (2005, 2008) Chairman

Roll International Corp.

Walter L. Weisman (1988, 2007)

Former Chairman and CEO

American Medical International, Inc.

Virginia V. Weldon (1996, 2007) Senior Vice President for Public Policy (Retired) Monsanto Company

549

Life Trustees (with date of first election and date of election as Life Trustee) George L. Argyros (1992, 2008) Chairman and CEO Arnel and Affiliates Stephen D. Bechtel Jr. (1967, 1997) Chairman (Retired) Bechtel Group, Inc. G. Patricia Beckman (2003, 2008) Community Leader Donald L. Bren (1983, 2004) Chairman of the Board The Irvine Company Eli Broad (1993, 2007) Founder The Broad Foundations Walter Burke (1975, 2010) Treasurer Sherman Fairchild Foundation, Inc. Jewel Plummer Cobb (1990, 2005) President Emerita California State University, Fullerton Harry M. Conger (1985, 2007) Chairman & CEO, Emeritus Homestake Mining Company Richard P. Cooley (1973, 2007) Retired Chairman Seafirst Bank Camilla C. Frost (1977, 2007) Trustee of the Chandler Trust and a Director and Secretary-Treasurer Chandis Securities Company Philip M. Hawley (1975, 1997) Chairman P. M. Hawley, Inc. William F. Kieschnick (1982, 2005) President and CEO (Retired) Atlantic Richfield Co. Gordon E. Moore (1983, 2010) Chairman Emeritus Chairman Emeritus Intel Corporation Sidney R. Petersen (1980, 2007) Chairman and CEO (Retired)

Getty Oil Company

Simon Ramo (1964, 1985)

Arthur Rock (1988, 1998) Principal

Arthur Rock and Company

TRW Inc.

Cofounder & Director Emeritus

Benjamin M. Rosen (1986, 2005) Chairman Emeritus Chairman Emeritus Compaq Computer Corporation Richard M. Rosenberg (1989, 2007) Chairman and CEO (Retired) Bank of America Corporation Robert J. Schultz (1991, 2002) Vice Chairman (Retired) General Motors Corporation Mary L. Scranton (1974, 1990) Nonprofit Consultant Dennis Stanfill (1976, 1999) Private Investor Charles H. Townes (1979, 1987) Nobel Laureate and Professor in the Graduate School Department of Physics University of California, Berkeley Albert D. Wheelon (1987, 2001) Honorary Life Trustee

Betty I. Moore Cofounder Gordon and Betty Moore Foundation

Standing Committees

Executive Committee—K. Kresa, Chair; D. L. Lee*, Vice Chair; J. E. Bryson, J.-L. Chameau*, W. H. Davidow*, S. M. Hufstedler, B. R. Inman, R. T. Jenkins*, L. Kirkbride*, A. Lidow*, R. K. Linde, P. M. Neches*, S. R. Onderdonk*, N. C. Rising,* S. R. Rawn Jr., S. A. Ross*, C. R. Trimble*, W. L. Weisman, G. E. Wilson; Consulting Members: G. E. Moore, B. M. Rosen; Advisory Members: D. W. Currie, C. Elachi, P. D. Hero, A. I. Sargent, E. M. Stolper, V. D. Stratman

Audit and Compliance Committee— J. E. Bryson, Chair; P. M. Neches, Vice Chair; R. C. Bonner, L. Kirkbride, K. Kresa*, L. J. Lavigne Jr., R. K. Linde, A. M. Lipper, S. R. Onderdonk, W. L. Weisman; Advisory Members: M. Brewer, J.-L. Chameau, D. W. Currie, C. Elachi, D. M. Johnson, P. Koyzis, J. Lum, S. E. Patterson, S. L. Proia, E. M. Stolper, V. D. Stratman, E. L. Tattini

AC Transaction Conflict Review Subcommittee—J. E. Bryson, Chair ex officio; R. C. Bonner, R. K. Linde, P. M. Neches; Advisory Member; V. D. Stratman Buildings and Grounds Committee—N. C. Rising, Chair; J.-L. Chameau*, L. M. Dyer, T. E. Everhart, R. T. Jenkins, K. Kresa*, S. R. Onderdonk, P. J. Pizarro, L. W. van Amerongen; Consulting Member: S. D. Bechtel Jr.; Advisory Members: J. Cowell, D. W. Currie, H. P. Daily, S. A. Ell, P. D. Hero, A. I. Sargent, E. M. Stolper

Business and Finance Committee—D. L. Lee, Chair; B. M. Bren, J.-L. Chameau*, T. E. Everhart, K. Kresa*, L. J. Lavigne Jr., A. Lidow, R. K. Linde, A. M. Lipper, S. M. Malcom, P. M. Neches, J. F. Rothenberg, D. W. Tang, L. W. van Amerongen, W. L. Weisman, S. H. Woolsey; Consulting Member: H. M. Conger; Advisory Members: D. W. Currie, S. A. Ell, P. D. Hero, D. M. Johnson, J. McCallin, S. E. Patterson, E. M. Stolper,

Development Committee—W. H. Davidow, Chair; J. F. Rothenberg, Vice Chair; J.-L. Chameau*, R. T. Jenkins, P. D. Kaufmann, K. Kresa*, D. D. McWhinney, W. L. Weisman; Advisory Members: P. D. Hero, R. E. McQuinn, E. M. Stolper

Executive Compensation

V. D. Stratman

Committee—R. K. Linde, *Chair*; J. E. Bryson, K. Kresa*, D. L. Lee, A. Lidow, P. M. Neches, W. L. Weisman; *Advisory Members*: J.-L. Chameau, J. M. McCallin

Institute and Alumni Relations

Committee—R. T. Jenkins, Chair; S. M. Malcom, Vice Chair; J.-L. Chameau*, W. H. Davidow, L. M. Dyer, G. I. Elbaz, W. T. Gross, L. Kirkbride, K. Kresa*, P. M. Neches, S. R. Onderdonk, V. V. Weldon, G. E. Wilson; Advisory Members: R. Basa, K. A. Brown, D. W. Currie, H. P. Daily, D. Dougherty, B. Folsom, P. D. Hero, T. Lloyd, A. I. Sargent, E. M. Stolper, E. Tito

Investment Committee—S. A. Ross, *Chair*; R. K. Linde, *Vice Chair*; J.-L. Chameau*, J. F. Rothenberg, J. S. Wintrob; *Advisory Members*: S. Dow, S. A. Ell, J. S. Friedman, R. Perry

Jet Propulsion Laboratory

Committee—C. R. Trimble, *Chair*; J. B. Kutler, *Vice Chair*; H. Brown, J.-L.

Chameau*, L. M. Dyer, T. E. Everhart, F. J. Hameetman, S. M. Hufstedler, B. R. Inman, J. F. Kayyem, L. Kirkbride, K. Kresa*, L. J. Lavigne Jr., P. M. Neches, P. Norton, R. L. Olson, S. R. Onderdonk, P. J. Pizarro, S. R. Rawn Jr., S. A. Resnick, S. K. Ride, W. L. Weisman, G. E. Wilson, S. H. Woolsey; Consulting Members: G. E. Moore, C. H. Townes; Advisory Members: D. W. Currie, H. P. Daily, C. Elachi, P. D. Hero, J. Lum, R. P. O'Toole, E. M. Stolper, V. D. Stratman

Nominating Committee—A. Lidow, Chair; J. E. Bryson, Vice Chair; B. M. Bren, J.-L. Chameau*, B. R. Inman, L. Kirkbride, K. Kresa*, D. L. Lee, R. K. Linde, D. D. McWhinney, R. L. Olson, M. I. Stern, D. W. Tang, W. L. Weisman, V. V. Weldon, G. E. Wilson, S. H. Woolsey; Consulting Members: W. F. Kieschnick, S. Ramo; Advisory Members: P. D. Hero, E. M. Stolper, V. D. Stratman

Student Experience Committee—

L. Kirkbride, Chair; P. H. Nettles Jr., Vice Chair; J.-L. Chameau*, M. M. Chang, R. B. Chess, L. M. Dyer, G. I. Elbaz, K. Kresa*, Y. Liao, S. M. Malcom, D. D. McWhinney; P. M. Neches, P. Norton, C. R. Trimble, V. V. Weldon, S. H. Woolsey; Advisory Members: P. D. Hero, M. L. Hunt, A. I. Sargent, J. E. Shepherd, E. M. Stolper, Dean of Students; Student Advisory Members: Z. Ahmed, D. Coleman, A. Price, R. Zia

Technology Transfer Committee—P. M. Neches, Chair; R. B. Chess, Vice Chair; H. Brown, J.-L. Chameau*, M. M. Chang, J. S. Chen, L. M. Dyer, A. L. Goldstein, J. F. Kayyem, L. Kirkbridge, K. Kresa*, J. B. Kutler, L. J. Lavigne Jr., A. Lidow, P. H. Nettles Jr., P. Norton, S. A. Resnick, D. W. Tang, C. R. Trimble, L. W. van Amerongen; Advisory Members: D. W. Currie, S. A. Ell, F. Farina, M. Gharib, E. M. Stolper, V. D. Stratman

Transaction Review Subcommittee

P. M. Neches, *Chair ex officio*; J. E. Bryson*, R. B. Chess*, J. B. Kutler, P. Norton; *Advisory Member*: V. D. Stratman

^{*} ex officio member

ADMINISTRATIVE OFFICERS



Jean-Lou Chameau President



Edward M. Stolper

Dean W. Currie Vice President for Business and Finance Hall P. Daily Director of Government Relations Dennis A. Dougherty Chair of the Faculty Charles Elachi Vice President and Director, 7et Propulsion Laboratory Richard E. Fagen Chief Information Officer Morteza Gharib Vice Provost Peter D. Hero Vice President for Development and Institute Relations Melany L. Hunt Vice Provost Julia McCallin Associate Vice President for Human Resources

Sharon E. Patterson
Associate Vice President for
Finance and Treasurer
Scott Richland
Chief Investment Officer
Anneila I. Sargent
Vice President for Student Affairs
Joseph E. Shepherd
Dean of Graduate Studies
Mary L. Webster
Secretary, Board of Trustees
Victoria D. Stratman
General Counsel
TBA
Dean of Students

Chairs of Divisions

Stephen L. Mayo

Biology
Jacqueline K. Barton

Chemistry and Chemical

Engineering
Ares J. Rosakis

Engineering and Applied Science
Kenneth A. Farley

Geological and Planetary Sciences
Jonathan N. Katz

Humanities and Social Sciences
B. Thomas Soifer

Physics, Mathematics and

Astronomy

Administrative Committees

Administrative Management Council (AMC)—J.-L. Chameau, Chair; D. W. Currie, D. A. Dougherty, C. Elachi, M. Gharib, P. D. Hero, M. L. Hunt, A. I. Sargent, E. M. Stolper, V. D. Stratman, M. L. Webster

Animal Care and Use [fills the role of Caltech's Institutional Animal Care and Use Committee—IACUC] (Reports to the Provost)—A. Huang, *Chair*; R. A. Anderson, J. Baer, P. Blue*, J. Brackman, D. Chan, G. C. Fisher-Adams*, E. Helms, L. Hsieh-Wilson, K. Lencioni, D. Mayo, C. Scislowicz* (alternate)

Benefits (Reports to the Vice President for Business and Finance)—D. M. Grether, *Chair*; P. L. Carter-Lockert*, W. Chapman, J. A. Grinols, C. Hart*, P. T. Hoffman, P. C. Jennings, D. M. Johnson, A. Kuppermann, J. McCallin*, J. C. Milbrandt, S. E. Patterson*, N. A. Pierce, M. Powell-Meeks, R. M. Roessler*, A. C. Santana*, J. Stock

Biosafety [fills the role of Caltech's Institutional Biosafety Committee—IBC] (Reports to the Vice President for Business and Finance)—E. Rothenberg, *Chair*; J. Baer, C. Cortese, W. Dietrick, G. Fisher-Adams*, R. D. Lansford, J. D. Leadbetter, S. Mitel, C. Saswati, C. Scislowicz*, R. P. Seligman*, M. Ton

Computing Advisory Committee (Reports to the Provost)—B. Fultz, *Chair*; K. C. Border, R. Clayton, D. W. Currie*, K. Douglas*, R. Fagen, J. Kaiser[§], J. McCallin*, B. V. McKoy, B. Simon

Council on Undergraduate Education (Reports to the Provost)—M. L. Hunt, *Chair*; P. M. Bellan, G. Blake, J. Campbell, M. Chiu[‡], D. Dougherty, F. Echenique, B. W. Filippone, B. Merlob[‡], M. N. Morley, A. I. Sargent, K. Sarma, R. B. Sherman, B. M. Stoltz

Institute Academic Council (IACC)—E. M. Stolper, *Chair*; J. K. Barton, J.-L. Chameau, K. A. Farley, J. N. Katz, E. M. Meyerowitz, A. J. Rosakis, B. T. Soifer

Institute Administrative Council (IAC)—J.-L. Chameau, *Chair*; J. K. Barton, J. Cowell, D. W. Currie, H. P. Daily, D. Dougherty, C. Elachi, S. A. Ell, R. Fagen, K. A. Farley, M. Gharib, P. D. Hero, M. L. Hunt, J. N. Katz, J. Lum, J. McCallin, E. M. Meyerowitz, S. Patterson, A. J. Rosakis, A. I. Sargent, R. P. Seligman, J. E. Shepherd, B. T. Soifer, E. M. Stolper, V. D. Stratman, M. L. Webster

Institute Art (Reports to the Director, Public Events)—P.
Perona, *Chair*; A. Boyle, J.
Buchwald, F. E. C. Gulick, H. P.
Daily, G. Gage, C. Klein[‡], T.
Knutson[†], D. Kremers, D. Nelson
Nash, T. Schneider, C. S. Smith, C.
Theodoris[‡] (alternate), L. Yeung[†]

Performing and Visual Arts (Reports to the Vice President for Student Affairs)—S. C. Frautschi, Chair; P. D. Asimow, J. Barry, D. Bing, D. Brophy, G. Dodd, C. Glick, P. T. Hoffman, J. Jewell, D. Nelson Nash, J. H. Richards, J. D. Roberts

Protection of Human Subjects [fills the role of Caltech's Institutional Review Board—IRB] (Reports to the Provost)—C. R. Plott, *Chair*; R. Anderson*, J. F. Baer* (alternate), R. I. Feinberg, G. Fisher-Adams, A. Frey (adviser), G. Q. Jung, J. L. Kirschvink, G. Lund, P. H. Patterson, P. Perona, C. Scislowicz*, R. P. Seligman*, V. D. Stratman*, J. M. Tyszka (adviser), K. K. Wong Jr., D. W. Zeh

Radiation Safety (Reports to the Vice President for Business and Finance)—D. S. Burnett, *Chair*;

A. Asthagiri, B. Filippone, H. Issaian, W. L. Johnson, A. Kumagai, C. Scislowicz*

Sponsored Research (Reports to the Provost)—B. V. McKoy, *Chair*; T. H. Heaton, J. O. Ledyard, P. H. Patterson, R. P. Seligman*, N. C. Yeh

SURF (Reports to the Provost)— H. B. Gray, *Chair*; G. A. Blake*, D. Chan, J. O. Dabiri, S. C. Frautschi, K. M. Gilmartin, J. M. Jackson, G. Orton, W. M. Whitney, R. M. Wilson

FACULTY OFFICERS AND COMMITTEES 2010-11

Officers

Chair: D. A. Dougherty
Vice Chair: S. M. Haile
Secretary: F. Cowie

Faculty Board

J. F. Adkins, 2013 R. M. Alvarez, 2011 K. C. Border, 2012 J. F. Brady, 2013 D. C. Calegari, 2012 R. C. Flagan, 2013 S. E. Fraser, 2011 N. Lapusta, 2012 D. K. Newman, 2013 V. J. Orphan, 2012 P. Perona, 2013 H. D. Politzer, 2012 W. Sargent, 2011 B. M. Simon, 2013 D. J. Stevenson, 2011 B. Stoltz, 2012 Z.-G. Wang, 2011

Ex Officio:

E. Winfree, 2011

J. K. Barton
J.-L. Chameau
K. A. Farley
J. N. Katz
S. L. Mayo
A. J. Rosakis
A. I. Sargent
J. E. Shepherd
B. T. Soifer
E. M. Stolper
Dean of Students

Steering

D. A. Dougherty, *Chair** F. Cowie* S. M. Haile* M. L. Hunt E. M. Stolper* Z.-G. Wang

^{*} ex officio member

[†] representing graduate students

[†] representing undergraduate students

[§] representing postdoctoral scholars

^{*}ex officio member

Tenure

K. C. Border, 2012

S. Fraser, 2012

J. A. Kornfield, 2011

P. Perona, 2011

D. Politzer, 2012

J. H. Seinfeld, 2011

Academic Policies

P. M. Bellan, Chair

O. Aharonson, 2012

S. C. Frautschi, 2013

W. Goddard, 2012

J. C. Peters, 2013

S. R. Quartz, 2012

C. A. Weinstein, 2013

Athletics and Physical Education

O. Aharonson, Chair

R. H. Grubbs, 2012

L. Hillenbrand, 2013

W. J. Irwin*

J. L. Kirschvink, 2012

N. Lapusta, 2013

J. Levesque (interim)*

J. Whitney*

K. G. Zinn, 2012

Convocations

S. M. Haile*

T. Schneider, 2013

J. E. Shepherd*

C. A. Weinstein, 2012

Dean of Students*

Core Curriculum Steering

B. W. Filippone, Chair

K. Gilmartin, 2012

N. S. Lewis, 2012 D. I. Meiron, 2013

E. Phinney III, 2011

J. Pine, 2011

B. P. Wernicke, 2013

Curriculum

F. Echenique, Chair

M. N. Morley*

D. Rees, 2011

M. Simmons, 2013

B. M. Simon, 2012

C. A. Weinstein, 2012

Dean of Students*

Educational Outreach

M. Feingold, Chair

M. Bronner-Fraser, 2013

S. Golwala, 2013

J. A. Johnson, 2013

N. Lapusta, 2012

Exchange Programs and Study Abroad (CEPSA)

H. B. Newman, *Chair*

J. P. Ampuero Saenz, 2013

J. R. Goodstein (non-voting)

T. C. Ho, 2011

G. J. Laurent, 2011

M. N. Morley*

W. Sargent, 2012

T. Schneider, 2012

D. J. Stevenson, 2013

L. Stolper*

Foreign Students and Scholars

A. G. Siapas, Chair

K. Arai, 2013

M. Gooding*

Y. T. Hou, 2012

H.-M. Muller, 2013

Freshman Admissions

K. C. Border, Chair

J. M. Allman, 2013

M. Aschbacher, 2013

J. L. Beauchamp, 2012

W. Bing (non-voting)

N. R. Corngold, 2012

D. R. Kiewiet, 2012

B. McKoy, 2011 B. Megdal (non-voting)

O. J. Painter, 2012

J. H. Schwarz, 2013

D. Tsao, 2012

J. Whitney*

Graduate Studies

B. T. Fultz, Chair*

R. W. Clayton, 2011

T. E. Colonius, 2011

S.-A. Hajimiri, 2011

J. E. Shepherd*

Health

K. Austin*

K. C. Border, 2013

M. Flach, 2013

D. M. Grether, 2012

J. A. Kornfield, 2010

H. A. Lester, 2013

J. Levesque (interim)*

S. C. Miller*

P. H. Patterson, 2012

^{*}ex officio member

Institute Programs

J. Cohen, Chair

D. Bing*
J. R. Greer, 2012

K. Haugen, 2013

D. LaVertu*

R. L. O'Rourke*

T. R. Palfrey, 2012

J. Pine, 2013

Library

J. H. Richards, *Chair* W. C. Brown, 2013

J. Bruck, 2012

S. G. Djorgovski, 2012

K. Douglas*

R. C. Flagan, 2011

A. P. Ingersoll, 2012

A. N. Kapustin, 2013

J. M. Kousser, 2013

A. G. Siapas, 2012

C. Steidel, 2011

P. W. Sternberg, 2012

Membership and Bylaws

S. M. Haile, Chair*

D. S. Cohen, 2011

F. Cowie*

M. Okumura, 2011

N. A. Pierce, 2011

T. Schneider, 2011

R. P. Sherman, 2011

Nominating

W. Sargent, Chair

D. C. Calegari, 2011

F. Cowie*

N. Lapusta, 2011

D. J. Stevenson, 2011

Z. G. Wang, 2011

Patents and Relations with Industry

J. Bruck, Chair

F. H. Arnold, 2012

K. Bhattacharya, 2013

M. Gharib, 2011

S.-A. Hajimiri, 2011

B. J. McKeon, 2013

N. A. Pierce, 2011

A. G. Siapas, 2012

B. J. Wold, 2012

A. Yariv, 2011

Scholarships and Financial Aid

R. D. Kiewiet, Chair

G. Blake*

D. Crewell*

J. L. Kirschvink, 2013

A. Kuppermann, 2012

G. Refael, 2012

J. Whitney*

Dean of Students*

Student Housing

P. D. Asimow, Chair

T. Agapie, 2012

G. A. Blake*

P. Daily (non-voting)

T. K. Dennison, 2013

M. Iaryczower, 2011

J. Levesque (interim)*

T. Mannion (non-voting) J. Shepherd, 2011

P. Wennberg, 2011

L. Yariv, 2011

Undergraduate Academic Standards and Honors

R. P. Sherman, Chair

D. A. Boyd, 2013

W. C. Brown, 2013

J. L. Campbell, 2012

G. R. Gavalas, 2012

D. Goodwin, 2011

M. N. Morley*

E. S. Phinney, 2012

D. P. Weitekamp, 2012

Dean of Students*

Upperclass Admissions

T. B. Graber, 2013

K. L. Haugen, 2012

J. Whitney*

^{*}ex officio member

556

STAFF OF INSTRUCTION AND RESEARCH

Division of Biology

Stephen L. Mayo, Chair Raymond Deshaies, Executive Officer for Molecular Biology Christof Koch, Executive Officer for Neurobiology

Professors Emeriti

John N. Abelson, Ph.D.

George Beadle Professor of Biology
Charles J. Brokaw, Ph.D.

Biology

John J. Hopfield, Ph.D.

Roscoe G. Dickinson Professor of
Chemistry and Biology

Ray D. Owen, Ph.D., Sc.D.h.c. Biology

Jean-Paul Revel, Ph.D.

Albert Billings Ruddock Professor
of Biology

Melvin I. Šimon, Ph.D.

Anne P. and Benjamin F. Biaggini
Professor of Biological Sciences

James H. Strauss, Ph.D.

Ethel Wilson Bowles and Robert
Bowles Professor of Biology

Senior Research Associate Emeriti

Roy J. Britten, Ph.D.

Distinguished Carnegie Senior
Research Associate in Biology,
Emeritus

Anne Chomya, Ph.D.

Anne Chomyn, Ph.D. Ellen G. Strauss, Ph.D.

Professors

Ralph Adolphs, Ph.D.

Bren Professor of Psychology and
Neuroscience and Professor of
Biology

John M. Allman, Ph.D. Frank P. Hixon Professor of Neurobiology Richard A. Andersen, Ph.D.

James G. Boswell Professor of
Neuroscience

David J. Anderson, Ph.D.¹ Seymour Benzer Professor of Biology

David Baltimore, Ph.D., D.Sc.h.c., D.Phil.h.c., Nobel Laureate Robert Andrews Millikan Professor of Biology

Pamela Bjorkman, Ph.D.¹
Max Delbrück Professor of Biology

Marianne Bronner-Fraser, Ph.D.

Albert Billings Ruddock Professor
of Biology

Judith L. Campbell, Ph.D. *Chemistry and Biology*

Eric H. Davidson, Ph.D. Norman Chandler Professor of Cell Biology

Raymond Deshaies, Ph.D.¹ Biology

Michael H. Dickinson, Ph.D. Esther M. and Abe M. Zarem Professor of Bioengineering

William G. Dunphy, Ph.D.

Grace C. Steele Professor of Biology

Scott E. Fraser, Ph.D.

Anna L. Rosen Professor of Biology
and Professor of Bioengineering

Bruce A. Hay, Ph.D. Biology

Mary B. Kennedy, Ph.D.

Allen and Lenabelle Davis

Professor of Biology

Christof Koch, Ph.D.

Lois and Victor Troendle Professor
of Cognitive and Behavioral
Biology and Professor of
Computation and Neural Systems

Masakazu Konishi, Ph.D.

Bing Professor of Behavioral
Biology

Gilles J. Laurent, Ph.D., D.V.M. Lawrence A. Hanson, Jr., Professor of Biology and Computation and Neural Systems

Henry Å. Lester, Ph.D. Bren Professor of Biology

Stephen L. Mayo, Ph.D.

Bren Professor of Biology and
Chemistry

Elliot M. Meyerowitz, Ph.D. George W. Beadle Professor of Biology

Dianne K. Newman, Ph.D.¹
Biology and Geobiology
Paul H. Patterson, Ph.D.
Anne P. and Benjamin F. Biaggini
Professor of Biological Sciences

Ellen Rothenberg, Ph.D.

Albert Billings Ruddock Professor
of Biology

Erin M. Schuman, Ph.D.¹ Biology

Shinsuke Shimojo, Ph.D. Gertrude Baltimore Professor of Experimental Psychology

Paul W. Sternberg, Ph.D.¹

Thomas Hunt Morgan Professor of Biology

Alexander J. Varshavsky, Ph.D. Howard and Gwen Laurie Smits Professor of Cell Biology

Barbara J. Wold, Ph.D.

Bren Professor of Molecular

Biology

N. W. D. D.

Kai Zinn, Ph.D. Biology

¹ Joint appointment with Howard Hughes Medical Institute

Associate Professors

David C. Chan, M.D., Ph.D.¹
Biology
Michael Elowitz, Ph.D.¹
Biology and Bioengineering
Grant J. Jensen, Ph.D.¹
Biology
Athanassios G. Siapas, Ph.D.
Computation and Neural Systems

Assistant Professors

Alexei Aravin, Ph.D.
Biology
Sarkis Mazmanian, Ph.D.
Biology
David Prober, Ph.D.
Biology
Angelike Stathopoulos, Ph.D.
Biology
Doris Ying Tsao, Ph.D.
Biology

Lecturers

Helen Bermudez, B.S. Andrea Loettgers, Ph.D. Jane E. Mendel, Ph.D. James R. Pierce, M.D. Carol Chace Tydell, D.V.M. Daniel A. Wagenaar, Ph.D.

Senior Research Associates

R. Andrew Cameron, Ph.D. Akiko Kumagai, Ph.D. Mary An-yuan Yui, Ph.D.

Senior Research Fellows

Holly J. Carlisle, Ph.D.
Stijn Cassenaer, Ph.D.
Benjamin Deverman, Ph.D.
Ryan Michael Drenan, Ph.D.
Maxellende Ezin, Ph.D.
Igor Kagan, Ph.D.
Mihoko Kato, Ph.D.
Gary L. Kleiger, Ph.D.
Evgueniy V. Lubenov, Ph.D.
Edoardo Marcora, Ph.D.
Sotiris Masmanidis, Ph.D.
Julie Miwa, Ph.D.
S. M. Reza Motaghian Nezam, Ph.D.

Hans-Michael Muller, Ph.D. Tatjana Sauka-Spengler, Ph.D. Jagan Srinivasan, Ph.D. Andrew Steele, Ph.D. Katalin Fejes Toth, M.D., Ph.D. Qiang Tu, Ph.D. Daniel A. Wagenaar, Ph.D. Guangying Wu, Ph.D.

Senior Faculty Associate

Alice S. Huang, Ph.D.

Visiting Associates

Christoph Adami, Ph.D. Elaine L. Bearer, Ph.D., M.D. Hamid Bolouri, Ph.D.

¹ Joint appointment with Howard Hughes Medical Institute

Andres Collazo, Ph.D. Michael Collins, Ph.D. Maria Elena deBellard, Ph.D. Pamela L. Eversole-Cire, Ph.D. Caleb Finch, Ph.D. Winrich Freiwald, Ph.D. Jordi García-Ojalvo, Ph.D. Ming Guo, Ph.D., M.D. Narimon Honarpour, M.D., Ph.D. Daniel Kahn, M.D., Ph.D. Carmel Levitan, Ph.D. Angelique Y. Louie, Ph.D. Carol Ann Miller, M.D. Eric Mjolsness, Ph.D. Daniele Procissi, Ph.D. Dinesh Rao, M.D., Ph.D. Carmie Puckett Robinson, M.D. José Luis Riechmann, Ph.D. Ian Ross, M.D. Surajit Sarkar, Ph.D.

Member of the Beckman Institute

Russell E. Jacobs, Ph.D.

Members of the Professional Staff

Eugene Akutagawa, B.S.
Janet F. Baer, D.V.
Gary Belford, Ph.D.
L. Elizabeth Bertani, Ph.D.
Bruce Cohen, Ph.D.
Rochelle A. Diamond, B.A.
Ali Khoshnan, Ph.D.
David Koos, Ph.D.
Ker-hwa Ou, M.S.
Shirley Pease, B.Sc.
Piotr J. Polaczek, Ph.D.
Andrew J. Ransick, Ph.D.
Peter Siegel, Ph.D.
Julian Michael Tyszka, Ph.D.
Jie Zhou, Ph.D.

Senior Postdoctoral Scholars

Vijay S. Chickarmane, Ph.D. Andrea Loettgers, Ph.D. Isabelle S. Peter Lashgari Faghani, Ph.D. Yan Zhang, M.D., Ph.D.

Postdoctoral Scholars

Murat Acar, Ph.D. Mark Aizenberg, Ph.D. Omar Akbari, Ph.D. Constantinos Anastassiou, Ph.D. Todd Anthony, Ph.D. Kenta Asahina, Ph.D. Young-Kyung Bae, Ph.D. Alejandro Balazs, Ph.D. Julius Barsi, Ph.D. Morgan Beeby, Ph.D.¹ Smadar Ben-Tabou de-Leon, Ph.D. Paola Betancur, Ph.D. Michael Bethune, Ph.D. Jesse Bloom, Ph.D. James Bonaiuto, Ph.D. Lindsay Bremner, Ph.D. Ariane Briegel, Ph.D.1 Haijiang Cai, Ph.D. Luca Caneparo, Ph.D. Robert Carrillo, Ph.D. Ameya Champhekar, Ph.D. Nickie Chan, Ph.D.1 Songve Chen, Ph.D. Vikram Chib, Ph.D. Tsui-Fen Chou, Ph.D. Maureen Coleman, Ph.D. Stehpanie Culler, Ph.D.1 Chiraj Dalal, Ph.D. Willem den Besten, Ph.D. Ron Diskin, Ph.D. Meenakshi Kshirsagar Doma, Ph.D.¹ David Doughty, Ph.D.1 Jiangang Du, Ph.D. Chee-Kwee Ea, Ph.D. Ethan D. Emberley, Ph.D. Jeremy Lane Emken, Ph.D. Katherine Fishwick, Ph.D. Joseph Gallagher, Ph.D. Lu Gan, Ph.D. Cai Guo, Ph.D. Xoana Gonzalez Troncoso, Ph.D. Sean Gordon, Ph.D. Arnulf Graf. Ph.D. Piercesare Grimaldi, Ph.D., M.D. Elissa Hallem, Ph.D. Cynthia Harley, Ph.D. Markus Hauschild, Ph.D. Rasheeda Hawk, Ph.D. Tobias Heinen, Ph.D. Michael R. H. Hill, Ph.D. Tatiana Hochgreb, Ph.D. Eric Hoopfer, Ph.D. Yen-Ping Hsueh, Ph.D.

Parameswaran Ramakrishnan,

Christopher Richards, Ph.D.

Ph.D.

Adrienne Roeder, Ph.D. Crystal Rogers, Ph.D. June Round, Ph.D. Frederique Ruf, Ph.D. Puja Saluja, Ph.D. Amir Sapir, Ph.D. Ankur Saxena, Ph.D. Hillel Schwartz, Ph.D. Christian García Siagian, Ph.D. Alex Sigal, Ph.D. Edward J. Silverman, Ph.D. Marcos Wasada Simões-Costa, Ph.D. Alex Yick-Lun So, Ph.D. Zhiyin Song, Ph.D.¹ Rahul Srinivasan, Ph.D. Pablo Strobl Mazzulla, Ph.D. Kaoru Sugimoto, Ph.D. Matthew Swulius, Ph.D. Paul Thomas Tarr, Ph.D. Timothy D. Tayler, Ph.D. Anne M. Taylor, Ph.D. Julia Tischler, Ph.D. Elitza Tocheva, Ph.D. Le A. Trinh, Ph.D. Thai V. Truong, Ph.D. Cevat Ustun, Ph.D. Sofia Vrontou, Ph.D. Ying Wang, Ph.D. Ying Wang, Ph.D. Kiichi Watanabe, M.D., Ph.D. Casimir Wierzynski, Ph.D. Claudia Beate Wilimzig, Ph.D. Melanie Wilke, Ph.D. Allan Wong, Ph.D. Cora Woodard, Ph.D. Ashley Wright, Ph.D. Chia-Hung Wu, Ph.D. Cheng Xiao, M.D., Ph.D. Suzuko Yorozu, Ph.D. Kyongsik Yun, Ph.D. Sohila Zadran, Ph.D. Alon Zaslaver, Ph.D. Xiaolan Zhang, Ph.D. Qi Zhao, Ph.D. Yun Zhou, Ph.D.

Visitors

Libera Berghela Pranav Kosuri, B.S. Agnes Lukaszewica, Ph.D. Jasna Markovac, Ph.D. Daniela U. Mier, Dipl.

¹ Joint appointment with Howard Hughes Medical Institute

Jonathan Moore, Ph.D.
Dirk Neumann, Ph.D.
Barry Olafson, Ph.D.
Seth W. Ruffins, Ph.D.
Ueli Rutishauser, Ph.D.
Heiko Stemmann, Ph.D.
Jeroen van Boxtel, Ph.D.
Andreas Walz, Ph.D.
Marianna Yanikke, Ph.D.
Chichiro Yasutake, M.A.

Division of Chemistry and Chemical Engineering

Jacqueline K. Barton, Chair
Richard C. Flagan, Executive Officer
for Chemical Engineering
Brian M. Stoltz, Executive Officer for
Chemistry
Douglas C. Rees, Executive Officer
for Biochemistry and Molecular

Professors Emeriti

Biophysics

Fred C. Anson, Ph.D., D.h.c. Elizabeth W. Gilloon Professor of Chemistry John D. Baldeschwieler, Ph.D. J. Stanley Johnson Professor and Professor of Chemistry Sunney I. Chan, Ph.D. George Grant Hoag Professor of Biophysical Chemistry George R. Gavalas, Ph.D. Chemical Engineering John J. Hopfield, Ph.D. Roscoe G. Dickinson Professor of Chemistry and Biology Aron Kuppermann, Ph.D. Chemical Physics John D. Roberts, Ph.D., Dr.rer.Nat.h.c., Sc.D.h.c., D.Sc.h.c. Institute Professor of Chemistry Nicholas W. Tschoegl, Ph.D. Chemical Engineering

Senior Research Associates Emeriti

Richard E. Marsh, Ph.D. Chemistry William P. Schaefer, Ph.D. Chemistry

Professors

Frances H. Arnold, Ph.D.

Dick and Barbara Dickinson

Professor of Chemical Engineering,
Bioengineering, and Biochemistry

Jacqueline K. Barton, Ph.D.,
D.Sc.h.c., D.L.h.c.
Arthur and Marian Hanisch
Memorial Professor and Professor
of Chemistry; Chair, Division of
Chemistry and Chemical
Engineering

Jesse L. Beauchamp, Ph.D. Mary and Charles Ferkel Professor of Chemistry

John E. Bercaw, Ph.D. Centennial Professor of Chemistry

Geoffrey A. Blake, Ph.D.

Cosmochemistry and Planetary
Sciences and Chemistry

John F. Brady, Ph.D.

Chevron Professor of Chemical
Engineering and Professor of
Mechanical Engineering

Judith L. Campbell, Ph.D. Chemistry and Biology

Mark E. Davis, Ph.D.

Warren and Katharine Schlinger
Professor of Chemical Engineering

Peter B. Dervan, Ph.D., D.Sc.h.c.

Bren Professor of Chemistry

Dennis A. Dougherty, Ph.D.

George Grant Hoag Professor of
Chemistry

Richard C. Flagan, Ph.D.

Irma and Ross McCollum–William
H. Corcoran Professor of Chemical
Engineering and Professor of
Environmental Science and
Engineering

William A. Goddard III, Ph.D. Charles and Mary Ferkel Professor of Chemistry, Materials Science, and Applied Physics

Harry B. Gray, Ph.D., D.Sc.h.c., Laurea h.c., Fil.Dr.h.c., D.L.h.c. Arnold O. Beckman Professor of Chemistry and Founding Director of the Beckman Institute

Robert H. Grubbs, Ph.D., Nobel Laureate Victor and Elizabeth Atkins

Professor of Chemistry Sossina M. Haile, Ph.D.

Materials Science and Chemical Engineering

James R. Heath, Ph.D. Elizabeth W. Gilloon Professor and Professor of Chemistry

Julia A. Kornfield, Ph.D. Chemical Engineering

Nathan S. Lewis, Ph.D. George L. Argyros Professor and Professor of Chemistry Rudolph A. Marcus, Ph.D., D.Sc.h.c., Fil.Dr.h.c., D.h.c., Nobel Laureate Arthur Amos Noyes Professor of Chemistry

Stephen L. Mayo, Ph.D.

Bren Professor of Biology and
Chemistry

B. Vincent McKoy, Ph.D. Theoretical Chemistry

Mitchio Okumura, Ph.D. Chemical Physics

Carl S. Parker, Ph.D. Biochemistry

Jonas C. Peters, Ph.D. Bren Professor of Chemistry

Douglas C. Rees, Ph.D.¹ Roscoe Gilkey Dickinson Professor of Chemistry

John H. Richards, Ph.D. Organic Chemistry and Biochemistry

John H. Seinfeld, Ph.D., D.Sc.h.c. Louis E. Nohl Professor and Professor of Chemical Engineering Brian M. Stoltz, Ph.D.

Ethel Wilson Bowles and Robert Bowles Professor of Chemistry

David A. Tirrell, Ph.D., D.h.c. Ross McCollum–William H. Corcoran Professor and Professor of Chemistry and Chemical Engineering

Zhen-Gang Wang, Ph.D. Chemical Engineering Daniel P. Weitekamp, Ph.D. Chemical Physics

Ahmed H. Zewail, Ph.D., D.Sc.h.c., D.h.c., D.Univ.h.c., D.Phil.h.c., LL.D.h.c., M.D.h.c., Nobel Laureate Linus Pauling Professor of Chemistry and Professor of Physics

¹ Joint appointment with Howard Hughes Medical Institute

Associate Professors

Konstantinos P. Giapis, Ph.D. Chemical Engineering Linda C. Hsieh-Wilson, Ph.D.¹ Chemistry

¹ Joint appointment with Howard Hughes Medical Institute

Assistant Professors

Theodor Agapie, Ph.D. Chemistry

Anand R. Asthagiri, Ph.D. Chemical Engineering

Long Cai, Ph.D. Chemistry

William M. Clemons, Ph.D. Biochemistry

Andre Hoelz, Ph.D. *Chemistry*

Thomas F. Miller III, Ph.D. *Chemistry*

Chemistry

Sarah E. Reisman, Ph.D. *Chemistry*

Shu-ou Shan, Ph.D. Chemistry

Lecturers

Kathryn Bikle, M.A. *Chemistry*

Bruce Brunschwig, Ph.D. *Chemistry*

Nathan Dalleska, Ph.D. Chemistry

Michael W. Day, Ph.D. Chemistry

Sonjong Hwang, Ph.D. Chemistry

Jay Labinger, Ph.D. Chemistry

Mona Shahgholi, Ph.D. Chemistry

Scott Virgil, Ph.D.

Chemistry

Jay Winkler, Ph.D. Chemistry

Faculty Associates

Jay A. Labinger, Ph.D. Chemistry Jay R. Winkler, Ph.D. Chemistry

Visiting Associates

Paul von Allmen, Ph.D. *Physics*

Richard J. Bing, M.D., D.h.c, M.D.h.c. Chemistry

Pin Chen, Ph.D. Chemistry

Ara Chutjian, Ph.D. *Chemistry*

Emmanuelle Despagnet, Ph.D.

Chemistry

Stephen J. Forman, M.D. *Chemical Engineering*

Vernon C. Gibson, Ph.D. *Chemistry*

M. Michael Glovsky, M.D. *Chemistry*

Michael G. Hill, Ph.D. *Chemistry*

Susan M. Hojnacki, Ph.D. *Chemistry*

James M. House, Ph.D. Chemical Engineering

James E. Howard, Ph.D. *Chemistry*

Keiko Kanamori, Ph.D. *Chemistry*

Henry Levenson, M.D. *Chemistry*

Charles Y. Liu, Ph.D. *Chemistry*

Michihisa Maeda, Ph.D. Agriculture

Ilan M. Marek, Ph.D. *Chemistry*

Samir K. Pal, Ph.D. Physical Chemistry

Roy A. Periana, Ph.D. Chemistry

Adrian Ponce, Ph.D. Chemistry

Matthew Sazinsky, Ph.D. *Biological Chemistry* Drora Shevy, M.D., Ph.D.

Medicine/Physics

Fria D. A. Stomp, Ph. D.

Eric D. A. Stemp, Ph.D. *Chemistry*

Robert D. Tanner, Ph.D. Chemical Engineering

Kenneth W. Wright, M.D. Chemical Engineering

Yun Yen, M.D., Ph.D.

Pathology and Cell Biology Dongping Zhong, Ph.D. Chemical Physics

Members of the Beckman Institute

Bruce S. Brunschwig, Ph.D. Jay R. Winkler, Ph.D.

Members of the Professional Staff

Thomas R. Dunn, A.A.

Chemistry
Suresha Guptha, M.S.

Chemical Engineering
Lawrence R. Henling, M.S.

Chemistry
Sonjong Hwang, Ph.D.

Chemistry
Mona Shahgholi, Ph.D.

Chemistry

Senior Postdoctoral Scholar

Hyun Soon Park, Ph.D.

Postdoctoral Scholars

Omar Farghaly Mohammed Abdelsaboor, Ph.D. Nandini Ananth, Ph.D. Shane A. Ardo, Ph.D. Matthew J. Bierman, Ph.D. Bahar Bingol, Ph.D. Paul J. Bracher, Ph.D. Eric M. Brustad, Ph.D. Maren E. Buck, Ph.D. William R. Carroll, Ph.D. Jacob Y. Cha, Ph.D. Arthur Wing Hong Chan, Ph.D. Ann Feng Chueng, Ph.D. Rosemary M. Conrad, Ph.D. Robert H. Coridan, Ph.D. Joel R. Courter, Ph.D. Joshua J. Day, Ph.D. Yousong Ding, Ph.D. Guangbin Dong, Ph.D. Nathan C. Eddingsaas, Ph.D. Mary F. Farrow, Ph.D. Alexey Fedorov, Ph.D. David J. Flannigan, Ph.D. Ladan L. Foose, Ph.D. Ronald L. Grimm II, Ph.D. Christian U. Gruenanger, Ph.D.

Amanda E. Hargrove, Ph.D. William H. Harman, Ph.D. Amaruka Hazari, Ph.D. Christopher E. Henry, Ph.D. Kathrin Hoeferl-Prantz, Ph.D. Rohan A. Hule, Ph.D. Vlad M. Iluc, Ph.D. Kyoung-Soon Jang, Ph.D. Thomas Jensen, Ph.D. Jeremiah A. Johnson, Ph.D. Sang Taek Jung, Ph.D. Kenneth K. Karanja, Ph.D. Hemamala I. Karunadasa, Ph.D. Kotaro Kikushima, Ph.D. Jimin Kim, Ph.D. Jin-Hong Kim, Ph.D. Tae-Young Kim, PhD. Taek-Soo Kim, Ph.D. Maksym Kryvohuz, Ph.D. Vinh Q. Lam, Ph.D. Vincent Lavallo, Ph.D. Carl A. Laskowski, Ph.D. Ryan M. Lauchli, Ph.D. Jonas Yun Lee, Ph.D. Paul E. Lee, Ph.D. Song-Gil Lee, Ph.D. Yunho Lee, Ph.D. Sergiv M. Levin, Ph.D. Jared C. Lewis, Ph.D. Xin Li, Ph.D. Wenxi Liang, Ph.D. Runhui Liu, Ph.D. Zhenfeng Liu, Ph.D. Anna J. McConnell, Ph.D. Charles C. L. McCrory, Ph.D. Jordan L. Meier, Ph.D. Gabriele Meloni, Ph.D. Qixi Mi, Ph.D. Niki M. Millward, Ph.D. Steven W. Millward, Ph.D. Florence Mingardon, Ph.D. Slobodan Mitrovic, Ph.D. Marc-Etienne Moret, Ph.D. Jonathan E. Mueller, Ph.D. Axel Muller, Ph.D. Mrinmoy Nag, Ph.D. Issei Nakamura, Ph.D. Eranda Nikolla, Ph.D. Valerie Ann Norton, Ph.D. Volkan Ortalan, Ph.D. Paresma R. Patel, Ph.D. Kimberly S. Petersen, Ph.D. Fabian Michel Piller, Ph.D. Subhash Pokharel, Ph.D. Melissa Davis Pope, Ph.D.

Angela L.A. Puchlopek, Ph.D. James W. Puckett, Ph.D. Kersten Stefan Rabe, Ph.D. Suresh Kumar Ramasamy, Ph.D. Evgenij A. Raskatov, Ph.D. Michael J. Rose, Ph.D. Bryce F. Sadtler, Ph.D. Ishu Saraogi, Ph.D. Sascha Schaefer, Ph.D. Curtis J. Schneider, Ph.D. Sebastian Schoof, Ph.D. Qihui Shi, Ph.D. Sergey Shklyaev, Ph.D. Russell C. Smith, Ph.D. Christopher D. Snow, Ph.D. Joshua M. Spurgeon, Ph.D. Nicholas C. Strandwitz, Ph.D. Bryan D. Stubbert, Ph.D. Tobias T. Stuwe, Ph.D. Jason D. Surratt, Ph.D. James W. Swan, Ph.D. Janek Szychowski, Ph.D. Nathaniel K. Szymczak, Ph.D. Shiho Tanaka, Ph.D. Peili Teo, Ph.D. Ekaterina Tkatchouk, Ph.D. Kristy Tran, Ph.D. Yuko Tsutsui, Ph.D. Shelly Tzlil, Ph.D. Phoebe Tzou, Ph.D. Florian Vogt, Ph.D. Michael G. Walter, Ph.D. Troy A. Walton, Ph.D. Jun Wang, Ph.D. Jeffrey J. Warren, Ph.D. Samuel H. Weisbrod, Ph.D. Kun-Liang (Phil) Wu, Ph.D. Chengxiang Xiang, Ph.D. Seiji Yamada, Ph.D. Ding-shyue (Jerry) Yang, Ph.D. Janet Gloria Yang, Ph.D. Kun-Yun Yang, Ph.D. Wanwan Yang, Ph.D. Wen Yi, Ph.D. Keiko Yokoyama, Ph.D. Sze-Man Yu, Ph.D. Aycan Yurtsever, Ph.D. Dawei Zhang, Ph.D. Limei Zhang, Ph.D. Ruoyu Zhang, Ph.D. Binquan Zhuang, Ph.D.

Visitors

Xiaohong Cui, Ph.D. Enhanced Oil Recovery Koji Endo, M.S. Chemistry Yasutoyo Kawashima, Ph.D. Chemical Engineering Ralf Langen, Ph.D. Chemistry Matthew S. Mattson, Ph.D. Applied Physics Josef C. Meier, Ph.D. Chemistry Yan Shuen Poon, Ph.D. Chemistry Nathaniel K. Szymczak, Ph.D. Chemistry Julius Tsu-Li Su, Ph.D. Chemistry Jun Tan, Ph.D. Biomedical Engineering Seiji Yamada, Ph.D. Chemistry Changjun Yu, Ph.D. Chemistry

Andreas Zund, Ph.D.

565

Division of Engineering and Applied Science

Ares J. Rosakis, *Chair* K. Mani Chandy, *Deputy Chair for Education*

Kaushik Bhattacharya, Executive Officer for Mechanical and Civil Engineering

Mathieu Desbrun, Director of Computing and Mathematical Sciences

Babak Hassibi, Executive Officer for Electrical Engineering

Oskar J. Painter, Executive Officer for Applied Physics and Materials Science

Niles A. Pierce, Executive Officer for Bioengineering

Guruswami Ravichandran, Director, Graduate Aerospace Laboratories

Professors Emeriti

Allan J. Acosta, Ph.D.
Richard L. and Dorothy M.
Hayman Professor of Mechanical
Engineering

Christopher E. Brennen, D.Phil. Richard L. and Dorothy M. Hayman Professor of Mechanical Engineering

William B. Bridges, Ph.D. Carl F Braun Professor of Engineering

Norman H. Brooks, Ph.D. James Irvine Professor of Environmental and Civil Engineering

Francis H. Clauser, Ph.D. Clark Blanchard Millikan Professor of Engineering

Donald S. Cohen, Ph.D. Charles Lee Powell Professor of Applied Mathematics

Donald E. Coles, Ph.D. Aeronautics

Noel R. Corngold, Ph.D. *Applied Physics*

Fred É. C. Culick, Ph.D.

