

## *Doctor of Philosophy*

### DIVISION OF BIOLOGY

- Jordan Benjamin (*Biology*) B.S., University of California, Santa Cruz 2001.  
Thesis: Structural Studies of Human Immunodeficiency Virus Type I by Cryo-Electron Tomography.
- Baris Bingol (*Biology*) B.S., Bilkent University 2000.  
Thesis: Ubiquitin-Proteasome System at the Synapse.
- Bede Michael Broome (*Biology*) B.A., Princeton University 1999.  
Thesis: Population Coding and Reconstruction of Complex Stimuli in the Locust Olfactory System.
- Ronald McKell Carter (*Biology*) B.S., The University of Utah 1998.  
Thesis: Explicit and Implicit Processes in Human Aversive Conditioning.
- Eun Jung Choi (*Biology*) B.S., Seoul National University 1998; M.S., 2000.  
Thesis: Development and Applications of Computational Protein Design.
- Gregory A. Cope (*Biochemistry and Molecular Biophysics*) B.S., University of California, Santa Cruz 1998.  
Thesis: Regulation of SCF Ubiquitin Ligases by Jab1/Csn5 and the Cop9 Signalosome.
- Johannes Graumann (*Biology*) Diplom, Universität Konstanz 2000.  
Thesis: Implementation of Multidimensional Protein Identification Technology and Its Application to the Characterization of Protein Complexes in Bakers Yeast.
- Harry Miguel Green (*Biology*) B.S., University of California, Riverside 1999.  
Thesis: Novel Methods for Studying Ras/Erk MAP Kinase Signaling in Developing T Cells.
- Erik Griffin (*Biology*) B.A., Swarthmore College 1996.  
Thesis: Mechanisms of Mitochondrial Fusion and Fission.
- Houman David Hemmati (*Biology*) B.S., Stanford University 1996.  
Thesis: Neural Stem and Progenitor Cells in Cancer and Development.
- Rajan P. Kulkarni (*Biochemistry and Molecular Biophysics and History and Philosophy of Science*) B.A., B.S., Stanford University 2000.  
Thesis: Mechanics of the Cytoskeleton: Examining the Dynamics of Cytoplasmic Transport through Fluorescence Microscopy.
- Christopher J. Lacener (*Genetics*) B.S., Carnegie Mellon University 1994; M.S., California Institute of Technology 2000.  
Thesis: Advances in Single Molecule Nucleic Acid Sequencing.
- Brian Lee (*Biology*) B.S., University of Southern California 1999.  
Thesis: Neural Computation of Self-Motion from Optic Flow in Primate Visual Cortex.

*When more than one field of study is listed, the first is the major, and the second and others are minors.*

## *Doctor of Philosophy* continued

Carolina Becker Livi (*Developmental Biology*) B.Sc., Universidade Federal do Rio Grande do Sul 1996; M.S., California Institute of Technology 2000.

Thesis: Spblimp1/krox: A Transcriptional Regulator with a Central Role in Endomesoderm Specification in Sea Urchin Embryos.

Jessica Mao (*Biochemistry and Molecular Biophysics*) B.S., State University of New York at Stony Brook 2000; M.S., California Institute of Technology 2006.

Thesis: Applications of Computational Protein Design.

Joshua Scott Marcus (*Biochemistry and Molecular Biophysics*) B.S., University of Florida 2001; M.S., California Institute of Technology 2006.

Thesis: Single Mammalian Cell Gene Expression Analysis Using Microfluidics.

Patricia A. Neil (*Computation and Neural Systems*) B.E., University of Colorado 1998.

Thesis: Development of Audiovisual Integration in Human Infants: The Effects of Spatial and Temporal Congruency and Incongruency on Response Latencies.

Eric Michael Slimko (*Computation and Neural Systems*) B.S.E., The University of Michigan 1994.

Thesis: Selective Silencing of Vertebrate Neurons: Strategies Using Invertebrate Ligand-Gated Ion Channels.

Karli Kiiko Watson (*Biology*) B.A., Swarthmore College 1997.

Thesis: The Von Economo Neurons: From Cells to Behavior.

Daw-An Wu (*Biology*) B.A., University of California, Berkeley 1998.

Thesis: How Perception Adheres Color to Objects and Surfaces: Studies Using Visual Illusions and Transcranial Magnetic Stimulation.

Eric Stafford Zollars (*Biochemistry and Molecular Biophysics*) B.S., University of Maryland 1999.

Thesis: Force Field Development in Protein Design.

## DIVISION OF CHEMISTRY AND CHEMICAL ENGINEERING

Eric R. Ashley (*Chemistry*) A.B., Harvard College 2000.

Thesis: The First Total Synthesis of (-)-Lemonomycin and Progress toward the Total Synthesis of (+)-Cyanocycline A.

Joel Francis Austin (*Chemistry*) B.S., Kettering University 2000.

Thesis: The Development of Organocatalytic Reactions Pertaining to Indoles.

Jeffrey Thomas Bagdanoff (*Chemistry*) B.S., University of California, Davis 1998.

Thesis: Development of the Enantioselective Oxidation of Secondary Alcohols and Natural Products Total Synthesis.

Julie Suzanne Biteen (*Chemistry*) A.B., Princeton University 2001; M.S., California Institute of Technology 2003.

