Doctor of Philosophy

DIVISION OF BIOLOGY

Ramzi I. Azzam (*Biology*) B.S., University of California, Santa Barbara 1996; M.A., 1997.
Thesis: The Role of Net1 Phosphorylation in Regulating CDC14 Release During Mitotic Exit.

Catherine Craig Baker (*Biology*) B.A., Princeton University 1997.
Thesis: Genetic and Genomic Studies of Shoot and Flower Growth in *Arabidopsis*.

Martín Leandro Basch (*Biology*) Licenciado, Universidad de Buenos Aires 1996.
Thesis: Early Neural Crest Specification, Induction and Competence.

Kyle Alan Bernheim (*Biology*) B.S. (*Biochemistry and Chemistry*), Pennsylvania State University 1998.
Thesis: Functional and Structural Magnetic Resonance Imaging of Humans and Macaques.

Eliot Christen Bush (*Biology*) A.B., Harvard College 1997; M.S., California Institute of Technology 2000.
Thesis: Evolution and Scaling in Mammalian Brains.

Anthony Michael Giannetti (*Biochemistry and Molecular Biophysics*) B.S., University of California, Santa Barbara 1998.
Thesis: Biochemical, Biophysical, and Cellular Investigations of the Interactions of Transferrin Receptor with Transferrin and the Hereditary Hemochromatosis Protein, HFE.

Ying Gong (*Biochemistry and Molecular Biophysics*) B.S., Peking University 1996; M.A., Smith College 1998.
Thesis: Cell Polarity and Morphogenesis: Functions and Mechanisms of Cell Divisions in Vertebrate Gastrulation.

Po-Ssu Huang (*Biochemistry and Molecular Biophysics*) B.A., University of California, Berkeley 1998.
Thesis: Computational Design and Experimental Characterization of Protein Oligomers.

Daniel Keith Meulemans (*Biology*) B.S., University of Hawaii at Manoa 1996.; M.S., California Institute of Technology 1999.
Thesis: Genetic Correlates of Neural Crest Evolution.

Javier Perez-Orive (*Computation and Neural Systems*) B.S., Universidad Iberoamericana 1995; M.S., Case Western Reserve University 1998.
Thesis: Neural Oscillations and the Decoding of Sensory Information.

Robert J. Peters (*Computation and Neural Systems*) B.S., University of Wisconsin, Madison 1995.
Thesis: Visual, Attention and Object Categorization: From Psychophysics to Computational Models.

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*

Kathleen Miho Sakamoto (*Biology*) B.A., Williams College 1979; M.S., University of Cincinnati College of Medicine 1982.
Thesis: Targeting Proteins for Ubiquitination and Degradation in the Treatment of Human Disease.

W. Bryan Smith (*Cellular and Molecular Neurobiology*) B.S., University of Southern California 1998; M.S., California Institute of Technology 2000.
Thesis: Local Control of Synaptic Strength: Neurotrophic and Dopaminergic Modulation of Dendritic Protein Synthesis.

Luis E. Vázquez (*Biology*) B.S., University of Puerto Rico, Mayaguez 1998; M.S., California Institute of Technology 2000.
Thesis: SynGAP Controls Synapse Formation by Regulating Spine Development and Morphology.

Lili Yang (*Biology*) B.S., University of Science and Technology of China 1997; M.S., University of California, Riverside 1999.
Thesis: Towards Engineering Immunity.

DIVISION OF CHEMISTRY AND CHEMICAL ENGINEERING

Matthew John Allen (*Chemistry*) B.S., Purdue University 1998.
Thesis: Delivery and Activation of Contrast Agents for Magnetic Resonance Imaging.

Pratip K. Bhattacharya (*Chemistry*) B.Sc., University of Calcutta 1995; M.Sc., Indian Institute of Technology, Kanpur 1997.
Thesis: Structure and Reactivity of Metal Complexes Bound to DNA.

Rhett Ty Brewer (*Chemical Engineering*) B.S., Brigham Young University 1997; M.S., California Institute of Technology 2000.
Thesis: Quantitative Biaxial Texture Analysis with Reflection High-Energy Electron Diffraction for Ion Beam-Assisted Deposition of MgO and Heteroepitaxy of Perovskite Ferroelectrics.