Richard L. and Dorothy M.

Hayman Professor of Mechanical

Engineering and Professor of Jet

Propulsion

Thomas E. Everhart, Ph.D., D.L.h.c., D.h.c. Electrical Engineering and Applied Physics

Joel N. Franklin, Ph.D. Applied Mathematics

David L. Goodstein, Ph.D.

Frank J. Gilloon Distinguished
Teaching and Service Professor and
Professor of Physics and Applied

Roy W. Gould, Ph.D.

Simon Ramo Professor of
Engineering

Hans G. Hornung, Ph.D.

C. L. "Kelly" Johnson Professor of
Aeronautics

Wilfred D. Iwan, Ph.D. Applied Mechanics

Paul C. Jennings, Ph.D. Civil Engineering and Applied Mechanics

Wolfgang G. Knauss, Ph.D. Theodore von Kármán Professor of Aeronautics and Applied Mechanics

Anthony Leonard, Ph.D.

Theodore von Kármán Professor of
Aeronautics

E. John List, Ph.D.

Environmental Engineering
Science

Frank E. Marble, Ph.D.
Richard L. and Dorothy M.
Hayman Professor of Mechanical
Engineering and Professor of Jet
Propulsion

Hardy C. Martel, Ph.D. Electrical Engineering

Robert J. McEliece, Ph.D. Allen E. Puckett Professor and Professor of Electrical Engineering

Carver A. Mead, Ph.D., D.Sc.h.c., D.h.c.

Gordon and Betty Moore Professor of Engineering and Applied Science

James J. Morgan, Ph.D., D.Sc.h.c. Marvin L. Goldberger Professor of Environmental Engineering Science

Marc-Aurele Nicolet, Ph.D. Electrical Engineering and Applied Physics

Fredric Raichlen, Sc.D.

Civil and Mechanical Engineering

566

Anatol Roshko, Ph.D.

Theodore von Kármán Professor of
Aeronautics

Rolf H. Sabersky, Ph.D. Mechanical Engineering

Frederick B. Thompson, Ph.D.

Applied Philosophy and Computer
Science

Thad Vreeland Jr., Ph.D. Materials Science

Gerald B. Whitham, Ph.D. Charles Lee Powell Professor of Applied Mathematics

Theodore Y. Wu, Ph.D. Engineering Science

Professors

Yaser S. Abu-Mostafa, Ph.D. Electrical Engineering and Computer Science

Jess F. Adkins, Ph.D. Geochemistry and Global Environmental Science

Harry A. Atwater Jr., Ph.D. Howard Hughes Professor and Professor of Applied Physics and Materials Science

Alan H. Barr, Ph.D. Computer Science

James L. Beck, Ph.D.

Engineering and Applied Science

Paul M. Bellan, Ph.D. *Applied Physics*

Kaushik Bhattacharya, Ph.D. Howell N. Tyson, Sr., Professor of Mechanics and Professor of Materials Science

John F. Brady, Ph.D. Chevron Professor of Chemical Engineering and Professor of Mechanical Engineering

Jehoshua Bruck, Ph.D. Gordon and Betty Moore Professor of Computation and Neural Systems and Electrical Engineering

Oscar P. Bruno, Ph.D.

Applied and Computational

Mathematics

Joel W. Burdick, Ph.D.

Mechanical Engineering and
Bioengineering

Emmanuel J. D. Candes, Ph.D. Ronald and Maxine Linde Professor of Applied and Computational Mathematics Jean-Lou Chameau, Ph.D.

Civil Engineering, Environmental
Science and Engineering, and
Mechanical Engineering

K. Mani Chandy, Ph.D. Simon Ramo Professor and Professor of Computer Science

Timothy E. Colonius, Ph.D. Mechanical Engineering

Mathieu Desbrun, Ph.D.

Computing and Mathematical
Sciences

Michael H. Dickinson, Ph.D. Esther M. and Abe M. Zarem Professor of Bioengineering

Paul E. Dimotakis, Ph.D.

John K. Northrop Professor of
Aeronautics and Professor of
Applied Physics

John C. Doyle, Ph.D.
John G Braun Professor of Control
and Dynamical Systems, Electrical
Engineering, and Bioengineering

Michelle Effros, Ph.D. Electrical Engineering

James P. Eisenstein, Ph.D. Frank J. Roshek Professor of Physics and Applied Physics

Charles Elachi, Ph.D.

Electrical Engineering and
Planetary Science

Richard C. Flagan, Ph.D.

Irma and Ross McCollum—William
H. Corcoran Professor of Chemical
Engineering and Professor of
Environmental Science and
Engineering

Scott E. Fraser, Ph.D.

Anna L. Rosen Professor of Biology
and Professor of Bioengineering

Brent T. Fultz, Ph.D.

Materials Science and Applied
Physics

Morteza Gharib, Ph.D. Hans W. Liepmann Professor of Aeronautics and Professor of Bioinspired Engineering

William A. Goddard III, Ph.D. Charles and Mary Ferkel Professor of Chemistry, Materials Science, and Applied Physics

David G. Goodwin, Ph.D. Mechanical Engineering and Applied Physics

Sossina M. Haile, Ph.D. Materials Science and Chemical Engineering Seyed-Ali Hajimiri, Ph.D. Thomas G. Myers Professor of Electrical Engineering

John F. Hall, Ph.D. Civil Engineering

Babak Hassibi, Ph.D.

Electrical Engineering Thomas H. Heaton, Ph.D.

Engineering Seismology Michael R. Hoffmann, Ph.D.

James Irvine Professor of Environmental Science

Yizhao Thomas Hou, Ph.D. Charles Lee Powell Professor of Applied and Computational Mathematics

Melany L. Hunt, Ph.D. Mechanical Engineering

William L. Johnson, Ph.D.
Ruben F. and Donna Mettler
Professor of Engineering and
Applied Science

Alexei Kitaev, Ph.D. Theoretical Physics and Computer Science

Christof Koch, Ph.D.

Lois and Victor Troendle Professor
of Cognitive and Behavioral
Biology and Professor of
Computation and Neural Systems

Steven Low, Ph.D.

Computer Science and Electrical

Engineering
Jerrold E. Marsden, Ph.D.
Carl F Braun Professor of
Engineering, Control and
Dynamical Systems, and Applied
and Computational Mathematics

Alain J. Martin, Ing. Computer Science

Daniel Î. Meiron, Sc.D. Fletcher Jones Professor of Aeronautics and Applied and Computational Mathematics

Richard M. Murray, Ph.D.

Thomas E. and Doris Everhart

Professor of Control and

Dynamical Systems and

Bioengineering

Michael Ortiz, Ph.D.

Dotty and Dick Hayman Professor
of Aeronautics and Mechanical
Engineering

Sergio Pellegrino, Ph.D. Joyce and Kent Kresa Professor of Aeronautics and Professor of Civil Engineering, and JPL Senior Research Scientist Pietro Perona, D.Eng., Ph.D. Allen E. Puckett Professor of Electrical Engineering

Robert Phillips, Ph.D.

Applied Physics and Mechanical
Engineering

Dale I. Pullin, Ph.D.

Theodore von Kármán Professor of
Aeronautics

Guruswami Ravichandran, Ph.D., D.h.c.

John E. Goode Jr. Professor of Aeronautics and Mechanical Engineering

Ares J. Rosakis, Ph.D.

Theodore von Kármán Professor of
Aeronautics and Professor of
Mechanical Engineering

Michael L. Roukes, Ph.D.

Physics, Applied Physics, and
Bioengineering

David B. Rutledge, Ph.D. Kiyo and Eiko Tomiyasu Professor of Electrical Engineering

Axel Scherer, Ph.D.

Bernard A. Neches Professor of

Electrical Engineering, Applied

Physics, and Physics

Tapio Schneider, Ph.D. Frank J. Gilloon Professor of Environmental Science and Engineering

Peter Schröder, Ph.D.

Computer Science and Applied and
Computational Mathematics

Leonard J. Schulman, Ph.D. Computer Science

John H. Seinfeld, Ph.D., D.Sc.h.c. Louis E. Nohl Professor and Professor of Chemical Engineering

Joseph E. Shepherd, Ph.D. C. L. "Kelly" Johnson Professor of Aeronautics and Professor of Mechanical Engineering

Yu-Chong Tai, Ph.D.

Electrical Engineering and
Mechanical Engineering

Sandra M. Troian, Ph.D.

Applied Physics, Aeronautics, and
Mechanical Engineering

Kerry J. Vahala, Ph.D.

Ted and Ginger Jenkins Professor
of Information Science and
Technology and Professor of Applied
Physics

P. P. Vaidyanathan, Ph.D. Electrical Engineering

568

Paul O. Wennberg, Ph.D.
R. Stanton Avery Professor of
Atmospheric Chemistry and
Environmental Science and
Engineering

Amnon Yariv, Ph.D.

Martin and Eileen Summerfield Professor of Applied Physics and Professor of Electrical Engineering

Associate Professors

John O. Dabiri, Ph.D.

Aeronautics and Bioengineering
Michael Elowitz, Ph.D.

Biology and Bioengineering
Nadia Lapusta Ph.D.

Nadia Lapusta, Ph.D.

Mechanical Engineering and
Geophysics

Jared R. Leadbetter, Ph.D. Environmental Microbiology

Oskar J. Painter, Ph.D. Applied Physics

Niles A. Pierce, D.Phil.

Applied and Computational

Mathematics and Bioengineering

Keith C. Schwab, Ph.D.

Applied Physics

Athanassios G. Siapas, Ph.D.

Computation and Neural Systems

Christopher Umans, Ph.D.

Computer Science

Erik Winfree, Ph.D.

Computer Science, Computation and Neural Systems, and Bioengineering

Changhuei Yang, Ph.D.

Electrical Engineering and
Bioengineering

¹ Joint appointment with Howard Hughes Medical Institute

Assistant Professors

José E. Andrade, Ph.D.
Civil and Mechanical Engineering
Guillaume Blanquart, Ph.D.
Mechanical Engineering
Simona Bordoni, Ph.D.
Environmental Science and
Engineering
Chiara Daraio, Ph.D.
Aeronautics and Applied Physics

Azita Emami-Neyestanak, Ph.D. *Electrical Engineering* Julia R. Greer, Ph.D.

Materials Science

Chin-Lin Guo, Ph.D.

Bioengineering and Applied Physics

Tracey C. Ho, Ph.D.

Electrical Engineering and
Computer Science

R. Andreas Krause, Ph.D. Computer Science

Swaminathan Krishnan, Ph.D. Structural Engineering and Geophysics

Beverley J. McKeon, Ph.D. *Aeronautics*

Houman Owhadi, Ph.D.

Applied and Computational
Mathematics and Control and
Dynamical Systems

Joel A. Tropp, Ph.D.

Applied and Computational

Mathematics

Axel van de Walle, Ph.D. Materials Science

Adam Wierman, Ph.D. *Computer Science*

Instructors

Guo Luo, Ph.D.

Theodore von Kármán Instructor
in Applied and Computational
Mathematics

Pengchong Yan, Ph.D.

Theodore von Kármán Instructor
in Applied and Computational
Mathematics

Lecturers

Channing Ahn, Ph.D.

Applied Physics and Materials
Science

Michael Aivazis, Ph.D.¹

Applied and Computational

Mathematics

Behnam Analui, Ph.D.¹ Electrical Engineering

Kenneth S. Andrews, Ph.D.¹ Electrical Engineering

Dimitros Antsos, Ph.D.

Electrical Engineering

Daniel E. A. Appelo, Ph.D.¹ Mechanical Engineering Douglas W. Caldwell, Ph.D.¹
Applied Physics

Gregory L. Davis, Ph.D. Aerospace

Noel E. Du Toit, Ph.D.¹ Mechanical Engineering

Antony R. H. Fender, B.S. Engineering

Francois J. M. Gay-Balmaz, Ph.D.¹ Control and Dynamical Systems

Glen A. George, M.S. Electrical Engineering

Alireza Ghaffari, M.S.

Applied Physics and Materials

Alex D. Groce, Ph.D.

Computing and Mathematical
Sciences

Klaus Havelund, Ph.D.

Computing and Mathematical
Sciences

Gerard J. Holzmann, Ph.D.

Computing and Mathematical
Sciences

Rajeev Joshi, Ph.D.

Computing and Mathematical
Sciences

Yunjin Kim, Ph.D. *Aerospace*

Monica D. Kohler, Ph.D.

Mechanical and Civil Engineering

Eugene Lavretsky, Ph.D.

Computing and Mathematical

Sciences
Douglas G. MacMynowski, Ph.D.
Computing and Mathematical
Sciences

Barry B. Megdal, Ph.D. Electrical Engineering

Nader Motee, Ph.D.¹

Control and Dynamical Systems Mika Nystroem, Ph.D.

Computing and Mathematical Sciences

Michael T. Pauken, Ph.D.

Mechanical and Civil Engineering

Danny Petrasek, Ph.D. *Bioengineering*

Gillian Pierce, B.A. Engineering

Donald Pinkston III, B.S.

Computing and Mathematical
Sciences

James E. Polk, Ph.D. *Aerospace*

Kevin J. Quirk, Ph.D. Electrical Engineering

Carol W. Readhead, Ph.D. Engineering

Zuoqiang Shi, Ph.D.¹
Applied and Computational
Mathematics

John P. Van Deusen, B.S.

Mechanical and Civil Engineering Michael C. Vanier, Ph.D. Computing and Mathematical Sciences

Jakob J. Van Zyl, Ph.D. Electrical Engineering

Michael Watkins, Ph.D.

Aerospace
Nan Yu. Ph.D.

Nan Yu, Ph.D.

Applied Physics and Materials
Science

Senior Research Associates

Channing C. Ahn, Ph.D.

Applied Physics and Materials
Science

Agustin J. Colussi, Ph.D. Environmental Science and

Engineering Douglas G. MacMynowski, Ph.D. Control and Dynamical Systems

Paul W. K. Rothemund, Ph.D.

Bioengineering, Computer Science,
and Computation and Neural
Systems

Senior Research Fellows

David A. Boyd, Ph.D.

Mechanical Engineering

Michael Hucka, Ph.D.

Control and Dynamical Systems

Andrew Straw, Ph.D.

Bioengineering

Senior Faculty Associate

Sander Weinreb, Ph.D. Electrical Engineering

¹ In residence 2009-10

Faculty Associates

Carol Carmichael, Ph.D.

Engineering and Applied Science
Gerard J. Holzmann, Ph.D.

Computer Science

G. Jeffrey Snyder, Ph.D.

Materials Science Mark A. Stalzer, Ph.D.

Computing and Mathematical
Sciences

Jakob J. Van Zyl, Ph.D. Electrical Engineering and Aerospace

Moore Distinguished Scholars

Andrew J. Hanson, Ph.D.¹

Engineering and Applied Science

Eric D. Mjolsness, Ph.D.

Biology and Engineering and

Applied Science

Linda F. Nazar, Ph.D.¹

Engineering and Applied Science

Visiting Professors

Bruno Crosignani, Lib.Doc.

Applied Physics and Materials
Science
Kenneth A. Pickar, Ph.D.
Mechanical Engineering
Vilupanur A. Ravi, Ph.D.
Bioengineering and Mechanical

and Civil Engineering

Visiting Associates

Mark A. Adams, Ph.D.

Aeronautics
Ashutosh Agrawal, Ph.D.

Applied Physics and Materials
Science

Arzhang Alimoradi, Ph.D. Civil Engineering

Lachlan L. H. Andrew, Ph.D. Computer Science

Erik K. Antonsson, Ph.D. Mechanical Engineering

Maria del Pilar Ariza Moreno, Ph.D. Aeronautics Josette Bellan, Ph.D. Mechanical Engineering Marc W. Bockrath, Ph.D. Applied Physics

James B. Breckinridge, Ph.D. *Aeronautics*

Yoon Seok Chang, Ph.D. Computer Science

Calum R. I. Chisholm, Ph.D. Materials Science

R. Dale Conner, Ph.D.

Materials Science

Matthew Cook, Ph.D.

Computation and Neural Systems

Luigi De Nardo, Ph.D.

Aerospace

Mamadou S. Diallo, Ph.D. Environmental Science and Engineering

Amir Fijany, Ph.D.

Aeronautics

Jacqueline G. Gish, Ph.D. *Aeronautics*

Philip L. Gleckman, Ph.D.

Materials Science

Frank A. Gomez, Ph.D.

Applied Physics
Janet G. Hering, Ph.D.
Environmental Science and
Engineering

Sandra S. Irani, Ph.D. Computer Science

Lee K. Johnson, Ph.D. Aeronautics

Emil P. Kartalov, Ph.D. Electrical Engineering

Abdollah Khodadoust, Ph.D. *Aeronautics*

Paul C. Kim, Ph.D. Materials Science

Richard R. King, Ph.D. *Applied Physics*

Monica D. Kohler, Ph.D. *Civil Engineering*

Yi-Kuen Lee, Ph.D.

Electrical Engineering

Ivett A. Leyva, Ph.D. Aerospace

Sami F. Masri, Ph.D. Civil Engineering

Abbas Nasiraei Moghaddam, Ph.D. *Bioengineering*

Alain Molinari, Ph.D.

Aeronautics

David D. Oglesby, Ph.D. Aeronautics

¹ In residence 2009-10

Anna Pandolfi, Ph.D.

Aeronautics
Jun Seok Park, Ph.D.

Computer Science
Leora Peltz, Ph.D.

Electrical Engineering
Danny Petrasek, M.D., Ph.D.

Applied and Computational
Mathematics and Bioengineering

James E. Polk, Ph.D.

Aeronautics
Demetri Psaltis, Ph.D.

Electrical Engineering
Daniel Rittel, Ph.D.

Aeronautics

Su Young Ryu, Ph.D.

Environmental Science and

Engineering
Peter N. Saeta, Ph.D.
Applied Physics
Konrad H. Samwer, Ph.D.
Materials Science

Andrew A. Shapiro, Ph.D.

Mechanical Engineering

Oisover Sup. Ph.D.

Qiaoyan Sun, Ph.D. Materials Science

Yung-Pin Tsai, Ph.D.

Environmental Science and
Engineering
Edwin T. Upchurch, Ph.D.

Edwin T. Upchurch, Ph.D. Center for Advanced Computing Research

Research
Theodore A. Waniuk, Ph.D.
Materials Science

Joyce Y. Wong, Ph.D.

Electrical Engineering

Bernard Yurke, Ph.D.

Computation and Neural Systems
John Zhong, Ph.D.

Electrical Engineering

Members of the Professional Staff

Michael Aivazis, Ph.D. Center for Advanced Computing Research

Julian C. Cummings, Ph.D.

Center for Advanced Computing

Research

Nathan F. Dalleska, Ph.D. Environmental Analysis Center Guy A. DeRose, Ph.D.

Applied Physics
Carol M. Garland, B.A.
Kavli Nanoscience Institute

David J. Hill, Ph.D.

Aerospace
Keith A. Porter, Ph.D.

Civil Engineering
Won-Kyu Rhim, Ph.D.

Materials Science
Mark A. Stalzer, Ph.D.

Center for Advanced Computing
Research

Roy D. Williams, Ph.D. Center for Advanced Computing Research

Senior Postdoctoral Scholars

Nathan L. Albin, Ph.D.

Applied and Computational

Mathematics

Mathematics
Roee Amit, Ph.D.
Applied Physics

Keita Ando, Ph.D.

Mechanical Engineering
Piotr Dollar, Ph.D.

Electrical Engineering Dongchan Jang, Ph.D.

Materials Science
Edwin N. Jiminez, Ph.D.
Applied and Computational
Mathematics

J. Brandon Keith, Ph.D. Materials Science

Ju-Young Kim, Ph.D.

Materials Science
Heun Iin Lee. Ph.D.

Applied Physics
Gaby Maimon, Ph.D.

Bioengineering Ljubomir Miljacic, Ph.D. Applied Physics and Materials

Science Yanzhong Pei, Ph.D. Materials Science

Eric Toberer, Ph.D.

Materials Science

Damien P. Woods, Ph.D.

Computer Science

Yoshihiro Yamazaki, Ph.D. Materials Science

Postdoctoral Scholars

Salman Abolfathe Beikidezfuli, Ph.D. Computer Science

Sachin Adlakha, Ph.D. Dennice Gayme, Ph.D. Center for the Mathematics of Control and Dynamical Systems Information Daniel R. Golovin, Ph.D. Thiago Pedro Mayer Alegre, Ph.D. Center for the Mathematics of Applied Physics Information Maen A. Alkhader, Ph.D. Ashwin Gopinath, Ph.D. Aeronautics Bioengineering Daniel E. A. Appelo, Ph.D. Jonathan Grandidier, Ph.D. Applied and Computational Applied Physics Mathematics Stephane M. Griffiths, Ph.D. Koray Aydin, Ph.D. Aeronautics Applied Physics Michele Guala, Ph.D. Sally P. M. Bane, Ph.D. Aeronautics Aerospace Christoph Haselwandter, Ph.D. Guy Baruch, Ph.D. Applied Physics Carrie E. Hofmann, Ph.D. Applied and Computational Mathematics Applied Physics Victor Beck, Ph.D. Mingyuan Huang, Ph.D. Bioengineering Materials Science Laurence Bodelot, Ph.D. Shiho Iwanaga, Ph.D. Aeronautics Materials Science James Q. Boedicker, Ph.D. Shirin Jalali, Ph.D. Applied Physics Center for the Mathematics of Agustin Bompadre, Ph.D. Information Aeronautics Michael D. Kelzenberg, Ph.D. Delphine Borivent, Ph.D. Applied Physics Materials Science Addis A. Kidane, Ph.D. Robert C. Brewster, Ph.D. Aeronautics Applied Physics and Materials Jaemin Kim, Ph.D. Science Materials Science Ho-Lin Chen, Ph.D. Jongmin Kim, Ph.D. Center for the Mathematics of Bioengineering Information Seheon Kim, Ph.D. Meng Cui, Ph.D. Electrical Engineering Electrical Engineering Matthias Kinzel, Ph.D. Alexander V. Dementsov, Ph.D. Aerospace Marin Kobilarov, Ph.D. Materials Science Noel E. Du Toit, Ph.D. W. M. Keck Institute for Space Mechanical Engineering Studies Postdoctoral Scholar in Matthew S. Eichenfield, Ph.D. Control and Dynamical Systems Imre R. Kondor, Ph.D. KNI Postdoctoral Scholar in Nanoscience Center for the Mathematics of Shinichi Enami, Ph.D. Information Environmental Science and Lise Lahourcade, Ph.D. Engineering Applied Physics Malena I. Espanol, Ph.D. Aaron D. LaLonde, Ph.D. Aeronautics Materials Science Eyal Feigenbaum, Ph.D. Ali Lashgari, Ph.D. Applied Physics and Materials Electrical Engineering Science Hansuek Lee, Ph.D. Dan Feldman, Ph.D. Applied Physics Center for the Mathematics of Marina S. Leite, Ph.D. Information Applied Physics and Materials Kin Chung Fong, Ph.D. Science Applied Physics Qiang Lin, Ph.D.

Applied Physics

Amir Gat, Ph.D.

Applied Physics

Bengt Martin Linden, Ph.D. Applied Physics Yu Liu, Ph.D. Applied Physics Michael R. Maire, Ph.D. Electrical Engineering Akita Mamiya, Ph.D. Bioengineering Nikolay Markovskiy, Ph.D. Materials Science Enrica Masi, Ph.D. Mechanical Engineering Euan McLeod, Ph.D. Applied Physics Pooran Memari, Ph.D. Computer Science Abha Misra, Ph.D. Aeronautics Nader Motee, Ph.D. Control and Dynamical Systems Jeremy Munday, Ph.D. Applied Physics and Materials Science Jong Hyun Na, Ph.D. Materials Science Duc M. Ngo, Ph.D. Aeronautics Hsin-Hung Ou, Ph.D. Environmental Science and Engineering Mingxing Ouyang, Ph.D. Bioengineering and Applied Physics Necmiye Ozay, Ph.D. Control and Dynamical Systems Saurabh Puri, Ph.D. Mechanical Engineering Morgan C. Putnam, Ph.D. Applied Physics Lulu Qian, Ph.D. Bioengineering Daniel Rodriguez, Ph.D. Mechanical Engineering Adam Rosenthal, Ph.D. Environmental Science and Engineering Arnab Samanta, Ph.D. Mechanical Engineering Matthew Shaw, Ph.D. Applied Physics Matthew T. Sheldon, Ph.D. Applied Physics Zuoqiang Shi, Ph.D.

Applied and Computational

Computation and Neural Systems

Mathematics
David Soloveichik, Ph.D.

Allesandro Spadoni, Ph.D. Aeronautics Timothy John Sullivan, Ph.D. Aeronautics Kelly R. Sutherland, Ph.D. Bioengineering Adele Tamboli, Ph.D. Applied Physics Parag U. Tandaiya, Ph.D. Mechanical Engineering Xiaoli Tang, Ph.D. Materials Science Georgios Theocharis, Ph.D. Aerospace Ufuk Topcu, Ph.D. Control and Dynamical Systems and the Center for Advanced Computing Research Jeffrey Vieregg, Ph.D. Bioengineering Christopher Walker, Ph.D. Electrical Engineering Ahuva Mu'alem Weil, Ph.D. Social and Information Sciences Laboratory Franz M. Weinert, Ph.D. Applied Physics Martin Winger, Ph.D. Applied Physics Tichakorn Wongpiromsarn, Ph.D. Control and Dynamical Systems Shuman Xia, Ph.D. Aeronautics Jinkyu Yang, Ph.D. Aerospace Konstantin M. Zuev, Ph.D. Conrol and Dynamical Systems

574

Division of Geological and Planetary Sciences

Kenneth A. Farley, *Chair* Jean-Philippe Avouac, *Director*; *Tectonics Observatory*

Robert W. Clayton, Divisional Academic Officer

Michael Gurnis

Director, Seismological Laboratory

Professors Emeriti

Thomas J. Ahrens, Ph.D. Fletcher Jones Professor of Geophysics

Arden L. Albee, Ph.D.

Geology and Planetary Science

Clarence R. Allen, Ph.D. Geology and Geophysics

Don L. Änderson, Ph.D., Crafoord Laureate Eleanor and John R. McMillan Professor of Geophysics

Donald S. Burnett, Ph.D.

Nuclear Geochemistry Peter Goldreich, Ph.D.

Lee A. DuBridge Professor of Astrophysics and Planetary Physics

David G. Harkrider, Ph.D. Geophysics

W. Barclay Kamb, Ph.D. Barbara and Stanley R. Rawn Jr. Professor of Geology and Geophysics

Hiroo Kanamori, Ph.D.

John E. and Hazel S. Smits

Professor of Geophysics

Duane O. Muhleman, Ph.D. Planetary Science

Bruce C. Murray, Ph.D.

Planetary Science and Geology

Leon T. Silver, Ph.D.

W. M. Keck Foundation Professor
for Resource Geology

Hugh P. Taylor Jr., Ph.D.

Robert P. Sharp Professor of
Geology

G. J. Wasserburg, Ph.D., D.h.c., D.Sc.h.c, Sc.D.h.c, Crafoord Laureate John D. MacArthur Professor of

Geology and Geophysics Peter J. Wyllie, Ph.D., D.Sc.h.c. Geology

Professors

Jess F. Adkins, Ph.D.

Geochemistry and Global
Environmental Science
Paul D. Asimow, Ph.D.

Geology and Geochemistry

Jean-Philippe Avouac, Doctorat

Geology

Geoffrey A. Blake, Ph.D.

Cosmochemistry and Planetary

Sciences and Chemistry

Michael E. Brown, Ph.D.

Richard and Barbara Rosenberg

Professor and Planetary Astronomy

Robert W. Clayton, Ph.D. *Geophysics*

John M. Eiler, Ph.D. Robert P. Sharp Professor of Geology and Professor of Geochemistry

Charles Elachi, Ph.D.

Electrical Engineering and
Planetary Science

Kenneth A. Farley, Ph.D. W. M. Keck Foundation Professor of Geochemistry

John P. Grotzinger, Ph.D. Fletcher Jones Professor of Geology

Michael C. Gurnis, Ph.D. John E. and Hazel S. Smits Professor of Geophysics

Thomas H. Heaton, Ph.D. Engineering Seismology

Donald V. Helmberger, Ph.D. Smits Family Professor of Geological and Planetary Sciences

Andrew P. Ingersoll, Ph.D.

Earle C. Anthony Professor of
Planetary Science

Joseph L. Kirschvink, Ph.D. Nico and Marilyn Van Wingen Professor of Geobiology

Shrinivas R. Kulkarni, Ph.D. John D. and Catherine T. MacArthur Professor of Astronomy and Planetary Science

Dianne K. Newman, Ph.D.¹
Biology and Geobiology

George R. Rossman, Ph.D. Eleanor and John R. McMillan Professor of Mineralogy Jason B. Saleeby, Ph.D.

Geology

Mark Simons, Ph.D. *Geophysics*

David J. Stevenson, Ph.D. George Van Osdol Professor of Planetary Science

Joann M. Stock, Ph.D. Geology and Geophysics

Edward M. Stolper, Ph.D., D.Sc.h.c.

Provost

William E. Leonhard Professor of

Geology

Paul O. Wennberg, Ph.D.
R. Stanton Avery Professor of
Atmospheric Chemistry and
Environmental Science and
Engineering

Brian P. Wernicke, Ph.D. Chandler Family Professor of Geology

Yuk L. Yung, Ph.D. Planetary Science

Associate Professors

Oded Aharonson, Ph.D.

Planetary Science

Nadia Lapusta, Ph.D.

Mechanical Engineering and
Geophysics

Jared Leadbetter, Ph.D.

Environmental Microbiology

Victoria Orphan, Ph.D.

Geobiology

Alex L. Sessions, Ph.D.

Geobiology

Assistant Professors

Jean-Paul Ampuero Saenz, Ph.D.
Seismology
Simona Bordoni, Ph.D.
Environmental Science and
Engineering
Woodward Fischer, Ph.D.
Geobiology

Jennifer Jackson, Ph.D.

Mineral Physics
Swaminathan Krishnan, Ph.D.

Structural Engineering and
Geophysics
Michael Lamb, Ph.D.
Geology
Victor Tsai, Ph.D.

Lecturer

Kathryn Bikle, M.A. *Geology* Joel Hurowitz, Ph.D. *Geology*

Geophysics

Senior Research Associate

Egill Hauksson, Ph.D. *Geophysics*

Faculty Associate

Dimitri A. Papanastassiou, Ph.D. *Geochemistry*

Visiting Associates

Mark A. Allen, Ph.D. Planetary Science Jamshid Hassanzadeh, Ph.D. Geology John M. Harris, Ph.D. Geology Susan Hough, Ph.D. Geophysics Robert Housley, Ph.D. Geochemistry Kenneth W. Hudnut, Ph.D. Geophysics Joel Hurowitz, Ph.D. Geology Takeo Ito, Ph.D. Geophysics Lucile M. Jones, Ph.D. Geophysics

Heather Knutson, Ph.D.

Planetary Science

Sung Keun Lee, Ph.D.

Geochemistry

¹ Joint appointment with Howard Hughes Medical Institute

Geology

Robert Pappalardo, Ph.D. *Planetary Science*

Paul Rosen, Ph.D.

Geophysics

Stanley P. Sander, Ph.D.

Planetary Science and

Environmental Engineering
Science

Science

Wolfgang Sturhahn, Ph.D. *Geophysics*

Joao Teixeira, Ph.D.

Environmental Science and Engineering

Geoffrey Toon, Ph.D. Planetary Science

Oliver Tschauner, Ph.D.

Geophysics

Duane Waliser, Ph.D.

Planetary Science

Frank Webb, Ph.D. *Geology*

Members of the Professional Staff

Vikki Appel, B.S. Geophysics

Michael B. Baker, Ph.D. *Geology*

John R. Beckett, Ph.D. Geology

Ma Chi, Ph.D. Geochemistry

Joachim Genrich, Ph.D. *Geology*

Yunbin Guan, Ph.D. Geochemistry

Katherine Hutton, Ph.D. Geophysics

Sebastien Leprince, Ph.D. *Geology*

Sally Newman, Ph.D. *Geology*

Senior Postdoctoral Scholar

Maren Boese, Ph.D. *Geophysics*

Postdoctoral Scholars

Piyush Agram, Ph.D. KISS Postdoctoral Scholar in Geophysics

Sylvain Barbot, Ph.D.

Geology

Melinda Beaver, Ph.D.

Environmental Science and
Engineering

Jeremy Boyce, Ph.D.

Geochemistry

Erin Burkett, Ph.D.

Geophysics

M. Robinson Cecil, Ph.D.

Geology

Phairot Chatanantavet, Ph.D. *Geology*

Bin Chen, Ph.D.

Geophysics

Risheng Chu, Ph.D.

Geophysics Alexander Copley, Ph.D.

Geology Nadaya Cubas, Ph.D.

Geology Robert Eagle, Ph.D.

Geochemistry

Ian Eisenman, Ph.D.

Environmental Science and Engineering

Jean Elkhoury, Ph.D. *Geophysics*

Ryan Ewing, Ph.D.

Geology

Alessandro Fabbrizio, Ph.D.

Geochemistry Seth Finnegan, Ph.D.

Geology Wesley Fraser, Ph.D.

Planetary Science

Itay Halevy, Ph.D.

Texaco Postdoctoral Scholar in
Geochemistry

Roberta Hansman, Ph.D.

Geobiology
James Hollingsworth, Ph.D.

Geology Seth John, Ph.D.

Geochemistry

Yohai Kaspi, Ph.D.

Environmental Science and

Engineering

Sarah Lambart, Ph.D.

Geology

Wei Leng, Ph.D.

O. K. Earl Postdoctoral Scholar
in Geophysics

Naomi Levin, Ph.D. Geochemistry

Marion Le Voyer, Ph.D. Geochemistry

Antoine Lucas, Ph.D. *Planetary Science*

Benjamin Mackey, Ph.D.

Geology

Eva Niedermeyer, Ph.D.

Foster and Coco Stanback

Postdoctoral Scholar in Global

Environmental Science

Hiroyuki Noda, Ph.D.

Geophysics

Guillaume Paris, Ph.D. Dreyfus Postdoctoral Scholar in Geochemistry

Hyo-Seok Park, Ph.D.

Environmental Science and Engineering

Neus Sabater, Ph.D. KISS Postdoctoral Scholar in Geology

Kunio Sayanagi, Ph.D. Planetary Science

Jason St. Clair, Ph.D.

Environmental Science and
Engineering

Joshua Steele, Ph.D. Geobiology

Jacob Waldbauer, Ph.D.

Foster and Coco Stanback Postdoctoral Scholar in Environmental Science and Engineering; Beckman Institute Fellow

Shengji Wei, Ph.D. Geophysics

Jonathan Wilson, Ph.D.

Geobiology

Wenzheng Yang, Ph.D. *Geophysics*

Xinning Zhang, Ph.D.

Environmental Science and
Engineering

Visitors

Abigail Allwood, Ph.D. Geology Ilya Bindeman, Ph.D. Geochemistry

Shu-Hao Chang, Ph.D. *Geology* James Chen, Ph.D. *Geochemistry*

Eric DeJong, Ph.D.

Planetary Science

Shana Goffredi, Ph.D. *Geobiology*

Martha House, Ph.D. Geology

Aron Meltzner, Ph.D. *Geology*

Henry Ngo, Ph.D. *Geochemistry* Sidao Ni, Ph.D.

Geophysics

Ying Tan, Ph.D. *Geophysics* Aradhna Tripati, Ph.D.

Geochemistry Jean-Pierre Williams, Ph.D. Planetary Science

Division of the Humanities and Social Sciences

Jonathan N. Katz, Chair Jean-Laurent Rosenthal, Executive Officer for the Social Sciences Cindy Weinstein, Executive Officer for the Humanities

Professors Emeriti

Louis Breger, Ph.D.

Psychoanalytic Studies

Lance E. Davis, Ph.D.

Mary Stillman Harkness

Professor of Social Science

David M. Grether, Ph.D.

Example T. Gillson, Professor

Frank J. Gilloon Professor of Economics

Daniel J. Kevles, Ph.D.
J. O. and Juliette Koepfli Professor
of the Humanities

Jenijoy La Belle, Ph.D. English

Oscar Mandel, Ph.D.

Literature
Theyer Soudder Ph.J.

Thayer Scudder, Ph.D. *Anthropology*

Annette J. Smith, Ph.D.

Literature

Fraderick P. Thompson Ph

Frederick B. Thompson, Ph.D.

Applied Philosophy and Computer
Science

James F. Woodward, Ph.D.

J. O. and Juliette Koepfli Professor of the Humanities

Associate Professor Emeritus

Heinz E. Ellersieck, Ph.D. History

Lecturers Emeriti

Lee F. Browne, M.S.

Education

Valentina A. Lindholm, M.A.

Russian

Shirley A. Marneus, M.A.

Theater Arts

Professors

Ralph Adolphs, Ph.D.

Bren Professor of Psychology and
Neuroscience and Professor of
Biology

R. Michael Alvarez, Ph.D. Political Science

Kim C. Border, Ph.D. *Economics*

Peter L. Bossaerts, Ph.D.

William D. Hacker Professor of
Economics and Management and
Professor of Finance

John Brewer, Ph.D.

Eli and Edye Broad Professor of
Humanities and Social Sciences
and Professor of History and
Literature

Jed Z. Buchwald, Ph.D. Doris and Henry Dreyfuss Professor of History

Colin F. Camerer, Ph.D.

Robert Kirby Professor of
Behavioral Economics

Jaksa Cvitanic, Ph.D.

Mathematical Finance

Federico Echenique, Ph.D. *Economics*

Jean E. Ensminger, Ph.D. Edie and Lew Wasserman Professor of Anthropology

Mordechai Feingold, D.Phil. History

Kevin M. Gilmartin, Ph.D. English

Christopher R. Hitchcock, Ph.D. *Philosophy*

Philip T. Hoffman, Ph.D. Rea A. and Lela G. Axline Professor of Business Economics and Professor of History

Jonathan N. Katz, Ph.D. Social Sciences and Statistics

D. Roderick Kiewiet, Ph.D. Political Science

Diana L. Kormos-Buchwald, Ph.D. History

J. Morgan Kousser, Ph.D. History and Social Science

John O. Ledyard, Ph.D., D.Lit.h.c. Allen and Lenabelle Davis Professor of Economics and Social Sciences

John P. O'Doherty, D.Phil. Psychology

Thomas R. Palfrey, Ph.D.

Flintridge Foundation Professor of
Economics and Political Science

George W. Pigman III, Ph.D. English

Charles R. Plott, Ph.D., D.Lit.h.c., D.h.c.

Edward S. Harkness Professor of Economics and Political Science

Antonio Rangel, Ph.D. Economics

Robert A. Rosenstone, Ph.D. *History*

Jean-Laurent Rosenthal, Ph.D. Rea A. and Lela G. Axline Professor of Business Economics

Robert P. Sherman, Ph.D. *Economics and Statistics*

Matthew S. Shum, Ph.D.

Economics

Cindy Weinstein, Ph.D. English

Leeat Yariv, Ph.D. Economics

Associate Professors

Warren C. Brown, Ph.D.

History Fiona Cowie, Ph.D.

Philosophy
Tracy K. Dennison, Ph.D.

History Catherine Jurca, Ph.D.

English
Steven R. Quartz, Ph.D.
Philosophy

Nicolas Wey-Gomez, Ph.D. History

Assistant Professors

Marina Agranov, Ph.D. Economics

Benjamin J. Gillen, Ph.D.

Economics

Dehn Gilmore, Ph.D. *English*

Christopher Hunter, Ph.D.

English

Kristine Haugen, Ph.D. English Gideon Manning, Ph.D. *Philosophy*

Andrea Mattozzi, Ph.D. Economics

Pietro Ortoleva, Ph.D.

Erik Snowberg, Ph.D.

Economics and Political Science

ACLS Postdoctoral Instructor

Nicole A. Archambeau, Ph.D. History

Ahmanson Postdoctoral Instructor

Katie E. Clark, Ph.D. *History*

Caltech-Huntington Mellon Postdoctoral Instructor

Marius Stan, Ph.D. *Philosophy*

McDonnell Postdoctoral Instructor

Luke F. Glynn, Ph.D. *Philosophy*

Mellon Postdoctoral Instructor

Salvatore Napolitano, Ph.D. *History*

Weisman Postdoctoral Instructors

Matthew C. Hunter, Ph.D. Art History Marita Huebner, Ph.D. History of Science

Instructor

Kenneth Winston, Ph.D. *Economics*

Lecturers

Andreas Aebi, Ph.D. *German* Gloria Arjona, Ph.D. *Spanish*

Shelley M. Bennett, Ph.D. Art History

Christine M. Daley, Ph.D. *English*

Charles de Bedts, Ph.D. French

Daniel A. Garcia, M.A. Spanish

Merrill Joan Gerber, M.A. Creative Writing

Judith Hall, M.A. Creative Writing

Ritsuko Hirai, Ph.D. Japanese

Kayoko Hirata, Ph.D. Japanese

Feng-Ying Ming, Ph.D. Chinese

Thomas A. Neenan, M.F.A. *Music*

Christiane H. Orcel, Ph.D. French

Lynn Paul, Ph.D. *Psychology*

Shiing-wu Wang, Ph.D.

Accounting

Xiangyun Wang, Ph.D. *Chinese*

Juliann Kay Wolfgram, Ph.D. Art History

Senior Research Associate

Tilman Sauer, Ph.D. History

Faculty Associates

Stuart A. Ende, Ph.D. *Literature*Simon J. Wilkie, Ph.D. *Economics*

Moore Distinguished Scholar

Christina Shannon, Ph.D. Economics

Eleanor Searle Visiting Professor

John L. Heilbron, Ph.D. History

Visiting Professors

Rabah Amir, Ph.D. *Economics*

Dan Bogart, Ph.D.

Economics

Bradford Cornell, Ph.D.

Finance

Richard C. Green, Ph.D.

Finance

R. Preston McAfee, Ph.D., D.h.c. 7. Stanley Johnson Professor of

Business Economics and

Management

Edward J. McCaffery, J.D.

Law

Mellon Visiting Associate Professor

Darius A. Spieth, Ph.D. *Art History*

Visiting Associates

Jasmina Arifovic, Ph.D.

Economics

Benedetto De Martino, Ph.D.

Neuroscience

Jan Glascher, Ph.D.

Psychology

Jozsef Illy, Ph.D.

History Christopher K. Kovach, Ph.D.

Neuroscience Anne Kox, Ph.D.

History

Elise Payzan Le Nestour, Ph.D.

Economics

Dennis Lehmkuhl, Ph.D.

Philosophy

Mathew D. McCubbins, Ph.D.

Political Science

1 onthun Stiente

Sergio Paradiso, Ph.D.

Psychology

Matthew Rabin, Ph.D.

Economics

Robert C. Ritchie, Ph.D.

History

Wolfram Schultz, Ph.D. Neuroscience Michael L. Spezio, Ph.D. Psychology

Noel M. Swerdlow, Ph.D. History

Member of the Professional Staff

Ze'ev Rosenkranz, M.L.S.

Postdoctoral Scholars

Erie D. Boorman, Ph.D. Psychology

Jeff Cooper, Ph.D.

Psychology

Mathieu d'Acremont, Ph.D. Neuroeconomics

Todd A. Hare, Ph.D. Neuroeconomics

Alison Harris, Ph.D.

Psychology

Cendri Hutcherson, Ph.D.

Neuroeconomics

Keise Izuma, Ph.D. Neuroscience

Ryan K. Jessup, Ph.D. Neuroscience

Neuroscience Daniel Kennedy, Ph.D.

Neuroscience Tobias Larsen, Ph.D.

Neuroscience Mimi Liljeholm, Ph.D.

Neuroscience Seung-Lark Lim, Ph.D.

Neuroeconomics

Lelia Montaser-Kouhsari, Ph.D. *Psychology*

Alexander Smith, Ph.D.

Economics

Peter Sokol-Hessner, Ph.D.

Neuroeconomics
Damian Stanley, Ph.D.

Neuroeconomics Naotsugu Tsuchiya, Ph.D.

Psychology and Neuroscience Oana Tuduscuic, Ph.D.

Neuroscience, Psychology

Stephanie W. Wang, Ph.D. Economics

Daw-An Wu, Ph.D. Neuroscience

Division of Physics, Mathematics and Astronomy

B. Thomas Soifer, Chair and Director, Spitzer Science Center

Lynne A. Hillenbrand, Executive Officer for Astronomy

Kenneth G. Libbrecht, Executive Officer for Physics

Charles A. Beichman

Executive Director, Michelson
Science Center

George Helou, Executive Director, Infrared Processing and Analysis

Shrinivas Kulkarni, Director, Caltech Optical Observatories

Jay Marx, Executive Director, LIGO Laboratory (Laser Interferometer Gravitational-Wave Observatory)

Thomas G. Phillips, *Director*; *Caltech Submillimeter Observatory*

Anthony C. S. Readhead, Director, Owens Valley Radio Observatory and Chajnantor Observatory

Michael Roukes, Codirector, Kavli Nanoscience Institute

Axel Scherer, Codirector, Kavli Nanoscience Institute

Barry Simon, Executive Officer for Mathematics

Professors Emeriti

Tom M. Apostol, Ph.D. Mathematics

Barry C. Barish, Ph.D., Laurea h.c. Ronald and Maxine Linde Professor of Physics

Charles A. Barnes, Ph.D. *Physics*

Felix H. Boehm, Ph.D. William L. Valentine Professor of Physics

Robert F. Christy, Ph.D.

Institute Professor of Theoretical
Physics

Marshall H. Cohen, Ph.D. Astronomy

Eugene W. Cowan, Ph.D. *Physics*

Richard A. Dean, Ph.D. Mathematics

Ronald W. P. Drever, Ph.D. *Physics*

Steven C. Frautschi, Ph.D. Theoretical Physics

Murray Gell-Mann, Ph.D., Sc.D.h.c., D.Sc.h.c., Nobel Laureate Robert Andrews Millikan Professor

of Theoretical Physics Peter M. Goldreich, Ph.D.

Lee A. DuBridge Professor of Astrophysics and Planetary Physics

David L. Goodstein, Ph.D.

Frank J. Gilloon Distinguished
Teaching and Service Professor and
Professor of Physics and Applied
Physics

Gary A. Lorden, Ph.D. Mathematics

W. A. J. Luxemburg, Ph.D. *Mathematics*

Gerry Neugebauer, Ph.D.

Robert Andrews Millikan Professor
of Physics

Charles W. Peck, Ph.D. *Physics*

Maarten Schmidt, Ph.D., Sc.D. Francis L. Moseley Professor of Astronomy

Kip S. Thorne, Ph.D., D.Sc.h.c., D.h.c., L.H.D.h.c. Richard P. Feynman Professor of Theoretical Physics

Rochus E. Vogt, Ph.D. R. Stanton Avery Distinguished Service Professor and Professor of Physics

David B. Wales, Ph.D. Mathematics

Ward Whaling, Ph.D. *Physics*

Harold Zirin, Ph.D. Astrophysics

Senior Research Associate Emeritus

Petr Vogel, Ph.D. Physics

Professors

Michael Aschbacher, Ph.D. Shaler Arthur Hanisch Professor of Mathematics Alexei Borodin, Ph.D.

Gordon M. Binder/Amgen
Professor of Mathematics

Danny Calegari, Ph.D.

Richard Merkin Distinguished

Professor of Mathematics

Judith G. Cohen, Ph.D.

Kate Van Nuys Professor of
Astronomy

Michael C. Cross, Ph.D. Theoretical Physics

S. George Djorgovski, Ph.D. *Astronomy*

James P. Eisenstein, Ph.D.

Frank J. Roshek Professor of
Physics and Applied Physics

Pichard S. Ellis, D. Phill, D. Sak

Richard S. Ellis, D.Phil., D.Sc.h.c. Steele Family Professor of Astronomy

Bradley W. Filippone, Ph.D. *Physics*

Matthew Fisher, Ph.D.

Earle C. Anthony Professor of
Theoretical Physics

Matthias Flach, Ph.D. Mathematics

Thomas Graber, Ph.D. *Mathematics*

Sergei Gukov, Ph.D. Theoretical Physics and Mathematics

Fiona A. Harrison, Ph.D., D.techn.h.c. Physics and Astronomy

David G. Hitlin, Ph.D. *Physics*

Marc Kamionkowski, Ph.D. Robinson Professor of Theoretical Physics and Astrophysics

Anton Kapustin, Ph.D. Theoretical Physics

Alexander S. Kechris, Ph.D., D.h.c. Mathematics

H. Jeff Kimble, Ph.D., D.Sc.h.c. William L. Valentine Professor and Professor of Physics

Alexei Kitaev, Ph.D.

Theoretical Physics and Computer
Science

Shrinivas R. Kulkarni, Ph.D. John D. and Catherine T. MacArthur Professor of Astronomy and Planetary Science

Kenneth G. Libbrecht, Ph.D. *Physics*

Nikolai G. Makarov, Ph.D. Mathematics

582

D. Christopher Martin, Ph.D. *Physics*

Robert D. McKeown, Ph.D. *Physics*

Harvey B. Newman, Sc.D. *Physics*

Hiroshi Oguri, Ph.D.