Thesis: Plasmon-Enhanced Silicon Nanocrystal Luminescence for Optoelectronic Applications.

*Doctor of Philosophy* continued

- Amanda Leigh Cashin (*Chemistry*) B.A., University of Colorado 1999.  
Thesis: Chemical Scale Investigations of Drug-Receptor Interactions at the Nicotinic Acetylcholine Receptor.
- Donato Marino Ceres (*Chemistry*) Ing. Phys. Dipl., École Polytechnique Fédérale de Lausanne 2000.  
Thesis: Electron Transfer at DNA-Modified Electrodes.
- Cynthia H. Collins (*Biochemistry and Molecular Biophysics*) B.Sc., University of Toronto 2000.  
Thesis: Directed Evolution of the Transcriptional Activator LUXR.
- Raymond Michael Doss (*Chemistry*) B.S., New York University 2000.  
Thesis: Programmable Oligomers for DNA Recognition.
- Joseph Anthony Duimstra (*Chemistry*) B.S., University of California, Berkeley 1997; M.S., California Institute of Technology 2002.  
Thesis: Modulation of Magnetic Properties in Magnetic Resonance Imaging Contrast Agents and Molecular Magnetic Materials.
- Jonathan S. Feenstra (*Chemistry*) B.S., Rutgers, The State University of New Jersey 2000.  
Thesis: Ultrafast Electron Diffraction: The Development of Methodology for the Direct Determination of Structural Dynamics of Molecular Excited States.
- Juliane L. Fry (*Chemistry*) B.S., The University of Rochester 2000.  
Thesis: Spectroscopy and Kinetics of Atmospheric Reservoir Species: HOONO, CH<sub>3</sub>C(O)OONO<sub>2</sub>, CH<sub>3</sub>OOH, and HOCH<sub>2</sub>OOH.
- Ronald L. Grimm (*Chemistry*) B.S., Case Western Reserve University 1999.  
Thesis: Fundamental Studies of the Mechanisms and Applications of Field-Induced Droplet Ionization Mass Spectrometry and Electrospray Mass Spectrometry.
- Seth Beebe Harkins (*Chemistry*) B.S., The Pennsylvania State University 1999.  
Thesis: The Synthesis and Study of Redox-Rich, Amido-Bridged Cu<sub>2</sub>N<sub>2</sub> Dicopper Complexes.
- Jonathan Ross Hart (*Chemistry*) B.S., California State Polytechnic University, San Luis Obispo 1999.  
Thesis: Synthesis and Applications of Bulky Rhodium(III) Intercalators for the Recognition of DNA Mismatches.
- Robert Hodyss (*Chemistry*) B.S., University of Florida 1999.  
Thesis: Methods for the Analysis of Organic Chemistry on Titan.
- Dean Marcu Holunga (*Chemical Engineering*) B.A., Ambassador University 1988; B.S., Rensselaer Polytechnic Institute 1999; M.S., California Institute of Technology 2003.  
Thesis: Aerosol Technologies for Fabrication, Collection, and Deposition of Engineered Nanoparticles.

*Doctor of Philosophy continued*

- Catharine Hoang-Mai Larsen (*Chemistry*) B.S., University of California, Irvine 2000.  
Thesis: Investigating Imidazolidinone Catalysts: Enantioselective Organocatalytic Diels-Alder Reactions, Conjugate Additions to Access Non-Natural  $\alpha$ -Amino Acids, and Bimodal Catalyst Activation for the Development of Organo-Cascade Reactions.
- Aaron James Link (*Chemical Engineering*) B.S.E., Princeton University 2000; M.S., California Institute of Technology 2002.  
Thesis: Azide-Bearing Amino Acids in Protein Engineering and Proteomic Profiling.
- Julie Chih-I Liu (*Chemical Engineering and Biology*) B.S.E., Princeton University 2000; M.S., California Institute of Technology 2002.  
Thesis: Endothelial Cell Response to Artificial Extracellular Matrix Proteins.
- Connie Chih Lu (*Chemistry*) S.B., Massachusetts Institute of Technology 2000.  
Thesis: The Chemistry of Tris(phosphino)borate Manganese and Iron Platforms.
- Ian Kyle Mangion (*Chemistry*) A.B., A.M., Harvard College 2001.  
Thesis: Development of Organocatalytic Direct Aldol Transformations, Total Syntheses of Brasoside and Littoralisone, and Progress Toward the Total Synthesis of Diazonamide A.
- Jeremy Allen May (*Chemistry*) B.S., The University of Utah 2000.  
Thesis: I. Synthesis and Utilization of Diazocompounds for Applications in Solution-Phase and Gas-Phase Chemistry. II. Progress toward the Synthesis of the Commanesin Indole Alkaloids.
- Michelle Margaret Meyer (*Biochemistry and Molecular Biophysics*) B.A., B.S., Rice University 2001.  
Thesis: Exploring Protein Sequence Space Using Computationally Directed Recombination.
- David Jason Michalak (*Chemistry*) B.A., Vassar College 1999.  
Thesis: Physics and Chemistry of Silicon Surface Passivation.
- Endy Yeo-Jung Min (*Chemistry*) A.B., Stanford University 1997.  
Thesis: Kinetic Resolution of Chiral  $\alpha$ -Olefins Using Enantiopure Ziegler-Natta Polymerization Catalysts.
- Swaroop Mishra (*Chemical Engineering and Biology*) B.S., Stanford University 1999.  
Thesis: Intracellular Considerations in the Development of Non-Viral Nucleic Acid Delivery Systems for Systemic Administration.
- Marissa Lee Mock (*Chemistry*) B.S., M.S., The Pennsylvania State University 1998.  
Thesis: Protein Modification through *in vivo* Incorporation of Noncanonical Amino Acids.
- Christie Morrill (*Chemistry*) B.S., Brigham Young University 2000.  
Thesis: Application of Transition Metal Catalysis to Small Molecule Synthesis.
- Tingwei Mu (*Chemistry*) B.S., University of Science and Technology of China 2000.  
Thesis: A Chemical-Scale Study on the Ligand-Binding Site of a Serotonin-Gated Ion Channel.