Isaac Sheridan Carrico (*Chemistry*) B.S., University of California, Santa Barbara 1997.
Thesis: Protein Engineering Through *in vivo* Incorporation of Phenylalanine Analogs.

Julie Diane Casperson (*Chemistry*) B.S., University of California, San Diego 1999; M.S., California Institute of Technology 2002.
Thesis: Design and Characterization of Layered Tunnel Barriers for Nonvolatile Memory Applications.

Tae-Lim Choi (*Chemistry*) B.S., Korea Advanced Institute of Science and Technology 1999.
Thesis: Olefin Metathesis - A Versatile Tool for the Synthesis of Small to Large Molecules.

Patrick Carmen Cirino (*Chemical Engineering*) B.S., Ohio University 1997.
Thesis: Laboratory Evolution of Cytochrome P450 Peroxygenase Activity.

Doctor of Philosophy *continued*

Sarah Delaney (*Chemistry*) B.A., Middlebury College 1999.
Thesis: Oxidative DNA Damage by Long-Range Charge Transport.

Wei-Qiao Deng (*Chemistry*) B.S., Lanzhou University 1994; M.S., Dalian Institute of Chemical Physics 1997.
Thesis: Computation Aided Design in Molecular Nanotechnology.

Vy Maria Dong (*Chemistry*) B.S., University of California, Irvine 1998; M.S., University of California, Berkeley 2000.
Thesis: Novel Variants of the Zwitterionic Claisen Rearrangement and the Total Synthesis of Erythronolide B.

Donald Eugene Elmore, Jr. (*Chemistry*) B.A., Grinnell College 1998.
Thesis: Investigations of Ion Channel Structure-Function Relationships Using Molecular Modeling and Experimental Biochemistry.

Shane Foister (*Chemistry*) B.S., University of Kentucky 1998.
Thesis: Shape Selective Recognition of the DNA Minor Groove by Hairpin Polyamides.

Michael Joseph Gordon (*Chemical Engineering*) B.S., Colorado School of Mines 1994; M.S., 1995; M.S., California Institute of Technology 1998.
Thesis: Low Energy Ion Beamline-Scattering Apparatus with Application to Charge Exchange Collisions at Surfaces.

Florian Gstrein (*Chemistry*) Diploma, Montanuniversitat Leoben 1997.
Thesis: Electron-Transfer Processes at Semiconductor/Liquid Interfaces and Metal/Nanogap Junctions.

Sarah Christine Heilshorn (*Chemical Engineering and Biology*) B.S., Georgia Institute of Technology 1998; M.S., California Institute of Technology 2000.
Thesis: Design and Characterization of Artificial Extracellular Matrix Proteins for Use as Small-Diameter Vascular Grafts.

Wendy Sandra Jen (*Chemistry*) S.B., Massachusetts Institute of Technology 1998.
Thesis: Development of New Asymmetric Organocatalytic Methods and Progress towards the Total Synthesis of Guanacastepene A.

M. Yashar S. Kalani (*Biochemistry and Molecular Biophysics*) B.S., M.S., University of California, Los Angeles 2002; M.S., California Institute of Technology 2003.
Thesis: Structure and Function Studies of the Human Dopamine Receptors.

Michael D. Kempe (*Chemical Engineering*) B.S., University of Utah 1997; M.S., California Institute of Technology 2002.
Thesis: Rheology and Dynamics of Side-Group Liquid Crystalline Polymers in Nematic Solvents.

Jacqueline Kessler (*Chemistry*) B.S., University of California, San Diego 1998.
Thesis: Gas and Dust Chemistry in Planet-Forming Disks.

Tristan Hayes Lambert (*Chemistry*) B.S., University of Wisconsin–Platteville 1998.
Thesis: Development of the Lewis Acid Catalyzed Allenoate-Claisen Rearrangement. Investigations of Enantioselective Catalysis of the Allenoate-Claisen Rearrangement. Studies Towards the Total Synthesis of Erythrolide E.

Doctor of Philosophy *continued*

Timothy Michael Lesko (*Chemistry*) B.S., University of California, Riverside 1998.
Thesis: Chemical Effects of Acoustic Cavitation.