Fred Kavli Professor of Theoretical
Physics

Thomas G. Phillips, D.Phil.

Altair Professor of Physics

E. Sterl Phinney, Ph.D. Theoretical Astrophysics

Jerome Pine, Ph.D. *Physics*

H. David Politzer, Ph.D., Nobel Laureate Richard Chace Tolman Professor of

Richard Chace Tolman Professor of Theoretical Physics

Frank C. Porter, Ph.D. *Physics*

John P. Preskill, Ph.D. John D. MacArthur Professor of Theoretical Physics

Thomas A. Prince, Ph.D. *Physics*

Eric M. Rains, Ph.D. *Mathematics*

Dinakar Ramakrishnan, Ph.D. Taussky-Todd-Lonergan Professor of Mathematics

Anthony C. S. Readhead, Ph.D.

Barbara and Stanley R. Rawn, Jr.,

Professor of Astronomy

Michael L. Roukes, Ph.D.

Physics, Applied Physics, and
Bioengineering

Anneila I. Sargent, Ph.D., D.Sc.h.c. Benjamin M. Rosen Professor of Astronomy

Wallace L. W. Sargent, Ph.D. Ira S. Bowen Professor of Astronomy

Axel Scherer, Ph.D.

Bernard A. Neches Professor of
Electrical Engineering, Applied
Physics, and Physics

John H. Schwarz, Ph.D. Harold Brown Professor of Theoretical Physics

Nicholas Z. Scoville, Ph.D. Francis L. Moseley Professor of Astronomy Barry M. Simon, Ph.D., D.Sc.h.c. IBM Professor of Mathematics and Theoretical Physics

B. Thomas Soifer, Ph.D. *Physics*

Charles C. Steidel, Ph.D.

Lee A. DuBridge Professor of

Astronomy

Edward C. Štone, Ph.D., D.Sc.h.c. David W. Morrisroe Professor of

Thomas A. Tombrello Jr., Ph.D., Ph.D.h.c.

William R. Kenan Jr. Professor and Professor of Physics

Alan J. Weinstein, Ph.D. *Physics*

Richard M. Wilson, Ph.D. Mathematics

Mark B. Wise, Ph.D.

John A. McCone Professor of High Energy Physics

Nai-Chang Yeh, Ph.D. *Physics*

Ahmed H. Zewail, Ph.D., D.Sc.h.c., D.h.c., D.Univ.h.c., D.Phil.h.c., LL.D.h.c., M.D.h.c., Nobel Laureate Linus Pauling Professor of

Chemistry and Professor of Physics Jonas Zmuidzinas, Ph.D.

Merle Kingsley Professor of Physics

Associate Professors

Yanbei Chen, Ph.D. *Physics*

Sunil Golwala, Ph.D. *Physics*

Lynne Anne Hillenbrand, Ph.D. *Astronomy*

Elena Montovan, Ph.D.

Mathematics

Gil Refael, Ph.D.

Theoretical Physics

Maria Spiropulu, Ph.D. *Physics*

Assistant Professors

Rana Adhikari, Ph.D. *Physics*Christopher Hirata, Ph

Christopher Hirata, Ph.D. Astrophysics 583

Olexei Motrunich, Ph.D. Theoretical Physics

Yi Ni, Ph.D.

Mathematics

Christian Ott. Ph.D. Theoretical Astrophysics Ryan Patterson, Ph.D.

Physics

Instructors

Susama Agarwala, Ph.D. Harry Bateman Research Instructor in Mathematics

Niranjan Balachandran, Ph.D. Harry Bateman Research Instructor in Mathematics

Matthew Day, Ph.D.

Olga Taussky and John Todd Instructor in Mathematics

Maurice Duits, Ph.D.

Olga Taussky and John Todd Instructor in Mathematics

Andrei Jorza, Ph.D.

Olga Taussky and John Todd Instructor in Mathematics

Miodrag Sokic, Ph.D.

Olga Taussky and John Todd Instructor in Mathematics

Fokko Van De Bult, Ph.D. Harry Bateman Research Instructor in Mathematics

Lecturers

Eric D. Black, Ph.D.

Physics

Thomas Gottschalk, Ph.D. **Physics**

Lee A. Lindblom, Ph.D. Physics

Chris Mach, B.S.

Physics Frank Rice, M.S.

Physics

Virginio Sannibale, Ph.D. **Physics**

Senior Research Associates

John Carpenter, Ph.D. Astronomy

Sean Carroll, Ph.D. **Physics**

George Helou, Ph.D. Physics

Lee A. Lindblom, Ph.D. Physics

Dariusz C. Lis, Ph.D.

Physics Jay Marx, Ph.D.

Physics

Richard A. Mewaldt, Ph.D. **Physics**

Stephen Padin, Ph.D.

Astrophysics

Timothy J. Pearson, Ph.D. Radio Astronomy

Senior Research Fellows

Koji Arai, Ph.D.

Experimental Physics

Andrew Benson, Ph.D.

Theoretical Cosmology

Kieran A. Cleary, Ph.D. Astronomy

Jan Harms, Ph.D.

Physics

Seung-Yeop Lee, Ph.D. Sherman Fairchild Senior Research Fellow in Mathematics

Yu Nakayama, Ph.D.

Theoretical Physics

Mark Scheel, Ph.D.

Physics Bela Szilagyi, Ph.D.

Physics Henry Wilton, Ph.D.

Scott Russell Johnson Senior Research Fellow in Mathematics

Senior Faculty Associates

James J. Bock, Ph.D. **Physics**

Curt Cutler, Ph.D. **Physics**

Faculty Associate

I. Juliana Sackmann, Ph.D. **Physics**

Visiting Associates	Stephen W. Hawking, Ph.D. Sherman Fairchild Distinguished
Paolo Aluffi, Ph.D.	Scholar
Mathematics	Emlyn W. Hughes, Ph.D.
Emanuele Berti, Ph.D.	Physics
Physics	Farid Khalili, Ph.D.
Igor Bilenko, Ph.D.	Physics
Physics	Richard A. M. Lee, Ph.D.
Roger Blandford, Ph.D.	Physics
Physics	Yan-Chiang Liang, Ph.D.
Charles Matt Bradford, Ph.D.	Physics
Physics	Daniel A. Lidar, Ph.D.
Vladimir B. Braginsky, Ph.D.	Theoretical Physics
Physics	Ute Lisenfeld, Ph.D.
Todd Brun, Ph.D.	Spitzer Center, IPAC
Physics	Jonathan Lubin, Ph.D.
Alessandra Buonanno, Ph.D.	Mathematics
Physics	Peter V. Mason, Ph.D.
Goutam Chattopadhyay, Ph.D.	Physics
Physics	Richard Massey, Ph.D.
Asantha Cooray, Ph.D.	Astronomy
Physics	Steve McGuire, Ph.D.
Brendan P. Crill, Ph.D.	Physics
Physics	Simona Mei, Ph.D.
Kelle Cruz, Ph.D.	Astronomy
Astronomy	Georges S. Meylan, Ph.D.
Shtefan L. Danilishin, Ph.D.	Astronomy
Theoretical Astrophysics	Valery Mitrofanov, M.Sc.
Peter Day, Ph.D.	Physics
Physics	Hien T. Nguyen, Ph.D.
Stanley Deser, Ph.D.	Physics
Theoretical Physics	Robert Penner, Ph.D.
Olivier Dore, Ph.D.	Mathematical and Theoretical
Theoretical Astrophysics	Physics
Darren Dowell, Ph.D. Physics	Bryan Penprase, Ph.D. Astronomy
Robert V. Duncan, Ph.D.	Elena Pierpaoli, Ph.D.
Physics	Astrophysics
Gerald Eigen, Ph.D.	Andreas Quirrenbach, Ph.D.
Physics Physics	Physics
Wolfgang Fink, Ph.D.	Michael Ramsey-Musolf, Ph.D.
Physics	Physics
Todd Gaier	David H. Reitze, Ph.D.
Astronomy	LIGO
Paul F. Goldsmith, Ph.D.	Paul Renteln, Ph.D.
Physics	Mathematics
Gabriela Gonzalez, Ph.D.	Jason Rhodes, Ph.D.
Physics	Astronomy
Krzysztof Gorski, Ph.D.	Re'em Sari, Ph.D.
Physics	Astrophysics
Korth I R Charman Dh D	Innot II Sahaal Uh II

Keith J.B. Grainge, Ph.D.

Herold R. Gustafson, Ph.D.

Physics

Physics

Physics

Inseob Hahn, Ph.D.

Janet D. Scheel, Ph.D.

Robert Schofield, Ph.D.

Michael D. Seiffert, Ph.D.

Physics

Physics

Physics

Eugene Serabyn, Ph.D. **Physics** David H. Shoemaker, Ph.D. LIGOKirill Shtengel, Ph.D. **Physics** David O. Siegmund, Ph.D. Mathematics David Silva, Ph.D. Astronomy, IPAC Ulrich Sperhake, Ph.D. **Physics** Lisa E. Szechter, Ph.D. LIGO Tony Travouillon, Ph.D. Astronomy Michele Vallisneri, Ph.D. **Physics** Steven J. van Enk, Ph.D. **Physics** Serguei Viattchanine, Ph.D. **Physics** Michael Werner, Ph.D. **Astrophysics** Mark E. Wiedenbeck, Ph.D. **Physics** Edward Wright, Ph.D. Astronomy, IPAC Sanichiro Yoshida, Ph.D.

Members of the Professional Staff

Physics

Rachel Akeson, Ph.D. Stuart Anderson, Ph.D. Philip Appleton, Ph.D Lee Armus, Ph.D. Thomas Barlow, Ph.D. Bruce Berriman, Ph.D. James Kent Blackburn, Ph.D. Andrew Boden, Ph.D. Julian Bunn, Ph.D. Sean J. Carey, Ph.D Robert W. Carr, M. Phil. Ranga Ram Chary, Ph.D. David R. Ciardi, Ph.D. Christina M. S. Cohen, Ph.D. Walter R. Cook, Ph.D. Dennis C. Coyne, M.S. Alan C. Cummings, Ph.D. Roc Cutri, Ph.D. Richard Dekany, Ph.D. Riccardo DeSalvo, Ph.D. Dario Fadda, Ph.D.

Valery Frolov, Ph.D. Philippe Galvez, Eng. Joseph A. Giaime, Ph.D. Thomas D. Gottschalk, Ph.D. Carl Grillmair, Ph.D. Eric K. Gustafson, Ph.D Dale Ingram, M.S. Thomas Jarrett, Ph.D. William Kells, Ph.D. Davy Kirkpatrick, Ph.D. Mark Lacy, Ph.D. Michael Landry, Ph.D. William Latter, Ph.D. Albert Lazzarini, Ph.D. Richard A. Leske, Ph.D. Deborah Levine, Ph.D. Phillip E. Lindquist, Eng. Steven Lord, Ph.D. Nanyao Lu, Ph.D. William Mahoney, Ph.D. Keith Matthews, M.S. Joseph Mazzarella, Ph.D. Rafael Millan-Gabet, Ph.D. Anna Marie Moore, Ph.D. Patrick Morris, Ph.D. Patrick Morrissey, Ph.D. Alberto Noriega-Crespo, Ph.D. Patrick Ogle, Ph.D. J. E. Brian O'Reilly, Ph.D. Deborah Padgett, Ph.D. Fredrick J. Raab, Ph.D. Simon J.E. Radford, Ph.D. Luisa M. Rebull, Ph.D. Alan P. Rice, B.S. Norna A. Robertson, Ph.D. Gary H. Sanders, Ph.D. Richard Savage, Ph.D. Stephen L. Scott, Ph.D. Patrick Shopbell, Ph.D. David Shupe, Ph.D. Daniel Sigg, Ph.D. Nancy Silbermann, Ph.D. Gordon Squires, Ph.D. John Stauffer, Ph.D. Lisa Storrie-Lombardi, Ph.D. Jason Surace, Ph.D. Harry Teplitz, Ph.D. Schuyler Van Dyk, Ph.D. Stanley E. Whitcomb, Ph.D. Phil A. Willems, Ph.D. David P. Woody, Ph.D. Hiroaki Yamamoto, Ph.D. Lin Yan, Ph.D. Ren-Yuan Zhu, Ph.D. Michael Zucker, Ph.D. John Zweizig, Ph.D.

David Frayer, Ph.D.

Senior Postdoctoral Scholars

Shin'ichiro Ando, Ph.D. *Astrophysics*

Chih-Hsiang Cheng, Ph.D. *Physics*

Ciro Ďonalek, Ph.D. Astronomy

Daniel Dwyer, Ph.D.

Physics

Bertrand Echenard, Ph.D. *Physics*

Andrea Isella, Ph.D. *Physics*

Jianglai Liu, Ph.D. Physics

Jason Melbourne, Ph.D. *Physics*

James Don Neill, Ph.D. Space Astrophysics

Oded Eran Ofek, Ph.D.

Astronomy

Angiola Orlando, Ph.D. *Physics*

Fang Peng, Ph.D. Astrophysics

Andreea Petric, Ph.D.

Astronomy

Robert Quimby, Ph.D.

Astronomy

Alexander Rakitin, Ph.D.

Physics Dominik Riechers, Ph.D. Astronomy

Jack Sayers, Ph.D.

Physics Antony Searle, Ph.D.

Physics Brian Siana, Ph.D.

Astronomy
Michael Zemcov, Ph.D.
Physics

Postdoctoral Scholars

Arthur Apresyan, Ph.D. Experimental Physics

Hakim Atek, Ph.D. Astrophysics, IPAC

Christoph Baranec, Ph.D. *Astronomy*

Pedro Beirao, Ph.D. Astronomy, IPAC

Doron L. Bergman, Ph.D. Theoretical Physics Joseph Betzweiser, Ph.D. *Physics*

Andrew D. Beyer, Ph.D. *Physics*

Alyson Brooks, Ph.D. Theoretical Cosmology

Dearrick Chang, Ph.D.

Theoretical Physics

Eileen Chollet, Ph.D. *Physics*

Michelle E. Cluver, Ph.D. Astronomy, IPAC

Alessandra Corsi, Ph.D.

Physics Justin R. Crepp, Ph.D.

Astronomy Emilio Donoso, Ph.D.

IPAC

Thomas Downes, Ph.D.

Experimental Cosmology
Lovice Edwards, Ph.D.

Louise Edwards, Ph.D. *Astrophysics*

Martin Émprechtinger, Ph.D. *Physics*

Lukasz Fidkowski, Ph.D. Theoretical Physics

Jeffrey P. Filippini, Ph.D. Experimental Physics

Hai Fu, Ph.D.

Astronomy

Murali Krishna Ghatkesar, Ph.D.

Physics

Orly Gnat, Ph.D. *Physics*

Alexey Gorshkov, Ph.D. Theoretical Physics

Brian Grefenstette, Ph.D. *Physics*

Pierre Guillard, Ph.D. Astronomy, IPAC

Sebastian Haan, Ph.D. Astronomy, IPAC

Andreas Hackl, Ph.D. Theoretical Physics

Daniel Hanish, Ph.D. *Physics*, *IPAC*

Erik A. Henriksen, Ph.D. *Physics*

Alastair Heptonstall, Ph.D. *Physics*Janice Hester, Ph.D.

Space Astrophysics
Tanja Hinderer, Ph.D.

Theoretical Relativity Sasha Hinkley, Ph.D. Astronomy 58

Douglas Hoffman, Ph.D. Christian Ospelkaus, Ph.D. Astronomy, IPAC Physics Lotte Hollands, Ph.D. Ajith Parameswaran, Ph.D. **Physics** Physics Vasiliki Pavlidou, Ph.D. Matthew Ian Hollister, Ph.D. Astronomy Astronomy Veli-Mati Pelkonen, Ph.D. Koji Ishiwata, Ph.D. Theoretical Physics IPACDonghui Jeong, Ph.D. David Pekker, Ph.D. Theoretical Cosmology Theoretical Physics Liang Jiang, Ph.D. Tamar Pereg-Barnea, Ph.D. Theoretical Physics **Physics** Stephen P. Jordan, Ph.D. Adrian Perez Galvan, Ph.D. Theoretical Physics **Physics** Yuko Kakazu, Ph.D. Annika H. Peter, Ph.D. Astronomy **Physics** Peter M. Kalmus, Ph.D. Xin Qian, Ph.D. Experimental Physics Christoph A. Keller, Ph.D. Christian Reisswig, Ph.D. Theoretical Physics **Astrophysics** Oliver King, Ph.D. Hakim Atek, Ph.D. W. M. Keck Institute for Space Astrophysics, IPAC Studies Brian Robertson, Ph.D. Evan Kirby, Ph.D. Astronomy Astronomy Fabian Schmidt, Ph.D. Takao Kitaguchi, Ph.D. Theoretical Cosmology **Physics** Frank Seifert, Ph.D. Nicholas Konidaris, Ph.D. **Physics** Astronomy Instrumentation Yong Shi, Ph.D. Helge Krueger, Ph.D. Astronomy, IPAC Theoretical Physics Hyunjin Shim, Ph.D. Clement Lacroute, Ph.D. Astronomy, IPAC Quantum Optics Nathaniel Stern, Ph.D. Nethaniel Lindner, Ph.D. Experimental Physics Theoretical Physics Amber L. Stuver, Ph.D. Louis Levenson, Ph.D. Physics Piotr Sulkowski, Ph.D. **Physics** Jessica Lu, Ph.D. **Physics** Observational Astronomy Ryuji Suzuki, Ph.D. Astronomy, Thirty Meter Telescope Martin Lueker, Ph.D. Nicholas Taylor, Ph.D. **Physics** Jean-Christophe Mauduit, Ph.D. **Physics** Christina V. Torres, Ph.D. Astronomy, IPAC Jon Mauerhan, Ph.D. **Physics** Astrophysics, IPAC David Tzang, Ph.D. Jean-Sebastian Moulet, Ph.D. Theoretical Astrophysics Tanya C. Urrutia, Ph.D. **Physics** Stephen J. C. Muchovej, Ph.D. IPACJulian C. van Eyken, Ph.D. Astronomy Eric Murphy, Ph.D. Astronomy, IPAC Astronomy, IPAC Marco Viero, Ph.D. Robert Nelson, Ph.D. **Astrophysics Physics** Luis Guillermo Villanueva Torrijo, Kang-Kuen Ni, Ph.D. Ph.D. Quantum Optics **Physics** Fenfang Wu, Ph.D. Roger O'Brient, Ph.D.

Physics

Physics

Yanling Wu, Ph.D.

Astronomy, IPAC
Zhongtao Wu, Ph.D.

Mathematics
Jing Xia, Ph.D.

Experimental Physics
Yi Zhao, Ph.D.

Quantum Optics
Benjamin I. Zwiebel, Ph.D.

Theoretical Physics

Center for Advanced Computing Research

Mark A. Stalzer, Ph.D. Director

Information Management Systems and Services

Rich Fagen, B.A.

Chief Information Officer

Directorate

Beverly Allen, M.B.A. Glenn W. Bach, M.S. RuthAnne Bevier, M.L.I.S. Bradley Cain, J.D. John A. Dundas III, M.S. Ron Kong, M.S. Robert Logan, B.S. Leslie Maxfield, M.S.

Jet Propulsion Laboratory

Administered by Caltech for the National Aeronautics and Space Administration

Charles Elachi, *Director*Eugene L. Tattini, *Deputy Director*

Executive Council

A. Blaine Baggett

Manager, Office of

Communications and Education

Paul E. Dimotakis

Chief Technologist

Diane L. Evans

Director for Earth Science and
Technology

Richard S. Grammier

Director for Solar System

Exploration Programs

Cozette M. Hart

Director for Human Resources

Dale M. Johnson
Associate Director/Chief Financial
Officer and Director for Business
Operations

Chris P. Jones

Associate Director for Flight Projects and Mission Success

Matthew R. Landano
Director for Safety and Mission

Fuk K. Li

Manager, Mars Exploration
Program Office and Director for
Mars Exploration

Leslie L. Livesay

Director for Engineering and
Science

Daniel J. McCleese Chief Scientist

John B. McNamee

Director for Interplanetary

Network Directorate

Firouz M. Naderi Associate Director for Project Formulation and Strategy

Richard P. O'Toole Manager, Office of Legislative Affairs

James J. Rinaldi
Manager, Office of the Chief
Information Officer

Michael J. Sander

Manager, Exploration Systems and
Technology

Jakob J. van Zyl

Director for Astronomy and Physics
Victoria D. Stratman

Caltech General Counsel

Library Services

Kimberly Douglas, M.A., M.S. (L.S.) University Librarian Michelle Aldecua, B.A. Library Operations Administrator

589

Judith Brott, M.B.A.

Business Manager

David McCaslin, M.S. (L.I.S.)

Access and Fulfillment Services

Manager

Jim O'Donnell, M.S. (L.S.)

Head, Collections, Information and Research Services Laura Smart, M.S. (L.I.S.)

Manager, Metadata Services
Charlotte E. Erwin, Ph.D.

Head, Archives and Special Collections

Professional Staff

Teague Allen, M.S. (L.I.S.) Kristin Buxton, M.S. (L.I.S.) Lindsay Cleary, M.S. (L.I.S.) Betsy Coles, B.A. S. Katherine Johnson, M.S. (L.I.S.) George Porter, M.S. (L.S.) Dana Roth, M.S., M.S. (L.S.) J. Alex Valdivia, M.S. (L.I.S.) Jay Walters, B.A.

Staff and Faculty Consultation Center

Linda Krippner, Psy.D., *Director* Susan Cross, Ph.D., *Associate Director* Eva Graham

Director of the Caltech Center for

Diversity

Barbara C. Green
Associate Dean of Students

Felicia A. Hunt
Associate Dean of Graduate
Studies

Julie M. Levesque

Acting Athletic Director

Tom Mannion
Assistant Vice President for

Student Life Stuart Miller

Medical Director
Mary N. Morley

Registrar Erica O'Neal Assistant Vice President for Enrollment

Dimitris Sakellariou

Chief Administrator
Joseph E. Shepherd

Dean of Graduate Studies

Lauren Stolper
Director of Fellowships Advising
and Study Abroad, and Career
Development Center

Jarrid Whitney
Director of Admissions
TBA
Dean of Students

Student Affairs

Anneila I. Sargent Vice President for Student Affairs Kevin P. Austin Senior Director of Health and Counseling Services Delores M. Bing Coordinator, Performing and Visual Arts Faculty and Programs Richard Bischoff Director of Admissions Geoffrey A. Blake Master of Student Houses Don A. Crewell Director of Financial Aid Peter Daily Assistant Vice President for

590

Housing and Dining

OFFICERS AND FACULTY

University of California = UC Berkeley California State University = Cal State L.A.

Sanjornia State Oniversity - Cai Sta

Jean-Lou Chameau, Ph.D., President; Professor of Civil Engineering, Environmental Science and Engineering, and Mechanical Engineering

Ing., École Nationale Supérieure d'Arts et Métiers, 1976; M.S., Stanford University, 1977; Ph.D., 1981. Professor of Civil Engineering, Environmental Science and Engineering, and Mechanical Engineering 2006—. President, 2006—.

John Norman Abelson, Ph.D., George Beadle Professor of Biology, Emeritus B.S., Washington State University, 1960; Ph.D., Johns Hopkins University, 1965. Professor, Caltech, 1982–91; Beadle Professor, 1991–2002; Beadle Professor Emeritus, 2002–. Chair, Division of Biology, 1989–95.

Yaser S. Abu-Mostafa, Ph.D., Professor of Electrical Engineering and Computer Science B.Sc., Cairo University, 1979; M.S.E.E., Georgia Institute of Technology, 1981; Ph.D., Caltech, 1983. Garrett Research Fellow in Electrical Engineering, 1983; Assistant Professor, 1983–89; Associate Professor, 1989–94; Professor, 1994–.

Allan James Acosta, Ph.D., Richard L. and Dorothy M. Hayman Professor of Mechanical Engineering, Emeritus B.S., Caltech, 1945; M.S., 1949; Ph.D., 1952. Assistant Professor, 1954–58; Associate Professor, 1958–66; Professor, 1966–90; Hayman Professor, 1990–93. Hayman Professor Emeritus, 1993–. Executive Officer for Mechanical Engineering, 1988–93.

Christoph Carl Adami, Ph.D., Visiting Associate in Biology

B.S., University of Bonn, 1982; Dipl., 1988; M.A., State University of New York (Stony Brook), 1988; Ph.D., 1991. Professor, Keck Graduate Institute of Applied Life Sciences, 2004— Division Research Fellow, Caltech, 1992–95; Lecturer, 1996–2004; 2006–07; Senior Research Fellow, 1995–2000; Faculty Associate, 2001–08; Visiting Associate, 2009–10.

Marc A. Adams, Ph.D., Visiting Associate in Aeronautics

B.S., Case Institute of Technology, 1967; M.S., University of California (Los Angeles), 1972; Ph.D., 1975. Senior Engineer, Jet Propulsion Laboratory, 1976–. Caltech, 2009–11. Rana Adhikari, Ph.D., Assistant Professor of Physics

B.S., University of Florida (Gainesville), 1998; Ph.D., Massachusetts Institute of Technology, 2004. Caltech, 2006–.

Jess F. Adkins, Ph.D., Professor of Geochemistry and Global Environmental Science B.S., Haverford College, 1990; Ph.D., Massachusetts Institute of Technology, 1998. Assistant Professor, Caltech, 2000–06; Associate Professor, 2006–2009; Professor, 2010–.

Ralph Adolphs, Ph.D., Bren Professor of Psychology and Neuroscience and Professor of Biology; Director, Caltech Brain Imaging Center

B.S., Stanford University, 1986; M.S., 1986; Ph.D., Caltech, 1992. Professor of Psychology and Neuroscience, 2004–05; Bren Professor, 2005–; Professor of Biology, 2005–. Director, 2008–.

Andreas Aebi, Ph.D., Lecturer in German M.A., University of Southern California, 1970; Ph.D., 1974. Lecturer in French, Caltech, 1978; Lecturer in German, 1978–83; 1986–; Instructor in German, 1983–86.

Theodor Agapie, Ph.D., Assistant Professor of Chemistry
B.S., Massachusetts Institute of Technology, 2001; Ph.D., Caltech, 2007. Assistant

Susama Agarwala, Ph.D., Harry Bateman Research Instructor in Mathematics M.S., Johns Hopkins University, 2006;

Professor, 2009-.

Marina Agranov, Ph.D., Assistant Professor of Economics

Ph.D., 2009. Caltech, 2009-.

B.A., St. Petersburg State Technical University, 1999; M.A., Tel Aviv University, 2004; Ph.D., New York University, 2010. Caltech, 2010–.

Ashutosh Agrawal, Ph.D., Visiting Associate in Applied Physics

B.S., IIT Bombay (India), 2001; M.S., Rice University, 2004; Ph.D., University of California, 2009. Research Assistant Professor, University of Houston, 2009–; Visiting Associate, Caltech, 2010.

Oded Aharonson, Ph.D., Associate Professor of Planetary Science

B.S., Cornell University, 1994; M.Eng., 1995; Ph.D., Massachusetts Institute of Technology, 2002. Assistant Professor, Caltech, 2002–08; Associate Professor, 2008–

Channing C. Ahn, Ph.D., Senior Research Associate in Materials Science; Lecturer in Materials Science

B.S., University of California, 1979; M.S., 1981; Ph.D., University of Bristol, 1985.

Senior Research Fellow, Caltech, 1987–92; Senior Research Associate, 1992–; Lecturer, 1988; 1990–2009.

Thomas J. Ahrens, Ph.D., Fletcher Jones Professor of Geophysics, Emeritus
B.S., Massachusetts Institute of Technology, 1957; M.S., Caltech, 1958; Ph.D.,
Rensselaer Polytechnic Institute, 1962.
Associate Professor of Geophysics, Caltech, 1967–76; Professor, 1976–2004; W. M.
Keck Foundation Professor of Earth
Sciences, 1996–2001; Jones Professor, 2004–05; Jones Professor Emeritus, 2005–.

Michael Aivazis, Ph.D., Lecturer in Applied and Computational Mathematics B.S., Illinois Institute of Technology, 1985; Ph.D., 1992. Caltech, 2010.

Arden Leroy Albee, Ph.D., Professor of Geology and Planetary Science, Emeritus A.B., Harvard College, 1950; A.M., Harvard University, 1951; Ph.D., 1957. Visiting Assistant Professor, Caltech, 1959–60; Associate Professor of Geology, 1960–66; Professor, 1966–99; Professor of Geology and Planetary Science, 1999–2002; Professor Emeritus, 2002–. Academic Officer, Geological and Planetary Sciences, 1971–79; Chief Scientist, Jet Propulsion Laboratory, 1979–84; Dean of Graduate Studies, 1984–2000.

Arzhang Alimoradi, Ph.D., Visiting Associate in Civil Engineering B.S., Azad University, 1996; M.S., University of Illinois, 2003; Ph.D., University of Memphis, 2004. Caltech, 2010.

Clarence R. Allen, Ph.D., Professor of Geology and Geophysics, Emeritus B.A., Reed College, 1949; M.S., Caltech, 1951; Ph.D., 1954. Assistant Professor, 1955–59; Associate Professor, 1959–64; Professor, 1964–90; Professor Emeritus, 1990–. Interim Director, Seismological Laboratory, 1965–67; Acting Chairman, Division of Geology, 1967–68.

Mark Andrew Allen, Ph.D., Visiting Associate in Planetary Science
B.A., Columbia University, 1971; Ph.D., Caltech, 1976. Member of the Technical Staff, Jet Propulsion Laboratory, 1984—. Research Fellow, Caltech, 1978–81; Institute Visiting Associate, 1987–88; Visiting Associate, 1981–86; 1988–96; 2001–10; Faculty Associate, 1996–2001.

Pierre J. C. Alliez, Ph.D., Visiting Associate in Computer Science M.S., École Supérieure en Sciences Informatiques de Sophis-Antipolis, 1997; Ph.D., École Nationale Supérieure des Telecommunications Paris, 2000. Caltech, 2009. John Morgan Allman, Ph.D., Frank P. Hixon Professor of Neurobiology
B.A., University of Virginia, 1965; A.M., University of Chicago, 1968; Ph.D., 1971. Assistant Professor, Caltech, 1974–77; Associate Professor, 1977–84; Professor, 1984–89; Hixon Professor, 1989–.

Paolo Aluffi, Ph.D., Visiting Associate in Mathematics
M.S., University of Turin, 1983; Ph.D.,
Brown University, 1987. Professor, Florida
State University, 2000—. Caltech, 2008–10.

R. Michael Alvarez, Ph.D., Professor of Political Science B.A., Carleton College, 1986; M.A., Duke University, 1990; Ph.D., 1992. Assistant Professor, Caltech, 1992–95; Associate Professor, 1995–2002; Professor, 2002–.

Xenia Amashukeli, Ph.D., Lecturer in Chemistry B.S., Brown University, 1997; Ph.D., Caltech, 2002. Lecturer, 2010.

Jean Paul (Pablo) Ampuero Saenz, Ph.D., Assistant Professor of Seismology B.S., University of Paris VII, 1997; M.S., 1998; Ph.D., 2002. Caltech, 2008–.

Behnam Analui, Ph.D., Lecturer in Electrical Engineering B.S., Sharif University of Technology, 1998; M.S., 2000; M.S., Caltech, 2005; Ph.D., 2006. Lecturer, 2009–10.

Richard A. Andersen, Ph.D., James G. Boswell Professor of Neuroscience B.S., University of California (Davis), 1973; Ph.D., University of California (San Francisco), 1979. Caltech, 1993—.

David Jeffrey Anderson, Ph.D., Seymour Benzer Professor of Biology; Investigator, Howard Hughes Medical Institute A.B., Harvard University, 1978; Ph.D., Rockefeller University, 1983. Assistant Professor, Caltech, 1986–92; Associate Professor, 1992–96; Professor, 1996–2004; Sperry Professor, 2004–2009; Benzer Professor, 2009. Assistant Investigator, 1989–92; Associate Investigator, 1992–97; Investigator, 1997–

Don Lynn Anderson, Ph.D., Crafoord Laureate, Eleanor and John R. McMillan Professor of Geophysics, Emeritus
B.S., Rensselaer Polytechnic Institute, 1955;
M.S., Caltech, 1958; Ph.D., 1962. Research Fellow, 1962–63; Assistant Professor, 1963–64; Associate Professor, 1964–68; Professor, 1968–89; McMillan Professor, 1989–2002; McMillan Professor Emeritus, 2002–. Director, Seismological Laboratory, 1967–89.

José E. Andrade, Ph.D., Assistant Professor of Civil and Mechanical Engineering B.S., Florida Institute of Technology, 2001; M.S., Stanford University, 2003; Ph.D., 2006. Caltech, 2010.

Lachlan Leicester Henry Andrew, Ph.D., Visiting Associate in Computer Science B.S., University of Melbourne, 1992; B.Sc., 1993; Ph.D., 1997. Caltech, 2009–11.

Kenneth Skilling Andrews, Ph.D., Lecturer in Electrical Engineering B.S., Caltech, 1990; M.Eng., Cornell University, 1995; Ph.D., 1999. Caltech, 2010.

Fred Colvig Anson, Ph.D., D.h.c., Elizabeth W. Gilloon Professor of Chemistry, Emeritus

B.S., Caltech, 1954; Ph.D., Harvard University, 1957; D.h.c., University of Paris VII, 1993. Instructor, Caltech, 1957–58; Assistant Professor, 1958–62; Associate Professor, 1962–68; Professor, 1968–95; Gilloon Professor, 1995–2001; Gilloon Professor Emeritus, 2001–. Executive Officer for Chemistry, 1973–77; Chairman, Division of Chemistry and Chemical Engineering, 1984–94.

Erik Karl Antonsson, Ph.D., Visiting Associate in Mechanical Engineering
B.S., Cornell University, 1976; M.S.,
Massachusetts Institute of Technology,
1978; Ph.D., 1982. Assistant Professor,
Caltech, 1984–90; Associate Professor,
1990–97; Professor of Mechanical
Engineering, 1997–2009; Visiting Associate,
2009–2011. Executive Officer for
Mechanical Engineering, 1998–2002; Chief
Technologist, Jet Propulsion Laboratory,
2002–.

Tom M. Apostol, Ph.D., Professor of Mathematics, Emeritus
B.S., University of Washington, 1944; M.S., 1946; Ph.D., University of California, 1948. Assistant Professor, Caltech, 1950–56; Associate Professor, 1956–62; Professor, 1962–92; Professor Emeritus, 1992–

Koji Arai, Ph.D., Senior Research Fellow in Experimental Physics Ph.D., University of Tokyo, 2002. Caltech, 2009—

Alexei A. Aravin, Ph.D., Assistant Professor of Biology B.S., University of Moscow, 1997; M.Sc., 1998; Ph.D., 2002. Caltech, 2009–.

Nicole Archambeau, Ph.D., ACLS Postdoctoral Instructor in History B.A., University of Wyoming, 1994; M.A., University of Montana, 1996; M.A., University of California (Los Angeles), 2002; Ph.D., University of California (Santa Barbara), 2009. Caltech, 2010-. Jasmina Arifovic, Ph.D., Visiting Associate in Economics
B.A., University of Sarajevo, 1981; M.A.,
University of Chicago, 1988; Ph.D., 1991.
Professor, Simon Fraser University
(Canada), 2002—Visiting Associate
Professor, Caltech, 1999–2001; Visiting
Associate, 2002–12.

Maria del Pilar Ariza Moreno, Ph.D., Visiting Associate in Aeronautics M.S., University of Seville, 1997; Ph.D., 2002. Assistant Professor, 2003.—Caltech, 2003.—06; 2007; 2009; 2010.—11.

Gloria Arjona, Ph.D., Lecturer in Spanish B.A., California State University, 1993; M.A., University of Southern California, 1997; Ph.D., University of Southern California, 2002. Caltech, 2000–10.

Frances Hamilton Arnold, Ph.D., Dick and Barbara Dickinson Professor of Chemical Engineering, Bioengineering and Biochemistry B.S., Princeton University, 1979; Ph.D., University of California, 1985. Visiting Associate, Caltech, 1986; Assistant Professor of Chemical Engineering, 1987–92; Associate Professor, 1992–96; Professor, 1996–99; Professor of Chemical Engineering and Biochemistry, 1999–2000; Dickinson Professor, 2000–.

Michael Aschbacher, Ph.D., Sbaler Arthur Hanisch Professor of Mathematics B.S., Caltech, 1966; Ph.D., University of Wisconsin, 1969. Bateman Research Instructor, Caltech, 1970–72; Assistant Professor, 1972–74; Associate Professor, 1974–76; Professor, 1976–96; Hanisch Professor, 1996–. Executive Officer for Mathematics, 1991–94.

Paul David Asimow, Ph.D., Professor of Geology and Geochemistry A.B., Harvard University, 1991; M.S., Caltech, 1993; Ph.D., 1997. Assistant Professor, 1999–2005; Associate Professor, 2005–2010; Professor, 2010–

Anand R. Asthagiri, Ph.D., Assistant Professor of Chemical Engineering B.S., Cornell University, 1995; Ph.D., Massachusetts Institute of Technology, 2000. Caltech, 2002–.

Harry A. Atwater Jr., Ph.D., Howard Hugbes Professor and Professor of Applied Physics and Materials Science; Director, Resnick Sustainability Institute B.S., Massachusetts Institute of Technology, 1982; M.S., 1983; Ph.D., 1987. Assistant Professor of Applied Physics, Caltech, 1988–94; Associate Professor, 1994–99; Professor of Applied Physics and Materials Science, 1999–; Howard Hughes Professor, 2002–; Director, 2009–. Jean-Philippe Avouac, Doctorat, Habil., Professor of Geology; Director, Tectonics

Observatory

Dipl., École Polytechnique, 1987; Doctorat, University of Paris VII, 1991; Habil., 1992. Professor, Caltech, 2003–. Director, 2004–.

Niranjan Balachandran, M.S., Harry Bateman Research Instructor in Mathematics M.S., The Indian Statistical Institute, 2001. Caltech, 2008—.

John Dickson Baldeschwieler, Ph.D.,

7 Stanley Johnson Professor and Professor of

J. Stanley Johnson Professor and Professor of Chemistry, Emeritus

B.Chem.E., Cornell University, 1956; Ph.D., University of California, 1959. Professor, Caltech, 1973–96; Johnson Professor and Professor of Chemistry, 1996–99; Johnson Professor and Professor Emeritus, 1999–. Chairman, Division of Chemistry and Chemical Engineering, 1973–78.

David Baltimore, Ph.D., D.Sc.h.c., D.Phil.h.c., Nobel Laureate, President Emeritus; Robert Andrews Millikan Professor of Biology

B.A., Swarthmore College, 1960; Ph.D., Rockefeller University, 1964; D.Sc.h.c, Swarthmore College; Mount Holyoke College; Mount Sinai Medical Center; Bard College; University of Helsinki; Cold Spring Harbor Laboratory; University of Alabama; California Polytechnic State University; Columbia University; Yale University; Rockefeller University; Harvard University; D.Phil.h.c., Weizmann Institute of Science. Professor, Caltech, 1997–2006; Millikan Professor, 2006–. President, 1997–2006; President Emeritus, 2006–.

Barry Clark Barish, Ph.D., Laurea h.c., Ronald and Maxine Linde Professor of Physics, Emeritus

B.A., University of California, 1957; Ph.D., 1962; Laurea h.c., University of Bologna. Research Fellow, Caltech, 1963–66; Assistant Professor, 1966–69; Associate Professor, 1969–72; Professor, 1972–91; Linde Professor Emeritus, 2005–. Principal Investigator of LIGO, 1994–97; Director, LIGO, 1997–2006.

Charles Andrew Barnes, Ph.D., Professor of Physics, Emeritus

B.A., McMaster University, 1943; M.A., University of Toronto, 1944; Ph.D., University of Cambridge, 1950. Research Fellow, Caltech, 1953–54; Senior Research Fellow, 1954–58; Associate Professor, 1958–62; Professor, 1962–92; Professor Emeritus, 1992–.

Alan H. Barr, Ph.D., Professor of Computer

B.S., Rensselaer Polytechnic Institute, 1973; M.S., 1976; Ph.D., 1983. Research Fellow, Caltech, 1984; Assistant Professor, 1984–90; Associate Professor, 1990–98; Professor, 1998–. Executive Officer for Computer Science, 2000–01.

Jim Barry, B.A., Lecturer in Art—Drawing, Painting, Silkscreen, and Airbrusb B.A., University of California (Santa Barbara), 1972. Caltech, 1999–2011.

Jacqueline K. Barton, Ph.D., D.Sc.h.c., D.L.h.c., Arthur and Marian Hanisch Memorial Professor and Professor of Chemistry; Chair, Division of Chemistry and Chemical Engineering
A.B., Barnard College, 1974; Ph.D., Columbia University, 1978; D.Sc.h.c., New Jersey Institute; Kenyon College; Yale University: Hamilton College: Williams

Columbia University, 1978; D.Sc.h.c., New Jersey Institute; Kenyon College; Yale University; Hamilton College; Williams College; Lawrence University; Columbia University; D.L.h.c., Skidmore College. Visiting Associate, Caltech, 1989; Professor, 1989-; Hanisch Professor, 1997-; Chair, 2009-.

Jason Baskin, Ph.D., Caltech-Huntington Mellon Postdoctoral Instructor in English A.B., Harvard University, 2000; M.A., Princeton University, 2006; Ph.D., 2008. Caltech, 2008–10.

Elaine L. Bearer, M.D., Ph.D., Visiting Associate in Biology

B.M., Manhattan School of Music, 1970; M.A., New York University, 1973; M.D., University of California (San Francisco), 1983; Ph.D., 1983. Professor, Brown University, 2004–. Visiting Associate in Biology, Caltech, 2004; 2005–11; Moore Distinguished Scholar, 2004–05.

Jesse Lee Beauchamp, Ph.D., Mary and Charles Ferkel Professor of Chemistry B.S., Caltech, 1964; Ph.D., Harvard University, 1967. Noyes Research Instructor, Caltech, 1967–69; Assistant Professor, 1969–71; Associate Professor, 1971–74; Professor, 1974–2000, Ferkel Professor, 2000–.

James L. Beck, Ph.D., Professor of Engineering and Applied Science B.Sc., University of Auckland, 1969; M.Sc., 1970; Ph.D., Caltech, 1979. Assistant Professor of Civil Engineering, 1981–87; Associate Professor, 1987–96; Professor of Applied Mechanics and Civil Engineering, 1996–2005; Professor of Engineering and Applied Science, 2005–. Executive Officer for Applied Mechanics and Civil Engineering, 1993–98.

Josette Bellan, Ph.D., Visiting Associate in Mechanical Engineering B.S., Lycee Jules Ferry, 1964; M.S., University of Sciences (Paris), 1969; M.S., Princeton University, 1972; Ph.D., 1974. Senior Research Scientist, Jet Propulsion

Laboratory, 1997–. Lecturer in Jet Propulsion, Caltech, 1992–93; Visiting Associate in Aeronautics, 1995–2006; Visiting Associate in Mechanical Engineering, 2006–10.

Paul Murray Bellan, Ph.D., Professor of Applied Physics B.Sc., University of Manitoba, 1970; M.A., Princeton University, 1972; Ph.D., 1976. Assistant Professor, Caltech, 1977–83; Associate Professor, 1983–89; Professor,

Shelley M. Bennett, Ph.D., Lecturer in Art History B.A., University of California (Riverside), 1969; M.A., University of California (Los Angeles), 1975; Ph.D., 1977. Caltech, 1986–2011.

Andrew J. Benson, Ph.D., Senior Research Fellow in Theoretical Cosmology M.Phys., University of Leicester, 1997; Ph.D., University of Durham, 2000. Caltech, 2006–12.

John Edward Bercaw, Ph.D., Centennial Professor of Chemistry
B.S., North Carolina State University, 1967;
Ph.D., University of Michigan, 1971.
Arthur Amos Noyes Research Fellow,
Caltech, 1972–74; Assistant Professor,
1974–77; Associate Professor, 1977–79;
Professor, 1979–93; Shell Distinguished
Professor, 1985–90; Centennial Professor,
1993–. Executive Officer for Chemistry,
1999–2002.

Marcus C. Berliant, Ph.D., Visiting Associate in Economics
B.A., Cornell University, 1977; M.S.,
University of California, 1981; Ph.D., 1982.
Professor, 1994— Caltech, 2009–10.

Helen Maria Bermudez, B.S., Lecturer in Biology

B.S., Caltech, 2009. Caltech, 2010.

Emanuele Berti, Ph.D., Visiting Associate in Physics Ph.D., University of Rome, 2002. Caltech, 2010–11.

Kaushik Bhattacharya, Ph.D., Hovell N. Tyson, Sr., Professor of Mechanics and Professor of Materials Science; Executive Officer for Mechanical and Civil Engineering
B.Tech., Indian Institute of Technology, 1986; Ph.D., University of Minnesota, 1991. Assistant Professor of Applied Mechanics, Caltech, 1993–97; Assistant Professor of Applied Mechanics and Mechanical Engineering, 1997–99; Associate Professor, 1999–2000; Professor of Applied Mechanics and Mechanical Engineering, 2000–02; Professor of Applied Mechanics

Mechanics and Materials Science, 2003–2010; Tyson, Sr., Professor, 2010–. Executive Officer, 2007–.

Kathryn Bikle, M.A., Lecturer in Chemistry; Lecturer in Geology B.A., University of California (Santa Cruz), 1981; M.A., University of California, 1984. Lecturer in Chemistry, Caltech, 2000–10; Lecturer in Geology, 2000–10.

Igor A. Bilenko, Ph.D., Visiting Associate in Physics
Ph.D., Moscow State University, 1991.
Associate Professor, 1999–. Caltech, 2005–10.

Delores M. Bing, M.M., Lecturer in Chamber Music; Coordinator of the Performing and Creative Arts Faculty and Program B.M., Drake University, 1970; M.M., University of Southern California, 1972. Lecturer in Chamber Music, Caltech, 1999–2007. Lecturer, Coordinator, 2007–.

Richard J. Bing, M.D., M.D.h.c., D.h.c., Visiting Associate in Chemistry
M.D., University of Munich, 1934; M.D., University of Bern, 1935; M.D.h.c., University of Bern, 1935; M.D.h.c., University of Disseldorf; D.h.c., University of Bologna. Professor of Medicine, University of Southern California, 1969–; Director, Cardiology and Intramural Medicine, Huntington Memorial Hospital, 1969–. Research Associate in Engineering Science, Caltech, 1970–72; Visiting Associate in Biomedical Engineering, 1972–78; Visiting Associate in Chemistry and Chemical Engineering, 1978–83; Visiting Associate in Chemistry, 1984–2012.

William W. Bing, M.M., Lecturer in Concert Band and Jazz Band B.M., University of Michigan, 1965; M.M., University of Southern California, 1971. Caltech, 2000–.

Elina Britt Birmingham, Ph.D., Visiting Associate in Psychology B.S., University of British Columbia, 2002; M.A., University of Toronto, 2003; Ph.D., University of British Columbia, 2008. Caltech, 2009–10.

Pamela Bjorkman, Ph.D., Max Delbrück Professor of Biology; Investigator, Howard Hugbes Medical Institute
B.A., University of Oregon, 1978; Ph.D., Harvard University, 1984. Assistant Professor, Caltech, 1988–95; Associate Professor, 1995–98; Professor, 1998–2004; Delbrück Professor, 2004–. Assistant Investigator, 1989–95; Associate Investigator, 1995–98; Investigator, 1998–2000; 2005–; Full Investigator, 2000–05. Executive Officer for Biology, 2000–06.

Eric D. Black, Ph.D., Lecturer in Physics B.S., University of Tennessee, 1991; M.S., University of Colorado, 1994; Ph.D., 1996. Caltech, 2001–10.

Andrew W. Blain, Ph.D., Assistant Professor of Astronomy
B.S., University of Cambridge, 1990; M.S.,

1991; Ph.D., 1995. Caltech, 2001–10.

Geoffrey A. Blake, Ph.D., Professor of Cosmochemistry and Planetary Sciences and Professor of Chemistry; Master of Student Houses

Houses
B.S., Duke University, 1981; Ph.D.,
Caltech, 1986. Assistant Professor of
Cosmochemistry, 1987–93; Associate
Professor of Cosmochemistry and Planetary
Sciences, 1993–97; Professor, 1997–99;
Professor of Cosmochemistry and Planetary
Sciences and Professor of Chemistry, 1999–.
Deputy Director, Owens Valley Radio
Observatory, 2000–06. Master of Student
Houses, 2009–.

Roger David Blandford, Ph.D., Visiting Associate in Physics

B.A., University of Cambridge (Magdalene College), 1970; Ph.D., 1974. Director, Kavli Institute, Stanford University, 2004—. Assistant Professor, Caltech, 1976–79; Professor, 1979–89; Tolman Professor, 1989–2004; Visiting Associate, 2004–10. Executive Officer for Astronomy, 1992–95.

Guillaume Blanquart, Ph.D., Assistant Professor of Mechanical Engineering B.S., M.S., École Polytechnique, 2002; M.S., Stanford University, 2004; Ph.D., 2008. Caltech, 2009–.