*Doctor of Philosophy continued*

- Eric Joseph Nemanick (*Chemistry*) B.A., Carleton College 1999.  
Thesis: Chemical and Electrical Passivation of Single Crystal Silicon Surfaces through Covalently Bound Organic Monolayers.
- Charles Sellers Nickerson (*Chemistry*) B.S. (*Chemistry*), B.S. (*Physics*), North Carolina State University 2001.  
Thesis: Engineering the Mechanical Properties of Ocular Tissues.
- Paul John Nowatzki (*Chemical Engineering and Biology*) B.S., University of Minnesota 1999.  
Thesis: Characterization of Crosslinked Artificial Protein Films.
- Adam P. Olsen (*Chemical Engineering*) Sc.B., Brown University 1999.  
Thesis: Scanning Activity Gravimetric Analysis (SAGA) of Aqueous Polyethylene Oxide.
- Eric A. Pape (*Chemical Engineering*) B.S., University of Missouri–Rolla 1999; M.S., California Institute of Technology 2001.  
Thesis: Light Adjustable Macromer-Doped Elastomers: The Thermodynamics, Transport, and Photochemistry of Silicones.
- Tracey Alayne Rissman (*Chemical Engineering and Environmental Science and Engineering*) B.S. (*Chemical Engineering*) and B.S. (*Environmental Engineering*), Northwestern University 2000; M.S., California Institute of Technology 2002.  
Thesis: Theory, Field Measurements, and Laboratory Experiments Concerning the Cloud Condensation Nucleus Properties of Organic and/or Insoluble Aerosol Components.
- Santiago de Jesus Solares (*Chemical Engineering*) B.S., University del Valle 1994; Licenciado, 1995; M.S., University of Miami 1996; M.S., California Institute of Technology 2005.  
Thesis: Multi-Scale Simulations of Single-Walled Carbon Nanotube Atomic Force Microscopy and Density Functional Theory Characterization of Functionalized and Non-Functionalized Silicon Surfaces.
- Steven Adrian Spronk (*Chemistry*) B.S., Calvin College 1999.  
Thesis: Investigations of Ion Channels with Computational Simulations and Biochemical Experiments.
- Uttam Krishan Tambar (*Chemistry*) A.B., Harvard College 2000.  
Thesis: Convergent Methods for Synthesizing Rings in the Context of Natural Product Synthesis: I. Development of a Tandem Stille-Oxa-Electrocyclization Reaction, and Progress toward the Total Synthesis of Saudin. II. Development of the Direct Acyl-Alkylation of Arynes, and Its Application toward the Total Synthesis of Amurensinine.
- Christine Marie Thomas (*Chemistry*) B.S., Lafayette College 2001.  
Thesis: Novel Reactivity at Iron Centers Supported by Poly(phosphino)borate Ligands.

## *Doctor of Philosophy continued*

Derek W. Thurman (*Chemistry*) B.S., Abilene Christian University 1999.

Thesis: Molecular Aspects of Flow-Induced Crystallization of Polypropylene.

Alexander Vincent Tobias (*Chemical Engineering and Biology*) B.E., McGill University 2000.

Thesis: Directed Evolution of Biosynthetic Pathways to Carotenoids with Unnatural Carbon Backbones.

Raissa M. Trend (*Chemistry*) B.A., University of Wisconsin–Madison 1998; B.S., The University of Chicago 2001.

Thesis: Concerning the Mechanism and Selectivity of Palladium(II)-Catalyzed Aerobic Oxidation Reactions.

Varuntida Varutbangkul (*Chemical Engineering and Environmental Science and Engineering*) B.S., Stanford University 2000; M.S., California Institute of Technology 2002.

Thesis: Ambient and Laboratory Studies of Aerosol Size Distributions and Hygroscopicity.

Andrew Willis Waltman (*Chemistry*) B.S., The University of Michigan 2000.

Thesis: N-Heterocyclic Carbene Ligands for Nickel Ethylene Polymerization Catalysts: Toward the Incorporation of Polar Comonomers.

## DIVISION OF ENGINEERING AND APPLIED SCIENCES

Behnam Analui (*Electrical Engineering*) B.S., Sharif University of Technology 1998; M.S., 2000; M.S., California Institute of Technology 2005.

Thesis: Signal Integrity Issues in High-Speed Wireline Links: Analysis and Integrated System Solutions.