Sarah Lynn May (*Chemistry*) B.Sc., University of Victoria 1997; M.Sc., 1999.
Thesis: Site-Specific Incorporation of Unnatural Amino Acids into Receptors Expressed in Mammalian Cells.

Elizabeth Idonia Mayo (*Chemistry*) B.S., Florida State University 1995; M.S., 1999.
Thesis: Kinetics and Thermodynamics of Dye (Group VIII Metal)–Sensitized Nanocrystalline Titanium Dioxide Photoelectrodes.

Daniel Hern Paik (*Chemistry*) B.A., Haveford College 1997.
Thesis: Femtosecond Time-Resolved Spectroscopy of Anionic Systems: Dynamics of Mesoscopic Solvation and Gas-Phase Organic Reactions.

Nick Anthony Paras (*Chemistry*) A.B., Harvard College 1998.
Thesis: Enantioselective Organocatalytic Friedel-Crafts Alkylations of Heterocycles and Electron-Rich Benzenes.

Noah Edward Robinson (*Chemistry*) B.S., Southern Oregon University 1999.
Thesis: Investigations of Peptide and Protein Deamidation.

Ramanathan Sankaran (*Chemical Engineering and Applied Physics*) B.S., University of California, Los Angeles 1998.
Thesis: High-Pressure Microdischarges as Microreactors for Materials Applications.

Oren Alexander Scherman (*Chemistry*) B.A., Cornell University 1999.
Thesis: Enhancing Materials through Controlled Architectures with Ring-Opening Metathesis Polymerization.

Susan J. Schofer (*Chemistry*) Sc.B., Brown University 1997.
Thesis: The Effect of Ligand Array on Stereocontrol and Molecular Weight in Metallocene-Catalyzed α-Olefin Polymerization and (PNP)$CrPh_3$ Complexes as Well-Defined Ethylene Trimerization Catalysts.

Shelley Ruth Starck (*Chemistry*) B.S., University of Virginia 1998.
Thesis: Exploring the Proteome: Insights into Eukaryotic Protein Synthesis Using Puromycin Analogs.

John Christopher Thomas (*Chemistry*) S.B., Massachusetts Institute of Technology 1999.
Thesis: Ligand Design, Coordination Chemistry, and Mechanistic Studies of (Phosphino)Borates and their Platinum, Nickel, and Copper Complexes.

Rene J. Trabanino (*Chemistry*) B.S., University of California, Los Angeles 1998.
Thesis: Prediction of Structure, Function, and Spectroscopic Properties of G-Protein-Coupled Receptors: Methods and Applications.

Timothy Mark VanReken (*Chemical Engineering*) B.S., University of Florida 1997.
Thesis: Understanding the Relationship between Aerosols and Clouds: Field Investigations and Instrument Development.

Pin Wang (*Chemical Engineering*) B.S., University of Science and Technology of China 1997; M.S., California Institute of Technology 2000.
Thesis: Expanding the Biosynthetic Capacity of the Aminoacyl-tRNA Synthetases.

Doctor of Philosophy *continued*

Donald William Ward (*Chemistry*) B.S., Principia College 1998.
Thesis: Stereoselective Ruthenium-Catalyzed Olefin Metathesis.

John Jacob Moely Wiener (*Chemistry*) B.S., Harvard College 1998.
Thesis: Design and Development of New Enantioselective Catalytic Reactions and Progress towards the Total Synthesis of Callipeltoside A.

Andrea Palmisano Wight (*Chemical Engineering and Chemistry*) B.S., Tulane University 1997; M.S., California Institute of Technology 2002.
Thesis: I. Synthesis, Characterization, and Base Catalysis of Organic-Functionalized Molecular Sieves. II. Selective Oxidation of Ethane via Heteropolyanion-Containing Solid Catalysts.

Tashica Tréshun Williams (*Chemistry*) B.S., Baylor University 1998.
Thesis: Fundamental Aspects of DNA-Mediated Charge Transport.

Niki Marie Zacharias (*Chemistry*) B.S., Texas A&M University 1997.
Thesis: Chemical-scale Manipulation of Ion Channels: *In vivo* Nonsense Suppression and Targeted Disulfide Crosslinking.