James J. Bock, Ph.D., Senior Faculty Associate in Physics B.S., Duke University, 1987; M.A., University of California, 1990; Ph.D., 1990. Research Scientist, Jet Propulsion Laboratory, 1994—Visiting Associate, Caltech, 1994—2008; Senior Faculty Associate, 2008—

Marc W. Bockrath, Ph.D., Visiting Associate in Applied Physics
B.S., Massachusetts Institute of Technology, 1993; Ph.D., University of California, 1999. Visiting Associate, Caltech, 2002; 2009; Assistant Professor, 2002–2009.

Felix Hans Boehm, Ph.D., William L. Valentine Professor of Physics, Emeritus Dipl., Federal Institute of Technology (Zurich), 1948; Ph.D., 1951. Research Fellow, Caltech, 1953–55; Senior Research Fellow, 1955–58; Assistant Professor, 1958–59; Associate Professor, 1959–61; Professor, 1961–85; Valentine Professor, 1985–95; Valentine Professor Emeritus, 1995–.

Dan Bogart, Ph.D., Visiting Associate in Economics

B.A., University of Minnesota, 1998; M.A., University of California (Los Angeles), 2000; Ph.D., 2003. Associate Professor, University of California (Irvine), 2010. Caltech, 2010.

Hamid Bolouri, Ph.D., Visiting Associate in Biology
B.S., Brunel University, 1984; M.S., 1985;
Ph.D. 1990, Guest Faculty, Institute for

B.S., Brunel University, 1984; M.S., 1985; Ph.D., 1990. Guest Faculty, Institute for Systems Biology, 2006–. Caltech, 1996–2010.

Mieke Boon, Ph.D., Visiting Associate in Philosophy
M.A., University of Technology (The

M.A., University of Technology (The Netherlands), 1997; Ph.D., Delft University of Technology, 1996. Associate Professor, University of Twente, 2001–. Caltech, 2009.

Kim Christian Border, Ph.D., Professor of Economics B.S., Caltech, 1974; Ph.D., University of

B.S., Caltech, 19/4; Ph.D., University of Minnesota, 1979. Assistant Professor, Caltech, 1979–83; Associate Professor, 1983–95; Professor, 1995–. Executive Officer for the Social Sciences, 1995–99.

Simona Bordoni, Ph.D., Assistant Professor of Environmental Science and Engineering Dipl., University of Rome Tor Vergata, 1996; M.Sc., University of California (Los Angeles), 2003; Ph.D., 2007. Moore Postdoctoral Fellow, Caltech, 2007; Assistant Professor, 2009–.

Alexei Borodin, Ph.D., Gordon M. Binder/Amgen Professor of Mathematics M.Sc., Moscow State University, 1997; M.S.E., University of Pennsylvania, 2001; Ph.D., 2001. Professor, Caltech, 2003–09. Binder/Amgen Professor, 2009–.

Peter L. Bossaerts, Ph.D., William D. Hacker Professor of Economics and Management and Professor of Finance Doctorandus, Universitaire Faculteiten Sint Ignatius (Belgium), 1982; Ph.D., University of California (Los Angeles), 1986. Assistant Professor of Finance, Caltech, 1990–94; Associate Professor, 1994–98; Professor, 1998–; Hacker Professor, 2003–. Executive Officer for the Social Sciences, 2002–05; Chair, Division of the Humanities and Social Sciences, 2006–07.

Blaise Bourdin, Ph.D., Visiting Associate in Mechanical Engineering M.S., University of Paris, 1995; Ph.D., 1998, Postdoctoral Scholar, Caltech, 2000–02; Visiting Associate, 2010.

David A. Boyd, Ph.D., Senior Research Fellow in Mechanical Engineering M.S., University of Alabama, 1990; Ph.D., University of Virginia, 1997. Visiting

Associate in Applied Physics, Caltech, 2001; Lecturer, 2007; 2008; 2009; Senior Research Fellow, 2009–.

Dane Andrew Boysen, Ph.D., Visiting Associate in Materials Science B.S., University of Washington, 1997; M.S., Caltech, 2001; Ph.D., 2004. Vice President, SuperProtonic, Inc., 2005.— Caltech, 2008–10.

Charles Mathias Bradford, Ph.D., Visiting Associate in Physics B.S., Stanford University, 1994; Ph.D., Cornell University, 2001. Research Scientist, Jet Propulsion Laboratory, 2003–. Caltech, 2004–10.

John F. Brady, Ph.D., Chevron Professor of Chemical Engineering and Professor of Mechanical Engineering B.S., University of Pennsylvania, 1975; M.S., Stanford University, 1977; Ph.D., 1981. Associate Professor, Caltech, 1985–89; Professor, 1990–99; Chevron Professor, 1999–; Professor of Mechanical Engineering, 2005– Executive Officer for Chemical Engineering, 1993–99.

Vladimir B. Braginsky, Ph.D., Visiting Associate in Physics M.S., Moscow University, 1954; Ph.D., 1959. Professor, Moscow State University, 1986.– Sherman Fairchild Distinguished Scholar, Caltech, 1990–91; Visiting Associate, 1994–2013.

Fred J. Brechtel, Ph.D., Visiting Associate in Environmental Science and Engineering B.S., University of California, 1987; M.S., 1992; Ph.D., Colorado State University, 1998. Research Scientist, Brechtel Manufacturing, Inc., 2002–. Caltech, 2002–10.

James B. Breckinridge, Ph.D., Visiting Associate in Aeronautics
B.Sc., Case Institute of Technology, 1961;
M.Sc., University of Arizona, 1970; Ph.D.,
1976. Lecturer in Applied Physics, Caltech,
1982; 1984–1991; 1993–96; 1998; Lecturer in Aeronautics, 2007; 2008; 2009; Visiting
Associate, 2009–13.

Louis Breger, Ph.D., Professor of Psychoanalytic Studies, Emeritus B.A., University of California (Los Angeles), 1957; M.A., Ohio State University, 1959; Ph.D., 1961. Visiting Associate Professor of Psychology, Caltech, 1970–71; Associate Professor, 1971–80; Associate Professor of Psychology and the Humanities, 1980–83; Professor of Psychoanalytic Studies, 1983–94; Professor Emeritus, 1994–.

Christopher E. Brennen, D.Phil., Richard L. and Dorothy M. Hayman Professor of Mechanical Engineering, Emeritus B.A., University of Oxford, 1963; M.A., D.Phil., 1966. Research Fellow, Caltech, 1969–72; Senior Research Fellow, 1972–75; Research Associate, 1975–76; Associate Professor, 1976–82; Professor, 1982–2005; Hayman Professor 2005–10; Hayman Professor Emeritus, 2010–. Master of Student Houses, 1983–87; Dean of Students, 1988–92; Executive Officer for Mechanical Engineering, 1993–97; Vice President for Student Affairs, 1997–2002.

John Brewer, Ph.D., Eli and Edye Broad Professor of Humanities and Social Sciences and Professor of History and Literature B.A., University of Cambridge, 1968; M.A., 1972; Ph.D., 1973. Moore Distinguished Scholar, Caltech, 2001; Professor, 2002–; Broad Professor, 2003–.

William Bruce Bridges, Ph.D., Carl F Braun Professor of Engineering, Emeritus B.S., University of California, 1956; M.S., 1957; Ph.D., 1962. Sherman Fairchild Distinguished Scholar, Caltech, 1974–75; Professor of Electrical Engineering and Applied Physics, 1977–83; Braun Professor, 1983–2002; Braun Professor Emeritus, 2002.– Executive Officer for Electrical Engineering, 1978–81.

Roy J. Britten, Ph.D., Distinguished Carnegie Senior Research Associate in Biology, Emeritus
B.S., University of Virginia, 1940; Ph.D., Princeton University, 1951. Visiting
Associate, Caltech, 1971–73; Senior
Research Associate, 1973–81; Distinguished
Carnegie Senior Research Associate, 1981–99; Carnegie Senior Research
Associate Emeritus, 1999–.

Charles Jacob Brokaw, Ph.D., Professor of Biology, Emeritus
B.S., Caltech, 1955; Ph.D., University of
Cambridge, 1958. Visiting Assistant
Professor, Caltech, 1960; Assistant
Professor, 1961–63; Associate Professor,
1963–68; Professor, 1968–2000; Professor
Emeritus, 2000–. Executive Officer for
Biology, 1976–80; 1985–89; Associate
Chairman of the Division of Biology,
1980–85.

Marianne Bronner-Fraser, Ph.D., Albert Billings Ruddock Professor of Biology Sc.B., Brown University, 1975; Ph.D., Johns Hopkins University, 1979. Professor, Caltech, 1996–2000; Ruddock Professor, 2000–.

Norman Herrick Brooks, Ph.D., James Irvine Professor of Environmental and Civil Engineering, Emeritus
A.B., Harvard College, 1949; M.S., Harvard University, 1950; Ph.D., Caltech, 1954.
Instructor in Civil Engineering, 1953–54;
Assistant Professor, 1954–58; Associate
Professor, 1958–62; Professor, 1962–70;

Professor of Environmental Science and Civil Engineering, 1970–76; Irvine Professor of Environmental Engineering Science, 1976–77; Irvine Professor of Environmental and Civil Engineering, 1977–95; Irvine Professor Emeritus, 1995–Academic Officer for Environmental Engineering Science, 1972–74; Director, Environmental Quality Laboratory, 1974–93; Executive Officer for Environmental Engineering Science, 1985–93.

Brian Brophy, M.F.A., Lecturer in Theater—Performing and Creative Arts B.S., Montana State University, 1981; M.A., California State University (Los Angeles), 1999; M.F.A., University of California (Riverside), 2006. Caltech, 2009–12.

Michael E. Brown, Ph.D., Richard and Barbara Rosenberg Professor and Professor of Planetary Astronomy A.B., Princeton University, 1987; M.A., University of California, 1990; Ph.D., 1994. Visiting Associate, Caltech, 1995; Assistant Professor, 1997–2002; Associate Professor, 2002–04; Professor, 2005–08; Rosenberg Professor, 2008–.

Warren C. Brown, Ph.D., Associate Professor of History B.S., Tufts University, 1985; M.A., University of Cincinnati, 1993; Ph.D., University of California (Los Angeles), 1997. Assistant Professor, Caltech, 1997–2003; Associate Professor, 2003–.

Lee F. Browne, M.S., Lecturer in Education, Emeritus

B.S., West Virginia State College, 1944; M.S., New York University, 1950. Director of Secondary School Relations, Caltech, 1969–77; Director of Secondary School Relations and Special Student Programs, 1977–90; Lecturer, 1971–90; Lecturer Emeritus, 1990–.

Jehoshua Bruck, Ph.D., Gordon and Betty Moore Professor of Computation and Neural Systems and Electrical Engineering B.Sc., Technion-Israel Institute of Technology, 1982; M.Sc., 1985; Ph.D., Stanford University, 1989. Associate Professor, Caltech, 1994–98; Professor, 1998–2001; Moore Professor, 2001– Director, Information Science and Technology, 2003–05.

Todd A. Brun, Ph.D., Visiting Associate in Theoretical Physics Ph.D., Caltech, 1994. Professor, University of Southern California, 2003—. Visiting

Associate, Caltech, 2007-11.

Oscar P. Bruno, Ph.D., Professor of Applied and Computational Mathematics Lic., University of Buenos Aires, 1982; Ph.D., New York University (Courant Institute of Mathematical Sciences), 1989. Associate Professor, Caltech, 1995–98; Professor, 1998–. Executive Officer for Applied Mathematics, 1998–2000.

Bruce S. Brunschwig, Ph.D., Lecturer in Chemistry

B.A., University of Rochester, 1966; Ph.D., Polytechnic University, 1972. Lecturer in Chemistry, Caltech, 2009–10.

Jed Z. Buchwald, Ph.D., Doris and Hemy Dreyfuss Professor of History B.A., Princeton University, 1971; M.A., Harvard University, 1973; Ph.D., 1974. Dreyfuss Professor, Caltech, 2001–.

Alessandra Buonanno, Ph.D., Visiting Associate in Physics Ph.D., University of Pisa, 1996. Associate Professor, University of Maryland, 2005—. Caltech, 2002–03; 2005–11.

Joel W. Burdick, Ph.D., Professor of Mechanical Engineering and Bioengineering B.S., Duke University, 1981; M.S., Stanford University, 1982; Ph.D., 1988. Assistant Professor, Caltech, 1988–94; Associate Professor, 1994–2000; Professor of Mechanical Engineering, 2000–02; Professor of Mechanical Engineering and Bioengineering, 2002–. Executive Officer for Bioengineering, 2006–07.

Donald Stacy Burnett, Ph.D., Professor of Nuclear Geochemistry, Emeritus B.S., University of Chicago, 1959; Ph.D., University of California, 1963. Research Fellow in Physics, Caltech, 1963–65; Assistant Professor of Nuclear Geochemistry, 1965–68; Associate Professor, 1968–75; Professor, 1975–2006; Professor Emeritus, 2006–. Academic Officer, Division of Geological and Planetary Sciences, 1979–87.

Gentian Buzi, Ph.D., Lecturer in Control and Dynamical Systems B.S., State University of New York, 2000; M.S., Caltech, 2004; Ph.D., 2009. Caltech, 2009–10.

Long Cai, Ph.D., Assistant Professor of Chemistry
B.A., Harvard University, 2001; Ph.D., 2006. Caltech, 2009–.

Douglas W. Caldwell, Ph.D., Lecturer in Applied Physics B.S., University of California (Los Angeles), 1986; M.S., 1986; Ph.D., 1998. Caltech, 2010.

Robert R. Caldwell, Ph.D., Visiting Associate in Physics A.B., Washington University (St. Louis), 1987; M.Sc., University of Wisconsin

50.

(Madison), 1989; Ph.D., University of Wisconsin (Milwaukee), 1992. Associate Professor, Dartmouth College, 2005–. Caltech, 2003–04; 2007; 2008; 2010.

Danny C. Calegari, Ph.D., The Richard Merkin Distinguished Professor of Mathematics B.A., University of Melbourne, 1994; Ph.D., University of California, 2000. Assistant Professor, Caltech, 2002–03; Associate Professor, 2003–06; Professor, 2007; Merkin Distinguished Professor, 2007–

Colin F. Camerer, Ph.D., Robert Kirby Professor of Behavioral Economics
B.A., Johns Hopkins University, 1976;
M.B.A., University of Chicago, 1979;
Ph.D., 1981. Visiting Associate, Caltech, 1993; Rea A. and Lela G. Axline Professor of Business Economics, 1994—2008; Kirby Professor of Behavioral Finance and Economics, 2008; Kirby Professor, 2008.

Robert Andrew Cameron, Ph.D., Senior Research Associate in Biology B.A., San José State College, 1968; Ph.D., University of California (Santa Cruz), 1975. Visiting Associate, Caltech, 1984–85; Senior Research Fellow, 1985–89; Senior Research Associate, 1989–.

Judith Lynn Campbell, Ph.D., Professor of Chemistry and Biology B.A., Wellesley College, 1965; Ph.D., Harvard University, 1974. Assistant Professor of Chemistry, Caltech, 1977–83; Associate Professor, 1983–85; Associate Professor of Chemistry and Biology, 1985–89; Professor, 1989–.

Emmanuel J. D. Candes, Ph.D., Ronald and Maxine Linde Professor of Applied and Computational Mathematics
Dipl., École Polytechnique, 1993; D.E.A.,
University of Paris IV and University of
Paris IX, 1994; Ph.D., Stanford University,
1998. Assistant Professor of Applied
Mathematics, Caltech, 2000; Assistant
Professor of Applied and Computational
Mathematics, 2000–03; Associate Professor,
2003–05; Professor, 2005–06, Linde
Professor, 2006–. Executive Officer for
Applied and Computational Mathematics,
2009.

Holly Carlisle, Ph.D., Senior Research Fellow in Biology B.S., University of California (Los Angeles), 1996; Ph.D., 2002. Caltech, 2009–10.

Carol Carmichael, Ph.D., Faculty Associate in Engineering and Applied Science
B.S., University of Wisconsin (Madison),
1985; M.S., Georgia Institute of
Technology, 1988; Ph.D., University of
Georgia, 2004. Caltech, 2006—.

John M. Carpenter, Ph.D., Senior Research Associate in Astronomy; Deputy Director, Owens Valley Radio Observatory B.S., University of Wisconsin (Madison), 1988; Ph.D., University of Massachusetts (Amherst), 1994. Senior Research Fellow, Caltech, 2002–05; Senior Research Associate, 2005–. Deputy Director, 2006–.

Sean M. Carroll, Ph.D., Senior Research Associate in Physics B.S., Villanova University, 1988; Ph.D., Harvard University, 1993. Caltech, 2006—.

Stijn Cassenaer, Ph.D., Broad Senior Research Fellow in Brain Circuitry B.S., University of California (San Diego), 1999; Ph.D., Caltech, 2007. Senior Research Fellow, 2009–.

Christopher P. Chambers, Ph.D., Associate Professor of Economics B.S., University of Maryland, 1998; M.A., University of Rochester, 2001; Ph.D., 2003. Assistant Professor, Caltech, 2003–06; Associate Professor, 2006–10.

Jean-Lou Chameau, Ph.D., President; Professor of Civil Engineering, Environmental Science and Engineering, and Mechanical Engineering (See page 591.)

David C. Chan, M.D., Ph.D., Associate Professor of Biology, Investiagor, Howard Hugbes Medical Institute A.B., Harvard College, 1988; M.D., Harvard Medical School, 1996; Ph.D., 1996. Assistant Professor, Caltech, 2000–06, Associate Professor, 2006–; Bren Scholar, 2000–06; Associate Investigator, 2008–.

Sunney Ignatius Chan, Ph.D., George

Grant Hoag Professor of Biophysical Chemistry, Emeritus
B.S., University of California, 1957; Ph.D., 1961. Assistant Professor of Chemical Physics, Caltech, 1963–64; Associate Professor, 1964–68; Professor, 1968–76; Professor of Chemical Physics and Biophysical Chemistry, 1976–92; Hoag Professor, 1992–2001; Hoag Professor

Professor of Chemical Physics and Biophysical Chemistry, 1976–92; Hoag Professor, 1992–2001; Hoag Professor Emeritus, 2002–. Acting Executive Officer or Chemistry, 1977–78; Executive Officer, 1978–80; 1989–94; Master of Student Houses, 1980–83.

K. Mani Chandy, Ph.D., Simon Ramo Professor and Professor of Computer Science; Deputy Chair for Education
B. Tech., Indian Institute of Technology, 1965; M.S., Polytechnic Institute of Brooklyn, 1966; Ph.D., Massachusetts Institute of Technology, 1969. Sherman Fairchild Distinguished Scholar, Caltech, 1988; Visiting Professor, 1988–89; Professor, 1989–; Ramo Professor, 1997–Executive Officer for Computer Science, 1997–2000; Deputy Chair, 2009–.

Yoon Seok Chang, Ph.D., Visiting Associate in Computer Science M.S., Inha University, 1993; Ph.D., Imperial College of Sciences. Caltech, 2010–11.

Goutam Chattopadhyay, Ph.D., Visiting Associate in Physics Ph.D., Caltech, 1999. Senior Member of the Engineering Staff, Jet Propulsion Laboratory, 2005—. Caltech, 2006–11.

Kuo-Ching Chen, Ph.D., Visiting Associate in Mechanical Engineering B.S., National Taiwan University, 1987; Ph.D., 1993. Caltech, 2010.

Pin Chen, Ph.D., Visiting Associate in Chemistry
B.S., University of California, 1991; Ph.D., Caltech, 1999. Scientist, Jet Propulsion Laboratory, 2000—. Visiting Associate, Caltech, 2006–07; 2008–11.

Qiang Chen, M.S., Visiting Associate in Electrical Engineering M.S., Wuhan University of Technology, 1984; M.S., 1987; Ph.D., Kagoshima University, 1999. Associate Professor, Kochi National College of Technology, 2004.. Caltech, 2009–10.

Tirong Chen, M.S., Visiting Associate in Applied Physics
M.S., Wuhan University (China), 1962. Senior Scientist, Archcom Technology Inc., 2001–. Caltech, 1980–82; 1985–2010.

Yanbei Chen, Ph.D., Associate Professor of Physics B.S., Peking University, 1999; Ph.D., Caltech, 2003. Visiting Associate, 2005–07; Assistant Professor, 2007–10; Associate Professor, 2010–.

Calum Ronald Inneas Chisholm, Ph.D., Visiting Associate in Materials Science B.S., Yale University, 1995; M.S., Caltech, 2000; Ph.D., 2003. Vice President, SuperProtonic, Inc., 2005–. Caltech, 2008–10.

Anne Chomyn, Ph.D., Senior Research Associate in Biology, Emeritus B.S., Drexel University, 1972; Ph.D., Caltech, 1978. Research Fellow, 1978–82; Senior Research Fellow, 1982–87; Senior Research Associate, 1989–2007; Senior Research Associate Emeritus, 2007–; Lecturer in Biology, 2007.

Kwang Ho Choo, Ph.D., Visiting Associate in Environmental Science and Engineering B.S., Seoul National University, 1990; M.S., 1992; Ph.D., 1996. Noh President, Kyungpook National University, 2004—. Caltech, 2008–09. Robert Frederick Christy, Ph.D., Institute Professor of Theoretical Physics, Emeritus B.A., University of British Columbia, 1935; Ph.D., University of California, 1941. Associate Professor of Physics, Caltech, 1946–50; Professor of Theoretical Physics, 1950–83; Institute Professor, 1983–85; Institute Professor Emeritus, 1986–. Executive Officer for Physics, 1968–70; Vice President and Provost, 1970–80; Acting President, 1977–78.

Ara Chutjian, Ph.D., Visiting Associate in Chemistry
B.S., Brown University, 1962; Ph.D.,
University of California, 1966. Senior
Research Scientist, Jet Propulsion
Laboratory, 1990. Caltech, 1998–2011.

Katie E. Clark, D.Phil., Abmanson Postdoctoral Instructor in History B.A., Tulane University (Newcomb College), 2005; M.St., University of Oxford, 2006; D.Phil., 2009. Caltech, 2009–.

Francis H. Clauser, Ph.D., Clark Blanchard Millikan Professor of Engineering, Emeritus B.S., Caltech, 1934; M.S., 1935; Ph.D., 1937. Clark Blanchard Millikan Professor of Engineering, 1969–80; Millikan Professor Emeritus, 1980—. Chairman, Division of Engineering and Applied Science, 1969–74.

Robert Webster Clayton, Ph.D., Professor of Geophysics; Divisional Academic Officer for Geological and Planetary Sciences
B.A.Sc., University of Toronto, 1973; M.Sc., University of British Columbia, 1976; Ph.D., Stanford University, 1981. Assistant Professor of Exploration Geophysics, Caltech, 1981–85; Associate Professor, 1985–89; Professor of Geophysics, 1989–. Executive Officer for Geophysics, 1987–94; Acting Director, Seismological Laboratory, 1989; 2008–09; Deputy Director, 1989–90; Academic Officer, 2008–.

Kieran A. Cleary, Ph.D., Senior Research Fellow in Astronomy M.Sc., University College Dublin, 1993; Ph.D., University of Manchester, 2003. Caltech, 2007–10.

William M. Clemons Jr., Ph.D., Assistant Professor of Biochemistry
B.S., Virginia Polytechnic Institute and State University, 1995; Ph.D., University of Utah, 2000. Assistant Professor of Chemistry, Caltech, 2005–07; Assistant Professor of Biochemistry, 2007–.

Donald S. Cohen, Ph.D., Charles Lee Powell Professor of Applied Mathematics, Emeritus Sc.B., Brown University, 1956; M.S., Cornell University, 1959; Ph.D., New York University (Courant Institute), 1962. Assistant Professor of Mathematics, Caltech, 1965–67; Associate Professor of Applied Mathematics, 1967–71; Professor, 1971–98; Powell Professor, 1998–2003; Powell Professor Emeritus, 2003–. Executive Officer for Applied Mathematics, 1988–93; Chairman, Division of Engineering and Applied Science, 1990.

Judith G. Cohen, Ph.D., Kate Van Nuys Page Professor of Astronomy B.A., Radcliffe College, 1967; M.S., Caltech, 1969; Ph.D., 1971; B.S., University of Arizona, 1978. Associate Professor, Caltech, 1979–88; Professor, 1988–2005; Page Professor, 2005– Executive Officer for Astronomy, 1995–96.

Marshall Harris Cohen, Ph.D., Professor of Astronomy, Emeritus
B.E.E., Ohio State University, 1948; M.S., 1949; Ph.D., 1952. Visiting Associate
Professor, Caltech, 1965; Professor of Radio Astronomy, 1968–90; Professor of Astronomy, 1990–95; Professor Emeritus, 1995–. Executive Officer for Astronomy, 1981–85.

Donald Earl Coles, Ph.D., Professor of Aeronautics, Emeritus B.S., University of Minnesota, 1947; M.S., Caltech, 1948; Ph.D., 1953. Research Fellow, 1953–55; Senior Research Fellow, 1955–56; Assistant Professor, 1956–59; Associate Professor, 1959–64; Professor, 1964–96; Professor Emeritus, 1996–.

Andres Collazo, Ph.D., Visiting Associate in Biology
B.S., Cornell University, 1985; Ph.D.,
University of California, 1990. Scientist II,
Section Chief, House Ear Institute, 2000–.
Research Fellow, Caltech, 1991–94; Senior
Research Fellow, 1994–96; Visiting
Associate, 2005–10.

Curtis L. Collins, Ph.D., Lecturer in Mechanical Engineering B.S., University of California (San Diego), 1990; M.S., University of California (Irvine), 1993; Ph.D., 1997. Instructor, Caltech, 1997–98; Visiting Associate, 2002–03; Lecturer, 2003–10.

Michael Collins, Ph.D., Visiting Associate in Biology

M.S., University of Illinois (Urbana-Champaign); M.S.P., University of Missouri (Columbia), 1981; Ph.D., 1982. Professor, University of California (Los Angeles), 2002—. Caltech, 2008–11.

Timothy E. Colonius, Ph.D., Professor of Mechanical Engineering B.S., University of Michigan (Ann Arbor), 1987; M.S., Stanford University, 1988; Ph.D., 1994. Assistant Professor, Caltech, 1994–2000; Associate Professor, 2000–05; Professor, 2005–. Agustin J. Colussi, Ph.D., Senior Research Associate in Environmental Science and Engineering Lic., University of Buenos Aires, 1968; Ph.D., 1972. Visiting Associate, Caltech, 1997–98; Senior Research Fellow, 1998–2004; Senior Research Associate, 2004—.

R. Dale Conner, Ph.D., Visiting Associate in Materials Science
B.S., California State Polytechnic
University, 1989; M.S., Caltech, 1994;
Ph.D., 1998. Assistant Professor, California
State University (Northridge), 2006—
Lecturer, Caltech, 2002—04; Senior
Research Fellow, 2003—06; Visiting
Associate, 2001—02; 2006—10.

Matthew Makonnen Cook, Ph.D., Visiting Associate in Computation and Neural Systems
Ph.D., Caltech, 2005. Assistant Professor, Swiss Federal Institute of Technology, 2006—. Caltech, 2006—11.

Asantha Cooray, Ph.D., Visiting Associate in Physics
B.S., Massachusetts Institute of Technology, 1997; M.S., 1997; M.S., University of Chicago, 1998; Ph.D., 2001. Assistant Professor, University of California (Irvine), 2005—Sherman Fairchild Senior Research Fellow, Caltech, 2001–05; Visiting Associate, 2005–10.

Bradford Cornell, Ph.D., Visiting Professor of Finance
A.B., Stanford University, 1970; M.S., 1974; Ph.D., 1975. Professor, Anderson School of Management, University of California (Los Angeles); Director, Bank of America Research Center, University of California (Los Angeles), 1987—. Visiting Associate Professor, Caltech, 1984; Visiting Professor, 2006–07; 2008; 2009; 2010.

Noel Robert Corngold, Ph.D., Professor of Applied Physics, Emeritus A.B., Columbia College, 1949; A.M., Harvard University, 1950; Ph.D., 1954. Professor of Applied Science, Caltech, 1966–74; Professor of Applied Physics, 1974–2002; Professor Emeritus, 2002–

Eugene Woodville Cowan, Ph.D., Professor of Physics, Emeritus B.S., University of Missouri, 1941; S.M., Massachusetts Institute of Technology, 1943; Ph.D., Caltech, 1948. Research Fellow, 1948–50; Assistant Professor, 1950–54; Associate Professor, 1954–61; Professor, 1961–86; Professor Emeritus, 1986–.

Fiona Cowie, Ph.D., Associate Professor of Philosophy B.A., University of Sydney, 1987; M.A.,

Princeton University, 1991; Ph.D., 1993. Instructor, Caltech, 1992–93; Assistant Professor, 1993–98; Associate Professor, 1998–.

Brendan Patrick Crill, Ph.D., Visiting Associate in Physics

Ph.D., Caltech, 2001. Senior Technical Staff, Jet Propulsion Laboratory, 2008–. Visiting Associate, Caltech, 2008–11.

Bruno Crosignani, Lib.Doc., Visiting Professor of Applied Physics Laurea, University of Rome, 1962; Lib.Doc., 1971. Professor, University of Aquila, 1987—. Research Fellow, Caltech, 1970–71; Visiting Associate in Electrical Engineering, 1976–78; 1980; 1982–84; Visiting Associate in Applied Physics, 1985–87; 1988–2004; Visiting Professor, 2001–10.

Michael Clifford Cross, Ph.D., Professor of Theoretical Physics B.A., University of Cambridge, 1972; Ph.D., 1975. Caltech, 1984–.

Darren Greg Crowdy, Ph.D., Visiting Associate in Applied and Computational Mathematics and Aeronautics B.S., University of Cambridge, 1992; Ph.D., Caltech, 1998. Chair, Imperial College London, 2006–. Visiting Associate, Caltech, 2009.

Kelle Lin Cruz, Ph.D., Visiting Associate in Astronomy
B.A., University of Pennsylvania, 2000; Ph.D., 2004. Caltech, 2010.

Fred E. C. Culick, Ph.D., Richard L. and Dorothy M. Hayman Professor of Mechanical Engineering and Professor of Jet Propulsion, Emeritus

S.B., S.M., Massachusetts Institute of Technology, 1957; Ph.D., 1961. Research Fellow in Jet Propulsion, Caltech, 1961–63; Assistant Professor, 1963–66; Associate Professor, 1966–71; Professor, 1971–78; Professor of Applied Physics and Jet Propulsion, 1978–88; Professor of Mechanical Engineering and Jet Propulsion, 1988–97; Hayman Professor, 1997–2004; Professor of Jet Propulsion, 1997–2004; Hayman Professor and Professor, Emeritus, 2004–.

Curt J. Cutler, Ph.D., Senior Faculty Associate in Physics B.S., Yale University, 1983; Ph.D., 1989. Visiting Associate, Caltech, 1999–2006; Senior Faculty Associate, 2006–

Jaksa Cvitanic, Ph.D., Professor of Mathematical Finance B.A., University of Zagreb (Croatia), 1985; M.S., 1988; M.Phil., Columbia University, 1991; Ph.D., 1992. Caltech, 2005–. John M. D'Auria, M.A., Coach A.A., Pasadena City College, 1972; B.A., California State University, 1974; M.A., Azusa Pacific University, 1988. Caltech, 1989...

John O. Dabiri, Ph.D., Associate Professor of Aeronautics and Bioengineering B.S., Princeton University, 2001; M.S., Caltech, 2003; Ph.D., 2005. Assistant Professor, 2005–2009; Associate Professor, 2009–

Christine M. Daley, Ph.D., Lecturer in Writing B.A., Boston College, 1991; M.A., Loyola

B.A., Boston College, 1991; M.A., Loyola Marymount University, 1997; Ph.D., City University of New York Graduate School, 2006. Caltech, 2007–10.

Nathan F. Dalleska, Ph.D., Lecturer in Chemistry

M.S., University of Minnesota, 1988; Ph.D., University of Utah, 1993. Lecturer in Environmental Science and Engineering, Caltech, 2003–06; Lecturer in Chemistry, 2008; 2009.

Chiara Daraio, Ph.D., Assistant Professor of Aeronautics and Applied Physics B.S., M.S., University of Ancona (Italy), 2001; M.S., University of California (Sand Diego), 2003; Ph.D., 2006. Caltech, 2006—.

Eric Harris Davidson, Ph.D., Norman Chandler Professor of Cell Biology B.A., University of Pennsylvania, 1958; Ph.D., Rockefeller University, 1963. Visiting Assistant Professor of Biology, Caltech, 1970; Associate Professor, 1971–74; Professor, 1974–81; Chandler Professor, 1982–.

Gregory L. Davis, Ph.D., Lecturer in Aeronautics
B.S., University of Akron, 1982; M.S., 1982; Ph.D., Rice University, 1998. Caltech, 2006–10.

Lance Edwin Davis, Ph.D., Mary Stillman Harkness Professor of Social Science, Emeritus B.A., University of Washington, 1950; Ph.D., Johns Hopkins University, 1956. Professor of Economics, Caltech, 1968–80; Harkness Professor, 1980–2005; Harkness Professor Emeritus, 2005–. Executive Officer for the Social Sciences, 1982–85.

Mark E. Davis, Ph.D., Warren and Katharine Schlinger Professor of Chemical Engineering
B.S., University of Kentucky, 1977; M.S., 1978; Ph.D., 1981. Professor, Caltech, 1991–93; Schlinger Professor, 1993–. Executive Officer for Chemical Engineering, 1999–2004.

Peter K. Day, Ph.D., Visiting Associate in Physics

B.S., University of California, 1988; Ph.D., Caltech, 1993. Senior Engineer, Jet Propulsion Laboratory, 2003. Lecturer, Caltech, 1993; Research Fellow, 1993–94; Visiting Associate, 2005–10.

Charles de Bedts, Ph.D., Lecturer in French A.A., Pasadena City College, 1980; B.A., University of California (Los Angeles), 1982; M.A., 1985; Ph.D., 1994. Caltech, 1996–99; 2001–10.

Maria Elena de Bellard, Ph.D., Visiting Associate in Biology

B.S., University Simon Bolivar (Venezuela), 1985; Ph.D., City University of New York, 1998. Assistant Professor, Cal State Northridge, 2005—Senior Research Fellow, Caltech, 2004—05; 2010—11.

Luigi De Nardo, Ph.D., Visiting Associate in Aeronautics M.S., Politecnico di Milano, 2003; Ph.D., 2007. Assistant Professor, 2007. Caltech, 2008–11.

Richard Albert Dean, Ph.D., Professor of Mathematics, Emeritus B.S., Caltech, 1945; A.B., Denison University, 1947; M.S., Ohio State University, 1948; Ph.D., 1953. Harry Bateman Research Fellow, Caltech, 1954–55; Assistant Professor, 1955–59; Associate Professor, 1959–66; Professor, 1966–86; Professor Emeritus, 1987–.

Marios Demetri Demetriou, Ph.D., Senior Research Fellow in Materials Science B.S., University of Arizona, 1995; M.S., University of California (Los Angeles), 1997; Ph.D., 2001. Caltech, 2007—.

Tracy K. Dennison, Ph.D., Associate Professor of Social Science History B.A., Bucknell University, 1992; M.Phil., University of Oxford, 1999; Ph.D., University of Cambridge, 2004. Assistant Professor of History, Caltech, 2006–2009; Associate Professor of Social Science History, 2009–.

Peter B. Dervan, Ph.D., D.Sc.h.c., Bren Professor of Chemistry

B.S., Boston College, 1967; Ph.D., Yale University, 1972; D.Sc.h.c., Boston College. Assistant Professor, Caltech, 1973–79; Associate Professor, 1979–82; Professor, 1982–88; Bren Professor, 1988–. Chair, Division of Chemistry and Chemical Engineering, 1994–99.

Mathieu Desbrun, Ph.D., Professor of Computing and Mathematical Sciences; Director of Computing and Mathematical Sciences, and Information Science and Technology M.Eng., National Engineering School of Computer Science and Applied Mathematics (Grenoble), 1994; M.S., University of Grenoble, 1994; Ph.D., National Polytechnic Institute of Grenoble, 1997. Visiting Associate, Caltech, 2000–04; Associate Professor, 2004–09; Professor, 2009–. Director of Computing and Mathematical Sciences, 2009–; Director of Information Science and Technology, 2009–.

Stanley Deser, Ph.D., Visiting Associate in Theoretical Physics M.A., Harvard University, 1950; Ph.D., 1953. Ancell Professor, Brandeis University, 1980.—Caltech, 2005–10.

Raymond Deshaies, Ph.D., Professor of Biology; Investigator, Howard Hugbes Medical Institute; Executive Officer for Molecular Biology B.S., Cornell University, 1983; Ph.D., University of California, 1988. Assistant Professor, Caltech, 1994–1999; Associate Professor, 2000–05; Professor, 2005–. Assistant Investigator, Howard Hughes Medical Institute, 2000–05; Investigator, 2005–; Executive Officer, 2006–10.

Emmanuelle Despagnet, Ph.D., Visiting Associate in Chemistry
B.S., École Normale Supérieure, 1998;
M.S., Paul Sabatier, 1999; Ph.D., 2002.
Caltech, 2010.

Benjamin E. Deverman, Ph.D., Senior Research Fellow in Biology B.S., University of Detroit Mercy, 1996; Ph.D., Washington University, 2002. Caltech, 2009–.

T. Gregory Dewey, Ph.D., Visiting Associate in Applied Physics B.S., University of Rochester, 1974; M.S., 1977; Ph.D., Carnegie-Mellon University, 1979. Finnegan Professor, Keck Graduate Institute of Applied Life Sciences, 1999– Caltech, 2009–10.

Mamadou S. Diallo, Ph.D., Visiting Associate in Environmental Science and Engineering B.S., École Nationale de l'Industrie Minérale, 1981; M.Sc., Colorado School of Mines, 1987; M.Sc., University of Michigan (Ann Arbor), 1993; Ph.D., 1995. Caltech,

2010-11.

Michael H. Dickinson, Ph.D., Esther M. and Abe M. Zarem Professor of Bioengineering Sc.B., Brown University, 1984; Ph.D., University of Washington, 1989. Visiting Associate, Caltech, 2001–02; Professor, 2002–03; Zarem Professor, 2003–.

William B. Dickson, Ph.D., Senior Research Fellow in Bioengineering B.A., University of Wisconsin (Madison), 1992; Ph.D., University of Glasgow, 1999. Caltech, 2007–.

Paul Emmanuel Dimotakis, Ph.D., John K. Northrop Professor of Aeronautics and Professor of Applied Physics; Chief Technologist, Jet Propulsion Laboratory
B.S., Caltech, 1968; M.S., 1969; Ph.D., 1973. Research Fellow, 1973–74, Research Fellow and Lecturer, 1974–75; Assistant Professor, 1975–81; Associate Professor, 1981–85; Professor, 1986–; Northrop Professor, 1995–. Chief Technologist, 2006–.

S. George Djorgovski, Ph.D., Professor of Astronomy

B.A., University of Belgrade, 1979; M.A., University of California, 1981; Ph.D., 1985. Assistant Professor, Caltech, 1987–90; Associate Professor, 1990–97; Professor, 1997–.

Clinton Dean Dodd, B.A., Coach B.A., Humboldt State University, 1978. Caltech, 1980–.

Olivier P. Doré, Ph.D., Visiting Associate in Theoretical Astrophysics Ph.D., Institute d'Astrophysique de Paris, 2001. Caltech, 2010–11.

Dennis A. Dougherty, Ph.D., George Grant Haag Professor of Chemistry B.S., M.S., Bucknell University, 1974; Ph.D., Princeton University, 1978. Assistant Professor, Caltech, 1979–85; Associate Professor, 1985–89; Professor, 1989–2001; Hoag Professor, 2002–. Executive Officer for Chemistry, 1994–99.

Kimberly Douglas, M.S., University Librarian

M.A., Freie Universität (Germany), 1976; M.S., Long Island University, 1977. Caltech, 2003–.

Charles D. Dowell, Ph.D., Visiting Associate in Physics; Lecturer in Physics B.S., Rice University, 1991; M.S., University of Chicago, 1992; Ph.D., 1997. Scientist, Jet Propulsion Laboratory, 2003–. Visiting Associate, Caltech, 2003–10; Lecturer, 2007; 2008; 2009; 2010.

John C. Doyle, Ph.D., John G Braun Professor of Control and Dynamical Systems, Electrical Engineering, and Bioengineering B.S., M.S., Massachusetts Institute of Technology, 1977; Ph.D., University of California, 1984. Visiting Assistant Professor of Electrical Engineering, Caltech, 1985; Visiting Associate Professor, 1986; Visiting Associate in Chemistry, 1986-87; Associate Professor of Electrical Engineering, 1987-91; Professor, 1991-2001; Professor of Control and Dynamical Systems, Electrical Engineering, and Bioengineering, 2002-04; Braun Professor, 2004–08; 2009–; Braun Professor Emeritus, 2008-2009.

Ronald William Prest Drever, Ph.D., Professor of Physics, Emeritus B.Sc., Glasgow University, 1953; Ph.D., 1958. Visiting Associate, Caltech, 1977; Professor, 1979–2002; Professor Emeritus, 2002–.

Noel Eduard Du Toit, Ph.D., Lecturer in Mechanical Engineering B.S., University of Stellenbosch, 2001; M.S., Massachusetts Institute of Technology, 2005; Ph.D., Caltech, 2009. Caltech, 2009–10.

Maurice Duits, M.Sc., Olga Taussky and John Todd Instructor in Mathematics M.Sc., Eindhoven University of Technology, 2004; Caltech, 2008–.

Robert V. Duncan, Ph.D., Visiting Associate in Physics
B.S., Massachusetts Institute of Technology, 1982; Ph.D., University of California (Santa Barbara), 1988. Associate Dean for Research and Professor of Physics, University of New Mexico, 2002–. Visiting Associate, Caltech, 1998–2004; 2005–10; Moore Distinguished Scholar, 2004–07.

William G. Dunphy, Ph.D., Grace C. Steele Professor of Biology A.B., Harvard College, 1980; Ph.D., Stanford University, 1985. Assistant Professor, Caltech, 1989–95; Associate Professor, 1995–2001; Professor, 2001–08; Steele Professor, 2008.— Assistant Investigator, Howard Hughes Medical Institute, 1994–98; Associate Investigator, 1998–2004.

Christopher Eagle, Ph.D., Instructor in English B.A., Villanova University, 1998; Ph.D., University of California, 2009. Caltech, 2009–10.

Bertrand Echenard, Ph.D., Lecturer in Physics Ph.D., Geneva University, 2005. Caltech, 2009.

Federico Echenique, Ph.D., Professor of Economics

M.A., University of the Republic (Uruguay), 1995; Ph.D., University of California, 2000. Instructor, Caltech, 2002–03; Assistant Professor, 2004; Associate Professor, 2004–10; Professor, 2010–.

Michelle Effros, Ph.D., Professor of Electrical Engineering B.S., Stanford University, 1989; M.S., 1990; Ph.D., 1994. Assistant Professor, Caltech, 1994–2000; Associate Professor, 2000–05; Professor, 2005–.

Gerald Eigen, Ph.D., Visiting Associate in Physics
Dipl., University of Freiburg (Germany),
1980; Ph.D., University of Munich, 1985.

Professor, University of Bergen (Norway), 1995— Research Fellow, Caltech, 1984—87; Senior Research Fellow, 1987—94; Lecturer, 1991; 1993; Visiting Associate, 1994—2010.

John M. Eiler, Ph.D., Robert P. Sharp Professor of Geology and Professor of Geochemistry

B.S., University of Iowa, 1989; M.S., University of Wisconsin (Madison), 1991; Ph.D., 1994. Research Fellow in Geochemistry, Caltech, 1994–97; Senior Research Fellow, 1997–98; Assistant Professor, 1998–2003; Associate Professor, 2003–06; Professor, 2006–; Sharp Professor, 2008–.

James P. Eisenstein, Ph.D., Frank J. Rosbek Professor of Physics and Applied Physics A.B., Oberlin College, 1974; Ph.D., University of California, 1980. Professor of Physics, Caltech, 1996–2004; Roshek Professor, 2004–05; Roshek Professor of Physics and Applied Physics, 2005–.

Charles Elachi, Ph.D., Vice President, Director of the Jet Propulsion Laboratory; Professor of Electrical Engineering and Planetary Science B.Sc., University of Grenoble, 1968; Dipl.Ing., National Polytechnic Institute (Grenoble), 1968; M.S., Caltech, 1969; Ph.D., 1971; M.B.A., University of Southern California, 1978. Research Fellow, Caltech, 1971–73; Lecturer in Electrical Engineering, 1982–88; Lecturer in Electrical Engineering, 1982–80; Professor, 2002– Vice President and Director, 2001–

Matthew P. Elgart, D.M.A., Lecturer in Guitar

B.F.A., University of California (Los Angeles), 1983; M.F.A., 1985; D.M.A., Claremont Graduate School, 1996. Caltech, 2007–11.

Heinz E. Ellersieck, Ph.D., Associate Professor of History, Emeritus A.B., University of California (Los Angeles), 1942; M.A., 1948; Ph.D., 1955. Instructor, Caltech, 1950–55; Assistant Professor, 1955–60; Associate Professor, 1960–88; Associate Professor Emeritus, 1988–.

Richard S. Ellis, D.Phil., D.Sc.h.c., Steele Family Professor of Astronomy
B.Sc., University College London, 1971;
D.Phil., University of Oxford, 1974;
D.Sc.h.c., University of Durham. Visiting
Associate, Caltech, 1997–98; Professor,
1999–2002; Steele Professor, 2002–. Deputy
Director, Palomar Observatory, 1999–2000;
Director, 2000–02; Director, Caltech
Optical Observatories, 2002–05.

Michael Elowitz, Ph.D., Associate Professor of Biology and Bioengineering; Investigator, Howard Hughes Medical Institute B.A., University of California, 1992; M.A., Ph.D., Princeton University, 1999. Assistant Professor, Caltech, 2003–2009; Associate Professor, 2009–; Bren Scholar, 2003–09; Investigator, 2008–.

Azita Emami-Neyestanak, Ph.D., Assistant Professor of Electrical Engineering B.S., Sharif University of Technology, 1996; M.S., Stanford University, 1999; Ph.D., 2004. Caltech, 2007–.

Stuart A. Ende, Ph.D., Faculty Associate in Literature
A.B., Cornell University, 1965; M.A., New
York University, 1966; Ph.D., Cornell
University, 1970. Assistant Professor of
English, Caltech, 1970–74; Associate
Professor, 1974–80; Associate Professor of
Literature, 1980–90; Faculty Associate,
1990–.

Hermann Engelhardt, Dr.rer.Nat., Senior Research Associate in Geophysics, Emeritus Dipl., Technical University of Munich, 1960; Dr.rer.Nat., 1974. Senior Research Fellow, Caltech, 1976–79; Visiting Associate, 1981; Senior Research Associate, 1988–2002; Senior Research Associate Emeritus, 2002–.

Jean E. Ensminger, Ph.D., Edie and Lew Wasserman Professor of Social Sciences B.A., Cornell University, 1974; M.A., Northwestern University, 1976; Ph.D., 1984. Professor of Anthropology, Caltech, 2000–07; Wasserman Professor of Anthropology, 2007–09; Wasserman Professor of Social Sciences, 2009. Chair, Division of the Humanities and Social Sciences, 2002–06.

Inessa Epstein, Ph.D., Lecturer in Mathematics B.S., Rutgers University, 2004; Ph.D., University of California (Los Angeles), 2008. Caltech, 2009–10.

Oliver W. Eslinger, M.A., Coach M.A., Clark University, 1999; M.A., Boston University, 2002. Caltech, 2009–.

Thomas Eugene Everhart, Ph.D., D.L.h.c., D.h.c., President Emeritus; Professor of Electrical Engineering and Applied Physics, Emeritus
A.B., Harvard College, 1953; M.Sc., University of California (Los Angeles), 1955; Ph.D., University of Cambridge, 1958; D.L.h.c., Illinois Wesleyan University; Pepperdine University; D.h.c., Colorado School of Mines. Professor, Caltech, 1987–99; Professor Emeritus, 1999–. President, 1987–97; President Emeritus, 1997–.

Pamela L. Eversole-Cire, Ph.D., Visiting Associate in Biology B.S. (Biology), B.S. (Chemistry), University

of California (Irvine), 1982; M.S., 1985; Ph.D., University of Southern California, 1994. Research Fellow, Caltech, 1995–98; Senior Research Fellow, 1998–2001; Visiting Associate, 2008–11.

Maxellende Ezin, Ph.D., Senior Research Fellow in Biology B.S., Spelman College, 1996; Ph.D., University of Virginia, 2002. Caltech, 2009...

Kenneth A. Farley, Ph.D., W. M. Keck Foundation Professor of Geochemistry; Chair, Division of Geological and Planetary Sciences B.S., Yale University, 1986; Ph.D., University of California (San Diego), 1991. Assistant Professor, Caltech, 1993–96; Associate Professor, 1996–98; Professor, 1998–2003; Keck Foundation Professor, 2003 – Director, Tectonics Observatory, 2003–04. Chair, 2004–.