Tom Baehr-Jones (*Applied Physics*) B.S., California Institute of Technology 2002; M.S., 2005.

Thesis: Novel Modulation and Detection Mechanisms in Silicon Nanophotonics.

Matthew Gregory Borselli (*Applied Physics*) B.S. (*Physics*) and B.S. (*Mathematics*), University of Arizona 2001; M.S., California Institute of Technology 2003.

Thesis: High-*Q* Microresonators as Lasing Elements for Silicon Photonics.

Edward Allan Branchaud (*Mechanical Engineering*) B.S., Boston University 2000; M.S., California Institute of Technology 2001.

Thesis: A Control System for Positioning Recording Electrodes to Isolate Neurons in Extracellular Recordings.

James Franklin Buckwalter (*Electrical Engineering*) B.S., California Institute of Technology 1999; M.S., University of California, Santa Barbara 2001.

Thesis: Deterministic Jitter in Broadband Communication.

Gestur Björn Christianson (*Computation and Neural Systems*) B.S., McMaster University 1998.

Thesis: Information Processing in the Interaural Time Difference Pathway of the Barn Owl.

*Doctor of Philosophy continued*

- Lars Brör Cremean (*Mechanical Engineering and Control and Dynamical Systems*) B.S., Cornell University 1999; M.S., California Institute of Technology 2000.  
Thesis: System Architectures and Environment Modeling for High-Speed Autonomous Navigation.
- Olivier Delaire (*Materials Science*) Diplôme d'Ingénieur, École Centrale Lyon 1999; M.S., Pennsylvania State University 2000; M.S., California Institute of Technology 2002.  
Thesis: The Phonon Entropy of Transition Metals and Alloys: Effects of Impurities and of a Martensitic Phase Transition.
- Laurent Demanet (*Applied and Computational Mathematics*) B.S., Université Catholique de Louvain 2002.  
Thesis: Curvelets, Wave Atoms, and Wave Equations.
- David Allan Drummond (*Computation and Neural Systems*) B.S., Princeton University 1995.  
Thesis: Misfolding Dominates Protein Evolution.
- Tao Feng (*Applied Physics*) B.E., Tsinghua University 1998; M.S., California Institute of Technology 2000.  
Thesis: Silicon Nanocrystal Charging Dynamics and Memory Device Applications.
- Megan Alameda Ferguson (*Environmental Science and Engineering*) B.S. (*Chemistry*) and B.S. (*Geography and Environmental Systems*), University of Maryland 2000; M.S., California Institute of Technology 2001.  
Thesis: TiO<sub>2</sub>-photocatalyzed Arsenic(III) Oxidation and Its Applicability to Water Treatment.
- Arian Soroush Forouhar (*Bioengineering*) B.S., University of California, Los Angeles 2001.  
Thesis: Dynamic Views of Structure and Function during Heart Morphogenesis.
- David Michael Goulet (*Applied and Computational Mathematics*) B.S., California Institute of Technology 1999; M.S., New York University 2001.  
Thesis: Mathematical Models of the Developing *C. elegans* Hermaphrodite Gonad.
- Xiang Guan (*Electrical Engineering*) B.E., Tsinghua University 1996; M.S., California Institute of Technology 2002.  
Thesis: Microwave Integrated Phased Array Receivers in Silicon.
- Qing He (*Electrical Engineering and Social Science*) B.E., Tsinghua University 2000; M.S., California Institute of Technology 2001.  
Thesis: Integrated Nano Liquid Chromatography System On-a-Chip.
- Michael Hochberg (*Applied Physics*) B.S., California Institute of Technology 2002; M.S., California Institute of Technology 2005.  
Thesis: Integrated Ultrafast Nonlinear Optical Devices in Silicon.
- Mandar Mukund Inamdar (*Applied Mechanics*) B.Tech., Indian Institute of Technology, Bombay 2000; M.S., California Institute of Technology 2001.  
Thesis: Dissipative Nanomechanics.