DIVISION OF ENGINEERING AND APPLIED SCIENCES

Mark Lee Adams (*Electrical Engineering*) B.S.E.E., Auburn University 1997; M.S., California Institute of Technology 2000.
Thesis: Integration of Optoelectronics and Microfluidics for Biological and Chemical Sensing.

Roberto Aparicio Joo (*Electrical Engineering*) Licenciado en Electrónica, Benemérita Universidad Autónoma 1999; M.S., California Institute of Technology 2001.
Thesis: Frequency Generation Techniques for Integrated Applications.

Cahit Can Aydiner (*Applied Mechanics and Materials Science*) B.Sc., Middle East Technical University 1998; M.S., California Institute of Technology 1999.
Thesis: Investigation of Thermal Tempering in Bulk Metallic Glasses.

Lorena A. Barba (*Aeronautics and French*) Grado de Licenciado, Universidad Tecnica Federico Santa Maria 1989, M.Sc., 1997; M.S., California Institute of Technology 1999.
Thesis: Vortex Method for Computing High-Reynolds Number Flows: Increased Accuracy with a Fully Mesh-Less Formulation.

David Nicholas Barsic (*Electrical Engineering*) B.S.E.E., University of Iowa 1997; M.S., California Institute of Technology 2001.
Thesis: Small-Scale Liquid-State Dynamics in Nanometer Size Devices.

Kumar Manoj Bobba (*Aeronautics and Applied and Computational Mathematics and Control and Dynamical Systems*) B.Tech., Indian Institute of Technology, Madras 1998; M.S., California Institute of Technology 1999.
Thesis: Robust Flow Stability: Theory, Computations and Experiments in Near Wall Turbulence.

Doctor of Philosophy *continued*

Dane Andrew Boysen (*Materials Science*) B.S., University of Washington 1997; M.S., California Institute of Technology 2001.
Thesis: Superprotonic Solid Acids: Structure, Properties, and Applications.

Charles D. Camp (*Applied and Computational Mathematics*) B.A., University of California, San Diego 1989.
Thesis: Temporal and Spatial Patterns of the Interannual Variability of Stratospheric Ozone and Dynamics.

Shiyan Cao (*Mechanical Engineering*) B.S., University of California, Berkeley 1998; M.S., California Institute of Technology 1999.
Thesis: Spike Train Characterization and Decoding for Neural Prosthetic Devices.

Tong Wa Chao (*Aeronautics*) B.A., B.Sc., University of Texas at Austin 1998; M.S., California Institute of Technology 1999.
Thesis: Gaseous Detonation-Driven Fracture of Tubes.

Mario Julián Chaubell (*Applied and Computational Mathematics*) B.S., Universidad Nacional de Mar del Plata 1992.
Thesis: Low-Coherence Interferometric Imaging: Solution of the One-Dimensional Inverse Scattering Problem.

Isaac Vikram Chenchiah (*Applied Mechanics*) B.Tech., Indian Institute of Technology, Madras 1998; M.S., California Institute of Technology 1999.
Thesis: Energy-Minimizing Microstructures in Multiphase Elastic Solids.

John Francis Clinton (*Civil Engineering and Geophysics*) B.E., University College Dublin 1997; M.S., California Institute of Technology 1998.
Thesis: Modern Digital Seismology-Instrumentation, and Small Amplitude Studies in the Engineering World.

Marcia Ann Cooper (*Mechanical Engineering*) B.S., Purdue University 1999; M.S., California Institute of Technology 2000.
Thesis: Impulse Generation by Detonation Tubes.

Diego G. Dugatkin (*Electrical Engineering*) Ingeniero Electrónico, Universidad de Buenos Aires 1994; M.S., California Institute of Technology 1997.
Thesis: Optimization of Multi-resolution Source Codes.

William Bruce Dunbar (*Control and Dynamical Systems*) B.S., Virginia Polytechnic Institute 1997; M.S., University of California, San Diego 1999.
Thesis: Distributed Receding Horizon Control of Multiagent Systems.

Matthew Justin Fago (*Aeronautics and Materials Science*) B.S.E., (*Aerospace Engineering)*, B.S.E., *(Mechanical Engineering*), University of Michigan 1995; M.S., California Institute of Technology 1999.
Thesis: Constrained Sequential Lamination: Nonconvex Optimization and Material Microstructure.