Mordechai Feingold, D.Phil., Professor of History

B.A., Hebrew University of Jerusalem, 1972; M.A., 1976; D.Phil., University of Oxford, 1980. Visiting Associate Professor, Caltech, 1994; Professor, 2002.

Katalin Fejes Toth, Ph.D., Thomas Hunt Morgan Senior Research Fellow in Biology M.D., Semmelweiss University, 2001; Ph.D., University of Heidelberg, 2004. Caltech, 2010—.

Antony R. H. Fender, B.S., Lecturer in Engineering B.S., University of California (Los Angeles), 1970. Caltech, 1996–2010.

Bradley Ward Filippone, Ph.D., Professor of Physics

B.S., Pennsylvania State University, 1977;
M.S., University of Chicago, 1979;
Ph.D., 1982. Research Fellow, Caltech, 1983–84;
Assistant Professor, 1984–90;
Associate Professor, 1990–95;
Professor, 1995–.

Caleb Finch, Ph.D., Visiting Associate in Biology

B.S., Yale University, 1961; Ph.D., 1969. Professor, University of Southern California, 1989–. Caltech, 2007–10.

Wolfgang Fink, Ph.D., Visiting Associate in Physics

Ph.D., University of Tübingen, 1997. Associate Professor, University of Southern California, 2005–. Associate Professor, University of Arizona, 2009–. Caltech, 2001–10.

Brian Fischer, D.Sc., Visiting Associate in Biology

B.A., Illinois Wesleyan University, 1999; M.A., University of Missouri (St. Louis), 2001; D.Sc., Washington University, 2005. Assistant Professor, Occidental College, 2008–. Caltech, 2008–09.

Woodward Fischer, Ph.D., Assistant Professor of Geobiology B.A., Colorado College, 2000; Ph.D., Harvard University, 2007. Caltech, 2009—

Matthew Fisher, Ph.D., Earle C. Anthony Professor of Theoretical Physics B.S., Cornell University, 1981; Ph.D., University of Illinois (Urbana-Champaign), 1986; Permanent Member, Institute for Theoretical Physics, University of California (Santa Barbara), 1993–2009; Caltech, 2009–.

Matthias Flach, Ph.D., Professor of Mathematics
Dipl., Johann-Wolfgang von Goethe
University (Frankfurt), 1986; Ph.D., St.
John's College, 1991. Associate Professor,
Caltech, 1995–99; Professor, 1999–.
Executive Officer for Mathematics,
2006–2009.

Richard Charles Flagan, Ph.D., Irma and Ross McCollum-William H. Corcoran Professor of Chemical Engineering and Professor of Environmental Science and Engineering; Executive Officer for Chemical Engineering B.S.E., University of Michigan, 1969; S.M., Massachusetts Institute of Technology, 1971; Ph.D., 1973. Assistant Professor of Environmental Engineering Science, Caltech, 1975-81; Associate Professor, 1981-84; Associate Professor of Environmental Engineering and Mechanical Engineering, 1984-85; Professor, 1986-90; Professor of Chemical Engineering, 1990-2000; McCollum Professor of Chemical Engineering, 2000-03; McCollum Professor of Chemical Engineering and Professor of Environmental Science and Engineering, 2003-04; McCollum-Corcoran Professor of Chemical Engineering and Professor of Environmental Science and Engineering, 2004-. Acting Executive Officer, 1996; Executive Officer, 1997; 2004-

Eanna E. Flanagan, Ph.D., Visiting Associate in Physics B.S., University College Dublin, 1987; M.S., 1998; Ph.D., Caltech, 1993. Caltech, 2010.

Stephen J. Forman, M.D., Visiting Associate in Chemical Engineering B.A., St. John's College, 1970; M.D., University of Southern California, 1974. Staff Physician and Chairman of the Board of Directors, City of Hope, 2001–. Caltech, 2005–11.

Joel N. Franklin, Ph.D., Professor of Applied Mathematics, Emeritus B.S., Stanford University, 1950; Ph.D., 1953. Associate Professor of Applied

Mechanics, Caltech, 1957–65; Professor of Applied Science, 1965–69; Professor of Applied Mathematics, 1969–2000; Professor Emeritus, 2000–.

Scott E. Fraser, Ph.D., Anna L. Rosen Professor of Biology and Professor of Biology and Professor of Bioengineering; Director, Donna and Benjamin M. Rosen Bioengineering Center
B.S., Harvey Mudd College, 1976; Ph.D., Johns Hopkins University, 1979. Professor of Biology, Caltech, 1991; Rosen Professor, 1991–; Professor of Bioengineering, 2005–. Director, Magnetic Resonance Imaging Center, 2002–08; Director, Rosen Bioengineering Center, 2008–.

Steven Clark Frautschi, Ph.D., Professor of Theoretical Physics, Emeritus
A.B., Harvard College, 1954; Ph.D.,
Stanford University, 1958. Assistant
Professor, Caltech, 1962–64; Associate
Professor, 1964–66; Professor, 1966–2006;
Professor Emeritus, 2006–. Executive
Officer for Physics, 1988–97; Master of
Student Houses, 1997–2002.

Stuart Freed, B.A., Lecturer in Art— Ceramics B.A., California State University (Northridge), 1979. Caltech, 1999–2011.

Winrich Freiwald, Ph.D., Visiting Associate in Biology
Dipl., Tübingen University, 1993; Ph.D., 1997. Assistant Professor, Rockefeller
University, 2009–. Caltech, 2009–11.

Brent Thomas Fultz, Ph.D., Professor of Materials Science and Applied Physics B.Sc., Massachusetts Institute of Technology, 1975; M.Sc., University of California, 1978; Ph.D., 1982. Assistant Professor of Materials Science, Caltech, 1985–90; Associate Professor, 1990–97; Professor of Materials Science, 1997–2002; Professor of Materials Science and Applied Physics, 2003–.

Avishay Gal-Yam, Ph.D., Visiting Associate in Astronomy
Ph.D., Tel Aviv University, 2003. Senior
Scientist, Weizmann Institute of Science,

Mandy Gamble, M.A., Coach B.A., California State University, 1995; M.A., 1997. Caltech, 2002–.

2007-. Caltech, 2007-12.

Daniel A. Garcia, M.A., Lecturer in Spanish Lic., National University of Colombia, 1988; M.A., University of Southern California, 1991. Caltech, 1996–.

Jorge García-Ojalvo, Ph.D., Visiting Associate in Biology M.Sc., University of Barcelona, 1991; Ph.D., 1995. Associate Professor, Technical University of Catalonia, 2003-. Caltech, 2006-11.

George Rousetos Gavalas, Ph.D., Professor of Chemical Engineering, Emeritus B.S., Technical University of Athens, 1958; M.S., University of Minnesota, 1962; Ph.D., 1964. Assistant Professor, Caltech, 1964–67; Associate Professor, 1967–75; Professor,

John B. Geasland, B.S.F.S., Lecturer in English as a Second Language B.S.F.S., Georgetown University, 1966. Caltech, 2001–10.

1975-2002; Professor Emeritus, 2002-.

Murray Gell-Mann, Ph.D., Sc.D.h.c.,
D.Sc.h.c., Nobel Laureate, Robert Andrews
Millikan Professor of Theoretical Physics,
Emeritus
B.S., Yale University, 1948; Ph.D.,
Massachusetts Institute of Technology,
1950; Sc.D.h.c., Columbia University;
University of Cambridge; University of
Chicago; University of Illinois; University
of Utah; Wesleyan University; Yale
University; D.Sc.h.c., University of Turin
(Italy). Associate Professor, Caltech,
1955–56; Professor, 1956–67; Millikan
Professor, 1967–93; Millikan Professor
Emeritus, 1993–.

Glen A. George, M.S., Lecturer in Computer Science and Electrical Engineering B.S. (Engineering and Applied Science), Caltech, 1981; B.S. (Electrical Engineering), 1982; M.S., University of California (Los Angeles), 1984. Lecturer in Applied Science, Caltech, 1986–91; Lecturer in Computer Science and Electrical Engineering, 1992–.

Merrill Joan Gerber, M.A., Lecturer in Creative Writing B.A., University of Florida, 1959; M.A., Brandeis University, 1980. Caltech, 1989–2009.

Alireza Ghaffari, M.S., Lecturer in Applied Physics B.S., California State University, 1986; M.S., Caltech, 2008. Lecturer, 2005–11.

Morteza Gharib, Ph.D., Hans W. Liepmann Professor of Aeronautics and Professor of Bioinspired Engineering; Vice Provost
B.S., Teheran University, 1976; M.S., Syracuse University, 1978; Ph.D., Caltech, 1983. Professor of Aeronautics, 1992–2001; Professor of Aeronautics and Bioengineering, 2001–02; Liepmann Professor of Aeronautics and Bioengineering, 2002–06; Professor of Bioengineering, 2006–09; Professor of Bioinspired Engineering, 2009–; Liepmann Professor, 2006–. Vice Provost, 2010–.

Amin Gholampour, Ph.D., Olga Taussky and John Todd Instructor in Mathematics M.S., Sharif University of Technology (Iran), 2002; Ph.D., University of British Columbia, 2007. Caltech, 2008–10.

Konstantinos P. Giapis, Ph.D., Associate Professor of Chemical Engineering Dipl., National Technical University of Athens, 1984; Ph.D., University of Minnesota, 1989. Lacey Instructor, Caltech, 1992–93; Assistant Professor, 1993–98; Associate Professor, 1999–.

Vernon Charles Gibson, Ph.D., Visiting Associate in Chemistry B.S., University of Sheffield, 1980; Ph.D., University of Oxford, 1984. Frankland BP Professor, Imperial College of Science, Technology and Medicine (London), 2001–. Caltech, 2006–07; 2008–10.

Benjamin J. Gillen, Ph.D., Assistant Professor of Economics B.A., Yale University, 1999; Ph.D., University of California (San Diego), 2010. Caltech, 2010–.

Kevin M. Gilmartin, Ph.D., Professor of English

B.Ä., Oberlin College, 1985; M.A., University of Chicago, 1986; Ph.D., 1991. Assistant Professor of Literature, Caltech, 1991–97; Associate Professor, 1997–2004; Associate Professor of English, 2004–07; Professor, 2007–.

Dehn Gilmore, Ph.D., Assistant Professor of English

B.Ä., Harvard University, 2002; M.Phil., Cambridge University (Trinity College), 2003; M.Phil., Columbia University, 2005; Ph.D., 2009. Caltech, 2009–.

Jacqueline G. Gish, Ph.D., Visiting Associate in Aerospace B.A., University of California (Los Angeles), 1972; Ph.D., Caltech, 1976; M.B.A., University of Southern California, 2003. Director, Directed Energy Technology, Northrop Grumman Space Technology, 2001–. Visiting Associate, Caltech, 2008–13.

Jan Glascher, Ph.D., Visiting Associate in Psychology Ph.D., University of Hamburg, 2005. Caltech, 2010–12.

Philip L. Gleckman, Ph.D., Visiting Associate in Materials Science B.S., Massachusetts Institute of Technology, 1984; Ph.D., University of Chicago, 1988. Chief Scientist, eSolar, 2008–. Visiting Associate, Caltech, 2009–10.

M. Michael Glovsky, M.D., Visiting Associate in Chemical Engineering B.S., Tufts University, 1957; M.D., Tufts Medical School, 1962. Head, Asthma and Allergy Center, Huntington Memorial Hospital, 1989–. Caltech, 1999–2010.

William Andrew Goddard III, Ph.D., Charles and Mary Ferkel Professor of Chemistry, Materials Science, and Applied Physics

Physics
B.S., University of California (Los Angeles),
1960; Ph.D., Caltech, 1965. Noyes
Research Fellow in Chemistry, 1964–66;
Noyes Research Instructor, 1966–67;
Assistant Professor of Theoretical
Chemistry, 1967–71; Associate Professor,
1971–74; Professor, 1974–78; Professor of
Chemistry and Applied Physics, 1978–84;
Ferkel Professor of Chemistry, 1984–2001;
Ferkel Professor of Chemistry, Materials
Science, and Applied Physics, 2001–

Anja-Silvia Goeing, Ph.D., Instructor in History M.A., University of Wuerzburg, 1992; Ph.D., 1999. Caltech, 2009–10.

Jacob K. Goeree, Ph.D., Professor of Economics B.S., Utrecht University (Netherlands), 1989; Ph.D. (Theoretical Physics), 1993; B.A., University of Amsterdam, 1994; Ph.D. (Economics), 1997. Visiting Associate, Caltech, 1999; Visiting Professor, 2003; Professor, 2004–10.

Marvin Leonard Goldberger, Ph.D., Sc.D.h.c., D.H.L.h.c., LL.D.h.c., President Emeritus

B.S., Carnegie Institute of Technology, 1943; Ph.D., University of Chicago, 1948; Sc.D.h.c., Carnegie Mellon University; University of Notre Dame; D.H.L.h.c., Hebrew Union College; University of Judaism; LL.D.h.c., Occidental College. President and Professor of Theoretical Physics, Caltech, 1978–87; President Emeritus, 1991–.

Peter Martin Goldreich, Ph.D., Lee A. DuBridge Professor of Astrophysics and Planetary Physics, Emeritus
B.S., Cornell University, 1960; Ph.D., 1963. Associate Professor of Planetary Science and Astronomy, Caltech, 1966–69; Professor, 1969–81; DuBridge Professor of Astrophysics and Planetary Physics, 1981–2002; DuBridge Professor Emeritus, 2002–. Acting Chairman, Division of Geological and Planetary Sciences, 1989.

Paul F. Goldsmith, Ph.D., Visiting Associate in Astronomy A.B., University of California, 1969; Ph.D., 1975. Principal Scientist, Jet Propulsion Laboratory, 2005—. Caltech, 2006—10.

Sunil Golwala, Ph.D., Associate Professor of Physics
B.A., University of Chicago, 1993; M.A.,

University of California, 1995; Ph.D., 2000. Assistant Professor, Caltech, 2003–10; Associate Professor, 2010–.

Frank A. Gomez, Ph.D., Visiting Associate in Applied Physics B.S., California State University, 1986; Ph.D., University of California (Los Angeles), 1991. Professor, California State University, 2002.— Caltech, 2003–11.

Gabriela Gonzalez, Ph.D., Visiting Associate in Physics Ph.D., Syracuse University, 1995–. Caltech, 2008–10.

David Louis Goodstein, Ph.D., Frank J. Gilloon Distinguished Teaching and Service Professor, Emeritus; Professor of Physics and Applied Physics, Emeritus
B.S., Brooklyn College, 1960; Ph.D., University of Washington, 1965. Research Fellow in Physics, Caltech, 1966–67; Assistant Professor, 1967–71; Associate Professor, 1971–75; Associate Professor of Physics and Applied Physics, 1975–76; Professor, 1976–2009; Gilloon Professor, 1995–2009; Gilloon Professor Emeritus, 2009–. Vice Provost, 1987–2007.

Judith R. Goodstein, Ph.D., Faculty Associate in History; University Archivist, Emeritus

B.A., Brooklyn College, 1960; Ph.D., University of Washington, 1969. Faculty Associate, Caltech, 1982–; Lecturer, 1989; 2001; 2002; 2007. Registrar, 1989–2003; Institute Archivist, 1968–95; University Archivist, 1995–2009; University Archivist Emeritus, 2009–.

David George Goodwin, Ph.D., Professor of Mechanical Engineering and Applied Physics B.S., Harvey Mudd College, 1979; M.S., Stanford University, 1980; Ph.D., 1986. Assistant Professor of Mechanical Engineering, Caltech, 1988–93; Associate Professor of Mechanical Engineering and Applied Physics, 1993–2000; Professor, 2000–.

Krzysztof M. Gorski, Ph.D., Visiting Associate in Physics M.Sc., Nicolaus Copernicus University

M.Sc., Nicolaus Copernicus University (Poland), 1975; Ph.D., Warsaw University, 1987. Senior Research Scientist, Jet Propulsion Laboratory, 2003–. Caltech, 2003–11.

Frederic Gosselin, Ph.D., Visiting Associate in Psychology
B.A., University of Ottawa, 1993; M.Sc.,
University of Montreal, 1996; Ph.D.,
University of Glasgow, 2000. Associate
Professor, University of Montreal, 2002–.

Roy Walter Gould, Ph.D., Simon Ramo Professor of Engineering, Emeritus B.S., Caltech, 1949; M.S., Stanford

Caltech, 2007-08; 2010.

University, 1950; Ph.D., Caltech, 1956. Assistant Professor of Electrical Engineering, 1955–58; Associate Professor, 1958–60; Associate Professor of Electrical Engineering and Physics, 1960–62; Professor, 1962–74; Professor of Applied Physics, 1974–80; Ramo Professor of Engineering, 1980–96; Ramo Professor Emeritus, 1996–. Executive Officer for Applied Physics, 1973–79; Chairman, Division of Engineering and Applied Science, 1979–85.

Thomas B. Graber, Ph.D., Professor of Mathematics A.B., Harvard University, 1994; M.A., University of California (Los Angeles), 1995; Ph.D., 1998. Associate Professor, Caltech, 2005–2008; Professor, 2008–.

Keith J. B. Grainge, Ph.D., Visiting Associate in Physics Ph.D., University of Cambridge, 1996. Senior Research Associate, 2004–. Caltech, 2008–11.

Harry Barkus Gray, Ph.D., D.Sc.h.c., Laurea h.c., Fil.Dr.h.c., D.L.h.c., Arnold O. Beckman Professor of Chemistry; Founding Director, Beckman Institute B.S., Western Kentucky College, 1957; Ph.D., Northwestern University, 1960; D.Sc.h.c., Northwestern University; University of Rochester; University of Chicago; Göteborg University; University of Pennsylvania; Bowling Green State University; University of Arizona; Laurea h.c., University of Florence; D.L.h.c., Illinois Wesleyan University. Visiting Professor of Inorganic Chemistry, Caltech, 1965; Professor of Chemistry, 1966-81; William R. Kenan Professor, 1976-81; Beckman Professor, 1981-. Chairman, Division of Chemistry and Chemical Engineering, 1978-84; Director, Beckman Institute, 1986-2001; Founding Director,

Julia R. Greer, Ph.D., Assistant Professor of Materials Science B.S., Massachusetts Institute of Technology, 1997; M.S., Stanford University, 2000; Ph.D., 2005. Caltech, 2007.

David M. Grether, Ph.D., Frank J. Gilloon Professor of Economics, Emeritus B.S., University of California, 1960; Ph.D., Stanford University, 1969. Associate Professor, Caltech, 1970–75; Professor, 1975–2009; Gilloon Professor, 2009–10; Gilloon Professor Emeritus, 2010–. Executive Officer for Social Sciences, 1978–82; Chairman, Division of the Humanities and Social Sciences, 1982–92; Interim Chair, Division of the Humanities and Social Sciences, 2006–07.

Allen R. Gross, D.M.A., Lecturer in Symphony Orchestra
A.B., Queens College, 1965; M.A.,
University of California, 1967; D.M.A.,
Stanford University, 1978. Caltech,
1999–2011.

John P. Grotzinger, Ph.D., Fletcher Jones Professor of Geology B.S., Hobart College, 1979; M.S., University of Montana, 1981; Ph.D., Virginia Polytechnic Institute and State University, 1985. Visiting Associate Professor, Caltech, 1996; Moore Distinguished Scholar, 2004; Jones Professor, 2005.

Robert H. Grubbs, Ph.D., Nobel Laureate, Victor and Elizabeth Atkins Professor of Chemistry B.S., University of Florida, 1963; M.S., 1965; Ph.D., Columbia University, 1968. Professor, Caltech, 1978–90; Atkins Professor, 1990–.

Sergei G. Gukov, Ph.D., Professor of Theoretical Physics and Mathematics B.S., Moscow Institute of Physics and Technology, 1997; M.S., Princeton University, 2001; Ph.D., 2001. Associate Professor, Caltech, 2005–07; Professor, 2007–.

Chin-Lin Guo, Ph.D., Assistant Professor of Bioengineering and Applied Physics B.S., National Taiwan University, 1994; M.S., 1996; Ph.D., University of California (San Diego), 2001. Caltech, 2006–.

Ming Guo, M.D., Ph.D., Visiting Associate in Biology
M.D., Shanghai Medical University, 1989;
Ph.D., University of California (San Francisco), 1996. Assistant Professor,
University of California (Los Angeles),
2002.— Caltech, 2005–11.

Michael C. Gurnis, Ph.D., John E. and Hazel S. Smits Professor of Geophysics; Director, Siesmological Laboratory B.S., University of Arizona, 1982; Ph.D., Australian National University, 1987. Associate Professor, Caltech, 1994–96; Professor, 1996–2005; Smits Professor, 2005–. Associate Director, Seismological Laboratory, 1995–2003; Director, 2009–.

Herold R. Gustafson, Ph.D., Visiting Associate in Physics B.S., Caltech, 1959; M.S., University of Washington, 1961; Ph.D., 1968. Senior Research Scientist, University of Michigan, 1968— Visiting Associate, Caltech, 1997—2010.

Inseob Hahn, Ph.D., Visiting Associate in Physics B.Sc., Seoul National University, 1985; Ph.D., University of Southern California, 1993. Principal Scientist, Jet Propulsion Laboratory, 2007–. Caltech, 2008–10.

Sossina M. Haile, Ph.D., Professor of Materials Science and Chemical Engineering B.S., Massachusetts Institute of Technology, 1986; M.S., University of California, 1988; Ph.D., Massachusetts Institute of Technology, 1992. Assistant Professor of Materials Science, Caltech, 1996–2001; Associate Professor, 2001–02; Associate Professor of Materials Science and Chemical Engineering, 2003–06; Professor, 2006–.

Seyed-Ali Hajimiri, Ph.D., Thomas G. Myers Professor of Electrical Engineering B.S., Sharif University of Technology, 1994; M.S., Stanford University, 1996; Ph.D., 1998. Assistant Professor, Caltech, 1998–2003; Associate Professor, 2003–06; Professor, 2006–10; Myers Professor, 2010–.

John Franklin Hall, Ph.D., Professor of Civil Engineering
B.S., West Virginia University, 1972; M.S.,
University of Illinois, 1973; Ph.D.,
University of California, 1980. Research
Fellow, Caltech, 1980–83; Lecturer, 1981–83;
Assistant Professor, 1983–89; Associate
Professor, 1989–97; Professor, 1997–.
Executive Officer for Civil Engineering and
Applied Mechanics, 1998–2005; Dean of
Students, 2005–10; Acting Vice President for
Student Affairs, 2006–07.

Judith Hall, M.A., Lecturer in Creative Writing
A.B., Clark University, 1973; M.A.,
Johns Hopkins University, 1979. Caltech,
1999–2006; 2008; 2009–11.

Kevin Hand, Ph.D., Visiting Associate in Geology B.A., Dartmouth University, 1998; M.S., Stanford University; Ph.D., 2007. Caltech, 2000, 10.

Andrew J. Hanson, Ph.D., Moore
Distinguished Scholar in Engineering and
Applied Science
B.S., Harvard College, 1966; Ph.D.,
Massachusetts Institute of Technology,
1971. Professor, Indiana University, 1995—.
Caltech, 2010.

David Garrison Harkrider, Ph.D., Professor of Geophysics, Emeritus B.A., Rice University, 1953; M.A., 1957; Ph.D., Caltech, 1963. Associate Professor, 1970–79; Professor, 1979–95; Professor Emeritus, 1995–. Associate Director, Seismological Laboratory, 1977–79.

Jan Harms, Ph.D., Senior Research Fellow in Physics
Ph.D., University of Hannover, 2006.
Caltech, 2010–13.

Andrew I. Harris, Ph.D., Visiting Associate in Physics

B.S., University of California (Davis), 1979; M.A., University of California, 1982; Ph.D., 1986. Professor, University of Maryland, 2007—. Caltech, 2004—05; 2009.

John M. Harris, Ph.D., Visiting Associate in Geology B.Sc., University of Leicester (United Kingdom), 1964; M.A., University of Texas (Austin), 1967; Ph.D., University of Bristol, 1970. Chief Curator, George C. Page

Museum, 1993-. Caltech, 2001-10.

Fiona A. Harrison, Ph.D., D.techn.h.c., Professor of Physics and Astronomy
A.B., Dartmouth College, 1985; Ph.D.,
University of California, 1993; D.techn.h.c.,
Danish Technical University, 2010. Robert
Millikan Research Fellow, Caltech,
1993–95; Assistant Professor of Physics,
1996–99; Assistant Professor of Physics and
Astronomy, 1999–2001; Associate Professor,
2001–05; Professor, 2005–.

Jamshid Hassanzadeh, Ph.D., Visiting Associate in Geology B.S., University of Tehran, 1974; M.S., 1978; Ph.D., University of California (Los Angeles), 1993. Associate Professor, University of Tehran, 2000–. Caltech, 2003–04; 2008–10.

Engineering; Executive Officer for Électrical Engineering; Associate Director of Information Science and Technology B.S., University of Tehran, 1989; M.S., Stanford University, 1993; Ph.D., 1996. Assistant Professor, Caltech, 2001–03; Associate Professor, 2003–08; Professor, 2008–. Executive Officer, 2008–; Associate Director, 2010–.

Babak Hassibi, Ph.D., Professor of Electrical

Kristine L. Haugen, Ph.D., Assistant Professor of English B.A., University of Chicago, 1996; M.A., Princeton University, 1998; Ph.D., 2001. Caltech, 2005–.

Egill Hauksson, Ph.D., Senior Research Associate in Geophysics M.S., University of Trondheim (Norway), 1974; M.A., Columbia University, 1978; M.Phil,, 1980; Ph.D., 1981. Research Fellow, Caltech, 1989–92; Senior Research Associate, 1992–.

Michael G. Hauser, Ph.D., Visiting Associate in Physics Ph.D., Caltech, 1967. Deputy Director, State Telescope Science Institute, 1995–. Caltech, 2009–10.

Bruce A. Hay, Ph.D., Professor of Biology B.A., Claremont McKenna College, 1982; Ph.D., University of California (San Francisco), 1989. Assistant Professor, Caltech, 1996–2002; Associate Professor, 2002–08; Professor, 2008–.

James R. Heath, Ph.D., Elizabeth W. Gillon Professor and Professor of Chemistry B.Sc., Baylor University, 1984; M.A., Rice University, 1988; Ph.D., 1988. Caltech, 2003—.

Thomas Harrison Heaton, Ph.D., Professor of Engineering Seismology B.S., Indiana University, 1972; Ph.D., Caltech, 1978. Visiting Associate in Geophysics, Caltech, 1980–91; Faculty Associate, 1991–95; Lecturer in Geophysics, 1993–94; Lecturer in Engineering Seismology, 1995; Professor, 1995–.

Donald Vincent Helmberger, Ph.D., Smits Family Professor of Geological and Planetary Science, S.S., University of Minnesota, 1961; M.S., University of California (San Diego), 1965; Ph.D., 1967. Assistant Professor, Caltech, 1970–74; Associate Professor, 1974–79; Professor, 1979–2000; Smits Family Professor, 2000.— Director, Seismological Laboratory, 1998–2003.

George Helou, Ph.D., Senior Research Associate in Physics; Executive Director of the Infrared Processing and Analysis Center B.S., American University of Beirut, 1975; Ph.D., Cornell University, 1980. Senior Research Associate, Caltech, 1998—. Executive Director, 1999—.

Janet G. Hering, Ph.D., Visiting Associate in Environmental Science and Engineering A.B., Cornell University, 1979; A.M., Harvard University, 1981; Ph.D., Massachusetts Institute of Technology, 1988. Visiting Associate, Caltech, 1995–96; Associate Professor of Environmental Engineering Science, 1996–2002; Professor of Environmental Science and Engineering, 2002–08; Visiting Associate, 2009–11. Executive Officer for Keck Laboratories, 2002–08.

Matthew C. Heverly, M.S., Lecturer in Mechanical Engineering B.S., California Polytechnic State University (San Luis Obispo), 1999; M.S., Boston University, 2005. Caltech, 2008; 2009–10.

David J. Hill, Ph.D., Senior Research Fellow in Aeronautics B.S., Reed College, 1991; Ph.D., Caltech, 1998. Lecturer, 2007; 2008; Senior Research Fellow, 2007–.

Michael G. Hill, Ph.D., Visiting Associate in Chemistry B.A., Macalester College, 1987; Ph.D., University of Minnesota, 1992. Assistant

Professor, Occidental College, 1994—. Research Fellow, Caltech, 1992–94; Visiting Associate, 1995–2010; Lecturer, 2008.

Lynne Anne Hillenbrand, Ph.D., Associate Professor of Astronomy; Executive Officer for Astronomy

A.B., Princeton University, 1989; M.S., 1989; Ph.D., University of Massachusetts, 1995. Assistant Professor, Caltech, 2000–06; Associate Professor, 2006–. Executive Officer, 2007–.

Christopher M. Hirata, Ph.D., Assistant Professor of Astrophysics B.S., Caltech, 2001; Ph.D., Princeton University, 2005. Caltech, 2007–.

Kayoko Hirata, Ph.D., Lecturer in Japanese B.A., Kitakyushu University (Japan), 1966; M.A., University of Oregon, 1978; M.A., University of Arizona (Tucson), 1987; Ph.D., 1989. Caltech, 1990.

Christopher Read Hitchcock, Ph.D., Professor of Philosophy

A.B., Princeton Úniversity, 1986; M.A. (Philosophy), M.A. (Mathematics), University of Pittsburgh, 1990; Ph.D., 1993. Associate Professor, Caltech, 1998–2002; Professor, 2002–.

David George Hitlin, Ph.D., Professor of Physics
B.A., Columbia University, 1963; M.A., 1965; Ph.D., 1968. Associate Professor, Caltech, 1979–85; Professor, 1986–.

Tracey C. Ho, Ph.D., Assistant Professor of Electrical Engineering and Computer Science S.B., Massachusetts Institute of Technology, 1999; M.Eng., 1999; Ph.D., 2004. Caltech, 2004.

Philip Thomas Hoffman, Ph.D., Rea A. and Lela G. Axline Professor of Business Economics and Professor of History
A.B., Harvard College, 1969; M.A.,
University of California, 1971; Ph.D., Yale
University, 1979. Lecturer in History,
Caltech, 1980–81; Instructor, 1981–82;
Assistant Professor, 1982–84; Associate
Professor of History and Social Science,
1984–95; Professor, 1995–2003; Richard
and Barbara Rosenberg Professor of History
and Social Science, 2003–08; Axline
Professor, 2008–. Executive Officer for the
Humanities, 1995–2000.

Michael Robert Hoffmann, Ph.D., James Irvine Professor of Environmental Science B.A., Northwestern University, 1968; Ph.D., Brown University, 1974. Research Fellow, Caltech, 1973–76; Associate Professor, 1980–85; Professor of Environmental Engineering Science, 1986–90; Professor of Environmental Chemistry, 1990–96; Irvine Professor of Environmental Science, 1996—. Executive Officer for Environmental Engineering Science, 1996–2002; Dean of Graduate Studies, 2002–09.

Susan Hojnacki, Ph.D., Visiting Associate in Chemistry

M.S., Rochester Institute of Technology, 2000; Ph.D., 2005. Senior Member, Engineering and Space Directorate, Jet Propulsion Laboratory, 2007–. Caltech, 2008–11.

Gerard J. Holzmann, Ph.D., Faculty Associate in Computer Science; Lecturer in Computer Science B.S., Delft University of Technology (Netherlands), 1973; M.S., 1976; Ph.D., 1979. Lecturer, Caltech, 2003–06; 2008;

2009; Faculty Associate, 2007-.

2006-11.

Narimon Honarpour, Ph.D., M.D., Visiting Associate in Biology B.S., University of Texas (Austin), 1996; Ph.D., University of Texas Southwestern Medical Center, 2001; M.D., University of California (Los Angeles), 2003. STAR Postdoctoral Fellow, 2005—. Caltech,

John J. Hopfield, Ph.D., Roscoe G. Dickinson Professor of Chemistry and Biology, Emeritus A.B., Swarthmore College, 1954; Ph.D.,

A.B., Swarthmore College, 1954; Ph.D., Cornell University, 1958. Dickinson Professor, Caltech, 1980–97; Dickinson Professor Emeritus, 1997–.

Hans G. Hornung, Ph.D., C. L. "Kelly" Johnson Professor of Aeronautics, Emeritus B.S., University of Melbourne, 1960; M.S., 1962; Ph.D., University of London (Imperial College), 1965. Johnson Professor, Caltech, 1987–2005; Johnson Professor Emeritus, 2005–. Director, Graduate Aeronautical Laboratories, 1987–2004.

Yizhao Thomas Hou, Ph.D., Charles Lee Powell Professor of Applied and Computational Mathematics
B.S., South China University of Technology, 1982; M.S., University of California (Los Angeles), 1985; Ph.D., 1987. Associate Professor of Applied Mathematics, Caltech, 1993–98; Professor, 1998–2000; Professor of Applied and Computational Mathematics, 2000–04; Powell Professor, 2004–. Executive Officer for Applied and Computational Mathematics, 2000–06.

Susan Hough, Ph.D., Visiting Associate in Geophysics
A.B., University of California, 1982; Ph.D., Scripps Institution of Oceanography, 1987. Scientist-in-Charge, U.S. Geological Survey, Pasadena, 2006–. Caltech, 2009–11.

James Morrow House, M.D., Visiting Associate in Chemical Engineering; Chief Administrator, Jacobs Institute for Molecular Engineering for Medicine B.S., University of Kansas, 1962; M.D., 1966. Staff Physician, Huntington Memorial Hospital, 1971–. Assistant Professor, University of California (Los Angeles), 1973–. Caltech, 2002–10; Chief Administrator, 2008–10.

Robert M. Housley, Ph.D., Visiting Associate in Geochemistry B.A., Reed College, 1956; Ph.D., University of Washington, 1964. Member of the Technical Staff, Rockwell International Science Center, 1966. Visiting Professor, Caltech, 1984–85; 1985–86; Visiting Associate, 1986–2004; 2010–11.

James B. Howard, Ph.D., Visiting Associate in Chemistry

B.A., DePauw University, 1964; Ph.D., University of California (Los Angeles), 1968. Professor, University of Minnesota, 1982–. Caltech, 1996–2010.

Linda C. Hsieh-Wilson, Ph.D., Associate Professor of Chemistry; Investigator, Howard Hughes Medical Institute B.S., Yale University, 1990; Ph.D., University of California, 1996. Assistant Professor, Caltech, 2000–06; Associate Professor, 2006—. Investigator, 2005—.

Alice Shih-hou Huang, Ph.D., M.A.h.c., D.Sc.h.c., Senior Faculty Associate in Biology B.A., Johns Hopkins University, 1961; M.S., 1963; Ph.D., 1966. M.A.h.c., Harvard University; D.Sc.h.c., Wheaton College; Mt. Holyoke College; Medical College of Pennsylvania. Faculty Associate, Caltech, 1997–2007; Senior Faculty Associate, 2007–.

Michael Hucka, Ph.D., Senior Research Fellow in Control and Dynamical Systems B.S., University of Utah, 1987; M.S., University of Michigan, 1991; Ph.D., 1989. Caltech, 2005—.

Kenneth W. Hudnut, Ph.D., Visiting Associate in Geophysics

A.B., Dartmouth College, 1983; M.A., Columbia University, 1986; Ph.D., 1989. Geophysicist and Project Chief, U.S. Geological Survey, 1992—. Research Fellow, Caltech, 1989–92; Visiting Associate, 1997–2011.

Marita Huebner, Ph.D., Weisman Postdoctoral Instructor in History of Science M.A., University of Göttingen, 2002; Ph.D., 2006. Caltech, 2010–.

Emlyn W. Hughes, Ph.D., Visiting Associate in Physics B.S., Stanford University, 1982; M.A., Columbia University, 1984; M.Phil., 1985; Ph.D., 1987. Associate Professor, Caltech, 1995–99; Professor, 1999–2008; Visiting Associate, 2008–.

Melany L. Hunt, Ph.D., Professor of Mechanical Engineering, Vice Provost B.S., University of Minnesota, 1983; M.S., University of California, 1985; Ph.D., 1987. Assistant Professor, Caltech, 1988–95; Associate Professor, 1995–2001; Professor, 2001–. Executive Officer for Mechanical Engineering, 2002–07; Vice Provost, 2007–.

Christopher Hunter, Ph.D., Assistant Professor of English B.A., Harvard University, 2002; M.A., University of Pennsylvania, 2004; Ph.D., 2009. Caltech, 2010—.

Matthew C. Hunter, Ph.D., Weisman Postdoctoral Instructor in Art History B.A., Reed College, 1997; M.A., University of Chicago, 1999; Ph.D., 2007. Caltech, 2008–.

Joel A. Hurowitz, Ph.D., Visiting Associate in Geology B.S., State University of New York, 1996; M.S., 2004; Ph.D., 2006. Directors Fellow, Jet Propulsion Laboratory, 2007–. Visiting Associate, Caltech, 2009–10.

Fazle Hussain, Ph.D., Moore Distinguished Scholar in Engineering and Applied Science B.S., University of Cambridge, 1992; M.A., 1996; Ph.D., Caltech, 1998. Chair, Imperial College London, 2006—. Caltech, 2009.

Matias J. Iaryczower, Ph.D., Assistant Professor of Economics and Political Science B.A., University of Buenos Aires, 1998; M.A., University of San Andres (Buenos Aires), 1998; Ph.D., University of California (Los Angeles), 2005. Caltech, 2005–10.

Teruyuki Ikeda, Ph.D., Visiting Associate in Materials Science Ph.D., Kyoto University, 2003. Caltech, 2009–11.

Jozsef Illy, Ph.D., Visiting Associate in History
Ph.D., Szeged University and Hungarian Academy of Sciences, 1982. Contributing Editor of Collected Papers of Albert Einstein, Princeton University Press, 1991–. Senior Research Associate, Retired, Hungarian Academy of Sciences (Institute of Isotopes), 1993–. Caltech, 2000–10.

Andrew Perry Ingersoll, Ph.D., Earle C. Anthony Professor of Planetary Science B.A., Amherst College, 1960; A.M., Harvard University, 1961; Ph.D., 1966. Assistant Professor, Caltech, 1966–71; Associate Professor, 1971–76; Professor, 1976–2003; Anthony Professor, 2003–Executive Officer for Planetary Science, 1987–94.

Sandra S. Irani, Ph.D., Visiting Associate in Computer Science

B.S., Princeton University, 1986; Ph.D., University of California, 1991. Chair, Computer Science Department, University of California (Irvine), 2004–. Visiting Associate, Caltech, 2008–10.

Takeo Ito, Ph.D., Visiting Associate in Geophysics

B.S., Ehime University, 1998; M.S., Kyushu University, 2000; Ph.D., 2003. Assistant Professor, Nagoya University, 2004–. Caltech, 2009–11.

Wilfred Dean Iwan, Ph.D., Professor of Applied Mechanics, Emeritus B.S., Caltech, 1957; M.S., 1958; Ph.D., 1961. Assistant Professor, 1964–67; Associate Professor, 1967–72; Professor, 1972–2004; Professor Emeritus, 2004–. Executive Officer for Civil Engineering and Applied Mechanics, 1980–86.

Jennifer Mae Jackson, Ph.D., Assistant Professor of Mineral Physics

B.Ś., University of Illinois (Urbana-Champaign), 1999; M.S., University of Notre Dame, 2000; Ph.D., University of Illinois, 2005. Assistant Professor of Geophysics, Caltech, 2007–2009; Assistant Professor of Mineral Physics, 2009–.

Paul Christian Jennings, Ph.D., Professor of Civil Engineering and Applied Mechanics, Emeritus

B.S., Colorado State University, 1958; M.S., Caltech, 1966; Ph.D., 1963. Research Fellow in Civil Engineering, 1965; Assistant Professor of Applied Mechanics, 1966–68; Associate Professor, 1968–72; Professor, 1972–77; Professor of Civil Engineering and Applied Mechanics, 1977–2002; 2004–07; Professor Emeritus, 2002–04; 2007–. Executive Officer for Civil Engineering and Applied Mechanics, 1975–80; Chairman, Division of Engineering and Applied Science, 1985–89; Vice President and Provost, 1989–95; Acting Vice President for Business and Finance, 1995; 1998–99; Provost, 2004–07.

Grant J. Jensen, Ph.D., Associate Professor of Biology; Investigator, Howard Hughes Medical Institute

B.S., Brigham Young University, 1994; Ph.D., Stanford University, 1999. Assistant Professor, Caltech, 2002–08; Associate Professor, 2008–. Investigator, 2008–.

John A. Johnson, Ph.D., Assistant Professor of Astronomy

B.S., University of Missouri (Rolla), 1999; M.A., University of California, 2002; Ph.D., 2007. Caltech, 2009–.

Lee K. Johnson, Ph.D., Visiting Associate in Aeronautics
B.S., Harvey Mudd College, 1982; M.S.,

Rice University, 1985; Ph.D., 1987. Senior Research Engineer, Jet Propulsion Laboratory, 2000–. Caltech, 2007–10.

William Lewis Johnson, Ph.D., Ruben F. and Donna Mettler Professor of Engineering and Applied Science
B.A., Hamilton College, 1970; Ph.D.,
Caltech, 1975. Assistant Professor of
Materials Science, 1977–80; Associate
Professor, 1980–84; Professor, 1984–89;
Mettler Professor, 1989–.

Lucile Merrill Jones, Ph.D., Visiting Associate in Geophysics A.B., Brown University, 1976; Ph.D., Massachusetts Institute of Technology, 1981. Research Associate, U.S. Geological Survey, 1984. Caltech, 1984-2010.

Catherine Jurca, Ph.D., Associate Professor of English

39.B.A., University of California, 1987; M.A., Johns Hopkins University, 1992; Ph.D., 1995. Instructor in Literature, Caltech, 1995; Assistant Professor, 1995–2001; Associate Professor, 2001–04; Associate Professor of English, 2004–. Master of Student Houses, 2002–09.

Igor Kagan, Ph.D., Senior Research Fellow in Biology B.Sc. Tel Aviv University, 1996; Ph.D.

B.Sc., Tel Aviv University, 1996; Ph.D., Technion-Israel Institute of Technology, Schepens Eye Research Institute, Harvard Medical School, 2003. Caltech, 2009—.

Daniel Kahn, Ph.D., M.D., Visiting Associate in Biology B.S., Ohio State University, 1994; Ph.D., University of California (San Diego), 2001; M.D., 2002. Residency, University of California (Los Angeles), 2003—. Caltech,

2008-11.

W. Barclay Kamb, Ph.D., Barbara and Stanley R. Rawn Jr. Professor of Geology and Geophysics, Emeritus
B.S., Caltech, 1952; Ph.D., 1956. Assistant Professor of Geology, 1956–60; Associate Professor, 1960–62; Professor, 1962–63; Professor of Geology and Geophysics, 1963–90; Rawn Professor, 1990–99; Rawn Professor Emeritus, 1999–. Chairman, Division of Geological and Planetary Sciences, 1972–83; Vice President and Provost, 1987–89.

Marc P. Kamionkowski, Ph.D., Robinson Professor of Theoretical Physics and Astrophysics B.A., Washington University (St. Louis), 1987; Ph.D., University of Chicago, 1991. Professor, Caltech, 1999–2006; Robinson Professor, 2006–.

Hiroo Kanamori, Ph.D., John E. and Hazel S. Smits Professor of Geophysics, Emeritus B.S., University of Tokyo, 1959; M.S., 1961; Ph.D., 1964. Research Fellow, Caltech,

1965–66; Professor, 1972–89; Smits Professor, 1989– 2005; Smits Professor Emeritus, 2005–. Director, Seismological Laboratory, 1990–98.

Keiko Kanamori, Ph.D., Visiting Associate in Chemistry

B.A., University of Tokyo, 1962; B.S., California State University, 1976; Ph.D., Caltech, 1981. Postdoctoral Research Chemist, University of California (Los Angeles), 1982–. Visiting Associate, Caltech, 1984–.

Anton N. Kapustin, Ph.D., Professor of Theoretical Physics

M.S., Moscow State University, 1993; Ph.D., Caltech, 1997. Assistant Professor, 2001–04; Associate Professor, 2004–10; Professor, 2010–.

Emil P. Kartalov, Ph.D., Visiting Associate in Electrical Engineering B.S., Caltech, 1998; M.S., 2004; Ph.D., 2004. Assistant Professor, University of Southern California, 2007–. Visiting Associate, Caltech, 2008–11.

Victoria M. Kaspi, Ph.D., Moore Distinguisbed Scholar in Physics B.Sc., McGill University, 1989; M.A., Princeton University, 1991; Ph.D., 1994. Hubble Postdoctoral Fellow, Jet Propulsion Laboratory, 1994— Professor, McGill University, 2006— Visiting Associate, Caltech, 1994–96; Moore Distinguished Scholar, 2009.

Mihoko Kato, Ph.D., Senior Research Fellow in Biology; Associate, Howard Hughes Medical Institute B.S., Caltech, 1996; M.S., The University of Chicago, 1997; Ph.D., 2002. Caltech, 2010–11.

Jonathan N. Katz, Ph.D., Professor of Social Sciences and Statistics; Chair, Division of the Humanities and Social Sciences
S.B., Massachusetts Institute of Technology, 1990; M.A., University of California (San Diego), 1992; Ph.D., 1995. Assistant Professor, Caltech, 1995–98, Associate Professor, 1998; 1999–2003; Professor of Political Science, 2003–2009; Professor of Social Sciences and Statistics, 2009–Executive Officer for the Social Sciences, 2007; Chair, 2007–

Seiji Kawamura, Ph.D., Visiting Associate in Physics
B.S., Waseda University, 1981; M.Eng., 1983; M.S., University of Tokyo, 1985; Ph.D., 1989. Associate Professor, National Astronomical Observatory of Japan, 1997–. Researach Fellow, Caltech, 1989–90; Visiting Associate, 1998; 2001–06; 2010.

Alexander Sotirios Kechris, Ph.D., D.h.c., Professor of Mathematics M.S., National Technological University (Athens), 1969; Ph.D., University of California (Los Angeles), 1972; D.h.c., University of Athens. Assistant Professor, Caltech, 1974–76; Associate Professor, 1976–81; Professor, 1981– Executive Officer for Mathematics, 1994–97.

Mary B. Kennedy, Ph.D., *The Allen and Lenabelle Davis Professor of Biology* B.S., St. Mary's College, 1969; Ph.D., Johns Hopkins University, 1975. Assistant Professor, Caltech, 1981–84; Associate Professor, 1984–92; Professor, 1992–2002; Davis Professor, 2002–.

Daniel Jerome Kevles, Ph.D., J. O. and Juliette Koepfli Professor of the Humanities, Emeritus
A.B., Princeton University, 1960; Ph.D., 1964. Assistant Professor of History, Caltech, 1964–68; Associate Professor, 1968–78; Professor, 1978–86; Koepfli Professor of the Humanities, 1986–2001; Koepfli Professor Emeritus, 2001–. Executive Officer for the Humanities, 1978–81.

Farid Ya Khalili, Ph.D., Visiting Associate in Physics Ph.D., Moscow State University, 1979. Professor, 1997–. Caltech, 2001–08; 2009.

Jeehyeong Khim, Ph.D., Visiting Associate in Environmental Science and Engineering Ph.D., Caltech, 1982. Professor, Pohang University of Science and Technology, 2001-. Research Fellow, Caltech, 1982–83; Visiting Associate, 2009–10.

Abdollah Khodadoust, Ph.D., Visiting Associate in Aeronautics B.S., Ohio State University, 1984; M.S., 1987; Ph.D., 1993. Visiting Associate, Caltech, 2009–12.

D. Roderick Kiewiet, Ph.D., Professor of Political Science
B.A., University of Iowa, 1974; Ph.D., Yale
University, 1980. Assistant Professor,
Caltech, 1979–82; Associate Professor,
1982–89; Professor, 1989–. Dean of
Students, 1992–96; Dean of Graduate
Studies, 2000–02.

Paul C. Kim, Ph.D., Visiting Associate in Materials Science B.S., University of South Florida, 1992; Ph.D., Caltech, 2001. Vice President, Liquidmetal Technologies, 2002–. Visiting Associate, Caltech, 2006–10.

Yunjin Kim, Ph.D., Lecturer in Aerospace B.S., California State University (Sacramento), 1983; M.S., University of Pennsylvania, 1985; Ph.D., 1987. Caltech, 2009–10.

H. Jeff Kimble, Ph.D., D.Sc.h.c., William L. Valentine Professor and Professor of Physics B.S., Abilene Christian University, 1971; M.S., University of Rochester, 1973; Ph.D., 1978; D.Sc.h.c., Niels Bohr Institute, University of Copenhagen. Professor, Caltech, 1989–; Valentine Professor, 1997–.

Richard R. King, Ph.D., Visiting Associate in Applied Physics B.S., Stanford University, 1985; M.S., 1987; Ph.D., 1990. Principal Scientist/Technical Fellow, Spectrolab, 1997–. Caltech, 2008–10.

James P. Kirby, Ph.D., Lecturer in Chemistry B.S., Ithaca College, 1990; Ph.D., Michigan State University, 1997. Caltech, 2009–10.