*Doctor of Philosophy continued*

- Sidharth Jaggi (*Electrical Engineering*) B.Tech., Indian Institute of Technology, Bombay 2000; M.S., California Institute of Technology 2001.  
Thesis: Design and Analysis of Network Codes.
- Sanggeun Jeon (*Electrical Engineering*) B.S., Seoul National University 1997; M.S., 1999; M.S., California Institute of Technology 2004.  
Thesis: Design and Stability Analysis Techniques for Switching-Mode Nonlinear Circuits: Power Amplifiers and Oscillators.
- Dal Mo Kang (*Mechanical Engineering*) B.S., Seoul National University 2000; M.S., California Institute of Technology 2002.  
Thesis: Measurements of Combustion Dynamics with Laser-based Diagnostic Techniques.
- Kristopher Lars Kriechbaum (*Mechanical Engineering*) B.S., Carnegie Mellon University 1999; M.S., California Institute of Technology 2001.  
Thesis: Tools and Algorithms for Mobile Robot Navigation with Uncertain Localization.
- Stuart Jon Laurence (*Aeronautics*) B.A., B.Sc., University of Auckland 2001; M.S., California Institute of Technology 2002.  
Thesis: Proximal Bodies in Hypersonic Flow.
- Ling Li (*Computer Science and Electrical Engineering*) B.Eng., Tsinghua University 1998; M.Eng., 2000; M.S., California Institute of Technology 2002.  
Thesis: Data Complexity in Machine Learning and Novel Classification Algorithms.
- Daniel Lieberman (*Aeronautics and Chemistry*) B.Sc., McGill University 2000; M.S., California Institute of Technology 2001.  
Thesis: Detonation Interaction with Sharp and Diffuse Interfaces.
- Matthieu Liger (*Electrical Engineering*) Diplôme d'Ingénieur, École Supérieure d'Ingénieurs en Électrotechnique et Électronique 2001; M.S., California Institute of Technology 2001.  
Thesis: Uncooled Carbon Microbolometer Imager.
- Wuan Luo (*Applied and Computational Mathematics*) B.S., Peking University 1998; M.S., 2001.  
Thesis: Wiener Chaos Expansion and Numerical Solutions of Stochastic Partial Differential Equations.
- Georgios C. Lykotrafitis (*Mechanical Engineering*) B.S., University of Athens 1986; M.S., National Technical University of Athens 2000; M.S., California Institute of Technology 2003.  
Thesis: Experimental Study of Dynamic Frictional Sliding Modes along Incoherent Interfaces.
- Brett Michael Maune (*Applied Physics*) B.S., University of Missouri–Rolla 2001; M.S., California Institute of Technology 2002.  
Thesis: Fluidic and Polymeric Integration and Functionalization of Optical Microresonators.

*Doctor of Philosophy continued*

- Bumki Min (*Applied Physics*) B.S., Seoul National University 1999; M.S., 2001; M.S., California Institute of Technology 2003.  
Thesis: Ultrahigh-Q Microtoroid On-Chip Resonators for Low Threshold Microlasers.
- Anna Karolina Mitros (*Computation and Neural Systems*) B.A., Rice University 1998.  
Thesis: A Compact System for Self-Motion Estimation.
- Michela Muñoz Fernández (*Electrical Engineering*) B.S., Universidad de Alcalá 1998; M.S., International Space University 2000; M.S., California Institute of Technology 2001.  
Thesis: Coherent Optical Array Receiver for PPM Signals under Atmospheric Turbulence.
- Terrell D. Neal (*Electrical Engineering and Applied Physics*) B.S.E.E., Georgia Institute of Technology 2000; B.S. (*Mathematics*), Morehouse College 2000; M.S., California Institute of Technology 2001.  
Thesis: Surface Plasmon Enhanced Light Emission from Organic Light Emitters.
- Karl Spyros Papadantonakis (*Computer Science*) B.A., Cornell University 2000; M.S., California Institute of Technology 2002.  
Thesis: Rigorous Analog Verification of Asynchronous Circuits.
- Alexander Blair Papandrew (*Materials Science*) B.S., Columbia University 2000; M.S., California Institute of Technology 2002.  
Thesis: The Effects of High Pressure on the Vibrational and Magnetic Properties of Iron-Based Materials.
- Kevin L. G. Parkin (*Aeronautics and Electrical Engineering*) M.Phys., University of Leicester 1999; M.S., California Institute of Technology 2001.  
Thesis: The Microwave Thermal Thruster and Its Application to the Launch Problem.
- Samuel Thomas Pfister (*Mechanical Engineering*) S.B., Harvard College 1999; M.S., California Institute of Technology 2001.  
Thesis: Algorithms for Mobile Robot Localization and Mapping, Incorporating Detailed Noise Modeling and Multi-scale Feature Extraction.
- Hossein Rokhsari Azar (*Applied Physics*) B.S., Sharif University of Technology 2001.  
Thesis: High-Q Microcavities: Optomechanical Nonlinearities, Measurement Techniques and Applications.
- Amir Sadjadpour (*Applied Mechanics*) B.Sc., University of Tehran 1999; M.Sc., 2001; M.S., California Institute of Technology 2003.  
Thesis: A Micromechanics-Inspired Three-Dimensional Constitutive Model for the Thermomechanical Response of Shape-Memory Alloys.
- Shawn Christopher Shadden (*Control and Dynamical Systems*) B.S., The University of Texas at Austin 2001.  
Thesis: A Dynamical Systems Approach to Unsteady Systems.