Michael Ian James Fleming (*Electrical Engineering*) B.S., University of Auckland 1996; M.S., 1998; M.S., California Institute of Technology 2000.
Thesis: On Source Coding for Networks.

Doctor of Philosophy *continued*

Cédric Jean Paul Florens (*Electrical Engineering*) Diplôme d'Ingénieur, École Supérieure d'Ingénieurs en Électronique et Électrotechnique 1999; M.S., California Institute of Technology 1999.
Thesis: Data Collection and Distribution in Sensory Networks.

Warren Chung Wah Fon (*Applied Physics*) B.S., Hong Kong University of Science and Technology 1997; M.S., California Institute of Technology 1999.
Thesis: Thermal Properties of Nano- and Microstructures.

Carl Lars Genghis Hansen (*Applied Physics*) B.A.Sc., University of British Columbia 2000.
Thesis: Microfluidic Technologies for Structural Biology.

Hossein Hashemi (*Electrical Engineering*) B.S., Sharif University of Technology 1997; M.S., 1999; M.S., California Institute of Technology 2001.
Thesis: Integrated Concurrent Multi-Band Radios and Multiple-Antenna Systems.

Maria Eugenia Hernández (*Environmental Science and Engineering and Biochemistry*) Licenciatura en Química, Universidad Nacional de Tucumán 1997; M.S., California Institute of Technology 1999.
Thesis: Mechanisms of Indirect Mineral Reduction by Bacteria.

Cynthia Lee Hunt (*Materials Science*) B.A., University of Chicago 1998; M.S., California Institute of Technology 2000.
Thesis: Transition-Edge Superconducting Antenna-Coupled Bolometer.

Ali Husain (*Electrical Engineering*) B.S., University of Pennsylvania 1998; M.S., California Institute of Technology 2001.
Thesis: Nanotube and Nanowire Devices.

Anxiao Jiang (*Electrical Engineering*) B.E., Tsinghua University 1999; M.S., California Institute of Technology 2000.
Thesis: Optimized Network Data Storage and Topology Control.

Emil P. Kartalov (*Applied Physics*) B.S., California Institute of Technology 1999.
Thesis: Single-Molecule Detection and DNA Sequencing-by-Synthesis.

Tobias Jan August Kippenberg (*Applied Physics*) Vordiplom Physik, Rheinisch-Westfälische Technische Hochschule Aachen 1998; M.S., California Institute of Technology 2000.
Thesis: Nonlinear Optics in Ultra-high Q Whispering-Gallery Optical Microcavities.

William Scott Klug (*Mechanical Engineering*) B.S., Westmont College 1997; M.S., University of California, Los Angeles 1999.
Thesis: A Director-Field Theory of DNA Packaging in Bacteriophage Viruses.

Swaminathan Krishnan (*Civil Engineering and Business, Economics and Management*) B.Tech., Indian Institute of Technology 1992; M.S., Rice University 1994.
Thesis: Three-Dimensional Nonlinear Analysis of Tall Irregular Steel Buildings Subject to Strong Ground Motion.

Doctor of Philosophy *continued*

Melvin Leok (*Control and Dynamical Systems and Applied and Computational Mathematics*) B.S., California Institute of Technology 2000; M.S., 2000.
Thesis: Foundations of Computational Geometric Mechanics.

Jiao Lin (*Materials Science*) B.S., Peking University 1996; M.S., Chinese Academy of Science 1999; M.S., California Institute of Technology 2001.
Thesis: Mössbauer Diffractometry: Principles, Practice, and an Application to a Study of Chemical Order in $^{57}Fe_3Al$.

Dai Lu (*Electrical Engineering*) B.E., Zhejiang University 1996; M.S., California Institute of Technology 2000.
Thesis: Active Patch Array Design and Indoor Channel Modeling for Future Wireless Communications.

Sanjeev Malhotra (*Aeronautics and Applied and Computational Mathematics*) B.Eng., Carlton University 1994; M.S., University of Tennessee Space Institute 1997.
Thesis: On Combustion Instability in Solid Rocket Motors.