Joseph Lynn Kirschvink, Ph.D., Nico and Marilyn Van Wingen Professor of Geobiology B.S., M.S., Caltech, 1975; M.A., Princeton University, 1978; Ph.D., 1979. Assistant Professor, Caltech, 1981–87; Associate Professor, 1987–92; Professor, 1992–2004; Van Wingen Professor, 2004–.

Alexei Kitaev, Ph.D., Professor of Theoretical Physics and Computer Science Dipl., Moscow Institute of Physics and Technology, 1986; Ph.D., Landau Institute for Theoretical Physics, 1989. Visiting Associate, Caltech, 1998–99; Lecturer, 1998–99; Senior Research Associate, 2001–02: Professor, 2002–.

Gary L. Kleiger, Ph.D., Senior Research Fellow in Biology Ph.D., University of California (Los Angeles), 2002. Caltech, 2009–.

Wolfgang Gustav Knauss, Ph.D., Theodore von Kármán Professor of Aeronautics and Applied Mechanics, Emeritus
B.S., Caltech, 1958; M.S., 1959; Ph.D., 1963. Research Fellow in Aeronautics, 1963–65; Assistant Professor, 1965–69; Associate Professor, 1969–78; Professor, 1978–82; Professor of Aeronautics and Applied Mechanics, 1982–2001; von Kármán Professor, 2001–04; von Kármán Professor Emeritus, 2004–.

Tarja Knuuttila, Ph.D., Visiting Associate in Philosophy
M.S., Helsinki School of Economics, 1991;
M.S., University of Helsinki, 2002; Ph.D., 2005. Teacher, 2003—. Caltech, 2009—10.

Christof Koch, Ph.D., The Lois and Victor Troendle Professor of Cognitive and Behavioral Biology and Professor of Computation and Neural Systems; Executive Officer for Neurobiology

M.S., University of Tübingen, 1980; Ph.D., 1982. Assistant Professor of Computation and Neural Systems, Caltech, 1986–91;

Associate Professor, 1991–94; Professor, 1994-; Troendle Professor, 2000–. Executive Officer for Computation and Neural Systems, 1997–2005; Executive Officer for Neurobiology, 2006–10.

Monica D. Kohler, Ph.D., Visiting Associate in Civil Engineering; Lecturer in Civil Engineering A.B., Harvard University, 1988; Ph.D., Caltech, 1995. Assistant Research Engineer, University of California (Los Angeles), 1998. Visiting Associate, Caltech, 2007–11; Lecturer, 2009.

Masakazu Konishi, Ph.D., Bing Professor of Behavioral Biology B.S., Hokkaido University (Japan), 1956; M.S., 1958; Ph.D., University of California, 1963. Professor of Biology, Caltech, 1975–80; Bing Professor, 1980–. Executive Officer for Biology, 1977–80.

Diana Lena Kormos-Buchwald, Ph.D., Professor of History
B.Sc., Technion—Israel Institute of Technology, 1981; M.Sc., Tel Aviv
University, 1983; A.M., Harvard University, 1985; Ph.D., 1990. Instructor, Caltech, 1989–90; Assistant Professor, 1990–96; Associate Professor, 1996–2005; Professor, 2005–.

Julia A. Kornfield, Ph.D., Professor of Chemical Engineering B.S., Caltech, 1983; M.S., 1984; Ph.D., Stanford University, 1988. Assistant Professor, Caltech, 1990–95; Associate Professor, 1995–2001; Professor, 2001–.

Petros D. Koumoutsakos, Ph.D., Clark B. Millikan Visiting Professor of Aeronautics Dipl., National Technical University of Athens, 1986; B.S., University of Michigan, 1987; M.S., Caltech, 1988; Ph.D., 1992. Director, Institute of Scientific Computing, ETH Zurich, 2003—. Research Fellow, Caltech, 1992–1994; Millikan Visiting Professor, 2009–10.

J. Morgan Kousser, Ph.D., Professor of History and Social Science
A.B., Princeton University, 1965; M.Phil., Yale University, 1968; Ph.D., 1971.
Instructor in History, Caltech, 1969–71; Assistant Professor, 1971–74; Associate Professor, 1974–79; Professor, 1979–80; Professor of History and Social Science, 1980–.

Christopher K. Kovach, Ph.D., Visiting Associate in Neuroscience B.A., University of Kansas, 1999; Ph.D., University of Iowa, 2008. Caltech, 2010–12.

Anne Jacob Kox, Ph.D., Visiting Associate in History
M.S., University of Amsterdam, 1972;

Ph.D., 1976. Pieter Zeeman Professor, 1998–. Visiting Professor, Caltech, 2003; Visiting Associate, 2005–10.

Rainer Andreas Krause, Ph.D., Assistant Professor of Computer Science Dipl., Technische Universität Munchen, 2004; M.Sc., Carnegie Mellon University, 2998; Ph.D., 2008. Caltech, 2009—

Rouslan Krechetnikov, Ph.D., Visiting Associate in Control and Dynamical Systems M.S., University of Notre Dame, 2000; Ph.D. (Aerospace and Mechanical Engineering), 2002; Ph.D. (Applied Mathematics), Moscow Institute of Physics and Technology, 2004. Assistant Professor, University of Alberta, 2007—. Caltech, 2008–09.

Swaminathan Krishnan, Ph.D., Assistant Professor of Structural Engineering and Geophysics

B.S., İndian Institute of Technology, 1992; M.S., Rice University, 1994; Ph.D., Caltech, 2003. Assistant Professor of Civil Engineering, 2006–07; Assistant Professor of Civil Engineering and Geophysics, 2007–10; Assistant Professor, 2010–.

Shrinivas R. Kulkarni, Ph.D., John D. and Catherine T. MacArthur Professor of Astronomy and Planetary Science; Director, Caltech Optical Observatories

M.S., Indian Institute of Technology, 1978; Ph.D., University of California, 1983. Millikan Research Fellow in Radio Astronomy, Caltech, 1985–87; Assistant Professor of Astronomy, 1987–90; Associate Professor, 1990–92; Professor, 1992–96; Professor of Astronomy and Planetary Science, 1996–2001; MacArthur Professor, 2001–. Executive Officer for Astronomy, 1997–2000; Director, 2006–.

Akiko Kumagai, Ph.D., Senior Research Associate in Biology B.S., Kyoto University (Japan), 1979; Ph.D., 1986. Senior Research Fellow, Caltech, 1989–95; Senior Research Associate, 1996–.

Aron Kuppermann, Ph.D., Professor of Chemical Physics, Emeritus
M.Sc., University of São Paulo, 1948;
Ph.D., University of Notre Dame, 1956.
Professor, Caltech, 1963–2010; Professor Emeritus, 2010–.

Jenijoy La Belle, Ph.D., Professor of English, Emeritus B.A., University of Washington, 1965; Ph.D., University of California (San Diego), 1969. Assistant Professor of English, Caltech, 1969–76; Associate Professor, 1977–80; Associate Professor of Literature, 1980–88; Professor, 1988–2004; Professor of English, 2004–07; Professor Emeritus, 2007–. Jay A. Labinger, Ph.D., Faculty Associate in Chemistry; Lecturer in Chemistry B.S., Harvey Mudd College, 1968; Ph.D., Harvard University, 1974. Lecturer, Caltech, 1988–1996; Faculty Associate, 2006-; Lecturer in Chemistry, 2008–11.

Michael P. Lamb, Ph.D., Assistant Professor of Geology B.S., University of Minnesota, 2001; M.S., University of Washington, 2004; Ph.D., University of California, 2008. Caltech,

Maria P. Lambros, Ph.D., Visiting Associate in Chemical Engineering
B.S., University of Greece, 1980; M.S.,
University of Cincinnati, 1983; Ph.D.,
University of Minnesota, 1991. Adjunct
Professor, University of Oklahoma, 1999–.
Caltech, 2007–08.

Russell D. Lansford, Ph.D., Lecturer in Bioengineering
A.B., University of California, 1986; M.A., Columbia University, 1989; M.S., 1990; Ph.D., 1996. Senior Research Fellow in Biology, Caltech, 1999–2002; 2003–10.

Nadia Lapusta, Ph.D., Associate Professor of Mechanical Engineering and Geophysics
Dipl., Kiev State University, 1994; M.S.,
Harvard University, 1996; Ph.D., 2001.
Assistant Professor of Mechanical
Engineering, Caltech, 2002–03; Assistant
Professor of Mechanical Engineering and
Geophysics, 2003–2008; Associate Professor
of Mechanical Engineering and Geophysics,
2008–.

Gilles J. Laurent, Ph.D., D.V.M., Lawrence A. Hanson, Tr., Professor of Biology and Computation and Neural Systems B.A., University of Toulouse, 1978; Ph.D., 1985; D.V.M., National School of Veterinary Medicine of Toulouse, 1985. Assistant Professor, Caltech, 1990–95; Associate Professor, 1996–2000; Professor, 2000–02; Hanson Professor, 2002–

Desiree LaVertu, M.M., Lecturer in Choral Music B.M., California State University (Fullerton), 1988; M.M., University of Nevada, 1998. Caltech, 2000–.

Eugene Lavretsky, Ph.D., Lecturer in Control and Dynamical Systems M.S., Saratov State University (Russia), 1983; Ph.D., Claremont Graduate University, 2000. Caltech, 2006–10.

Jared Renton Leadbetter, Ph.D., Associate Professor of Environmental Microbiology B.S., Goucher College, 1991; Ph.D., Michigan State University, 1997. Assistant Professor, Caltech, 2000–06; Associate Professor, 2006–.

John O. Ledyard, Ph.D., D.Lit.h.c., Allen and Lenabelle Davis Professor of Economics and Social Sciences

A.B., Wabash College, 1963; M.S., Purdue University, 1965; Ph.D., 1967; D.Lit.h.c., Purdue University, Professor, Caltech, 1985–2002; Davis Professor, 2002–. Executive Officer for the Social Sciences, 1989–92; Chair, Division of the Humanities and Social Sciences, 1992–2002.

Joon-Hyung Lee, Ph.D., Visiting Associate in Materials Science B.S., Yeungnam University, 1989; M.S., Kyungpook National University, 1991; Ph.D., 1995. Associate Professor, 2004–. Caltech, 2008–10.

Patrick A. Lee, Ph.D., Moore Distinguished Scholar

B.S., Massachusetts Institute of Technology, 1966; Ph.D., 19770. Caltech, 2010.

Richard A. M. Lee, Ph.D., Visiting Associate in Physics Ph.D., Lancaster University, 1994. Senior Member, Technical Staff, Jet Propulsion Laboratory, 2007–. Caltech, 2007–10.

Seung-Yeop Lee, Ph.D., Sherman Fairchild Senior Research Fellow in Mathematics M.S., Pennsylvania State University, 2001; Ph.D., University of Chicago, 2007. Caltech, 2009–12.

Yi-Kuen Lee, Ph.D., Visiting Associate in Electrical Engineering B.S., National University of Taiwan, 1992; M.S., 1995; Ph.D., University of California (Los Angeles), 2001. Associate Professor,

M.S., 1995; Ph.D., University of California (Los Angeles), 2001. Associate Professor, Hong Kong University of Science and Technology, 2007–. Visiting Associate, Caltech, 2010.

Dennis Lehmkuhl, D.Phil., Visiting Associate in History M.Sc., Imperial College London, 2003; M.A., Hamburg University, 2006; D.Phil., Oxford University (Oriel College), 2009. Visiting Associate, Caltech, 2010.

Anthony Leonard, Ph.D., Theodore von Kármán Professor of Aeronautics, Emeritus B.S., Caltech, 1959; M.S., Stanford University, 1960; Ph.D., 1963. Professor, Caltech, 1985–2000; von Kármán Professor, 2000–05; von Kármán Professor Emeritus, 2005–.

Henry Allen Lester, Ph.D., Bren Professor of Biology

Å.B., Harvard College, 1966; Ph.D., Rockefeller University, 1971. Assistant Professor, Caltech, 1973–76; Associate Professor, 1976–83; Professor, 1983–2000; Bren Professor, 2000–. Henry Levenson, M.D., Visiting Associate in Chemistry

B.A., West Virginia University, 1972; M.D., West Virginia School of Medicine, 1976. Pasadena Rehabilitation Institute, 1998–. Caltech, 2006–11.

Julie M. Levesque, M.S., Acting Athletic Director; Coach

B.S., California Polytechnic State University (San Luis Obispo), 1994; M.S., 1996. Caltech, 1997–2007; Assistant Athletic Director, 2007–; Acting Athletic Director, 2010–.

Carmel Levitan, Ph.D., Visiting Associate in Biology

B.S., Stanford University, 2001; Ph.D., University of California (San Francisco & Berkeley), 2007. Caltech, 2009–10.

Nathan S. Lewis, Ph.D., George L. Argyros Professor and Professor of Chemistry B.S., Caltech, 1977; W.S., 1977; Ph.D., Massachusetts Institute of Technology, 1981. Associate Professor, Caltech, 1988–91; Professor, 1991–; Argyros Professor, 2002–.

Ivett A. Leyva, Ph.D., Visiting Associate in Aeronautics
B.A., Whitman College, 1994; B.S., Caltech, 1994; M.S., 1995; Ph.D., 1999. Combustion Devices Lead, Air Force Research Laboratory, Edwards Air Force Base, 2006—, Caltech, 2009—10.

Yuan-Chang Liang, Ph.D., Visiting Associate in Physics M.S., Taiwan University, 1999; Ph.D., 2004. Caltech, 2009–10.

Kenneth George Libbrecht, Ph.D., Professor of Physics; Executive Officer for Physics

Projects
B.S., Caltech, 1980; Ph.D., Princeton
University, 1984. Visiting Associate in Solar
Astronomy, Caltech, 1984; Assistant
Professor of Astrophysics, 1984–89;
Associate Professor, 1989–95; Professor of
Physics, 1995–. Executive Officer, 1997–.

Daniel Lidar, Ph.D., Visiting Associate in Theoretical Physics Ph.D., Hebrew University, 1997. Associate Professor, University of Southern California, 2005.— Caltech, 2008–10.

Ron Yitzhak Lifshitz, Ph.D., Visiting Associate in Physics B.Sc., Hebrew University of Jerusalem, 1990; Ph.D., Cornell University, 1995. Associate Professor, Tel Aviv University, 2006— Research Fellow, Caltech, 1995—98; Senior Research Fellow, 1998—99; Visiting Associate, 2001; 2003; 2006—07; 2009.

Lee A. Lindblom, Ph.D., Senior Research Associate in Theoretical Astrophysics B.S., Caltech, 1972; M.S., University of Maryland, 1975; Ph.D., 1978. Visiting Associate, Caltech, 1992; 1996–2002; Lecturer, 2000–01; 2003–06; 2008. Senior Research Associate, 2002–.

Valentina A. Lindholm, M.A., Lecturer in Russian, Emeritus M.A., Moscow State University, 1971. Lecturer, Caltech, 1974–2000; Lecturer Emeritus, 2000–.

Dariusz C. Lis, Ph.D., Senior Research Associate in Physics Ph.D., University of Massachusetts (Amherst), 1989. Research Fellow, Caltech, 1989–92; Senior Research Fellow, 1992–98; Senior Research Associate, 1998–.

Ute Lisenfeld, Ph.D., Visiting Associate at the Spitzer Science Center/IPAC Ph.D., University of Heidelberg, 1993. Caltech, 2010–11.

E. John List, Ph.D., Professor of Environmental Engineering Science, Emeritus B.E., University of Auckland, 1961; M.E., 1962; Ph.D., Caltech, 1965. Research Fellow, 1965–66; Assistant Professor, 1969–72; Associate Professor, 1972–78; Professor, 1978–97; Professor Emeritus, 1997. Executive Officer for Environmental Science, 1980–85.

Charles Y. Liu, Ph.D., M.D., Visiting Associate in Chemical Engineering B.S.E., University of Michigan (Ann Arbor), 1987; Ph.D., Rice University, 1993; M.D., Yale University School of Medicine, 1996. Resident Physician, University of Southern California, Keck School of Medicine, 1996.—Caltech, 2002–10.

Andrea Loettgers, Ph.D., Lecturer in Biology

Dipl., University of Heidelberg (Germany), 1991; Ph.D., University of Gottingen, 1995. Caltech, 2001–03; 2010.

Gary Allen Lorden, Ph.D., Professor of Mathematics, Emeritus B.S., Caltech, 1962; Ph.D., Cornell University, 1966. Assistant Professor, Caltech, 1968–71; Associate Professor, 1971–77; Professor, 1977–2009; Professor Emeritus, 2009 – Dean of Students, 1984–88; Vice President for Student Affairs, 1989–98; Acting Vice President, 2002; Executive Officer for Mathematics, 2003–06.

Angelique Y. Louie, Ph.D., Visiting Associate in Biology B.S., University of California (Davis), 1985; M.S., University of California (Los Angeles), 1988; Ph.D., University of California (Irvine), 1994. Assistant Professor, University of California (Davis), 2002–. Research Fellow, Caltech, 1995–98; Senior Research Fellow, 1998–2002; Visiting Associate, 2003–07; 2009–10.

Steven H. Low, Ph.D., Professor of Computer Science and Electrical Engineering B.S., Cornell University, 1987; M.S., University of California, 1989; Ph.D., 1992. Associate Professor, Caltech, 2000–06; Professor, 2006–.

Jonathan Lubin, Ph.D., Visiting Associate in Mathematics Ph.D., Harvard University, 1963. Professor Emeritus, Brown University, 2000–. Caltech, 2003–10.

Guo Luo, Ph.D., von Kármán Instructor in Applied and Computational Mathematics B.S., Zhongshan University, 2001; M.Phil., Chinese University of Hong Kong, 2003; Ph.D., Ohio State University, 2009. Caltech, 2009.

Wilhelmus A. J. Luxemburg, Ph.D., Professor of Mathematics, Emeritus B.A., University of Leiden, 1950; M.A., 1953; Ph.D., Delft Institute of Technology, 1955. Assistant Professor, Caltech, 1958–60; Associate Professor, 1960–62; Professor, 1962–2000; Professor Emeritus, 2000–. Executive Officer for Mathematics, 1970–85.

Chris Mach, B.S., Lecturer in Physics B.S., California State University (Northridge), 1993. Caltech, 2001–10.

Douglas G. MacMynowski, Ph.D., Senior Research Associate in Control and Dynamical Systems; Lecturer in Control and Dynamical Systems

B.A.Sc., University of Toronto, 1987; S.M., Massachusetts Institute of Technology, 1990; Ph.D., 1992. Visiting Associate, Caltech, 2000–02; Lecturer, 2001; 2004; 2005; 2009–10; Senior Research Fellow, 2002–08; Senior Research Associate, 2008–.

Michihisa Maeda, Ph.D., Visiting Associate in Chemical Engineering B.S., University of Tokyo, 1987; M.S., 1989; Ph.D., 1992. Associate Professor, Meiji University, 2001–. Caltech, 2010–11.

Nikolai G. Makarov, Ph.D., Professor of Mathematics

B.A., Leningrad University, 1982; Ph.D., LOMI Mathematics Institute (Leningrad), 1986. Visiting Professor, Caltech, 1991; Professor, 1991–.

Oscar Mandel, Ph.D., Professor of Literature, Emeritus
B.A., New York University, 1947; M.A.,
Columbia University, 1948; Ph.D., Ohio
State University, 1951. Visiting Associate
Professor of English, Caltech, 1961–62;
Associate Professor, 1962–68; Professor,
1968–80; Professor of Literature,
1980–2003; Professor Emeritus, 2003–.

Gideon Manning, Ph.D., Assistant Professor of Philosophy
A.B., Harvard University, 1974; Ph.D.,
University of Chicago, 2006. Caltech,
2007.

Elena Mantovan, Ph.D., Assistant Professor of Mathematics Laurea, University of Padua, 1995; M.A., Harvard University, 1998; Ph.D., 2002. Assistant Professor, Caltech, 2005–10; Associate Professor, 2010–.

Frank Earl Marble, Ph.D., Richard L. and Dorothy M. Hayman Professor of Mechanical Engineering and Professor of Jet Propulsion, Emeritus

M.S., Case Institute of Technology, 1940; M.S., 1942; A.E., Caltech, 1947; Ph.D., 1948. Instructor in Aeronautics, 1948–49; Assistant Professor of Jet Propulsion and Mechanical Engineering, 1949–53; Associate Professor, 1953–57; Professor, 1957–80; Hayman Professor of Mechanical Engineering and Professor of Jet Propulsion, 1980–89; Hayman Professor and Professor Emeritus, 1989–. Administrator, Industrial Relations Center, 1986–89.

Sandra E. Marbut, B.A., Coach B.A., Sheldon Jackson College, 1991. Caltech, 2003–.

Matilde Marcolli, Ph.D., Professor of Mathematics Laurea, University Degli Studi, 1993; M.Sc., University of Chicago, 1994; Ph.D., 1997. Caltech, 2008–.

Edoardo Marcora, Ph.D., Senior Research Fellow in Physics Ph.D., University of Colorado (Boulder), 2002. Caltech, 2008–10.

Rudolph Arthur Marcus, Ph.D.,
D.Sc.h.c., Fil.Dr.h.c., D.h.c., Nobel
Laureate, Arthur Amos Noyes Professor of
Chemistry
B.Sc., McGill University, 1943; Ph.D.,
1946; D.Sc.h.c., University of Chicago;
McGill University; Polytechnic University;
University of Oxford; University of New
Brunswick; Queen's University; University
of North Carolina (Chapel Hill); University
of Illinois; Technion–Israel Institute of
Technology; Universidad Politecnica de

Valencia; University of Waterloo; Fil.Dr.h.c., Gothenburg University; D.h.c., Yokohama National University; Northwestern University. Caltech, 1978–.

Shirley A. Marneus, M.A., Lecturer in Theater Arts, Emeritus
B.A., San José State College, 1959; M.A.,
State University of Iowa, 1962. Lecturer in
Literature, Caltech, 1999–2005; Lecturer in
English, 2005–07; Lecturer in Theater Arts,
1999–2008; Lecturer in Theater Arts
Emeritus, 2008–.

Jerrold E. Marsden, Ph.D., Carl F Braun Professor of Engineering, Control and Dynamical Systems, and Applied and Computational Mathematics
B.S., University of Toronto, 1965; Ph.D., Princeton University, 1968. Sherman Fairchild Distinguished Scholar, Caltech, 1992; Professor, Control and Dynamical Systems, 1995–2003; Braun Professor of Applied and Computational Mathematics and Computer Science, 2003–09; Braun Professor, 2009–.

Richard E. Marsh, Ph.D., Senior Research Associate in Chemistry, Emeritus B.S., Caltech, 1943; Ph.D., University of California (Los Angeles), 1950. Research Fellow, Caltech, 1950–55; Senior Research Fellow, 1955–73; Research Associate, 1973–81; Senior Research Associate, 1981–90; Senior Research Associate Emeritus, 1990–.

Hardy Cross Martel, Ph.D., Professor of Electrical Engineering, Emeritus B.S., Caltech, 1949; M.S., Massachusetts Institute of Technology, 1950; Ph.D., Caltech, 1956. Instructor, 1953–55; Assistant Professor, 1955–58; Associate Professor, 1958–82; Professor, 1982–90; Professor Emeritus, 1990–. Executive Assistant to the President, 1969–83; Secretary of the Board of Trustees, 1973–83; Executive Officer for Electrical Engineering, 1981–86.

Alain Jean Martin, Ing., Professor of Computer Science B.S., University of Marseille, 1965; Ing., Polytechnic Institute (Grenoble), 1969. Visiting Assistant Professor, Caltech, 1981–83; Visiting Associate Professor, 1983; Associate Professor, 1983–86; Professor, 1986–. Executive Officer for Computer Science, 1994–97.

D. Christopher Martin, Ph.D., Professor of Physics B.A., Oberlin College, 1978; Ph.D., University of California, 1986. Caltech, 1993—.

Jay N. Marx, Ph.D., Senior Research Associate in Physics; Executive Director, LIGO M.S., Columbia University, 1969; Ph.D., 1970. Senior Research Associate, Caltech, 2006-; Executive Director, 2006-.

Sotiris K. Masmanidis, Ph.D., Broad Senior Research Fellow in Brain Circuitry B.Sc., University College (London), 2001; M.S., Caltech, 2003; Ph.D., 2006. Broad Senior Research Fellow, 2006-.

Peter V. Mason, Ph.D., Visiting Associate in Physics

B.Š., Caltech, 1951; M.S., 1952; Ph.D., 1962. Technical Staff, Retired, Jet Propulsion Laboratory, 1997.- Assistant Professor, Caltech, 1962–66; Visiting Associate, 1997–2010.

Sami F. Masri, Ph.D., Visiting Associate in Civil Engineering

B.S., University of Texas, 1960; M.S., 1961; M.S., Caltech, 1962; Ph.D., 1965. Professor, University of Southern California, 1981–. Research Fellow in Mechanical Engineering, Caltech, 1965–66; Visiting Associate, 1973; 1981; 1989–96; 2002–04; 2010–11.

Richard Massey, Ph.D., Visiting Associate in Astronomy

Ph.D., University of Cambridge, 2003; STFC Advanced Fellow, Royal Observatory Edinburgh, 2008–. Caltech, 2009–10.

Andrea Mattozzi, Ph.D., Assistant Professor of Economics

B.A., Bocconi University (Italy), 1997;Ph.D., University of Pennsylvania, 2004.Caltech, 2004—.

Stephen Leon Mayo, Ph.D., Bren Professor of Biology and Chemistry; Chair, Division of Biology

B.S., Pennsylvania State University, 1983; Ph.D., Caltech, 1987. Senior Research Fellow, 1991–92; Assistant Professor, 1992–98; Associate Professor, 1998–2003; Professor, 2003–07; Bren Professor, 2007–. Assistant Investigator, Howard Hughes Medical Institute, 1994–2000; Associate Investigator, 2000–05; Investigator, 2005–07. Executive Officer for Biochemistry and Molecular Biophysics, 2004–07; Vice Provost, 2007–10; Chair, 2010–.

Sarkis Mazmanian, Ph.D., Assistant Professor of Biology B.S., University of California (Los Angeles), 1995; Ph.D., 2002. Caltech, 2006–.

Preston R. McAfee, Ph.D., D.Sc.h.c., Visiting Professor of Economics B.A., University of Florida, 1976; M.S., Purdue University, 1978; Ph.D., 1980; D.Sc.h.c., Purdue University. Visiting Associate Professor, Caltech, 1988–89; Visiting Professor, 1989–90; 2010–12; Johnson Professor, 2004–09. Executive Officer for the Social Sciences, 2005–07.

Edward J. McCaffery, J.D., Visiting Professor of Law

B.Á., Yale University, 1980; J.D., Harvard Law School, 1985. Associate Professor, University of Southern California, 1991.. Visiting Associate Professor, Caltech, 1996–97; Visiting Professor, 1997–2008; 2009–10; Visiting Associate, 2008–09.

David R. McClay, Ph.D., Visiting Associate in Biology

B.S., Pennsylvania State University, 1963; M.S., University of Vermont, 1965; Ph.D., University of North Carolina (Chapel Hill), 1971. Professor, Duke University, 1973. Caltech, 2002; 2009–10.

Daniel McCleese, D.Phil., Visiting Associate in Planetary Science B.S., Antioch College, 1972; D.Phil., University of Oxford, 1976. Chief Scientist, Jet Propulsion Laboratory, 1994.. Caltech, 2002–10.

Robert James McEliece, Ph.D., Allen E. Puckett Professor and Professor of Electrical Engineering, Emeritus
B.S., Caltech, 1964; Ph.D., 1967. Professor, 1982–2007; Puckett Professor, 1997–2007; Puckett Professor and Professor, Emeritus, 2007–. Executive Officer for Electrical Engineering, 1990–99.

Stephen Craig McGuire, Ph.D., Visiting Associate in Physics B.S., Southern University and A&M College, 1970; M.S., University of Rochester, 1974; Ph.D., Cornell University, 1979. Professor and Chair, Southern University and A&M College, 1999–. Caltech, 2000–11.

Beverley J. McKeon, Ph.D., Assistant Professor of Aeronautics B.A., University of Cambridge, 1995; M.Eng., 1996; M.A. (Mechanical and Aerospace Engineering), M.A., (Engineering), Princeton University, 1999; Ph.D., 2003. Caltech, 2006—

Robert D. McKeown, Ph.D., Professor of Physics

B.S., State University of New York (Stony Brook), 1974; Ph.D., Princeton University, 1979. Assistant Professor, Caltech, 1980–86; Associate Professor, 1986–92; Professor, 1992–.

Basil Vincent McKoy, Ph.D., Professor of Theoretical Chemistry B.S., Nova Scotia Technical University, 1960; Ph.D., Yale University, 1964. Noyes

Research Instructor in Chemistry, Caltech,

1964–66; Assistant Professor of Theoretical Chemistry, 1967–69; Associate Professor, 1969–75; Professor, 1975–.

Carver Andress Mead, Ph.D., D.Sc.h.c., D.h.c., Gordon and Betty Moore Professor of Engineering and Applied Science, Emeritus B.S., Caltech, 1956; M.S., 1957; Ph.D., 1960; D.Sc.h.c., University of Lund (Sweden); D.h.c., University of Southern California. Instructor in Electrical Engineering, Caltech, 1958-59; Assistant Professor, 1959-62; Associate Professor, 1962-67; Professor, 1967-77; Professor of Computer Science and Electrical Engineering, 1977-80; Moore Professor of Computer Science, 1980-92; Moore Professor of Engineering and Applied Science, 1992-99; Moore Professor Emeritus, 1999-.

Barry B. Megdal, Ph.D., Lecturer in Electrical Engineering B.S., Caltech, 1977; M.S., 1978; Ph.D., 1983. Lecturer, 1992–2009.

Simona Mei, Ph.D., Visiting Associate in Astronomy
Ph.D., University of Strasbourg, 1999. Associate Professor, University of Paris, 2006.— Caltech, 2008–10.

Daniel I. Meiron, Sc.D., Fletcher Jones Professor of Aeronautics and Applied and Computational Mathematics; Associate Director, Graduate Aerospace Laboratories S.B., Massachusetts Institute of Technology, 1976; Sc.D., 1981. Research Fellow in Applied Mathematics, Caltech, 1981-83; Visiting Associate, 1984–85; Assistant Professor, 1985-89; Associate Professor, 1989-94; Professor, 1994-2000; Professor of Applied and Computational Mathematics, 2000; Professor of Applied and Computational Mathematics and Computer Science, 2001-06; Jones Professor of Applied and Computational Mathematics and Computer Science, 2006-09; Jones Professor, 2009-. Executive Officer for Applied Mathematics, 1994-98; Associate Provost for Information and Information Technology, 2000-04. Associate Director, 2009-.

Joao M. Melo de Sousa, Ph.D., Visiting Associate in Mechanical Engineering Ph.D., Technical University of Lisbon, 1996; Visiting Associate, Caltech, 2010.

Remy Mevel, Ph.D., Visiting Associate in Aerospace B.S., University of Orleans, 2004; M.S., 2006; Ph.D., 2009. Visiting Associate,

Richard A. Mewaldt, Ph.D., Senior Research Associate in Physics B.A., Lawrence University, 1965; M.A.,

Caltech, 2010.

Washington University (St. Louis), 1967; Ph.D., 1971. Research Fellow, Caltech, 1971–75; Senior Research Fellow, 1975–81; Lecturer, 1987; Senior Research Associate, 1981–.

Elliot M. Meyerowitz, Ph.D., George W. Beadle Professor of Biology
A.B., Columbia University, 1973; M.Phil., Yale University, 1975; Ph.D., 1977.
Assistant Professor, Caltech, 1980–85; Associate Professor, 1985–89; Professor, 1989–2002; Beadle Professor, 2002–.
Executive Officer for Biology, 1995–2000.
Chair, Division of Biology, 2000–10.

Georges Meylan, Ph.D., Visiting Associate in Astronomy Ph.D., University of Geneva, 1985. Director, École Polytechnique Fédérale de Lausanne, 2004. Caltech, 2001–10.

Carol Ann Miller, M.D., Visiting Associate in Biology
A.B., Mount Holyoke College, 1961; M.D., Jefferson Medical College, 1965. Professor, University of Southern California School of Medicine, 1990-; Chief, Cajal Laboratory of Neuropathology, University of Southern California Medical Center, 1982–. Caltech, 1982–2003; 2005–11.

Thomas F. Miller III, Ph.D., Assistant Professor of Chemistry B.S., Texas A&M University, 2000; Ph.D., University of Oxford, 2005. Caltech, 2008—.

Ralph Milliken, Ph.D., Visiting Associate in Geology B.S., Indiana University, 2001; M.S., Brown University, 2003; Ph.D., 2006. Staff Scientist, Jet Propulsion Laboratory, 2007–. Caltech, 2009–10.

Feng-Ying Ming, Ph.D., Lecturer in Chinese B.A., Tamkang University (Taiwan), 1978; M.A., California State University, 1984; M.A., University of California (Los Angeles), 1991; Ph.D., 1999. Caltech, 2000–11.

Yasushi Mino, Ph.D., Senior Research Fellow in Physics B.S., Kyoto University, 1993; M.S., 1995; Ph.D., 1998. Caltech, 2008—.

Valery P. Mitrofanov, Visiting Associate in Physics M.Sc., Moscow State University, 1971;

M.Sc., Moscow State University, 1971; Kandidat, 1975. Assistant Professor, 1981–. Caltech, 1995–2008; 2009; 2010.

Julie M. Miwa, Ph.D., Senior Research Fellow in Biology B.A., University of California, 1987; Ph.D., Rockefeller University, 1997. Caltech, 2009Eric Mjolsness, Ph.D., Moore Distinguished Scholar in Biology and Engineering and Applied Science

A.B., Washington University, 1980; Ph.D., Caltech, 1985. Principal Computer Scientist, Jet Propulsion Laboratory, 1998.– Associate Professor, University of California (Irvine), 2002.– Faculty Associate, Caltech, 2000–02; Visiting Associate, 2002–10; Moore Distinguished Scholar, 2010.

Bahram Mobasher, Ph.D., Visiting Associate in Astronomy M.Sc., University of Durham, 1983; Ph.D., 1988. Professor, University of California (Riverside), 2007.– Caltech, 2008.

Farshad Moradi, Ph.D., Visiting Associate in Biology

M.S., Tehran University of Medical Sciences, 2000; Ph.D., Caltech, 2006. Postdoctoral Scholar, New York University, 2006. Visiting Associate, Caltech, 2007–09.

James John Morgan, Ph.D., D.Sc.h.c., Marvin L. Goldberger Professor of Environmental Engineering Science, Emeritus B.C.E., Manhattan College, 1954; M.S.E., University of Michigan, 1956; M.A., Harvard University, 1962; Ph.D., 1964; D.Sc.h.c., Manhattan College. Associate Professor of Environmental Health Engineering, Caltech, 1965-69; Professor, 1969-87; Goldberger Professor of Environmental Engineering Science, 1987-2000; Goldberger Professor Emeritus, 2000-. Academic Officer for Environmental Engineering Science, 1971-72; Dean of Students, 1972-75; Executive Officer for Environmental Engineering Science, 1974-80, 1993-96; Acting Dean of Graduate Studies, 1981-84; Vice President for Student Affairs, 1980-89.

Baptiste J. Morin, Ph.D., Harry Bateman Research Instructor in Mathematics M.S., Universite de Bordeaux I, 2004. Caltech, 2008–.

S. M. Motaghian Nezam, Ph.D., Senior Research Fellow in Biology B.S., Sharif University of Technology, 1995; M.S., Iran University of Science and Technology, 1999; M.S., University of Southern California, 2002; Ph.D., 2004. Caltech, 2008.

Nader Motee, Ph.D., Lecturer in Control and Dynamical Systems B.S., Sharif University of Technology, 2000; M.S., University of Pennsylvania, 2006; Ph.D., 2007. Caltech, 2010.

Olexei I. Motrunich, Ph.D., Assistant Professor of Theoretical Physics B.S., University of Missouri (Columbia), 1996; Ph.D., Princeton University, 2001. Caltech, 2006—. Duane Owen Muhleman, Ph.D., Professor of Planetary Science, Emeritus
B.S., University of Toledo, 1953; Ph.D.,
Harvard University, 1963. Associate
Professor, Caltech, 1967–71; Professor,
1971–97; Professor Emeritus, 1997–. Staff
Member, Owens Valley Radio Observatory,
1967–.

Hans-Michael Müller, Ph.D., Senior Research Fellow in Biology Ph.D., Caltech, 1999. Senior Research Fellow, 2009–.

Bruce Churchill Murray, Ph.D., Professor of Planetary Science and Geology, Emeritus S.B., Massachusetts Institute of Technology, 1953; S.M., 1954; Ph.D., 1955. Research Fellow in Space Science, Caltech, 1960–63; Associate Professor of Planetary Science, 1963–68; Professor, 1968–92; Professor of Planetary Science and Geology, 1992–2001; Professor Emeritus, 2001–. Director, Jet Propulsion Laboratory, 1976–82.

Richard Martin Murray, Ph.D., Thomas E. and Doris Everhart Professor of Control and Dynamical Systems and Bioengineering B.S., Caltech, 1985; M.S., University of California, 1988; Ph.D., 1990. Assistant Professor of Mechanical Engineering, Caltech, 1991-97; Associate Professor, 1997-2000; Professor, 2000-05; Professor of Control and Dynamical Systems, 2005-06; Everhart Professor of Control and Dynamical Systems, 2006-09; Everhart Professor of Control and Dynamical Systems and Bioengineering, 2009-; Chair, Division of Engineering and Applied Science, 2000-05; Interim Chair, Engineering and Applied Science, 2008-09; Director, Information Science & Technology, 2006-2009.

Paul Myrow, Ph.D., Visiting Professor of Geology B.S., Colgate University, 1980; M.S., University of Vermont, 1983; Ph.D., Memorial University of Newfoundland, 1987. Professor, Colorado College, 2000–. Caltech, 2009–10.

Steven Nafziger, Ph.D., Visiting Associate in Economics
B.A., Northwestern University, 2000; M.A., Yale University, 2002; M.Phil., 2003; Ph.D., 2006. Assistant Professor, Williams College, 2006. Caltech, 2009–10.

Yoshie Narui, M.S., Lecturer in Chemistry B.S., Ohio State University, 2003; M.S., Caltech, 2009. Caltech, 2010.

Abbas Nasiraei Moghaddam, Ph.D., Visiting Associate in Bioengineering B.S., University of Tehran, 1995; M.S., 1998; Ph.D., Caltech, 2006. Caltech, 2010–11.

Linda Faye Nazar, Ph.D., Moore Distinguished Scholar in Engineering and Applied Science B.S., University of British Columbia, 1978; Ph.D., University of Toronto, 1984. Caltech, 2010.

Thomas A. Neenan, M.F.A., *Lecturer in Music* B.F.A., California State University

(Northridge), 1977; M.F.A., University of California (Los Angeles), 1982. Caltech, 1991–98; 1998–.

Gerry Neugebauer, Ph.D., Robert Andrews Millikan Professor of Physics, Emeritus A.B., Cornell University, 1954; Ph.D., Caltech, 1960. Assistant Professor, 1962–65; Associate Professor, 1965–70; Professor, 1970–96; Howard Hughes Professor, 1985–96; Millikan Professor, 1998–98; Millikan Professor Emeritus, 1998–. Acting Director, Palomar Observatory, 1980–81; Director, 1981–94; Chairman, Division of Physics, Mathematics and Astronomy, 1988–93.

Dianne K. Newman, Ph.D., Professor of Biology and Geobiology; Investigator, Howard Hughes Medical Institute
B.A., Stanford University, 1993; Ph.D.,
Massachusetts Institute of Technology,
1997. Clare Booth Luce Assistant Professor of Geobiology and Environmental Science and Engineering, Caltech, 2000–05; Associate Professor of Geobiology and Environmental Science and Engineering, 2005; Associate Professor of Geobiology, 2006–96; Professor of Geobiology, 2006–97 Professor of Biology, 2006–1 Investigator, Howard Hughes Medical Institute,

Harvey B. Newman, Sc.D., D.h.c., Professor of Physics B.S., Massachusetts Institute of Technology, 1968; Sc.D., 1973; D.h.c., University Politehnica of Bucharest; Pavol Jozef Safarik University. Associate Professor, Caltech, 1982–90; Professor, 1990–.

2005-07; 2010-.

Hien Trong Nguyen, Ph.D., Visiting Associate in Physics; Lecturer in Physics Ph.D., Princeton University, 1993. Research Scientist, Jet Propulsion Laboratory, 2002–. Visiting Associate, Caltech, 2007–09; Lecturer, 2007; 2008; 2009–11.

Yi Ni, Ph.D., Assistant Professor of Mathematics B.S., Peking University, 2001; M.S., 2003; Ph.D., Princeton University, 2007. Caltech, 2009—.

Marc-Aurele Nicolet, Ph.D., Professor of Electrical Engineering and Applied Physics, Emeritus Ph.D., University of Basel, 1958. Assistant Professor of Electrical Engineering, Caltech, 1959–65; Associate Professor, 1965–73; Professor, 1973–88; Professor of Electrical Engineering and Applied Physics, 1988–98; Professor Emeritus, 1998–.

Mika Nystroem, Ph.D., Visiting Associate in Computer Science; Lecturer in Computer Science S.B. (Physics), S.B. (Electrical Engineering), Massachusetts Institute of Technology, 1994; M.S., Caltech, 1997; Ph.D., 2001. Research Scientist, Situs Logic of Pasadena, 2005–1. Instructor, Caltech, 2001–03; Visiting Associate, 2005–06; 2008–10; Lecturer, 2009–10.

John P. O'Doherty, D.Phil., Professor of Psychology B.A., University of Dublin (Trinity College), 1996; D.Phil., University of Oxford, 2000. Assistant Professor, Caltech, 2004–07; Associate Professor, 2007–09; Professor, 2009–.

David D. Oglesby, Ph.D., Visiting Associate in Aeronautics
B.S., Carleton College; M.S., University of California (Santa Barbara), 1993; Ph.D., 1999. Associate Professor, University of California (Riverside), 2006–. Visiting Associate, Caltech, 2009–11.

Hiroshi Oguri, Ph.D., Fred Kavli Professor of Theoretical Physics B.A., Kyoto University (Japan), 1984; M.A., 1986; Ph.D., University of Tokyo, 1989. Visiting Associate, Caltech, 1999–2000; Professor, 2000–07; Kavli Professor, 2007–.

Mitchio Okumura, Ph.D., Professor of Chemical Physics; Executive Officer for Chemistry
B.S., Yale University, 1979; M.S., 1979;
C.P.G.S., University of Cambridge, 1980;
Ph.D., University of California, 1986.
Assistant Professor, Caltech, 1988–94;
Associate Professor, 1994–2003; Professor, 2003.– Executive Officer, 2006–.

Christiane H. Orcel, Ph.D., Lecturer in French
M.A., Princeton University, 1987; Ph.D., 1992. Instructor, Caltech, 1990–93; Lecturer, 1993–95; 1995–.

Peter C. Ordeshook, Ph.D., Mary Stillman Harkness Professor of Political Science B.S., Massachusetts Institute of Technology, 1964; Ph.D., University of Rochester, 1969. Professor, Caltech, 1987–2009; Harkness Professor, 2009— Executive Officer for the Social Sciences, 1992–95.

Naomi Oreskes, Ph.D., Francis Bacon Visiting Professor of History B.Sc., University of London, 1981; Ph.D., Stanford University, 1990. Professor, University of California (San Diego), 2005–. Caltech, 2010.

Victoria Orphan, Ph.D., Associate Professor of Geobiology B.A., University of California (Santa Barbara), 1994; Ph.D., 2002. Assistant Professor, Caltech, 2004–10; Associate Professor, 2010–.

Michael Ortiz, Ph.D., Dotty and Dick Hayman Professor of Aeronautics and Mechanical Engineering B.S., Polytechnic University of Madrid, 1977; M.S., University of California, 1978; Ph.D., 1982. Sherman Fairchild Distinguished Scholar, Caltech, 1994–95; Professor of Aeronautics and Applied Mechanics, 1995–2000; Professor of Aeronautics and Mechanical Engineering, 2000–04; Hayman Professor, 2004–.

Pietro S. T. Ortoleva, Ph.D., Assistant Professor of Economics B.A., University of Turin, 2004; Ph.D., New York University, 2009. Caltech, 2009.

Christian D. Ott, D.Sc., Assistant Professor of Theoretical Astrophysics
Dipl., University of Heidelberg, 2003;
Dr.rer.nat, University of Potsdam, 2007.
Sherman Fairchild Prize Fellow, Caltech, 2008–09; Assistant Professor, 2009–.

Benjamin J. Owen, Ph.D., Visiting Associate in Physics Ph.D., Caltech, 1998. Associate Professor, Penn State, 2008–. Caltech, 2010.

Ray David Owen, Ph.D., Sc.D.h.c., Professor of Biology, Emeritus B.S., Carroll College, 1937; Ph.M., University of Wisconsin, 1938; Ph.D., 1941; Sc.D.h.c., Carroll College; University of the Pacific. Gosney Fellow, Caltech, 1946–47;

Pacific. Gosney Fellow, Caltech, 1946–47; Associate Professor, 1947–53; Professor, 1953–83; Professor Emeritus, 1983–. Chairman, Division of Biology, 1961–68; Vice President for Student Affairs and Dean of Students, 1975–80.

Houman Owhadi, Ph.D., Assistant Professor of Applied and Computational Mathematics and Control and Dynamical Systems
B.S., École Polytechnique (France), 1994;
M.S., École Nationale des Ponts et Chaussées, 1997; Ph.D., École
Polytechnique Fédérale de Lausanne
(Switzerland), 2001. Caltech, 2004.

Stephen Padin, Ph.D., Senior Research Associate in Astrophysics B.Sc., University of Manchester, 1982; Ph.D., 1985. Caltech, 2009–.

Oskar J. Painter, Ph.D., Associate Professor of Applied Physics; Executive Officer for Applied Physics and Materials Science B.S., University of British Columbia, 1994; M.S., Caltech, 1995; Ph.D., 2001. Visiting Associate, 2001–02; Assistant Professor, 2002–08; Associate Professor, 2008–. Executive Officer, 2010–.

Thomas R. Palfrey III, Ph.D., Flintridge Foundation Professor of Economics and Political Science
B.A., University of Michigan, 1975; M.A., 1976; Ph.D., Caltech, 1981. Professor, 1986–2002; Flintridge Foundation
Professor, 2003–05; 2006–. Executive
Officer for the Social Sciences, 2001–02.

Anna Pandolfi, Ph.D., Visiting Associate in Aeronautics
M.S., Technical University (Milan), 1984;
Ph.D., Université Paul Verlaine de Metz, 2007. Associate Professor, 2001. Caltech, 1996–2001; 2005–06; 2008–10.

Dimitri A. Papanastassiou, Ph.D., Faculty Associate in Geochemistry
B.S., Caltech, 1965; Ph.D., 1970. Research Fellow in Physics, 1970–72; Senior Research Fellow in Planetary Science, 1972–76; Research Associate in Geochemistry, 1976–81; Senior Research Associate, 1981–99; Faculty Associate, 1999–.

Robert Pappalardo, Ph.D., Visiting Associate in Planetary Science B.A., Cornell University, 1986; Ph.D., Arizona State University, 1994. Principal Scientist and Director's Fellow, Jet Propulsion Laboratory, 2006–. Caltech, 2007–11.

Jun Seok Park, Ph.D., Visiting Associate in Computer Science B.S., Kookmin University, 1991; M.S., 1993; Ph.D., 1996. Associate Professor, 2003.— Caltech, 2010–11.

Carl Stevens Parker, Ph.D., Professor of Biochemistry

B.A., University of Rochester, 1973; Ph.D., Washington University (St. Louis), 1977. Assistant Professor of Chemical Biology, Caltech, 1981–87; Associate Professor, 1987–92; Professor, 1992–99; Professor of Biochemistry, 1999–. Executive Officer for Biochemistry and Molecular Biophysics, 2000–04.

Paul H. Patterson, Ph.D., Anne P. and Benjamin F. Biaggini Professor of Biological Sciences

B.A., Grinnell College, 1965; Ph.D., Johns Hopkins University, 1970. Professor, Caltech, 1983–2005; Biaggini Professor, 2005–. Executive Officer for Neurobiology, 1989–2000.

Michael T. Pauken, Ph.D., Lecturer in Mechanical Engineering B.S., Vanderbilt University, 1983; M.S., Washington University, 1990; Ph.D.,

Georgia Institute of Technology, 1994. Caltech, 2001; 2008–10.

Timothy John Pearson, Ph.D., Senior Research Associate in Radio Astronomy B.A., University of Cambridge, 1972; M.A., 1976; Ph.D., 1977. Research Fellow, Caltech, 1977–80; Senior Research Associate, 1988–.

Charles William Peck, Ph.D., Professor of Physics, Emeritus

B.Ś., New Mexico College of Agricultural and Mechanical Arts, 1956; Ph.D., Caltech, 1964. Research Fellow, 1964–65; Assistant Professor, 1965–69; Associate Professor, 1969–77; Professor, 1977–2004; Professor Emeritus, 2004–. Executive Officer for Physics, 1983–86; Chair, Division of Physics, Mathematics and Astronomy, 1993–98.