## *Doctor of Philosophy continued*

- Masoud Sharif (*Electrical Engineering*) B.Sc., Sharif University of Technology 1999; M.Sc., 2001.  
Thesis: Broadband Wireless Broadcast Channels: Throughput, Performance, and PAPR Reduction.
- Victor Chi-Yuan Shih (*Electrical Engineering*) B.S., National Tsing Hua University 1996; M.S., 1998; M.S., California Institute of Technology 2002.  
Thesis: Temperature-Controlled Microchip Liquid Chromatography System.
- Demetri Polychronis Spanos (*Control and Dynamical Systems*) B.A., B.S., Rice University 2002; M.S., California Institute of Technology 2003.  
Thesis: Distributed Gradient Systems and Dynamic Coordination.
- Kartik Srinivasan (*Applied Physics*) B.S., California Institute of Technology 2000; M.S., 2002.  
Thesis: Semiconductor Optical Microcavities for Chip-Based Cavity QED.
- Theofilos Strinopoulos (*Applied and Computational Mathematics*) B.S., The University of Wisconsin–Madison 1999.  
Thesis: Upscaling Immiscible Two-Phase Flows in an Adaptive Frame.
- Tabitha Liana Swan-Wood (*Materials Science*) B.S., University of California, Riverside 2000; M.S., California Institute of Technology 2002.  
Thesis: Vibrational Entropy Contributions to the Phase Stability of Iron- and Aluminum-Based Binary Alloys.
- Shervin Taghavi Larigani (Laridjani) (*Electrical Engineering*) Diplôme d'Ingénieur, Université de Paris XI 1999; M.S., California Institute of Technology 2001.  
Thesis: Theory, Fabrication and Applications of a Novel Archetype Semi-Ring Fabry-Perot (SRFP) Resonator.
- Ao (Kevin) Tang (*Electrical Engineering and Applied and Computational Mathematics*) B.E., Tsinghua University 1999; M.E., 2001; M.S., California Institute of Technology 2002.  
Thesis: Heterogeneous Congestion Control Protocols.
- MinTao (*Applied Mechanics and Materials Science*) B.S., Tsinghua University 1999; M.S., California Institute of Technology 2002.  
Thesis: High Temperature Deformation of Vitreloy Bulk Metallic Glasses and Their Composite.
- Cristian Țăpuș (*Computer Science*) B.S., California Institute of Technology 1999; M.S., 2004; M.S., University of Maryland 2001.  
Thesis: Distributed Speculations: Providing Fault-tolerance and Improving Performance.
- Mankei Tsang (*Electrical Engineering*) B.Sc., University of California, Los Angeles 2003; M.S., California Institute of Technology 2004.  
Thesis: Classical and Quantum Nonlinear Optical Information Processing.

*Doctor of Philosophy* continued

- Naotsugu Tsuchiya (*Computation and Neural Systems*) B.A., Kyoto University 2000.  
Thesis: Attention and Awareness: Visual Psychophysics and Aversive Conditioning in Humans.
- Robert Michael van Dam (*Applied Physics*) B.S., Queen's University 1996; M.S., University of Toronto 1998.  
Thesis: Solvent-Resistant Elastomeric Microfluidic Devices and Applications.
- Saurabh Vyawahare (*Applied Physics*) B.Tech., Indian Institute of Technology, Madras 2001; M.S., California Institute of Technology 2003.  
Thesis: Manipulating Fluids: Advances in Micro-Fluidics, Opto-Fluidics and Fluidic Self-Assembly.
- Dirk Walther (*Computation and Neural Systems*) Diplom (*Physics*), Universität Leipzig 1997; Diplom (*Computer Science*) 1998; M.Phil., University of Cambridge 1999.  
Thesis: Interactions of Visual Attention and Object Recognition: Computational Modeling, Algorithms, and Psychophysics.
- Feyi Wang (*Electrical Engineering*) B.A., B.S., Lafayette College 2001; M.S., California Institute of Technology 2003.  
Thesis: Design and Analysis of High-Efficiency L-Band Power Amplifiers.
- Jiantao Wang (*Control and Dynamical Systems*) B.S., Tsinghua University 1998; M.S., 1999.  
Thesis: A Theoretical Study of Internet Congestion Control: Equilibrium and Dynamics.
- Rebecca Ann Washenfelder (*Environmental Science and Engineering*) B.A., Pomona College 1999; M.S., California Institute of Technology 2002.  
Thesis: Column Abundances of Carbon Dioxide and Methane Retrieved from Ground-Based Near-Infrared Solar Spectra.
- Lisa Renee Welp (*Environmental Science and Engineering*) B.S., Indiana University 2000; M.S., California Institute of Technology 2002.  
Thesis: Links between Carbon and Water Cycles in Northern Ecosystems: Constraints from Stable Isotopes.
- Kjerstin Irja Williams (*Electrical Engineering*) B.S., California Institute of Technology 2000; M.S., 2002.  
Thesis: Multi-robot Systems: Modeling Swarm Dynamics and Designing Inspection Planning Algorithms.
- Fu-Ling Yang (*Mechanical Engineering*) B.S., National Taiwan University 2000; M.S., California Institute of Technology 2002.  
Thesis: Interaction Law for a Collision between Two Solid Particles in a Viscous Liquid.
- Ya-Tang Yang (*Applied Physics*) B.S., National Taiwan University 1996; M.S., California Institute of Technology 2000.  
Thesis: Phase Noise of Nanoelectromechanical Systems.