Maribeth Swiatek Mason (*Applied Physics*) B.S., University of Illinois at Urbana-Champaign 1997; M.S., California Institute of Technology 1999.
Thesis: Synthesis of Large-Grained Polycrystalline Silicon by Hot-Wire Chemical Vapor Deposition for Thin Film Photovoltaic Applications.

Mark Meyer *(Computer Science)* B.S. *(Computer Engineering),* B.S. *(Computer Science),* Northwestern University 1997; M.S., California Institute of Technology 2000.
Thesis: Discrete Differential Operators for Computer Graphics.

Paul O'Gorman (*Aeronautics and Applied and Computational Mathematics*) B.S., Trinity College Dublin 1998; M.S., 1999.
Thesis: Theory and Simulation of Passive Scalar Mixing in the Presence of a Mean Scalar Gradient.

Neal Curtis Oldham (*Materials Science*) B.S., University of Tennessee 1999; M.S., California Institute of Technology 2002.
Thesis: Investigation of Spintronic Materials Systems: Deposition and Characterization.

Gerard Kieran O'Reilly (*Aeronautics and Applied and Computational Mathematics*) B.A., M.Sc., Trinity College Dublin 1998.
Thesis: Compressible Vortices and Shock-Vortex Interactions.

Ravi Palanki (*Electrical Engineering*) B.Tech., Indian Institute of Technology, Madras 2000; M.S., California Institute of Technology 2001.
Thesis: Iterative Decoding for Wireless Networks.

Alastair Thomas Preston (*Mechanical Engineering*) B.E., Canterbury University 1995; M.S., California Institute of Technology 1997.
Thesis: Modeling Heat and Mass Transfer in Bubbly Cavitating Flows and Shock Waves in Cavitating Nozzles.

Doctor of Philosophy *continued*

Hongyu Ran *(Mechanical Engineering)* B.S., University of Science and Technology of China 1995; M.S., California Institute of Technology 1996.
Thesis: Numerical Study of the Dynamics and Sound Generation of a Turbulent Vortex Ring.

Marcus Riedel (*Electrical Engineering*) B.E., McGill University 1995; M.S., California Institute of Technology 1997.
Thesis: Cyclic Combinational Circuits.

Matthew James Ringuette (*Aeronautics and Science, Ethics, and Society*) B.S., Rensselaer Polytechnic Institute 1999; M.S., California Institute of Technology 2000.
Thesis: Vortex Formation and Drag on Low Aspect Ratio, Normal Flat Plates.

Robert Cashman Rogan (*Materials Science*) B.S., Boston College 2000; M.S., California Institute of Technology 2002.
Thesis: Investigation of the Multiscale Constitutive Behavior of Ferroelectric Materials Using Advanced Diffraction Techniques.

Shane David Ross (*Control and Dynamical Systems*) B.S., California Institute of Technology 1998.
Thesis: Cylindrical Manifolds and Tube Dynamics in the Restricted Three-Body Problem.

Steven Schkolne (*Computer Science*) B.S., Carnegie Mellon University 1997; M.S., California Institute of Technology 1999.
Thesis: 3-D Interfaces for Spatial Construction.

Jeffrey T. Scruggs (*Applied Mechanics*) B.S., Virginia Polytechnic Institute and State University 1997; M.S., 1999; M.S., California Institute of Technology 2000.
Thesis: Structural Control Using Regenerative Force Actuation Networks.

Rustem Vil Shaikhutdinov (*Applied Mechanics*) B.A., Moscow State University of Technology 1998; M.S., California Institute of Technology 1999.
Thesis: Structural Damage Evaluation: Theory and Applications to Earthquake Engineering.

Sean Michael Spillane *(Applied Physics)* B.S., Cornell University 1998.
Thesis: Fiber-Coupled Ultra-high-Q Microresonators for Nonlinear and Quantum Optics.

Geoffrey A. Swift (*Materials Science*) A.S., John A. Logan College 1995; B.S., Southern Illinois University 1997; M.S., 1999; M.S., California Institute of Technology 2001.
Thesis: Neutron Diffraction Study of *In Situ*-Reinforced Silicon Nitride during Creep.

Michel Tanguay (*Mechanical Engineering*) B.Eng., McGill University 1995; M.Eng., 1997.
Thesis: Computation of Bubbly Cavitating Flow in Shock Wave Lithotripsy.