Jinsong Pei, Ph.D., Visiting Associate in Civil Engineering B.S., Xian Jiaotong University, 1989; M.E., Nanyang Technological University, 1996; M.S., Columbia University, 2000; Ph.D., 2001. Caltech, 2009–10.

Sergio Pellegrino, Ph.D., Joyce and Kent Kresa Professor of Aeronautics and Professor of Civil Engineering, Jet Propulsion Laboratory Senior Research Scientist Laurea, University of Naples, 1982; Ph.D., University of Cambridge, 1986. Professor, Caltech, 2007–10; Kresa Professor, 2010– Senior Research Scientist, Jet Propulsion Laboratory, 2009–.

Leora Peltz, Ph.D., Visiting Associate in Electrical Engineering
B.S., University of Negev, 1975; B.S., 1976;
M.S., Case Western Reserve University,
1995; Ph.D., 2005. Scientist, Boeing, 2003—.
Caltech, 2007–10.

Robert C. Penner, Ph.D., Visiting Associate in Mathematical and Theoretical Physics Ph.D., Massachusetts Institute of Technology, 1982. Caltech, 2010–11.

Bryan E. Penprase, Ph.D., Visiting Associate in Astronomy
M.S., Stanford University, 1985; Ph.D.,
University of Chicago, 1992. Associate
Professor, Pomona College, 2000–. Caltech,
2007–10.

Matthew Perlmutter, Ph.D., Visiting Associate in Control and Dynamical Systems B.S., University of California, 1990; Ph.D., 1999. Caltech, 2009–10.

Pietro Perona, D.Eng., Ph.D., Allen E. Puckett Professor of Electrical Engineering D.Eng., University of Padua (Italy), 1985; Ph.D., University of California, 1990. Assistant Professor, Caltech, 1991–96; Professor, 1996–2008; Puckett Professor,

2008–. Director, Center for Neuromorphic Systems Engineering, 1999–2004. Executive Officer, 2006–10.

Jonas C. Peters, Ph.D., Bren Professor of Chemistry B.S., University of Chicago, 1993; Ph.D., Massachusetts Institute of Technology, 1998. Assistant Professor, Caltech, 1999–2004; Associate Professor, 2004–06; Professor, 2006–09; Bren Professor, 2010–.

Danny Petrasek, M.D., Ph.D., Visiting Associate in Applied and Computational Mathematics and Bioengineering; Lecturer in Bioengineering
B.S., University of California (Los Angeles), 1980; M.D., Chicago Medical School, 1985; Ph.D., Caltech, 2002. Clinical Professor, University of California (Los Angeles) School of Medicine, 2004—. Senior Research Fellow in Applied and Computational Mathematics and Bioengineering, 2002–08; Lecturer in Bioengineering, 2005–10; Visiting Associate, 2008–12.

Robert B. Phillips, Ph.D., Professor of Applied Physics and Mechanical Engineering B.S., University of Minnesota, 1986; Ph.D., Washington University, 1989. Clark Millikan Visiting Assistant Professor, Caltech, 1997; Professor, 2000–.

Thomas G. Phillips, D.Phil., Altair Professor of Physics; Director, Caltecb Submillimeter Observatory
B.A., University of Oxford, 1961; M.A., 1964; D.Phil., 1964. Visiting Associate in Radio Astronomy, Caltech, 1978–79; Professor of Physics, 1979–2004; Altair Professor, 2004—Staff Member, Owens Valley Radio Observatory, 1978–85; Associate Director, Owens Valley Radio Observatory, 1981–85; Director, Caltech Submillimeter Observatory, 1986—

E. Sterl Phinney III, Ph.D., Professor of Theoretical Astrophysics B.S., Caltech, 1980; Ph.D., University of Cambridge, 1983. Assistant Professor, Caltech, 1985–91; Associate Professor, 1991–95; Professor, 1995–.

Kenneth A. Pickar, Ph.D., Visiting Professor of Mechanical Engineering B.S., City University of New York, 1961; Ph.D., University of Pennsylvania, 1966. Senior Vice President, Retired, Allied Signal Aerospace, 1993—. Visiting Professor of Engineering, Caltech, 1998; Visiting Professor of Mechanical Engineering, 1998–99; 2003–11; J. Stanley Johnson Visiting Professor, 1999–2003.

Gillian Pierce, B.A., Lecturer in Engineering B.A., Oxford University, 1997. Caltech, 2009; 2010.

James R. Pierce, M.D., Lecturer in Biology B.S., Caltech, 1998; M.D., Jefferson Medical College, 2002. Lecturer, Caltech, 2002–03; 2005–09.

Niles A. Pierce, D.Phil., Associate Professor of Applied and Computational Mathematics and Bioengineering; Executive Officer for Bioengineering
B.S.E., Princeton University, 1993; D.Phil., University of Oxford, 1997. Assistant Professor of Applied Mathematics, Caltech, 2000; Assistant Professor of Applied and Computational Mathematics, 2000–04; Assistant Professor of Applied and Computational Mathematics and Bioengineering, 2004–06; Associate Professor, 2006–; Acting Executive Officer for Bioengineering, 2007; Executive Officer, 2007–.

Elena Pierpaoli, Ph.D., Visiting Associate in Astrophysics

Ph.D., International School for Advanced Studies (Italy), 1998. Assistant Professor, University of Southern California, 2006–. Senior Research Fellow, Caltech, 2004–06; Visiting Associate, 2006–10.

George Pigman III, Ph.D., Professor of English

Å.B., Harvard College, 1973; M.Phil., Yale University, 1975; Ph.D. (Comparative Literature), 1977; Ph.D. (Psychoanalysis), Southern California Psychoanalytic Institute, 1989. Assistant Professor of English, Caltech, 1977–80; Assistant Professor of Literature, 1980–83; Associate Professor, 1983–93; Professor, 1993–2004; Professor of English, 2004–. Executive Officer for the Humanities, 2003–08.

Jerome Pine, Ph.D., Professor of Physics A.B., Princeton University, 1949; M.S., Cornell University, 1952; Ph.D., 1959. Associate Professor, Caltech, 1963–67; Professor, 1967–.

Donald Pinkston III, B.S., *Lecturer in Computer Science* B.S., Caltech, 1998. Lecturer, 2005–10.

Charles Raymond Plott, Ph.D., D.Lit.h.c., D.h.c., Edward S. Harkness Professor of Economics and Political Science B.S., Oklahoma State University, 1961; M.S., 1964; Ph.D., University of Virginia, 1965; D.Lit.h.c., Purdue University; D.h.c., Université Pierre Mendès. Professor of Economics, Caltech, 1971–87; Harkness Professor, 1987–.

Hugh David Politzer, Ph.D., Nobel Laureate, Richard Chace Tolman Professor of Theoretical Physics B.S., University of Michigan, 1969; Ph.D., Harvard University, 1974. Visiting Associate, Caltech, 1975–76; Associate Professor, 1976–79; Professor, 1979–2004; Tolman Professor, 2004–. Executive Officer for Physics, 1986–88.

James E. Polk, Ph.D., Visiting Associate in Aeronautics
B.S., Georgia Institute of Technology, 1984; M.S., Princeton University, 1986; Ph.D., 1996. Lecturer, Caltech, 1999–2002;

2005-08; Visiting Associate, 2007-12.

Adrian Ponce, Ph.D., Visiting Associate in Chemistry
B.S., Michigan State University, 1993;
Ph.D., Caltech, 1999. Research Scientist,
Jet Propulsion Laboratory, 2001–. Visiting
Associate, Caltech, 2000–.

Frank Clifford Porter, Ph.D., Professor of Physics B.S., Caltech, 1972; Ph.D., University of California, 1977. Research Fellow, Caltech, 1977–78; Weizmann Research Fellow, 1978–80; Senior Research Fellow, 1980–82; Assistant Professor, 1982–88; Associate Professor, 1988–94; Professor, 1994–

John P. Preskill, Ph.D., Richard P. Feynman Professor of Theoretical Physics A.B., Princeton University, 1975; A.M., Harvard University, 1976; Ph.D., 1980. Associate Professor, Caltech, 1983–90; Professor, 1990–2002; MacArthur Professor, 2002–09; Feynman Professor, 2010–.

Thomas Allen Prince, Ph.D., Professor of Physics; Jet Propulsion Laboratory Senior Research Scientist; Director, W. M. Keck Institute for Space Studies B.S., Villanova University, 1970; M.S., University of Chicago, 1972; Ph.D., 1978. Research Fellow, Caltech, 1979-80; Robert A. Millikan Research Fellow, 1980-82; Senior Research Fellow, 1982-83; Assistant Professor, 1983-86; Associate Professor, 1986-92; Professor, 1992-. Associate Director, Center for Advanced Computer Research, 1995-2001; Director, 2005-; Director, Keck Institute, 2008-. Chief Scientist, Jet Propulsion Laboratory, 2001-06; Senior Research Scientist, 2006-.

David Prober, Ph.D., Assistant Professor of Biology B.Sc., University of Manitoba, 1995; Ph.D., University of Washington, 2002. Caltech, 2009.

Daniele Procissi, Ph.D., Visiting Associate in Biology
M.S., University of Florence, 1998; Ph.D.,
Iowa State University, 2003. Caltech, 2010.

Carmie Puckett Robinson, M.D., Visiting Associate in Biology B.S., Michigan State University, 1970; M.D., 1975. Professor, University of Southern California, 2000—. Senior

Research Fellow, Caltech, 1986–92; Visiting Associate, 2006–10.

Pierre Puget, Ph.D., Visiting Associate in Physics

M.Sc., School of Applied Mathematics and Computer Sciences of Grenoble, 1985; Ph.D., Grenoble Institute of Technology, 1989. Senior Scientist and Program Portfolio Manager, CEA/LETI, 2004—. Caltech, 2008–09.

Dale Ian Pullin, Ph.D., Theodore von Kármán Profesor of Aeronautics B.Sc., University of Melbourne, 1966; B.E., University of Sydney, 1968; Ph.D., University of London (Imperial College), 1974. Visiting Associate, Caltech, 1990; Professor, 1991–2006; von Kármán Professor, 2006–.

Steven R. Quartz, Ph.D., Associate Professor of Philosophy
B.A., University of Western Ontario (Huron College), 1986; M.A., 1988; Ph.D.,
University of California (San Diego), 1993.
Instructor, Caltech, 1998–99; Assistant
Professor, 1999–2002; Associate Professor, 2002–.

Kevin J. Quirk, Ph.D., Lecturer in Electrical Engineering B.S., University of California (San Diego), 1993; M.S., 1997; Ph.D., 2000. Caltech, 2006–10.

Andreas Quirrenbach, Ph.D., Visiting Associate in Astronomy
Ph.D., University of Bonn, 1990. Professor, University of Heidelberg, 2002–. Caltech, 2006–11.

Fredric Raichlen, Sc.D., Professor of Civil and Mechanical Engineering, Emeritus B.E., Johns Hopkins University, 1953; S.M., Massachusetts Institute of Technology, 1955; Sc.D., 1962. Assistant Professor of Civil Engineering, Caltech, 1962–67; Associate Professor, 1967–72; Professor, 1972–97; Professor of Civil and Mechanical Engineering, 1997–2001; Professor Emeritus, 2001–.

Eric M. Rains, Ph.D., Professor of Mathematics
B.A., Case Western Reserve University,
1991; B.S., 1991; M.S., 1991; Ph.D.,
Harvard University, 1995. Visiting Associate
and Lecturer, Caltech, 2002; Professor,
2007—.

Dinakar Ramakrishnan, Ph.D., Taussky-Todd-Lonergan Professor of Mathematics B.E., University of Madras, 1970; M.S., Brooklyn Polytech, 1973; M.A., Columbia University, 1977; Ph.D., 1980. Professor, Caltech, 1988–2007; Taussky-Todd-Lonergan Professor, 2007–. Michael Ramsey-Musolf, Ph.D., Visiting Associate in Physics Ph.D., Princeton University, 1989. Visiting Associate, Caltech, 2001; 2007–10; Senior Research Associate, 2001–07; Lecturer, 2005–06.

Antonio Rangel, Ph.D., Professor of Economics
B.Sc., Caltech, 1993; M.S., Harvard
University, 1996; Ph.D., 1997. Assistant
Professor, Stanford University, 1998.
Instructor, Caltech, 1997–98; Visiting
Associate, 2005–06; Associate Professor,
2006–10; Professor, 2010–.

Vilupanur A. Ravi, Ph.D., Visiting Professor of Bioengineering and Materials Science B.S., University of Madras, 1980; B.E., Indian Institute of Science, 1983; M.S., Ohio State University, 1986; Ph.D., 1988. Associate Professor, California State Polytechnic University, 1996-; Adjunct Professor, Drexel University, 1996-. Visiting Associate in Aeronautics, Caltech, 2001–04; Visiting Associate Professor, 2004–06; Visiting Professor, 2006–10.

Guruswami Ravichandran, Ph.D., D.h.c., John E. Goode Jr. Professor of Aeronautics and Mechanical Engineering; Director, Graduate Aerospace Laboratories B.E., University of Madras (Regional Engineering College), 1981; Sc.M. (Solid Mechanics and Structures), Brown University, 1983; Sc.M. (Applied Mathematics), 1984; Ph.D., 1986; D.h.c., Paul Verlaine University. Assistant Professor of Aeronautics, Caltech, 1990-95; Associate Professor, 1995-99; Professor, 1999-2000; Professor of Aeronautics and Mechanical Engineering, 2000-05; Goode Professor, 2005-. Associate Director, Graduate Aerospace Laboratories, 2008-09; Director, 2009-.

Anthony C. S. Readhead, Ph.D., Barbara and Stanley R. Rawn, Jr., Professor of Astronomy; Director, Chajnantor Observatory; Jet Propulsion Laboratory Senior Research Scientist; Director, Owens Valley Radio Observatory B.Sc., University of Witwatersrand (South Africa), 1968; Ph.D., University of Cambridge, 1972. Research Fellow, Caltech, 1974-75; Senior Research Fellow, 1976-79; Research Associate, 1979-81; Professor of Radio Astronomy, 1981-90; Professor of Astronomy, 1990-2000; Rawn Professor, 2000-. Director, Owens Valley Radio Observatory, 1981-86; 2007-; Executive Officer for Astronomy, 1990-92; Director, Chajnantor Observatory, 2006-; Senior Research Scientist, Jet Propulsion Laboratory, 2006-.

Carol Readhead, Ph.D., Lecturer in Engineering
B.Sc., University of Witwatersrand (South Africa), 1969; Ph.D., University of
Cambridge, 1976. Research Fellow in
Biology, Caltech, 1977–79; Senior Research
Fellow, 1980–83; Senior Research Associate,
1998–2002; Lecturer in Engineering,
2006–10.

Dickinson Professor of Chemistry; Investigator, Howard Hughes Medical Institute; Executive Officer for Biochemistry and Molecular Biophysics
B.S., Yale University, 1974; Ph.D., Harvard University, 1980. Professor, Caltech, 1989–2004, Dickinson Professor, 2004—Investigator, 1997–2002; 2005–; Full Investigator, 2002–05. Executive Officer for

Chemistry, 2002-06; Executive Officer, 2007-.

Douglas C. Rees, Ph.D., Roscoe Gilkey

Gil Refael, Ph.D., Associate Professor of Theoretical Physics B.S., Tel Aviv University, 1997; M.S., 1998; Ph.D., Harvard University, 2003. Assistant Professor, Caltech, 2005–08; Associate Professor, 2008–.

Sarah E. Reisman, Ph.D., Assistant Professor of Chemistry B.A., Connecticut College, 2001; Ph.D., Yale University, 2006. Caltech, 2008–.

David H. Reitze, Ph.D., Visiting Associate in LIGO B.A., Northwestern University, 1983; Ph.D., University of Texas (Austin), 1993. Professor University of Florida 1998–

Ph.D., University of Texas (Austin), 1993. Professor, University of Florida, 1998–. Visiting Associate, Caltech, 1996–97; 2000; 2003; 2007–11.

Paul Renteln, Ph.D., Visiting Associate in Mathematics
A.B. University of California 1981: Ph.D.

A.B., University of California, 1981; Ph.D., Harvard University, 1988. Assistant Professor, California State University (San Bernardino), 1991–. Caltech, 1998–2010.

Jean-Paul Revel, Ph.D., Albert Billings Ruddock Profesor of Biology, Emeritus B.Sc., University of Strasbourg, 1949; Ph.D., Harvard University, 1957. Professor of Biology, Caltech, 1971–78; Ruddock Professor, 1978–2006; Ruddock Professor Emeritus, 2006–. Dean of Students, 1996–2005.

Jason Rhodes, Ph.D., Visiting Associate in Astronomy B.S., Harvey Mudd College, 1994; Ph.D., Princeton University, 1999. Staff Scientist, Jet Propulsion Laboratory, 2004—. Caltech, 2004—11.

Frank R. Rice, M.S., Lecturer in Physics M.S., Caltech, 1996. Lecturer, 2001–10.

John Hall Richards, Ph.D., Professor of Organic Chemistry and Biochemistry B.A., University of California, 1951; B.Sc., University of Oxford, 1953; Ph.D., University of California, 1955. Assistant Professor of Organic Chemistry, Caltech, 1957–61; Associate Professor, 1961–70; Professor, 1970–99; Professor of Organic Chemistry and Biochemistry, 1999–.

Mark I. Richardson, Ph.D., Assistant Professor of Planetary Science B.Sc., University of London (Imperial College), 1992; M.S. (Geophysics and Space Science), University of California (Los Angeles), 1995; M.S. (Atmospheric Science), 1996; Ph.D., 1999. Caltech, 2001–10.

José Luis Riechmann, Ph.D., Visiting Associate in Biology
B.S., Madrid Autonomous University, 1987; Ph.D., 1991. ICREA Research Professor, Center for Research in Agriculture Genomics, 2008— Research Fellow, Caltech, 1993–96; Senior Research Fellow, 1996–98; Senior Research Associate, 2004–08; Visiting Associate, 2008–11.

Robert C. Ritchie, Ph.D., Visiting Associate in History
A.B., Occidental College, 1960; Ph.D.,
University of California (Los Angeles),
1970. W. M. Keck Foundation Director of
Research, Huntington Library and Art
Gallery, 1992–. Visiting Associate, Caltech,
1993–; Lecturer, 1995; 1997; 1999: 2001;
2005.

John D. Roberts, Ph.D., Dr.rer.nat.h.c., Sc.D.h.c., D.Sc.h.c., Institute Professor of Chemistry, Emeritus B.A., University of California (Los Angeles), 1941; Ph.D., 1944; Dr.rer.Nat.h.c., University of Munich; Sc.D.h.c., Temple University; D.Sc.h.c., University of Wales; University of Notre Dame; Scripps Research Institute. Research Associate, Caltech, 1952-53; Professor, 1953-72; Institute Professor, 1972-88; Institute Professor Emeritus, 1988-; Lecturer, 1988-92. Chairman, Division of Chemistry and Chemical Engineering, 1963-68; Acting Chairman, 1972-73; Provost and Vice President, Dean of the Faculty, 1980-83.

Ares J. Rosakis, Ph.D., Theodore von Kármán Professor of Aeronautics and Professor of Mechanical Engineering, Chair, Division of Engineering and Applied Science
B.Sc., University of Oxford, 1978; Sc.M., Brown University, 1980; Ph.D., 1982.
Assistant Professor of Aeronautics and Applied Physics, Caltech, 1982–88;
Associate Professor, 1988–93; Professor of Aeronautics and Applied Mechanics, 1993–2000; Professor of Aeronautics and Mechanical Engineering, 2000–04; von Kármán Professor, 2004–; Professor, 2009–.

Director, Graduate Aeronautical Laboratories, 2004–08; Director, Graduate Aerospace Laboratories, 2008–09; Chair, 2009–.

Paul A. Rosen, Ph.D., Visiting Associate in Geophysics

B.S., University of Pennsylvania, 1981; M.S., 1982; Ph.D., Stanford University, 1989. Technical Group Supervisor, Jet Propulsion Laboratory, 1992—. Visiting Associate, Caltech, 1998–2010; Lecturer, 2000–03; 2005.

Robert Allan Rosenstone, Ph.D., Professor of History
B.A., University of California (Los Angeles),
1957; Ph.D., 1965. Visiting Assistant
Professor, Caltech, 1966–68; Assistant
Professor, 1968–69; Associate Professor,
1969–75; Professor, 1975–. Executive
Officer for the Humanities, 1983–86.

Howard Rosenthal, Ph.D., Visiting Professor of Economics B.S., Massachusetts Institute of Technology, 1960; Ph.D., 1964. Professor, New York University, 2005.— Caltech, 2010.

Jean-Laurent Rosenthal, Ph.D., Rea A. and Lela G. Axline Professor of Business Economics; Executive Officer for the Social Sciences
B.A., Reed College, 1984; Ph.D., Caltech, 1988. Professor of Economics, 2006–08; Axline Professor, 2008–. Executive Officer, 2007–.

Anatol Roshko, Ph.D., Theodore von Kármán Professor of Aeronautics, Emeritus B.Sc., University of Alberta, 1945; M.S., Caltech, 1947; Ph.D., 1952. Research Fellow, 1952–54; Senior Research Fellow, 1952–55; Assistant Professor, 1955–55; Associate Professor, 1958–62; Professor, 1962–85; von Kármán Professor Emeritus, 1994–Acting Director, Graduate Aeronautical Laboratories, 1985–87.

Ian Ross, Ph.D., Visiting Associate in Biology B.Sc., McGill University, 1981; M.D., Queens University, 1985; M.Sc., University of Toronto, 1992. Provisional Staff, Huntington Memorial Hospital, 2005–. Caltech, 2008–10.

George Robert Rossman, Ph.D., Eleanor and John R. McMillan Professor of Mineralogy B.S., Wisconsin State University, 1966; Ph.D., Caltech, 1971. Instructor, 1971; Assistant Professor, 1971–77; Associate Professor, 1977–83; Professor, 1983–2008; McMillan Professor, 2008. Divisional Academic Officer for Geological and Planetary Sciences, 1999–2008.

Paul W. K. Rothemund, Ph.D., Senior Research Associate in Bioengineering, Computer Science, and Computation and Neural Systems B.S., Caltech, 1994; Ph.D., University of Southern California, 2001. Visiting Associate, Caltech, 2001; Beckman Senior Research Fellow, 2001–04; Senior Research Fellow in Computation and Neural Systems and Computer Science, 2004–08; Senior Research Associate, 2008–.

Ellen Rothenberg, Ph.D., Albert Billings Ruddock Professor of Biology A.B., Harvard University, 1972; Ph.D., Massachusetts Institute of Technology, 1977. Assistant Professor, Caltech, 1982–88; Associate Professor, 1988–94; Professor, 1994–2007; Ruddock Professor, 2007–.

Ira Zvi Rothstein, Ph.D., Visiting Associate in Physics Sc.B., Brown University, 1985; M.S., 1987; Ph.D., University of Maryland, 1992. Assistant Professor, Carnegie Mellon University, 1998. Caltech, 1999–2000; 2010.

Michael L. Roukes, Ph.D., Professor of Physics, Applied Physics, and Bioengineering; Codirector, Kavli Nanoscience Institute
B.A., University of California (Santa Cruz), 1978; Ph.D., Cornell University, 1985. Associate Professor of Physics, Caltech, 1992–96; Professor, 1996–2002; Professor of Physics, Applied Physics, and Bioengineering, 2002– Director, Kavli Nanosicence Institute, 2004–06; Codirector, 2008–.

David B. Rutledge, Ph.D., Kiyo and Eiko Tomiyasu Professor of Electrical Engineering; B.A., Williams College, 1973; M.A., University of Cambridge, 1975; Ph.D., University of California, 1980. Assistant Professor, Caltech, 1980–84; Associate Professor, 1984–89; Professor, 1989–2001; Tomiyasu Professor, 2001–. Executive Officer for Electrical Engineering, 1999–2002; Chair, Division of Engineering and Applied Science, 2005–2008.

Eric Ryckman, Ph.D., Harry Bateman Research Instructor in Mathematics M.A., University of California (Los Angeles), 2003; Ph.D., 2007. Caltech, 2008–10.

Su Young Ryu, Ph.D., Visiting Associate in Environmental Science and Engineering B.S., Chungnam National University, 1990; M.S., 1997; Ph.D., 2002. Oak Crest Institute of Science, 2009–. Caltech, 2009–10.

Rolf Heinrich Sabersky, Ph.D., Professor of Mechanical Engineering, Emeritus B.S., Caltech, 1942; M.S., 1943; Ph.D., 1949. Assistant Professor, 1949–55; Associate Professor, 1955–61; Professor, 1961–88; Professor Emeritus, 1988–.

Inge-Juliana Sackmann, Ph.D., Faculty Associate in Physics B.A., University of Toronto, 1963; M.A., 1965; Ph.D., 1968. Research Fellow, Caltech, 1971–74; Visiting Associate, 1974–76; Senior Research Fellow, 1976–81; Faculty Associate, 1981.

John Elie Sader, Ph.D., Visiting Associate in Physics
B.S., University of New South Wales, 1989;
Ph.D., 1993. Professor, University of Melbourne, 2008—. Caltech, 2009; 2010.

Peter N. Saeta, Ph.D., Visiting Associate in Applied Physics Ph.D., Harvard University, 1991; Professor, Harvey Mudd College, 1995—. Caltech, 2008–10.

Vatche Sahakian, Ph.D., Visiting Associate in Physics
Ph.D., University of Chicago, 1999;
Associate Professor, Harvey Mudd College, 2009. Caltech, 2009–10.

Jason Brian Saleeby, Ph.D., Professor of Geology B.S., California State University (Northridge), 1972; Ph.D., University of California (Santa Barbara), 1975. Associate Professor, Caltech, 1978–88; Professor, 1988–.

Konrad H. Samwer, Ph.D., Visiting Associate in Materials Science Ph.D., University of Göttingen (Germany), 1981. Professor, 1990–. Research Fellow, Caltech, 1981–82; Visiting Associate, 1987; 1994; 1998–2000; 2004–05; 2007; 2009–11.

Stanley P. Sander, Ph.D., Visiting Associate in Planetary Science
B.A., Pomona College, 1974; M.S., Caltech, 1975; Ph.D., 1980. Senior Research
Scientist, Jet Propulsion Laboratory, 1996–. Visiting Associate in Planetary Science and Environmental Engineering Science,
Caltech, 1998–2005; Lecturer in Geology and Planetary Sciences and Environmental Engineering Science, 1998–2004; Visiting Associate in Planetary Science and Environmental Engineering and Science, 2005; Visiting Associate in Planetary Science, 2006–10.

Virginio Sannibale Ph.D., Lecturer in Physics

Ph.D., University of Savoy (France), 1998. Caltech, 2001–10.

Anneila I. Sargent, Ph.D., D.Sc.h.c., Benjamin M. Rosen Professor of Astronomy; Vice President for Student Affairs B.Sc., University of Edinburgh, 1963; M.S., Caltech, 1967; Ph.D., 1977; D.Sc.h.c., University of Edinburgh. Research Fellow in Astronomy, 1977–79; Member of the Professional Staff, 1979–88; Senior Research Fellow, 1988–90; Senior Research Associate, 1990–98; Professor, 1998–2004; Rosen Professor, 2004–. Associate Director, Owens Valley Radio Observatory, 1992–96; Executive Director, 1996–98; Director, 1998–2007; Director, Interferometry Science Center, 2000–03; Director, Michelson Science Center, 2003; Vice President for Student Affairs, 2007–.

Wallace L. W. Sargent, Ph.D., Ira S. Bowen Professor of Astronomy
B.Sc., University of Manchester, 1956;
M.Sc., 1957; Ph.D., 1959. Research Fellow,
Caltech, 1959–62; Assistant Professor,
1966–68; Associate Professor, 1968–71;
Professor, 1971–81; Bowen Professor,
1981–. Executive Officer for Astronomy,
1975–81; 1996–97; Staff Member, Owens
Valley Radio Observatory, 1978–88;
Director, Palomar Observatory, 1997–2000.

Re'em Sari, Ph.D., Visiting Associate in Astrophysics
B.Sc. (Physics), Ben-Gurion University of the Negev, 1991; B.Sc. (Mathematics), 1992; M.Sc., Hebrew University of Jerusalem, 1994; Ph.D., 1998. Fairchild Senior Research Fellow in Astrophysics, Caltech, 1998–2003; Lecturer in Physics, 2001; Lecturer in Planetary Science, 2001; Associate Professor of Astrophysics and Planetary Science, 2003–2009; Visiting Associate, 2010–11.

Surajit Sarkar, Ph.D., Visiting Associate in Biology B.Sc., Banaras Hindu University, 1999; M.Sc., 2001; Ph.D., 2007. Caltech, 2010–11.

Tilman Sauer, Ph.D., Senior Research Associate in History; Lecturer in History Dipl., Free University (Berlin), 1990; Ph.D., 1994. Visiting Associate, Caltech, 2001–03; Senior Research Fellow, 2003–05; Senior Research Associate, 2005–; Lecturer, 2006; 2008; 2009.

Tatjana Sauka-Spengler, Ph.D., Senior Research Fellow in Biology B.A., The Faculty of Natural and Mathematical Sciences, 1992; M.S., University of Paris VII, 1998; Ph.D., 2002. Caltech, 2008–.

William P. Schaefer, Ph.D., Senior Research Associate in Chemistry, Emeritus B.S., Stanford University, 1952; M.S., University of California (Los Angeles), 1954; Ph.D., 1960. Instructor, Caltech, 1960–62; Assistant Professor, 1962–66; Senior Research Fellow, 1968–77; Research Associate, 1977–81; Senior Research

Associate, 1981–94; Senior Research Associate Emeritus, 1994.- Assistant Director of Admissions, 1968–73; Registrar, 1971–77; Director of Financial Aid, 1973–77.

Janet D. Scheel, Ph.D., Visiting Associate in Physics

Ph.D., Caltech, 2006. Assistant Professor, California Lutheran University, 2006–. Visiting Associate, Caltech, 2006–10.

Mark Scheel, Ph.D., Senior Research Fellow in Physics

Ph.D., Cornell University, 1996. Senior Research Fellow, Caltech, 2005–; Lecturer, 2005–06.

Axel Scherer, Ph.D., Bernard A. Neches Professor of Electrical Engineering, Applied Physics, and Physics; Codirector, Kavli Nanoscience Institute

B.S., New Mexico Institute of Mining and Technology, 1981; M.S., 1982; Ph.D., 1985. Associate Professor of Electrical Engineering, Caltech, 1993–95; Professor, 1995; Professor of Electrical Engineering and Applied Physics, 1995–96; Professor of Electrical Engineering, Applied Physics, and Physics, 1996–2000; Neches Professor, 2000–Director, Kavli Nanoscience Institute, 2006–08; Codirector, 2008–.

Maarten Schmidt, Ph.D., Sc.D., Francis L. Moseley Professor of Astronomy, Emeritus Ph.D., University of Leiden, 1956; Sc.D., Yale University, 1966. Associate Professor, Caltech, 1959–64; Professor, 1964–81; Institute Professor, 1981–87; Moseley Professor, 1987–96; Moseley Professor Emeritus, 1996–. Executive Officer for Astronomy, 1972–75; Chairman, Division of Physics, Mathematics and Astronomy, 1976–78; Director, Hale Observatories, 1978–80.

Tapio Schneider, Ph.D., Frank J. Gilloon Professor of Environmental Science and Engineering

Vordipl., Freiburg University, 1993; Ph.D., Princeton University, 2001. Assistant Professor, Caltech, 2002–08; Associate Professor, 2008–2009; Professor, 2009–10; Gilloon Professor, 2010–.

Robert Schofield, Ph.D., Visiting Associate in Physics

Ph.D., University of Oregon, 1990. Senior Research Associate, 1999–. Caltech, 2000–10.

Peter Schröder, Ph.D., Professor of Computer Science and Applied and Computational Mathematics B.S., Technical University of Berlin, 1987; M.S., Massachusetts Institute of Technology, 1990; M.A., Princeton University, 1992; Ph.D., 1994. Assistant Professor of Computer Science, Caltech, 1995–98; Associate Professor, 1998–2000; Associate Professor of Computer Science and Applied and Computational Mathematics, 2000–01; Professor, 2001–.

Leonard J. Schulman, Ph.D., Professor of Computer Science

B.S., Massachusetts Institute of Technology, 1988; Ph.D., 1992. Associate Professor, Caltech, 2000–05; Professor, 2005–.

Wolfram Schultz, M.D., Ph.D., Visiting
Associate in Neuroscience
B.A., Universities of Hamburg and
Heidelberg, 1971; M.D., University of
Heidelberg, 1972; Ph.D., University of
Fribourg, 1981. Professor, University of

Heidelberg, 1972; Ph.D., University of Fribourg, 1981. Professor, University of Cambridge, 2001–. Visiting Associate, Caltech, 2004–05; 2007; 2008; 2009; 2010. Moore Distinguished Scholar, 2005–06.

Erin M. Schuman, Ph.D., Professor of Biology; Investigator, Howard Hughes Medical Institute

Institute
B.A., University of Southern California,
1985; M.A., Princeton University, 1987;
Ph.D., 1990. Assistant Professor, Caltech,
1993–99; Associate Professor, 1999–2004;
Professor, 2004. Assistant Investigator,
1997–2002; Associate Investigator, 2002–05;
Investigator, 2005–. Executive Officer for
Neurobiology, 2000–06.

Keith C. Schwab, Ph.D., Associate Professor of Applied Physics B.A., University of Chicago, 1990; Ph.D., University of California, 1996. Caltech, 2009—.

John H. Schwarz, Ph.D., Harold Brown Professor of Theoretical Physics A.B., Harvard College, 1962; Ph.D., University of California, 1966. Research Associate, Caltech, 1972–81; Senior Research Associate, 1981–85; Professor of Theoretical Physics, 1985–89; Brown Professor, 1989–.

Clint Scovel, Ph.D., Visiting Associate in Applied and Computational Mathematics B.S., Cornell University, 1977; M.S., University of Arizona, 1979; Ph.D., New York University, 1983. Caltech, 2010.

Nicholas Zabriskie Scoville, Ph.D., Francis L. Moseley Professor of Astronomy B.A., Columbia University, 1967; Ph.D., 1972. Professor, Caltech, 1984—96; Moseley Professor, 1996—. Director, Owens Valley Radio Observatory, 1986—96. Executive Officer for Astronomy, 2000—04.

Thayer Scudder, Ph.D., Professor of Anthropology, Emeritus A.B., Harvard College, 1952; Ph.D., Harvard University, 1960. Assistant Professor, Caltech, 1964–66; Associate Professor, 1966–69; Professor, 1969–2000; Professor Emeritus, 2000–.

Yoav Segev, Ph.D., Visiting Associate in Mathematics
B.S., Hebrew University, 1975; M.S., 1978; Ph.D., 1985. Professor, Ben Gurion
University of the Negev, 1999—. Bateman
Research Instructor, Caltech, 1985–87;
Visiting Associate, 1990–91; 1993; 1996;
1998–2000; 2002–06; 2009.

Michael D. Seiffert, Ph.D., Visiting Associate in Physics B.S., Stanford University, 1986; Ph.D., University of California (Santa Barbara), 1994. Group Supervisor and Lead Scientist for Cosmology, Jet Propulsion Laboratory, 2004—. Caltech, 2005–10.

John Hersh Seinfeld, Ph.D., D.Sc.h.c., Louis E. Nobl Professor and Professor of Chemical Engineering

B.S., University of Rochester, 1964; Ph.D., Princeton University, 1967; D.Sc.h.c, University of Patras (Greece); Carnegie Mellon University; Clarkson University. Assistant Professor, Caltech, 1967–70; Associate Professor, 1970–74; Professor, 1974–; Nohl Professor, 1979–. Executive Officer for Chemical Engineering, 1974–90; Chair, Division of Engineering and Applied Science, 1990–2000.

Eugene Serabyn, Ph.D., Visiting Associate in Physics

B.S., Massachusetts Institute of Technology, 1978; M.S., University of California, 1980; Ph.D., 1984. Senior Research Scientist, Jet Propulsion Laboratory, 2001–. Research Fellow, Caltech, 1986–89; Senior Research Fellow, 1989–95; Senior Research Associate, 1995–98; Visiting Associate, 1998–2010.

Alex L. Sessions, Ph.D., Associate Professor of Geobiology

B.A., Williams College, 1991; M.Sc., Dartmouth College, 1996; Ph.D., Indiana University (Bloomington), 2001. Assistant Professor, Caltech, 2003–10; Associate Professor, 2010–.

Mona Shahgholi, Ph.D., Lecturer in Chemistry

B.S., Oklahoma State University, 1979; M.S., University of Colorado, 1989; Ph.D., University of Tennessee, 1993. Caltech, 2008; 2009; 2010.

Shu-ou Shan, Ph.D., Assistant Professor of Chemistry

B.S., University of Maryland, 1994; Ph.D., Stanford University, 2000. Caltech, 2005-.

Andrew A. Shapiro, Ph.D., Visiting Associate in Mechanical Engineering B.S., University of California, 1981; M.S., University of California (Los Angeles), 1989; Ph.D., University of California (Irvine), 1998. Principal Engineer, Jet Propulsion Laboratory, 2002–. Caltech, 2008–10.

Peter M. Shearer, Ph.D., Visiting Professor of Geophysics B.S., Yale University, 1978; Ph.D., University of California (San Diego), 1986.

Caltech, 2010.

Joseph E. Shepherd, Ph.D., C. L. "Kelly" Johnson Professor of Aeronautics and Professor of Mechanical Engineering: Dean of Graduate Studies

B.S., University of South Florida, 1976; Ph.D., Caltech, 1981. Associate Professor of Aeronautics, Caltech, 1993–99. Professor, 1999–2005; Professor of Aeronautics and Mechanical Engineering, 2006–08; Johnson Professor and Professor of Mechanical Engineering, 2008–; Dean, 2009–.

Robert P. Sherman, Ph.D., Professor of Economics and Statistics
B.A., Marquette University, 1978; M.A.,
University of Louisville, 1985; M.Phil., Yale
University, 1987; Ph.D., 1991. Assistant
Professor, Caltech, 1996–99; Associate
Professor, 1999–2005; Professor, 2005–.

Zuoqiang Shi, Ph.D., Lecturer in Applied and Computational Mathematics B.S., Tsinghua University, 2003; Ph.D., 2008. Caltech, 2010.

Shinsuke Shimojo, Ph.D., Gertrude Baltimore Profesor of Experimental Psychology B.A., University of Tokyo, 1978; M.A., 1980; Ph.D., Massachusetts Institute of Technology, 1985. Associate Professor of Biology, Caltech, 1997–98; Professor of Biology, 1999–2010; Baltimore Professor, 2010.

David H. Shoemaker, Ph.D., Visiting Associate in LIGO M.S., Massachusetts Institute of Technology, 1980; Ph.D., University of Paris (Sud), 1987. Principal Research Scientist, Massachusetts Institute of

Technology, 1991-. Caltech, 2005-11.

Kirill Shtengel, Ph.D., Visiting Associate in

B.Š., St. Petersburg Technical University, 1988; M.S., University of California (Los Angeles), 1994; Ph.D., 1999. Assistant Professor, University of California (Riverside), 2005. Caltech, 2005–10.

Matthew S. Shum, Ph.D., Professor of Economics

B.A., Columbia University, 1992; Ph.D., Stanford University, 1998. Caltech, 2008–.

Athanassios G. Siapas, Ph.D., Associate Professor of Computation and Neural Systems B.S., Massachusetts Institute of Technology, 1990; M.S., 1992; Ph.D., 1996. Assistant

Professor, Caltech, 2002–2008; Associate Professor, 2008–; Bren Scholar, 2003–08.

Peter H. Siegel, Ph.D., Faculty Associate in Electrical Engineering
B.A., Colgate University, 1975; M.S.,
Columbia University, 1983; M.Ph., 1983;
Ph.D., 1983. Caltech, 2002; 2007—

David O. Siegmund, Ph.D., Visiting Associate in Mathematics B.A., Southern Methodist University, 1963; Ph.D., Columbia University, 1966. Professor, Stanford University, 1976–. Caltech, 2006–11.

Kerry Edward Sieh, Ph.D., Professor of Geology

A.B., University of California (Riverside), 1972; Ph.D., Stanford University, 1977. Assistant Professor, Caltech, 1977–82; Associate Professor, 1982–86; Professor, 1986–2002; 2008–10; Robert P. Sharp Professor of Geology, 2003–08. Divisional Academic Officer, 1989–94.

David Silva, Ph.D., Visiting Associate in Astronomy
Ph.D., Unversity of Michigan, 1991.
Director, AURA/NOAO, 2008–. Caltech, 2008–11.

Leon Theodore Silver, Ph.D., W. M. Keck Foundation Professor for Resource Geology, Emeritus

B.S., University of Colorado, 1945; M.S., University of New Mexico, 1948; Ph.D., Caltech, 1955. Assistant Professor of Geology, 1955–62; Associate Professor, 1962–65; Professor, 1965–83; Keck Professor, 1983–96; Keck Professor Emeritus, 1996–.

Barry Martin Simon, Ph.D., D.Sc.h.c.,
International Business Machines Professor of
Mathematics and Theoretical Physics; Executive
Officer for Mathematics
A.B., Harvard College, 1966; Ph.D.,
Princeton University, 1970; D.Sc.h.c.,
Technion–Israel Institute of Technology;
University of Wales Swansea. Sherman
Fairchild Distinguished Scholar, Caltech,
1980–81; Professor, 1981–84; International
Business Machines Professor, 1984–
Executive Officer for Mathematics,
1997–2003; 2009–.

Melvin I. Simon, Ph.D., Anne P. and Benjamin F. Biaggini Professor of Biological Sciences, Emeritus B.S., City College of New York, 1959; Ph.D., Brandeis University, 1963. Professor, Caltech, 1982–86; Biaggini Professor, 1986–2005; Biaggini Professor Emeritus, 2005–. Chair, Division of Biology, 1995–2000. Mark Simons, Ph.D., Professor of Geophysics B.S., University of California (Los Angeles), 1989; Ph.D., Massachusetts Institute of Technology, 1995. Assistant Professor, Caltech, 1997–2003; Associate Professor, 2003–07; Professor, 2007–.

Annette Jacqueline Smith, Ph.D., Professor of Literature, Emeritus B.A., University of Paris (Sorbonne), 1947; M.A., 1950; Ph.D., 1970. Visiting Assistant Professor of French, Caltech, 1970–71; Lecturer, 1971–81; Associate Professor, 1982–85; Professor, 1985–92; Professor of Literature Emeritus, 1993–.

Christina Smolke, Ph.D., Assistant Professor of Chemical Engineering B.S., University of Southern California, 1997; Ph.D., University of California, 2001. Caltech, 2003—.

Erik Snowberg, Ph.D., Assistant Professor of Economics and Political Science S.B., Massachusetts Institute of Technology, 1999; Ph.D., Stanford University, 2008. Caltech, 2008–.

G. Jeffrey Snyder, Ph.D., Faculty Associate in Materials Science
B.A., Cornell University, 1991; Ph.D.,
Stanford University, 1997. Visiting
Associate, Caltech, 2000–06; Lecturer,
2003; 2007–08; Faculty Associate, 2006–.

B. Thomas Soifer, Ph.D., Professor of Physics; Director, Spitzer Science Center; Chair, Division of Physics, Mathematics and Astronomy

B.S., Caltech, 1968; Ph.D., Cornell
University, 1972. Senior Research Fellow, Caltech, 1978–81; Senior Research
Associate, 1981–89; Professor, 1989–.
Director, Space Infrared Telescope Facility (SIRTF) Science Center, 1997–2004; Director, Spitzer Science Center, 2004–; Deputy Chair, Division of Physics, Mathematics and Astronomy, 2008–10; Acting Chair, 2010; Chair, 2010–.

The-Ru Alex Song, Ph.D., Visiting Associate in Geophysics B.S., National Central University, 1995; M.S., 1997; Ph.D., Caltech, 2006. Visiting Associate, Caltech, 2010.

Eileen Marie Spain, Ph.D., Visiting Associate in Environmental Science and Engineering B.S., Sonoma State University, 1987; Ph.D., University of Utah, 1992. Professor, Occidental College, 1995–. Visiting Associate, Caltech, 2009–10.

Ulrich Sperhake, Ph.D., Visiting Associate in Physics Ph.D., University of Southhampton, 2001. Caltech, 2010–11. Michael L. Spezio, Ph.D., Visiting Associate in Psychology

B.S., Case Western Reserve University, 1988; Ph.D., Cornell University, 1994; M.Div., Pittsburgh Theological Seminary, 1996; Ph.D., University of Oregon, 2002. Assistant Professor, Scripps College, 2007–. Lecturer, Caltech, 2006–07; Visiting Associate, 2007–12.

Maria Spiropulu, Ph.D., Associate Professor of Physics

B.Sc., Aristotle University of Thessaloniki,1993; M.A., Harvard University,1995;Ph.D.,2000. Caltech,2008–.

Matthew L. Spitzer, J.D., Ph.D., Professor of Law and Social Science
B.A., University of California (Los Angeles), 1973; J.D., University of Southern
California, 1977; Ph.D., Caltech, 1979.
Visiting Professor, Caltech, 1988; 1990; 1991–92; Professor of Law and Social
Sciences, 1992–2001; 2006–; Visiting
Associate, 2001–06.

Jagan Srinivasan, Ph.D., Senior Research Fellow in Biology B.S., University of Madras, 1993; M.S., University of Goa, 1995; Ph.D., Max Planck Institute, 2003. Caltech, 2010.

Mark Stalzer, Ph.D., Faculty Associate in Computing and Mathematical Sciences B.S., California State University (Northridge), 1984; Ph.D., University of Southern California, 1993. Caltech, 2010—.

Marius Stan, Ph.D., Caltech-Huntington Mellon Postdoctoral Instructor in Philosophy B.A., University of Bucharest, 1997; M.A., 1999; M.A., Freiburg Universität, 1999; M.A., Johns Hopkins University, 2005; Ph.D., 2009. Caltech, 2009–

Angelike Stathopoulos, Ph.D., Assistant Professor of Biology B.A., University of California, 1992; Ph.D., Stanford University, 1998. Caltech, 2005—.

Andrew Steele, Ph.D., Broad Senior Research Fellow in Brain Circuitry A.B., University of Chicago, 2001; Ph.D., Massachusetts Institute of Technology, 2008. Caltech, 2008—

Charles C. Steidel, Ph.D., Lee A. DuBridge Professor of Astronomy
A.B., Princeton University, 1984; Ph.D.,
Caltech, 1990. Assistant Professor, 1995–97;
Associate Professor, 1997–98; Professor,
1998–2004; DuBridge Professor, 2004–.
Executive Officer for Astronomy, 2004–07.

Aldo Ernesto Steinfeld, Ph.D., Visiting Associate in Materials Science B.S., Technion-Israel Institute of Technology, 1983; M.S., Tel Aviv University, 1986; Ph.D., University of Minnesota, 1989. Deputy Head, Department of Mechanical Process Engineering, ETH Zurich, 2007–. Caltech, 2009.

Eric D. A. Stemp, Ph.D., Visiting Associate in Chemistry
B.S., University of Denver, 1987; M.S.,
Northwestern University, 1988; Ph.D.,
1993. Assistant Professor, Mount St. Mary's
College, 1996.– Research Fellow, Caltech,
1993–96; Visiting Associate, 1996–2012.

Thomas L. Sterling, Ph.D., Visiting Associate in the Center for Advanced Computing Research B.S., Old Dominion University, 1974; M.S., Massachusetts Institute of Technology, 1983; Ph.D., 1984. Visiting Associate, Caltech, 1996–99; 2008–10. Faculty Associate, 1999–2008.

Paul Warren Sternberg, Ph.D., Thomas Hunt Morgan Professor of Biology; Investigator, Howard Hughes Medical Institute B.A., Hampshire College, 1978; Ph.D., Massachusetts Institute of Technology, 1984. Assistant Professor, Caltech, 1987–92; Associate Professor, 1992–96; Professor, 1996–2004; Morgan Professor, 2004–. Associate Investigator, 1992–97; Investigator, 1997–.

David J. Stevenson, Ph.D., George Van Osdol Professor of Planetary Science B.S., Victoria University (New Zealand), 1971; M.S., 1972; Ph.D., Cornell University, 1976. Associate Professor, Caltech, 1980–84; Professor, 1984–95; Van Osdol Professor, 1995–. Chair, Division of Geological and Planetary Sciences, 1989–94.

Joann M. Stock, Ph.D., Professor of Geology and Geophysics B.S., Massachusetts Institute of Technology, 1981; M.S., 1981; Ph.D., 1988. Visiting Assistant Professor, Caltech, 1990; Associate Professor, 1992–98; Professor, 1998–.

Edward Manin Stolper, Ph.D., D.Sc.h.c., Provost; William E. Leonhard Professor of Geology
A.B., Harvard College, 1974; M.Phil.,
University of Edinburgh, 1976; Ph.D.,
Harvard University, 1979; D.Sc.h.c.,
University of Edinburgh. Assistant
Professor, Caltech, 1979–82; Associate
Professor, Caltech, 1979–82; Associate
Professor, 1982–83; Professor, 1983–90;
Leonhard Professor, 1990–. Acting
Executive Officer for Geochemistry, 1989;
Executive Officer, 1989–94; Chair, Division
of Geological and Planetary Sciences,
1994–2004; Acting Provost, 2004; Provost,
2007–.