*Doctor of Philosophy* continued

- Rongjing Zhang (*Aeronautics and Applied Physics*) B.E., Qinghua University 1997; M.E., Chinese Academy of Sciences 2000.  
Thesis: Mechanical Characterization of Thin Films with Application to Ferroelectrics.
- Yizhen Zhang (*Mechanical Engineering*) B.S., Tsinghua University 2000; M.S., California Institute of Technology 2001.  
Thesis: Engineering Design Synthesis of Sensor and Control Systems for Intelligent Vehicles.
- Matias Gabriel Zielonka (*Aeronautics and Applied Computation*) B.S., University of Buenos Aires 1998; M.S., California Institute of Technology 2002.  
Thesis: Configurational Forces and Variational Mesh Adaption in Solid Dynamics.
- DIVISION OF GEOLOGICAL AND PLANETARY SCIENCES
- Huirong Ai (*Geology*) B.S., Peking University 1996; M.S., 1999; M.S., California Institute of Technology 2001.  
Thesis: Shock-induced Damage in Rocks: Application to Impact Cratering.
- Shabari Basu (*Planetary Science and Astronomy*) B.Sc., St. Stephen's College 2001; M.S., California Institute of Technology 2003.  
Thesis: Simulations of the Martian Dust Cycle with a General Circulation Model.
- Selene Farrell Eltgroth (*Geochemistry*) B.S., University of California, San Diego 1998; M.S., California Institute of Technology 2003.  
Thesis: Unraveling Deep-Ocean Connections to Climate with Deep-Sea Coral Records of Radiocarbon and Cd/Ca.
- Nir Yitzhak Krakauer (*Geochemistry*) B.S.E., The University of Michigan 2001; M.S., California Institute of Technology 2004.  
Thesis: Characterizing Carbon-Dioxide Fluxes from Oceans and Terrestrial Ecosystems.
- Mao-Chang Liang (*Planetary Science and Astronomy*) B.S., National Tsing Hua University 1998; M.S., 2000.  
Thesis: Chemical and Dynamical Processes in the Atmospheres of I. Ancient and Present-Day Earth, II. Jupiter and Galileo Satellite, III. Extrasolar "Hot Jupiters."
- Junjun Liu (*Planetary Science and Applied and Computational Mathematics*) B.S., Peking University 1997; M.S., 2000; M.S., California Institute of Technology 2004.  
Thesis: Interaction of Magnetic Field and Flow in the Outer Shells of Giant Planets.
- Qinya Liu (*Geophysics*) B.S., University of Science and Technology of China 2000.  
Thesis: Spectral-element Simulations of 3-D Seismic Wave Propagation and Applications to Source and Structural Inversions.
- J. Bruce H. Shyu (*Geology*) B.S., National Taiwan University 1994; M.S., 1999.  
Thesis: A Neotectonic Model of Taiwan, with a Focus on the Longitudinal Valley Suture.

## *Doctor of Philosophy* continued

Deborah Elaine Smith (*Geophysics*) B.S., Harvey Mudd College 1995; M.S., California Institute of Technology 1997.

Thesis: A New Paradigm for Interpreting Stress Inversions from Focal Mechanisms: How 3D Stress Heterogeneity Biases the Inversions toward the Stress Rate.

Eh Tan (*Geophysics*) B.S., National Taiwan University 1997.

Thesis: I. Multi-scale Dynamics of Mantle Plumes, and II. Compressible Thermo-chemical Convection and the Stability of Mantle Superplumes.

Ying Tan (*Geophysics*) B.S., Peking University 1999.

Thesis: Broadband Waveform Modeling Over a Dense Seismic Network.

### DIVISION OF THE HUMANITIES AND SOCIAL SCIENCES

Jernej Čopič (*Social Science*) B. Math., University of Ljubljana 1997; M.A., Universitat Autònoma de Barcelona 2000.

Thesis: Robust Bilateral Trade and an Essay on Awareness as an Equilibrium Notion.

Brian W. Rogers (*Social Science*) B.A. (*Economics*) and B.A. (*Mathematics*), The University of Virginia 2001; M.S., California Institute of Technology 2003.

Thesis: Learning and Status in Social Networks.

### DIVISION OF PHYSICS, MATHEMATICS AND ASTRONOMY

Anura Yamesh Abeyesinghe (*Physics*) A.B., Dartmouth College 2001; M.S., California Institute of Technology 2005.

Thesis: Unification of Quantum Information Theory.

Jessica Lynn Arlett (*Physics*) B.Sc., Queen's University 1998.

Thesis: Properties of Piezoresistive Silicon Nano-scale Cantilevers with Applications to BioNEMS.

Kevin Bundy (*Astrophysics*) B.A., University of California, Berkeley 2000.

Thesis: The Mass Assembly History of Field Galaxies.

Andrew Rosenberg Chatto (*Physics*) B.S., Yale University 1995.

Thesis: Experiments on the Self-Organized Critical State of  ${}^4\text{He}$ .

Ching-Tzu Chen (*Physics*) B.S., National Taiwan University 1998.

Thesis: Scanning Tunneling Spectroscopy Studies of High-Temperature Cuprate Superconductors.

Chin-wen Chou (*Physics*) B.S., National Taiwan University 1999; M.S. 2000.

Thesis: Towards a Quantum Network with Atomic Ensembles.

Matthew Paul Dorsten (*Physics*) B.S., The Ohio State University 2000; M.S., California Institute of Technology 2002.

Thesis: Topics in Heavy Particle Effective Theories.

Alexei Dvoretiskii (*Physics*) B.S., Novosibirsk State University 1997.

Thesis: Dalitz Plot Analysis of the Decay  $B^\pm \rightarrow K^\pm K^\pm K^\mp$ .