Andre Tkacenko (*Electrical Engineering*) B.S., California Institute of Technology 1999; M.S., 2001.
Thesis: Optimization Algorithms for Realizable Signal-Adapted Filter Banks.

Bojan Vrcelj (*Electrical Engineering*) Diploma, University of Belgrade 1998; M.S., California Institute of Technology 1999.
Thesis: Multirate Signal Processing Concepts in Digital Communications.

Theodore A. Waniuk (*Materials Science*) B.S., Harvey Mudd College 1996; M.S., California Institute of Technology 1998.
Thesis: Viscosity and Crystallization in a Series of Zr-based Bulk Amorphous Alloys.

Matthew West (*Control and Dynamical Systems*) B.Sc., University of Western Australia 1997.
Thesis: Variational Integrators.

Eric Wintenberger (*Aeronautics*) Diplôme d'Ingénieur, École Centrale Paris 1998; M.S., California Institute of Technology 2000.
Thesis: Application of Steady and Unsteady Detonation Waves to Propulsion.

Catherine Grace Wong (*Computer Science and Electrical Engineering*) B.S., University of Toronto 1999; M.S., California Institute of Technology 2000.
Thesis: High-Level Synthesis and Rapid Prototyping of Asynchronous VLSI Systems.

Qiang Yang (*Aeronautics and Electrical Engineering*) B.E., Dalian University of Technology 1996; M.E., Tsinghua University 1999.
Thesis: Thermomechanical Variational Principles for Dissipative Materials with Application to Strain Localization in Bulk Metallic Glasses.

Tomoyuki Yoshie (*Electrical Engineering and Physics*) B.Eng., Kyoto University 1990; M.Eng., 1992; M.S., California Institute of Technology 2000.
Thesis: Planar Photonic Crystal Nanocavities with Active Quantum Nanostructures.

DIVISION OF GEOLOGICAL AND PLANETARY SCIENCES

Antonin Henri Bouchez (*Planetary Science*) B.A., University of California, Berkeley 1995.
Thesis: Seasonal Trends in Titan's Atmosphere: Haze, Wind, and Clouds.

Javier Favela (*Geophysics*) B.S., California Institute of Technology 1995; M.S., Stanford University 1996.
Thesis: Energy Radiation from a Multi-Story Building.

Xianglei Huang (*Planetary Science and Applied Computation*) B.S., University of Science and Technology of China 1997; M.S., California Institute of Technology 2000.
Thesis: I. Variability of the Outgoing Thermal IR Spectra and Its Application in GCM Validation. II. The Detection of Cloud/Aerosol in the Outgoing Thermal IR Spectra.

Rowena Benfer Lohman (*Geology*) B.S., California Institute of Technology 1998.
Thesis: The Inversion of Geodetic Data for Earthquake Parameters.

Patricia Persaud (*Geophysics*) B.S., University of Houston 1998; M.S., California Institute of Technology 2001.
Thesis: Images of Early Continental Breakup in and around the Gulf of California and the Role of Basal Shear in Producing Wide Plate Boundaries.

Doctor of Philosophy *continued*

Brian Kirk Savage (*Geophysics*) B.A., University of California, Berkeley 1998; M.S., California Institute of Technology 2000.
Thesis: Regional Seismic Wavefield Propagation.

Huiqun Wang (*Planetary Science and Applied and Computational Mathematics*) B.S., University of Science and Technology of China 1997.
Thesis: Global Observations of Martian Clouds with the Mars Orbiter Camera of the Mars Global Surveyor Spacecraft.

Lingsen Zeng (*Geology*) B.S., Nanjing University 1991; M.S., Chinese Academy of Geological Sciences 1994; M.S., California Institute of Technology 2000.
Thesis: Non-Modal Partial Melting of Metasedimentary Pendants in the Southern Sierra Nevada and Implications for the Deep Origin of Within-Pluton Isotopic Heterogeneity.

DIVISION OF HUMANITIES AND SOCIAL SCIENCES

Elena Nikolaeva Asparouhova (*Social Science*) B.Sc., Sofia University 1994; M.Sc., 1996; B.B.A., 1998; M.S., California Institute of Technology 2000.
Thesis: Competition and Equilibration in Financial Markets.