Brian M. Stoltz, Ph.D., Ethel Wilson Bowles and Robert Bowles Professor of Chemistry; Executive Officer for Chemistry B.S., B.A., Indiana University of Pennsylvania, 1993; M.A., Yale University, 1996; Ph.D., 1997. Assistant Professor, Caltech, 2000–06; Associate Professor, 2006–07; Professor, 2007; Bowles Professor, 2007–. Executive Officer, 2010–.

Edward Carroll Stone Jr., Ph.D., D.Sc.h.c., David Morrisroe Professor of Physics; Vice Provost for Special Projects S.M., University of Chicago, 1959; Ph.D., 1964; D.Sc.h.c., Harvard University; Washington University; University of Chicago; University of Southern California. Research Fellow, Caltech, 1964-66; Senior Research Fellow, 1967; Assistant Professor, 1967-71; Associate Professor, 1971-76; Professor, 1976-94; Morrisroe Professor, 1994-. Chairman, Division of Physics, Mathematics and Astronomy, 1983-88; Vice President for Astronomical Facilities, 1988-90; Vice President and Director of the Jet Propulsion Laboratory, 1991-2001; Vice Provost, 2004-.

Ellen Glowacki Strauss, Ph.D., Senior Research Associate in Biology, Emeritus B.A., Swarthmore College, 1960; Ph.D., Caltech, 1966. Research Fellow, 1969–73; Senior Research Fellow, 1973–84; Senior Research Associate, 1984–2007; Senior Research Associate Emeritus, 2007–.

James Henry Strauss Jr., Ph.D., Ethel Wilson Bowles and Robert Bowles Professor of Biology, Emeritus
B.S., Saint Mary's University, 1960; Ph.D.,
Caltech, 1967. Assistant Professor, 1969–75;
Associate Professor, 1975–83; Professor, 1983–93; Bowles Professor, 1993–2007;
Bowles Professor Emeritus, 2007–.
Executive Officer for Molecular and Cellular Biology, 1980–89.

Andrew D. Straw, Ph.D., Senior Research Fellow in Computation and Neural Systems B.S., University of Southern California, 1997; Ph.D., University of Adelaide, 2004. Caltech, 2010—.

Wolfgang Sturhahn, Ph.D., Visiting Associate in Geophysics B.S., University of Hamburg, 1981; M.S., 1958; Ph.D., 1992. Physicist, Argonne National Laboratory, 1999–. Caltech, 2008–11.

Francis Su, Ph.D., Visiting Associate in Mathematics Ph.D., Harvard University, 1995. Professor, Harvey Mudd College, 2006—. Caltech, 2009.

Nancy Sulahian, M.A., Lecturer in Choral Music—Performing and Creative Arts B.A., University of Southern California, 1983; M.A., 1992. Caltech, 2009–11. Qiaoyan Sun, Ph.D., Visiting Associate in Materials Science B.S., Xi'an Institute of Technology, 1994; M.S., 1997; Ph.D., Xi'an Jiaotong University, 2001. Caltech, 2010–11.

Noel M. Swerdlow, Ph.D., Visiting Associate in History B.S., University of California (Los Angeles), 1964; M.A., Yale University, 1967; Ph.D., 1968. Professor, University of Chicago, 1982.- Visiting Associate, Caltech, 2008; 2010; Visiting Professor, 2008–09.

Lisa E. Szechter, Ph.D., Visiting Associate in Physics A.B., Oberlin College, 1997; M.S., Pennsylvania State University, 1999; Ph.D., 2003. Assistant Professor, Tulane University, 2005.— Caltech, 2005–10.

Bela Szilagyi, Ph.D., Senior Research Fellow in Physics Ph.D., University of Pittsburgh, 2000. Caltech, 2010–.

Yu-Chong Tai, Ph.D., Professor of Electrical Engineering and Mechanical Engineering B.S., National Taiwan University, 1981; M.S., University of California, 1986; Ph.D., 1989. Assistant Professor of Electrical Engineering, Caltech, 1989–95; Associate Professor, 1995–2000; Professor, 2000–05; Professor of Electrical Engineering and Mechanical Engineering, 2005–. Executive Officer for Electrical Engineering, 2005–2008.

Robert D. Tanner, Ph.D., Visiting Associate in Chemical Engineering
B.S., University of Michigan, 1962; M.S., 1963; Ph.D., Case Western Reserve, 1967.
Caltech, 2010–11.

Hugh Pettingill Taylor Jr., Ph.D., Robert P. Sharp Professor of Geology, Emeritus B.S., Caltech, 1954; A.M., Harvard University, 1955; Ph.D., Caltech, 1959. Assistant Professor, 1959–61; Research Fellow, 1961; Assistant Professor, 1962–64; Associate Professor, 1964–69; Professor, 1969–81; Sharp Professor, 1981–2002; Sharp Professor Emeritus, 2002–. Executive Officer for Geology, 1987–94.

Joao Teixeira, Ph.D., Visiting Associate in Environmental Science and Engineering Ph.D., University of Lisbon, 2000. Caltech, 2010–11.

Saul A. Teukolsky, Ph.D., Moore Distinguished Scholar B.Sc. (Applied Mathematics, Physics), University of Witwatersrand, 1970; Ph.D., Caltech, 1973. Bethe Professor, Cornell University, 1999. Tolman Research Fellow, Caltech, 1973–74; Moore Distinguished Scholar, 2009–10.

Vassilios Theofilis, Ph.D., Visiting Associate in Mechanical Engineering B.S., University of Patras, 1984; M.S., University of Manchester, 1988; Ph.D., 1991. Tenured Research Professor, Technical University of Madrid, 2006. Caltech, 2008; 2009; 2010.

Frederick Burtis Thompson, Ph.D., Professor of Applied Philosophy and Computer Science, Emeritus

A.B., University of California (Los Angeles), 1946; M.A., 1947; Ph.D., University of California, 1952. Professor of Applied Science and Philosophy, Caltech, 1965–77; Professor of Applied Philosophy and Computer Science, 1977–93; Professor Emeritus, 1993–.

Kip Stephen Thorne, Ph.D., D.Sc.h.c., D.h.c., L.H.D.h.c., Ricbard P Feynman Professor of Theoretical Physics, Emeritus B.S., Caltech, 1962; Ph.D., Princeton University, 1965; D.Sc.h.c., Illinois College; Utah State University; University of Chicago; D.h.c., Moscow University; University of Glasgow; L.H.D.h.c., Claremont Graduate University Research Fellow in Physics, Caltech, 1966–67; Associate Professor of Theoretical Physics, 1967–70; Professor, 1970–91; William R. Kenan Professor, 1981–91; Feynman Professor, 1991–2009; Professor Emeritus, 2009.

Massimo Tinto, Ph.D., Visiting Associate in Physics

Ph.D., University College (Wales), 1987. Senior Scientist, Jet Propulsion Laboratory, 1991–. Research Fellow, Caltech, 1987–89; Visiting Associate, 2001–10.

David A. Tirrell, Ph.D., D.h.c., Ross McCollum-William H. Corcoran Professor and Professor of Chemistry and Chemical Engineering

B.S., Massachusetts Institute of Technology, 1974; M.S., University of Massachusetts, 1976; Ph.D., 1978; D.h.c., Eindhoven Technical University. McCollum-Corcoran Professor and Professor, Caltech, 1998—Chair, Division of Chemistry and Chemical Engineering, 1999–2009.

Thomas Anthony Tombrello, Ph.D., Ph.D.h.c., William R. Kenan Jr. Professor and Professor of Physics; Technology Assessment Officer

B.A., Rice University, 1958; M.A., 1960; Ph.D., 1961; Ph.D.h.c., Uppsala University. Research Fellow, Caltech, 1961–62; 1964–65; Assistant Professor, 1965–67; Associate Professor, 1967–71; Professor, 1971–; Kenan Professor, 1997–. Technology Assessment Officer, 1996–2010. Chair, Division of Physics, Mathematics and Astronomy, 1998–2008. Ritsuko Hirai Toner, Ph.D., Lecturer in Japanese B.A., Kyoto University of Foreign Studies (Japan), 1974; M.A., University of Southern California, 1979; Ph.D., 1987. Caltech,

1992-2011.

Geoffrey C. Toon, D.Phil., Visiting Associate in Planetary Science B.A., University of Oxford, 1978; M.A., 1981; D.Phil., 1984. Research Scientist, Jet Propulsion Laboratory, 1986–. Caltech, 2001–10.

Tony D. Travouillon, Ph.D., Visiting Associate in Astronomy Ph.D., University of New South Wales, 2004. Site Testing Scientist, Thirty-Meter

Telescope, 2005—. Caltech, 2006—İ1.

Marie Treyer, Ph.D., Visiting Associate in Physics

Physics

Physics Caltech (1904) Property 1004 Propert

Ph.D., University of Paris, 1994. Research Associate, Laboratoire d'Astrophysique de Marseille, 1999–. Caltech, 2003–10.

Sandra M. Troian, Ph.D., Professor of Applied Physics, Aeronautics, and Mechanical Engineering B.A., Harvard University, 1980; M.S., Cornell University, 1984; Ph.D., 1987. Moore Distinguished Scholar, Caltech, 2004–05; Professor, 2006–.

Joel A. Tropp, Ph.D., Assistant Professor of Applied and Computational Mathematics B.A., B.S., University of Texas (Austin), 1999; M.S., 2001; Ph.D., 2004. Caltech, 2007-.

Ung-Pin Tsai, Ph.D., Visiting Associate in Environmental Science and Engineering B.S., National Central University, 1993; Ph.D., 1988. Visiting Associate, Caltech, 2010.

Doris Ying Tsao, Ph.D., Assistant Professor of Biology B.S., Caltech, 1996; Ph.D., Harvard University, 2002. Caltech, 2008–.

Oliver Tschauner, Ph.D., Visiting Associate in Geophysics B.A., University of Cologne, 1994; M.A., 1994; Ph.D., 1997. Assistant Research Professor, University of Nevada (Las Vegas), 2002— Caltech, 2006—11.

Nicholas William Tschoegl, Ph.D., Professor of Chemical Engineering, Emeritus B.Sc., New South Wales University of Technology, 1954; Ph.D., University of New South Wales, 1958. Associate Professor of Materials Science, Caltech, 1965–67; Professor of Chemical Engineering, 1967–85; Professor Emeritus, 1985–.

Snow H. Tseng, Ph.D., Visiting Associate in Electrical Engineering
B.S., National Taiwan University, 1994;
M.S., University of Chicago, 1997; Ph.D.,
Northwestern University, 2005. Assistant
Professor, National Taiwan University,
2006—. Caltech, 2009–10.

Qiang Tu, Ph.D., Senior Research Fellow in Biology B.S., Anhui Normal University, 1997; M.S., Fudan University, 2000; Ph.D., Shanghai Institutes for Biological Sciences, 2003. Caltech, 2010–.

Carol Chace Tydell, D.V.M., Visiting Associate in Biology; Lecturer in Biology B.S., University of California (Davis), 1980; D.V.M., 1982. Adjunct Professor, Pasadena City College, 2007–. Visiting Associate, Caltech, 2007–10; Lecturer, 2008; 2010.

Michiko Ueda, Ph.D., Assistant Professor of Political Science
B.A., International Christian University (Japan), 1996; M.A., University of Tokyo, 1999; M.A., Stanford University, 2001; Ph.D., Massachusetts Institute of Technology, 2006. Instructor, Caltech, 2006–08; Assistant Professor, 2008–10.

Christopher M. Umans, Ph.D., Associate Professor of Computer Science B.A., Williams College, 1996; Ph.D., University of California, 2000. Assistant Professor, Caltech, 2002–08; Associate Professor, 2008–.

Edwin T. Upchurch, Ph.D., Visiting Associate in the Center for Advanced Computing Research B.S., University of Texas (Austin), 1964; M.S., University of Wisconsin (Madison), 1969; Ph.D., University of Texas (Austin), 1982. Staff Scientist, Jet Propulsion Laboratory, 2000.— Caltech, 2002–11.

Rolando Uribe, M.S., Coach B.S., California State University (San Bernardino), 1995; M.S., 2002. Caltech, 2001–.

Kerry J. Vahala, Ph.D., Ted and Ginger Jenkins Professor of Information Science and Technology and Professor of Applied Physics B.S., Caltech, 1980; M.S., 1981; Ph.D., 1985. Research Fellow in Applied Physics, 1985; Assistant Professor, 1986–90; Associate Professor, 1990–96; Professor, 1996-; Jenkins Professor, 2002–.

Palghat P. Vaidyanathan, Ph.D., Professor of Electrical Engineering
B.Sc., University of Calcutta, 1974; B.Tech., 1977; M.Tech., 1979; Ph.D., University of California (Santa Barbara), 1982. Assistant Professor, Caltech, 1983–88; Associate Professor, 1988–93; Professor, 1993–.
Executive Officer for Electrical Engineering, 2002–05.

Michele Vallisneri, Ph.D., Visiting Associate in Physics Laurea, University of Parma (Italy), 1997; M.S., 2000; Ph.D., Caltech, 2002. Research Scientist, Jet Propulsion Laboratory, 2005—.

Lecturer, Caltech, 2003-05; Visiting

Associate, 2005-10.

Christiaan Van Bochove, Ph.D.,, Visiting Associate in Economics M.A., Utrecht University, 2003; Ph.D., 2008. Caltech, 2010.

Fokko van de Bult, Ph.D., Harry Bateman Research Instructor in Mathematics M.A., University of Amsterdam, 2003; Ph.D., 2007. Caltech, 2008–11.

Axel van de Walle, Ph.D., Assistant Professor of Materials Science B.Eng., École Polytechnique de Montreal, 1994; M.Math., University of Waterloo, 1995; Ph.D., Massachusetts Institute of Technology, 2000. Caltech, 2006—.

John P. Van Deusen, B.S., Lecturer in Mechanical Engineering A.A., El Camino College, 1978; B.S., California State University (Long Beach), 2003. Caltech, 2004–10.

Jeroen van Dongen, Ph.D., Visiting Associate in History B.Sc., University of Amsterdam, 1994; M.Sc., 1998; Ph.D., 2002. Veni Research Fellow, University of Utrecht, 2005–. Caltech, 2007–10.

Steven J. Van Enk, Ph.D., Visiting Associate in Physics
M.S., University of Utrecht, 1988; Ph.D.,
University of Leiden, 1992. Associate
Professor, University of Oregon, 2006–.
Caltech, 2005–10.

Marten H. Van Kerkwijk, Ph.D., Moore Distinguisbed Scholar M.S., University of Amsterdam, 1988; Ph.D., 1993. Professor, University of Toronto, 2003—. Caltech, 2010.

Jakob J. van Zyl, Ph.D., Faculty Associate; Lecturer in Electrical Engineering B.Eng., University of Stellenbosch (South Africa), 1979; M.S., Caltech, 1983; Ph.D., 1986. Research Fellow in Electrical Engineering, 1986; Lecturer in Electrical Engineering and Planetary Science, 2001–07; Faculty Associate, 2007–; Lecturer in Electrical Engineering, 2008–11.

Michael C. Vanier, Ph.D., Lecturer in Computer Science B.S., McGill University, 1986; M.S., 1993; Ph.D., Caltech, 2001. Lecturer, 2004–.

Alexander J. Varshavsky, Ph.D., Howard and Gwen Laurie Smits Professor of Cell Biology B.S., Moscow State University, 1970; Ph.D.,

Institute of Molecular Biology, 1973. Caltech, 1992-.

Scott C. Virgil, *Lecturer in Chemistry* Caltech, 2008; 2009; 2010.

Petr Vogel, Ph.D., Senior Research Associate in Physics, Emeritus
Ph.D., Joint Institute of Nuclear Research (USSR), 1966. Senior Research Fellow, Caltech, 1970–75; Research Associate, 1975–81; Senior Research Associate, 1981–2004; Lecturer, 1983–90; 1992; 1995–96; 1999–2000; 2006. Senior Research Associate Emeritus, 2004–.

Rochus E. Vogt, Ph.D., R. Stanton Avery Distinguished Service Professor and Professor of Physics, Emeritus

S.M., University of Chicago, 1957; Ph.D., 1961. Assistant Professor, Caltech, 1962–65; Associate Professor, 1965–70; Professor, 1970–2002; R. Stanton Avery Distinguished Service Professor, 1982–2002; Avery Professor and Professor of Physics, Emeritus, 2002.– Chief Scientist, Jet Propulsion Laboratory, 1977–78; Chairman, Division of Physics, Mathematics and Astronomy, 1978–83; Acting Director, Owens Valley Radio Observatory, 1980–81; Vice President and Provost, 1983–87; Director, Laser Interferometer Gravitational-Wave Observatory Project, 1987–94.

Paul von Allmen, Ph.D., Visiting Associate in Chemistry

B.S., Swiss Federal Institute of Technology, 1984; Ph.D., 1991. Principal Member, Technical Staff, Jet Propulsion Laboratory, 2005—. Caltech, 2008–11.

Thad Vreeland Jr., Ph.D., Professor of Materials Science, Emeritus
B.S., Caltech, 1949; M.S., 1950; Ph.D., 1952. Research Fellow in Engineering, 1952–54; Assistant Professor of Mechanical Engineering, 1954–58; Associate Professor, 1958–63; Associate Professor of Materials Science, 1963–68; Professor, 1968–91; Professor Emeritus, 1991–.

Daniel A. Wagenaar, Ph.D., Broad Senior Research Fellow in Brain Circuitry; Lecturer in Biology

M.Sc., University of Amsterdam, 1977; M.Sc., King's College, London, 1998; Ph.D., Caltech, 2006. Broad Senior Research Fellow, Caltech, 2008–; Lecturer, 2010.

David Bertram Wales, Ph.D., Professor of Mathematics, Emeritus

B.S., University of British Columbia, 1961; M.A., 1962; Ph.D., Harvard University, 1967. Bateman Research Fellow, Caltech, 1967–68; Assistant Professor, 1968–71; Associate Professor, 1971–77; Professor, 1977–2008; Professor Emeritus, 2008– Associate Dean of Students, 1976–80; Dean of Students, 1980–84; Executive Officer for Mathematics, 1985–91; Master of Student Houses, 1991–97.

Duane E. Waliser, Ph.D., Visiting Associate in Planetary Science B.S., Oregon State University, 1985; M.S., University of California (San Diego), 1987; Ph.D., 1992. Research Scientist, Jet Propulsion Laboratory, 2004–. Caltech, 2004–12.

Benjamin Wandelt, Ph.D., Visiting Associate in Physics B.Sc., Imperial College London, 1994; Ph.D., 1997. Associate Professor, University of Illinois (Urbana-Champaign), 2006–. Caltech, 2009.

Jiajun Wang, Ph.D., Olga Taussky and John Todd Instructor in Mathematics M.S., Peking University, 2001; Ph.D., University of California, 2007. Caltech, 2007–10.

Shicheng Wang, Ph.D., Visiting Associate in Mathematics
M.Sc., Peking University, 1981; Ph.D.,
University of California (Los Angeles),
1988. Professor, Peking University, 1993–.
Caltech, 2009–10.

Shiing-wu Wang, Ph.D., Lecturer in Accounting
B.S., National Chiao Tung University, 1978;
M.B.A., University of Wisconsin (Madison),
1980; Ph.D., University of Michigan, 1988.
Associate Professor, University of Southern
California, 1999–. Caltech, 2006–07;
2008–11.

Shu Wang, Ph.D., Visiting Associate in Applied and Computational Mathematic B.S., Henan University, 1990; M.S., Beijing Institute of Technology, 1993; Ph.D., Nanjing University, 1998. Professor, Beijing Institute of Technology, 2003—. Caltech, 2009.

Xiangyun Wang, Ph.D., Lecturer in Chinese M.A., Central Institute for Nationalities (China), 1985; Ph.D., Harvard University, 1995. Caltech, 2001–.

Xinlong Wang, Ph.D., Visiting Associate in Engineering Science B.S., Ocean University of Tsingtao (China), 1982; M.S., Nanjing University, 1987; Ph.D., 1991. Professor, 1991–. Caltech, 2004–06, 2008.

Zhen-Gang Wang, Ph.D., Professor of Chemical Engineering
B.Sc., Beijing University, 1982; Ph.D.,
University of Chicago, 1987. Associate
Professor, Caltech, 1991–97; Associate
Professor, 1997–2002; Professor, 2002–.

Theodore A. Waniuk, Ph.D., Visiting Associate in Materials Science B.S., Harvey Mudd College, 1996; M.S., Caltech, 1998; Ph.D., 2004. Senior Scientist, Liquidmetal Technology, 2002–. Caltech, 2008–11.

Robert S. Ward, M.A., Piano Lecturer B.A., University of Illinois, 1962; M.A., 1964. Caltech, 2009–11.

Gerald J. Wasserburg, Ph.D., D.h.c., D.Sc.h.c., Sc.D.h.c., Crafoord Laureate, John D. MacArthur Professor of Geology and Geophysics, Emeritus
S.B., University of Chicago, 1951; S.M., 1952; Ph.D., 1954; D.h.c., University of Brussels; University of Paris; Sc.D.h.c., Arizona State University; D.Sc.h.c., University of Chicago; Dr.h.c., Rennes I University of Chicago; Dr.h.c., Rennes I University Assistant Professor of Geology, Caltech, 1955–59; Associate Professor, 1959–62; Professor of Geology and Geophysics, 1963–82; MacArthur Professor, 1982–2001; MacArthur Professor Emeritus, 2001–. Chairman, Division of Geological

and Planetary Sciences, 1987-89; Executive

Michael Watkins, Ph.D., Lecturer in Aeronautics
M.S., University of Texas (Austin), 1985; Ph.D., 1989. Mission Manager, Jet Propulsion Laboratory, 1998–. Caltech, 2005–10.

Officer for Geochemistry, 1987–89.

Frank H. Webb, Ph.D., Visiting Associate in Geology
B.A., University of California (Santa Barbara), 1984; M.S., Caltech, 1989; Ph.D., 1990. Group Supervisor, Satellite Geodesy and Geodynamics Systems Group, Jet Propulsion Laboratory, 2000–. Visiting Associate, Caltech, 2005–10.

Sander Weinreb, Ph.D., Senior Faculty Associate in Electrical Engineering B.S., Massachusetts Institute of Technology, 1958; Ph.D., 1963. Caltech, 1999–.

Alan Jay Weinstein, Ph.D., Professor of Physics A.B., Harvard University, 1978; Ph.D., 1983. Assistant Professor, Caltech, 1988–95; Associate Professor, 1995–99; Professor, 2000–.

Cindy A. Weinstein, Ph.D., Professor of English; Executive Officer for the Humanities B.A., Brandeis University, 1982; Ph.D., University of California, 1989. Assistant Professor of Literature, Caltech, 1989–95; Associate Professor, 1995–2004; Associate Professor of English, 2004–05; Professor, 2005–. Executive Officer, 2008–.

Shimon Weiss, Ph.D., Visiting Associate in Applied Physics B.S., Technion-Israel Institute of Technology, 1984; Ph.D., 1989. Professor, University of California (Los Angeles), 2001–. Caltech, 2010.

Daniel Paul Weitekamp, Ph.D., Professor of Chemical Physics
B.A., Harvard College, 1974; Ph.D.,
University of California, 1982. Assistant
Professor of Chemistry, Caltech, 1985–91;
Associate Professor of Chemical Physics,
1991–2006; Professor, 2006–

Paul O. Wennberg, Ph.D., R. Stanton Avery Professor of Atmospheric Chemistry and Environmental Science and Engineering B.A., Oberlin College, 1985; Ph.D., Harvard University, 1994. Associate Professor of Atmospheric Chemistry and Environmental Engineering Science, Caltech, 1998–2001; Professor, 2001–03; Professor of Atmospheric Chemistry and Environmental Science and Engineering, 2003–04; Avery Professor, 2004–. Director, Ronald and Maxine Linde Center for Global Environmental Science, 2008–10.

Michael W. Werner, Ph.D., Visiting Associate in Astrophysics B.A., Haverford College, 1963; Ph.D., Cornell University, 1968. Visiting Associate, Caltech, 1992–96; 2009–10.

Brian P. Wernicke, Ph.D., Chandler Family Professor of Geology
B.S., University of Southern California,
1978; Ph.D., Massachusetts Institute of
Technology, 1982. Visiting Professor,
Caltech, 1990; Professor of Geology,
1992–2001; Chandler Professor, 2001–.

Nicolas Wey-Gomez, Ph.D., Associate Professor of History B.A., Brandeis University, 1986; M.A., Johns Hopkins University, 1987; M.A., 1991; PhD, 1996. Caltech, 2010—

Ward Whaling, Ph.D., Professor of Physics, Emeritus
B.S., Rice University, 1944; M.A., 1947;
Ph.D., 1949. Research Fellow, Caltech, 1949–52; Assistant Professor, 1952–58;
Associate Professor, 1958–62; Professor, 1962–93; Professor Emeritus, 1993–.

Gerald Beresford Whitham, Ph.D.,
Charles Lee Pawell Professor of Applied
Mathematics, Emeritus
B.Sc., University of Manchester, 1948;
M.Sc., 1949; Ph.D., 1953. Visiting
Professor of Applied Mechanics, Caltech,
1961–62; Professor of Aeronautics and
Mathematics, 1962–67; Professor of Applied
Mathematics, 1967–83; Powell Professor,
1983–98; Powell Professor Emeritus, 1998–,
Executive Officer for Applied Mathematics,
1971–80.

Mark Wiedenbeck, Ph.D., Visiting Associate in Physics B.S., University of Michigan, 1971; Ph.D., 1978. Principal Research Scientist, Jet Propulsion Laboratory, 1992–. Caltech, 2009–12.

Adam C. Wierman, Ph.D., Assistant Professor of Computer Science B.S., Carnegie Mellon University, 2001; M.S., 2004; Ph.D., 2007. Caltech, 2007.

Simon J. Wilkie, Ph.D., Faculty Associate in Economics
B.Comm., University of New South Wales, 1982; M.A., University of Rochester, 1988; Ph.D., 1990. Instructor, Caltech, 1994–95; Assistant Professor, 1995–2002; Senior Research Associate, 2002–05; Faculty Associate, 2005–.

Christian E. Willert, Ph.D., Visiting Associate in Aeronautics B.S., University of California (San Diego), 1987; M.S., 1991; Ph.D., 1992. Senior Research Scientist, German Aerospace Center, 1997.— Research Fellow, Caltech, 1993.—94; Visiting Associate, 2009–10.

David B. Wilson, Ph.D., Eleanor Searle Visiting Professor of History
B.A., Wabash College, 1963; Ph.D., Johns Hopkins University, 1968. Professor, Iowa State University, 1987. Caltech, 2010.

Richard M. Wilson, Ph.D., Professor of Mathematics B.S., Indiana University, 1966; M.S., Ohio State University, 1968; Ph.D., 1969. Sherman Fairchild Distinguished Scholar, Caltech, 1976; Professor, 1980–.

Henry J. R. Wilton, Ph.D., Scott Russel Johnson Senior Research Fellow in Mathematics B.A., Trinity College, University of Cambridge, 2001; Ph.D., Imperial College London, 2006. Caltech, 2009-.

Erik Winfree, Ph.D., Associate Professor of Computer Science, Computation and Neural Systems, and Bioengineering
B.S., University of Chicago, 1991; Ph.D., Caltech, 1998. Assistant Professor, 1999–2006; Associate Professor of Computer Science and Computation and Neural Systems, 2006–07; Associate Professor of Computer Science, Computation and Neural Systems, and Bioengineering, 2007–.

Jay R. Winkler, Ph.D., Faculty Associate in Chemistry, Lecturer in Chemistry B.S., Stanford University, 1978; Ph.D., Caltech, 1993. Lecturer, 2002; 2004–05; 2009–10; Faculty Associate, 2008–. Mark Brian Wise, Ph.D., John A. McCone Professor of High Energy Physics B.Sc., University of Toronto, 1976; M.Sc., 1977; Ph.D., Stanford University, 1980. Assistant Professor of Theoretical Physics, Caltech, 1982–84; Associate Professor, 1984–85; Professor, 1985–92; McCone Professor, 1992–.

Barbara J. Wold, Ph.D., Bren Professor of Molecular Biology; Director, Beckman Institute B.S., Arizona State University (Tempe), 1973; Ph.D., Caltech, 1978. Research Fellow, 1978; Assistant Professor, 1981–88; Associate Professor, 1988–96; Professor, 1996–2002; Bren Professor, 2003–. Director, 2001–.

Juliann Kay Wolfgram, Ph.D., Lecturer in Art History B.A., Scripps College, 1979; M.A., University of Kansas, 1986; M.Phil., 1986; Ph.D., 1986. Caltech, 1992–2010.

Nicolaj Wolfson, M.D., Visiting Associate in Materials Science M.D., Tel Aviv Medical School, 1984. Visiting Assistant Professor, University of Southern California, 2006–. Caltech, 2007–10.

Joyce Y. Wong, Ph.D., Visiting Associate in Electrical Engineering B.S., Caltech, 1995; M.S., 1996; Ph.D., 2000. Senior Research Scientist, Schlumberger, 2000–. Visiting Associate, Caltech, 2004–11.

Vanessa Woods, Ph.D., Lecturer in Psychology
B.S., University of California (Santa Barbara), 2000; M.A., 2002; Ph.D., 2006. Caltech, 2009; 2010.

James Francis Woodward, Ph.D., J. O. and Juliette Koepfil Professor of the Humanities, Emeritus B.A., Carleton College, 1968; Ph.D., University of Texas (Austin), 1977. Mellon Postdoctoral Instructor, Caltech, 1983–86; Associate Professor, 1986–88; Associate Professor, 1988–92; Professor, 1992–2001; Koepfil Professor, 2001–10; Koepfil Professor Emeritus, 2010–. Executive Officer for the Humanities, 1992–95; 2000–03.

Edward Wright, Ph.D., Visiting Associate in Astronomy
Ph.D., Harvard University, 1976. Caltech, 2010–11.

Guangying Wu, Ph.D., Broad Senior Research Fellow in Brain Circuitry B.S., Huazhong University of Science and Technology, 2004; Ph.D., University of Southern California, 2009. Caltech, 2009—.

Theodore Yao-Tsu Wu, Ph.D., Professor of Engineering Science, Emeritus
B.S., Chiao-Tung University (China), 1946;
M.S., Iowa State University, 1948; Ph.D.,
Caltech, 1952. Research Fellow, 1952–55;
Assistant Professor of Applied Mechanics,
1955–57; Associate Professor, 1957–61;
Professor, 1961–66; Professor of
Engineering Science, 1966–96; Professor
Emeritus, 1996–.

Yanqing Wu, Ph.D., Visiting Associate in Planetary Science B.S., University of Science and Technology of China, 1991; Ph.D., Caltech, 1997. Associate Professor, University of Toronto, 2008—. Caltech, 2010.

Peter John Wyllie, Ph.D., D.Sc.h.c., Professor of Geology, Emeritus B.Sc. (Geology and Physics), Saint Andrews University (Scotland), 1952; B.Sc. (Geology), 1955; Ph.D., 1958; D.Sc.h.c., Saint Andrews University. Professor, Caltech, 1983–99; Professor Emeritus, 1999–. Chairman, Division of Geological and Planetary Sciences, 1983–87; Divisional Academic Officer, 1994–99.

Pengchong Yan, Ph.D., von Kármán Instructor in Applied and Computational Mathematics B.S., Fudan University, 2002; Ph.D., University of California (Davis), 2008. Caltech, 2008–.

Changhuei Yang, Ph.D., Associate Professor of Electrical Engineering and Bioengineering B.S. (Electrical Engineering), B.S. (Physics), Massachusetts Institute of Technology, 1997; M.S. (Engineering), 1997; B.S. (Mathematics), 2002; Ph.D., 2001. Assistant Professor of Electrical Engineering, Caltech, 2003–04; Assistant Professor of Electrical Engineering and Bioengineering, 2004–09; Associate Professor, 2009–.

Amnon Yariv, Ph.D., Martin and Eileen Summerfield Professor of Applied Physics and Professor of Electrical Engineering B.S., University of California, 1954; M.S., 1956; Ph.D., 1958. Associate Professor of Electrical Engineering, Caltech, 1964–66; Professor, 1966–74; Professor of Electrical Engineering and Applied Physics, 1974–79; Thomas G. Myers Professor of Electrical Engineering and Professor of Applied Physics, 1979–96; Summerfield Professor and Professor of Electrical Engineering, 1996–

Leeat Yariv, Ph.D., Professor of Economics B.Sc., Tel Aviv University, 1992; M.Sc., 1995; M.A., Harvard University, 2001; Ph.D., 2001. Visiting Assistant Professor, Caltech, 2004–05; Associate Professor of Economics, 2005–10; Professor, 2010–. Rachid Yazami, Ph.D., Visiting Associate in Materials Science

Eng., National Polytechnic Institute of Grenoble, 1978; Ph.D., 1985. Research Director, National Center for Scientific Research, 1998—. Visiting Associate in Materials Science, Caltech, 2000–06; 2010–; Visiting Associate in Chemistry, 2006–09.

Ye Jun, Ph.D., Moore Distinguished Scholar in Physics B.S., Jiao Tong University, 1989; M.S., University of New Mexico, 1991; Ph.D., University of Colorado, 1997. Associate Professor, 2004—. Moore Distinguished Scholar, Caltech, 2008; 2010.

Nai-Chang Yeh, Ph.D., Professor of Physics B.S., National Taiwan University, 1983; Ph.D., Massachusetts Institute of Technology, 1988. Assistant Professor, Caltech, 1989–95; Associate Professor, 1995–97; Professor, 1997–.

Yun Yen, M.D., Ph.D., Visiting Associate in Chemical Engineering M.D., Taipei Medical College, 1982; Ph.D., Thomas Jefferson University, 1987. Associate Cancer Center Director, City of Hope, 2005—. Caltech, 2007–11.

Satoshi Kokojima, Ph.D., Visiting Associate in Mechanical Engineering
B.S., Kobe University, 1998; M.S., 1999;
Ph.D., 2002. Assistant Professor, Shizuoka
University, 1999.— Caltech, 2006—.

Sanichiro Yoshida, Ph.D., Visiting Associate in Physics Ph.D., Keio University (Japan), 1986. Engineer, University of Florida, 1997–. Caltech, 2000–11.

Nan Yu, Ph.D., Lecturer in Applied Physics B.S., Nanjing Institute of Technology, 1982; M.S., University of Arizona, 1985; Ph.D., 1988. Caltech, 2010.

Mary An-yuan Yui, Ph.D., Senior Research Fellow in Biology B.S., University of California (Santa Barbara), 1977; M.S., Oregon State University, 1982; Ph.D., Florida University, 1995. Lecturer, Caltech, 2005; Senior Research Fellow, 2005–09; 2009–.

Yuk Ling Yung, Ph.D., Professor of Planetary Science B.S., University of California, 1969; Ph.D., Harvard University, 1974. Visiting Associate, Caltech, 1976; Assistant Professor, 1977–82; Associate Professor, 1982–86; Professor, 1986–.

Bernard Yurke, Ph.D., Visiting Associate in Computation and Neural Systems B.S., University of Texas (Austin), 1975; M.A., 1976; Ph.D., Cornell University, 1982. Distinguished Member of the Technical Staff, Bell Labs, Lucent Technologies, 1982–. Moore Distinguished Scholar, Caltech, 2003–04; Visiting Associate, 2006–11.

William R. Zame, Ph.D., Visiting Associate in Economics
B.S., Caltech, 1965; M.S., Tulane
University, 1967; Ph.D., 1970. Professor,
University of California (Los Angeles),
1991–. Visiting Associate, Caltech,
1999–2005; 2009–10; Visiting Professor,
2000–03; 2005–06.

Ahmed H. Zewail, Ph.D., D.Sc.h.c., D.h.c., D.Univ.h.c., D.Phil.h.c., LL.D.h.c., D.H.L., M.D.h.c., Nobel Laureate, Linus Pauling Professor of Chemistry and Professor of Physics B.Sc., Alexandria University, 1967; Ph.D., University of Pennsylvania, 1974; D.Sc.h.c., American University in Cairo; Katholieke Universiteit, Leuven; University of Pennsylvania; Université de Lausanne; University of New Brunswick; Jadavpur University (India); Heriot-Watt University; Bogaziçi University; École Normale Supérieure; University of Oxford; University of Dublin; University of Cambridge; D.h.c., University of Rome; Université de Liége; D.Univ.h.c., Swinburne University of Technology (Australia); Peking University; Tohoku University; University of Buenos Aires; Babes-Bolyai University; D.Phil.h.c., Alexandria University, Lund University; D.H.L., American University of Beirut; LL.D.h.c., Concordia University (Canada); M.D.h.c., Pusan National University (Korea). Assistant Professor of Chemical Physics, Caltech, 1976-78; Associate Professor, 1978-82; Professor, 1982-89; Linus Pauling Professor of Chemical Physics, 1990-97; Professor of Physics, 1995-; Pauling Professor, 1997-.

Jiji Zhang, Ph.D., Assistant Professor of Philosophy B.A., Peking University, 2000; M.S., Carnegie Mellon University, 2002; Ph.D., 2006. Caltech, 2006–09.

John Zhong, Ph.D., Visiting Associate in Electrical Engineering B.S., San José State University, 1997; M.S., University of Southern California, 2002; Ph.D., 2003. Director, Bioinformatics, University of Southern California, 2003—. Caltech, 2009–10.

Kai G. Zinn, Ph.D., Professor of Biology B.A., University of California (San Diego), 1977; Ph.D., Harvard University, 1983. Assistant Professor, Caltech, 1989–95; Associate Professor, 1995–99; Professor, 1999–. Harold Zirin, Ph.D., Professor of Astrophysics, Emeritus
A.B., Harvard College, 1950; A.M., Harvard
University, 1951; Ph.D., 1953. Visiting
Associate, Caltech, 1963; Professor,
1964–98; Professor Emeritus, 1998–. Chief
Astronomer, Big Bear Solar Observatory,
1970–80; Director, Big Bear Solar
Observatory, 1980–97.

Jonas Zmuidzinas, Ph.D., Merle Kingsley Professor of Physics; Jet Propulsion Laboratory Senior Research Scientist; Director, Microdevices Laboratory, Jet Propulsion Laboratory B.S., Caltech, 1981; Ph.D., University of California, 1987. Assistant Professor, Caltech, 1989–95; Associate Professor, 1995–2000; Professor, 2000–10; Kingsley Professor, 2010–. Senior Research Scientist, Jet Propulsion Laboratory, 2005–; Director, 2007–.

Peter Albert Zoller, Ph.D., Moore Distinguished Scholar in Physics Ph.D., University of Innsbruck, 1977. Moore Distinguished Scholar, Caltech, 2008; 2010.

INDEX

A

abbreviations of courses, 341 academic calendar, 4-5 academic divisions, 10, 237 academic standards, 142, 166, 258 accreditations, 48 administrative officers, 551 admission, 125, 130, 238 admission to candidacy, 145, 247, 248, 251 advanced placement, 127 advisers, 31, 143, 243 aerospace courses, 342 graduate option, 264 instructional and research staff. 565-573 option representative, 237 study and research, 79 undergraduate minor, 181 aerospace engineer degree, 267 Air Force ROTC, 138 alcohol on campus, 54 allowance of credit, 146 Alumni Association, 38 Americans with Disabilities Act (ADA), 54 anthropology courses, 349 applied and computational mathematics courses, 350 graduate option, 269 instructional and research staff, 565-573 option representative, 237 study and research, 83 undergraduate option, 181 applied computation minor, 271, 308 applied mechanics courses, 356 graduate option, 272 instructional and research staff, 565-573 option representative, 237 study and research, 85 applied physics courses, 358

graduate option, 274 instructional and research staff, 565-573 option representative, 237 study and research, 85 undergraduate option, 182 applying for admission, 125, 238 applying for financial aid, 152 applying for graduate standing, 238 Army ROTC, 138 art history courses, 362 ASCIT, 31 assistantships, 257 Associated Students of Caltech, 31 astronomical observatories, 88-89 astrophysics courses, 365 graduate option, 276 instructional and research staff, 581-589 option representative, 237 study and research, 87 undergraduate option, 185 athletics, 31. See also physical education auditing courses, 39 authorization and accreditation, 48 awards, 166, 259

В

bachelor of science degree, 142, 247 Beckman Auditorium, 22, 34 Beckman Institute, 24, 26 Beckman Laboratory, 93, 98. See also buildings and facilities behavioral and social neuroscience study and research, 89 graduate option, 280 option representative, 237 Big Bear Solar Observatory, 26, 88 biochemistry and molecular biophysics courses, 371 graduate option, 284 instructional and research staff, 556-560 option representative, 237 study and research, 90

computing support services, 589 conflict resolution, 43, 161	dropping courses, 41–42, 148 drugs on campus, 54–60
control and dynamical systems courses, 422	dual degree (3/2) plan, 130
graduate option, 308 instructional and research staff,	E
565–573 option representative, 237	early action application plan, 125
study and research, 103	École Polytechnique Scholars
undergraduate minor, 203	Program, 134
controlled substances, 55	economics
Copenhagen Scholars program, 133 core curriculum requirements,	courses, 425 undergraduate option, 203
176–181	Edinburgh Scholars program, 136
counseling service, 35	electrical engineering
course loads. See overloads; under-	courses, 428
loads	graduate option, 310
courses, 342–544. See also under spe- cific option	instructional and research staff, 565–573
first-year schedule, 180	option representative, 237
required for graduation,	study and research, 105
176–180 credit, transfer of, 130, 146	undergraduate option, 203 electrical engineer's degree, 311
credits, 42, 127, 146	electronic information resources
credits, 12, 127, 110	policy, 52
.	employment, 36–38, 61–62,
D	161–163
deferral of entrance, 126	energy science and technology, 109, 438
degrees	engineering and applied science
aerospace engineer, 267	instructional and research staff,
bachelor of science, 142, 176,	565–573
247. See also under specific	undergraduate option, 208
option	engineering courses (general), 438
civil engineer, 301	engineer's degree, 248
doctor of philosophy, 250. See	English
also under specific option electrical engineer, 311	advanced placement/college credit, 127
engineer, 248	courses, 440
joint B.S./M.S., 247	undergraduate minor, 213
master of science, 246. See also	undergraduate option, 213
under specific option	English as a second language,
mechanical engineer, 328	238–239, 450
departmental and option regula-	English requirements for interna-
tions, 142, 180–235, 264–339	tional students, 130, 238–239,
detached duty, 243	251–252
dining facilities, 256	environmental science and engi-
Direct Loan Programs, 158–160 directory of campus, 7	neering
disputes, 43, 161. See also grievances	courses, 451
1	graduate option 312
doctor of philosophy degree, 250.	graduate option, 312 instructional and research staff,

option representative, 237 study and research, 110 undergraduate concentration, 208, 211 Equal Employment Opportunity, 61–62 essays for undergraduate admission, 126 examinations. See admission; placement examinations exchange programs, 131, 246. See also study abroad expenses, 147, 254. See also registration; tuition	geological and planetary sciences courses, 455 graduate option, 315 instructional and research staff, 574–577 minor, 219 option representative, 238 study and research, 112 undergraduate option, 214 geology. See geological and planetary sciences geology summer field course, 151 geophysics. See geological and planetary sciences
	German. See language courses
	grade appeals, 43-44
F	grade-point average, 42
	grades, 40–44
facilities, 19–28	graduate degrees, 237-239, 246,
faculty advisers, 31, 243	246–253
faculty and officer listings, 591	graduate program, 11–12
faculty officers and committees,	admission to, 238
553–555	career development advising, 36
faculty option representatives,	expenses, 254
237–238	faculty advisers, 243-244
faculty-student relations, 30	financial assistance, 256
FAFSA, 152, 153	housing, 255–256
federal/state grants and loans,	option representatives, 237–238
155–161. See also financial aid;	options, 264–339
repayments	policies and procedures,
return of funds, 147–151	238–246
federal student aid application, 152	residency requirements, 241
fees. See expenses	graduate record examination, 238
fellowships, 257 film courses, 455	graduate student council, 32
financial aid, 151–165, 256–259	graduates, employment experience
firearms, 61	of, 37–38 graduate studies committee, 237
fire policy, 60–61	graduation requirements, 130,
first-year course schedule, 179	143–145, 176–180
foreign students, 39	grants, 155, 155–156
French. See language courses	grievances, 49–50
freshman advisers, 31	<i>6</i>

\mathbf{G}

GALCIT, 79 general deposit, 147, 150 geobiology. See geological and planetary sciences geochemistry. See geological and planetary sciences Н

harassment policy, 68 health services, 34–36 high school requirements for admission, 125 history courses, 470 graduate minor, 320

undergraduate minor, 220–221	N.
undergraduate option, 220–221	
history and philosophy of science	Keck Observatory, 26, 89, 117, 121
courses, 478	Kellogg Radiation Laboratory, 122.
graduate minor, 320	See also buildings and facilities
study and research, 114	Kerckhoff Marine Laboratory, 25,
undergraduate minor, 221-224	93
undergraduate option, 221-224	
history of Caltech, 12	
honor system, 32, 149, 255	L
housing, 29, 255	
humanities, 115, 486	laboratories, special, 245
drop policy, 140	laboratory of chemical synthesis,
humanities and social sciences, 146,	96. See also buildings and facilities
177–179	laboratory requirements, 177
instructional and research staff,	language courses, 491
578–581	late registration fees, 150, 242, 255
	law courses, 494
	leave, 140–141. See also sabbaticals
I	libraries, 27–28, 589–590
	LIGO, 26, 122
immigration matters, 39	literature. See English
independent studies program, 116,	loans, 155, 157–161, 258
224, 490	London Scholars program, 136
Information Management Systems	London Scholars program, 150
and Services (IMSS), 589	
Information Science and	M
	171
Technology, 116, 490	major fields of study. See ontions
Infrared Processing and Analysis	major fields of study. See options
Center (IPAC), 24, 87	map of campus, 6
Institute policies, 52	marine biology laboratory, 25, 93
insurance, health, 35	master of science degree, 246. See
interhouse activities, 30	also under specific option
international baccalaureate, 127	materials science
international students, 39, 238	courses, 495
employment program, 161	graduate option, 321
English requirement, 130, 238, 249, 251–252	instructional and research staff, 565–573
financial aid, 154	option representative, 238
sabbaticals, 242-243	study and research, 116
internships, 38	undergraduate concentration,
involuntary leave, 141	208, 211
,	mathematics
	advanced placement/college
J	credit, 127
-	courses, 499
Japanese. See language courses	graduate option, 323
Jet Propulsion Laboratory, 9, 25,	instructional and research staff,
114, 245, 589	581–589
joint B.S./M.S. degree, 247	
, ,	option representative, 238
	study and research, 117
	undergraduate option, 225

mechanical engineering	part-time graduate study programs,
courses, 508	244
graduate option, 326	pass/fail grading, 42
instructional and research staff,	patent agreement, 50
565–573	Pell grants, 155
option representative, 238	performance courses, 515
study and research, 118	performing and visual arts, 33
undergraduate option, 227	Ph.D. degree, 250. See also under
mechanical engineer's degree, 328	specific option
medical examination, 34. See also	philosophy
health services	courses, 517
medical school, 37, 292-293. See	undergraduate minor, 230–231
also premedical program	undergraduate option, 230–231
menu classes, 177	physical education, 177, 515
missing student policy, 61	physical examination, 34
M.S. degree, 246. See also under spe-	physics
cific option	advanced placement/college
mural policy, 61	credit, 128
music courses, 513	courses, 526
	graduate option, 331
	instructional and research staff,
N	581–589
	option representative, 238
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	study and research, 120
new student orientation, 128	undergraduate option, 232
Nobel laureates, 18	placement examinations
nondegree programs, 245	astrophysics, 276
nondiscrimination policy, 61	physics, 331
	planetary science. See geological
0	and planetary sciences
O	policies of Caltech, 52
66 6 11 2 2 5	political science
off-campus facilities, 25	courses, 535
officers and faculty listings, 591	undergraduate option, 234
officers of Caltech, 547, 551, 553	postdoctoral scholars, 12
on-campus recruiting program, 37	premedical program, 37, 190. See
option advisers, 31, 143	also medical school
option representatives, 237–238	prizes, 166, 259
options, 10	PROFILE, 152, 153
change of, 144	psychology courses, 538
regulations, 143, 180-235,	publications, 32–33
264–339	public events, 34
selection of, 143	paone crones, 5 i
overloads, 146	

Owens Valley Radio Observatory,

Palomar Observatory, 25, 87-88,

26, 87-88, 122

121, 122

P

general deposit, 147, 150 graduate students, 240

options, 180-235

requirements, 176–180 research, 28, 140 underloads, 146, 166 units, 42 unpaid bills policy, 151, 254 USC-Caltech M.D./Ph.D. Program, 293

\mathbf{V}

vacations. See recesses veterans, 44 visas, 39 visiting students, 131, 239 visual arts, 33

W

withdrawal, 141, 146–151, 259 work-study, 37, 155, 162 writing, 127, 170, 177, 178, 179

Y

Y, Caltech, 34