*Doctor of Philosophy* continued

- Dawn Karuna Erb (*Astrophysics*) B.S., University of Washington 2000.  
Thesis: The Properties of Star-Forming Galaxies at  $z \sim 2$ : Kinematics, Stellar Populations, and Metallicities.
- Oleg Evnin (*Physics*) B.S., Rostov State University 1998; M.S., 2000.  
Thesis: On Quantum Interacting Embedded Geometrical Objects of Various Dimensions.
- Robert Burke Forster (*Physics*) A.B., Harvard College 1995.  
Thesis: Population Dynamics in the Presence of Quasispecies Effects and Changing Environments.
- Marat I. Gataullin (*Physics*) B.S., Moscow Institute of Physics and Technology 1996.  
Thesis: Studies of Electroweak Interactions and Searches for New Physics Using Photonic Events with Missing Energy at the Large Electron-Positron Collider.
- Matthew Thomas Gealy (*Mathematics*) B.A., M.S., The University of Chicago 2001.  
Thesis: On the Tamagawa Number Conjecture for Motives Attached to Modular Forms.
- David J. Gryniewicz (*Mathematics*) B.A., Bates College 2001.  
Thesis: Sumsets, Zero-Sums and Extremal Combinatorics.
- Alejandro Jenkins (*Physics*) A.B. (*Physics*) and A.B. (*Mathematics*), Harvard College 2001; M.S., California Institute of Technology 2002.  
Thesis: Topics in Theoretical Particle Physics and Cosmology beyond the Standard Model.
- Attila Kovács (*Physics*) A.B., Harvard College 1997.  
Thesis: SHARC-2 350 Micron Observations of Distant Submillimeter Selected Galaxies and Techniques for the Optimal Analysis and Observing of Weak Signals.
- Benjamin Leonard Lev (*Physics*) A.B., Princeton University 1999.  
Thesis: Magnetic Microtraps for Cavity QED, Bose-Einstein Condensates, and Atom Optics.
- Xiaoyu Liu (*Mathematics*) B.S., Peking University 2001.  
Thesis: On Divisible Codes over Finite Fields.
- Nathan Eric Lundblad (*Physics*) B.A., University of California, Berkeley; M.S., California Institute of Technology 2002.  
Thesis: All-Optical Spinor Bose-Einstein Condensation and the Spinor Dynamics-Driven Atom Laser.
- Thomas Patrick Mack (*Mathematics*) S.B., Massachusetts Institute of Technology 2001.  
Thesis: Quasiconvex Subgroups and Nets in Hyperbolic Groups.
- Raymond Timothy James McGarvey (*Biochemistry and Molecular Biophysics*) B.S., United States Naval Academy 1986; M.A., University of Toronto 1992.  
Thesis: Ultra-Sensitive Absorption Measurements through Cavity-Enhanced Spectroscopy.

*Doctor of Philosophy* continued

- Stanimir Angelov Metchev (*Astronomy*) A.B., Harvard College 1999.  
Thesis: Brown Dwarf Companions to Young Solar Analogs: An Adaptive Optics Survey Using Palomar and Keck.
- Stefan Mihalas (*Physics*) B.S., West University Timisoara 1997; M.S., 1999.  
Thesis: Quantitative Model of Calcium/Calmodulin-Dependent Protein Kinase II Activation.
- Tejaswi Navilarekallu (*Mathematics*) B.S., Chennai Mathematical Institute 2001.  
Thesis: On the Equivariant Tamagawa Number Conjecture.
- Margaret Whei-Jie Pan (*Astrophysics*) S.B., Massachusetts Institute of Technology 2001.  
Thesis: Slices of Theoretical Astrophysics: Solar System Dynamics and Relativistic Explosions.
- Yi Pan (*Physics*) B.S., Peking University 2000.  
Thesis: Topics of LIGO Physics: Template Banks for the Inspiral of Precessing, Compact Binaries, and Design of the Signal-Recycling Cavity for Advanced LIGO.
- Naveen Ananta Reddy (*Astrophysics*) B.S., The University of Texas at Austin 2000.  
Thesis: A Multi-Wavelength Census of Star Formation at Redshifts  $z$  Equals 2.
- Alexander Samuel (*Physics*) A.B., Harvard College 1995.  
Thesis: Measurement of Branching Fractions and Mass Spectra of  $B \rightarrow K\pi\pi\gamma$  Decays.
- David Jerome Sand (*Physics*) B.S., University of California, Los Angeles 2000.  
Thesis: On the Distribution of Dark Matter in Clusters of Galaxies.
- Graeme Stewart Baird Smith (*Physics*) B.Sc., University of Toronto 2001; M.S., California Institute of Technology 2004.  
Thesis: Upper and Lower Bounds on Quantum Codes.
- Claus Mazanti Sorensen (*Mathematics*) Cand. Scient., Aarhus Universitet 2001.  
Thesis: Level-raising for  $GSp(4)$ .
- Daniel Alexander Wagenaar (*Physics*) M.Sc., Universiteit van Amsterdam 1997; M.S., King's College London 1998.  
Thesis: Development and Control of Epileptiform Bursting in Dissociated Cortical Cultures.
- Bahattin Yildiz (*Mathematics*) B.S., Bilkent University 2001.  
Thesis: Weight Enumerators and Gray Maps of Linear Codes over Rings.
- Junhua Yuan (*Physics*) B.S., University of Science and Technology of China 1998; M.S., California Institute of Technology 2000.  
Thesis: Progress towards a High Precision Measurement of the Neutron Spin–Electron Angular Correlation in Polarized Neutron  $\beta$  Decay with Ultra-Cold Neutrons.