Carla Emily VanBeselaere (*Social Science*) B.A., University of Western Ontario 1995; M.A., 1996; M.S., California Institute of Technology 2002.
Thesis: The Shirking Model–A Theory of How People Answer Survey Questions.

DIVISION OF PHYSICS, MATHEMATICS AND ASTRONOMY

Charlene Sonja Ahn (*Physics*) A.B., Harvard College 1998; M.S., California Institute of Technology 2002.
Thesis: Extending Quantum Error Correction: New Continuous Measurement Protocols and Improved Fault-Tolerant Overhead.

Jay L. Bartroff (*Mathematics*) B.A., University of California, Berkeley 1998.
Thesis: Asymptotically Optimal Multistage Hypothesis Tests.

David E. Beckman (*Physics*) B.S. (*Electrical Engineering*), B.S. *(Engineering Physics)*, University of Illinois at Urbana-Champaign 1992; M.S., California Institute of Technology 2000.
Thesis: Investigations in Quantum Computing: Causality and Graph Isomorphism.

Klejda Adnan Bega (*Physics*) B.S., California Institute of Technology 1999.
Thesis: Measurement of the Weak Mixing Angle in Møller Scattering.

Edo Berger (*Astrophysics*) B.S., University of California Los Angeles 1999.
Thesis: Cosmic Explosions: The Beasts and Their Lair.

Vadim Borokhov (*Physics*) B.S., Moscow Institute of Physics and Technology 1996; M.S., 1998.
Thesis: Monopole Operators and Mirror Symmetry in Three-Dimensional Gauge Theories.

Doctor of Philosophy *continued*

Avery Earl Broderick (*Physics*) B.S., State University of New York at Stony Brook 1999.
Thesis: Radiative Transfer in Accreting Environments.

Keng-Hwee Chiam (*Physics*) B.S.E., University of Michigan 1996.
Thesis: Spatiotemporal Chaos in Rayleigh-Bénard Convection.

Calin A. Ciocarlie *(Physics)* B.S., California Institute of Technology 1997: M.A., Harvard University 1999
Thesis: D-Brane Actions and *N=2* Supergravity Solutions.

Jason Andrew Colwell (*Mathematics*) B.S., University of Alberta 1995; M.S., 1997.
Thesis: The Conjecture of Birch and Swinnerton-Dyer for Elliptic Curves with Complex Multiplication by a Nonmaximal Order.

John Anthony Cortese (*Physics*) B.S., Worcester Polytechnic Institute 1982; M.S., 1985; M.S. (*Applied Mathematics*), California Institute of Technology 1990; Ph.D. (*Electrical Engineering*), 1995; M.S. (*Physics*), California Institute of Technology 2000.
Thesis: Quantum Information Theory - Classical Communication Over Quantum Channels.

Sumit Kumar Daftuar (*Mathematics*) A.B., Harvard College 1996.
Thesis: Eigenvalue Inequalities in Quantum Information Processing.

Samantha Faye Edgington (*Physics*) A.B., Princeton University 1997.
Thesis: A Galaxy Cluster Survey Using the Sunyaev Zel'dovich Effect.

Vineet Gupta (*Mathematics*) A.B. Harvard College 1990.
Thesis: Conformal Laminations.

James William Harrington (*Physics*) B.S., Duke University 1998.
Thesis: Analysis of Quantum Error-Correcting Codes: Symplectic Lattice Codes and Toric Codes.

Xue Ming Henry Huang (*Physics*) B.S., Peking University 1995; M.S., Arizona State University 1997.
Thesis: Ultrahigh and Microwave Frequency Nanomechanical Systems.

Matthew Philip Hunt (*Astrophysics*) B.S., Pennsylvania State University 1998.
Thesis: Faint Optically Selected AGN at $z = 3$.

Gary Mark Jones *(Physics)* B.S., University of Kentucky 1999.
Thesis: A Precision Measurement of the Weak Mixing Angle in Møller Scattering at Low Q_2.

David Lior Ariel Kaplan (*Astrophysics*) B.S., Cornell University 1999.
Thesis: The Diversity of Neutron Stars: Nearby Thermally Emitting Neutron Stars and the Compact Central Objects in Supernova Remnants.

Qiang Lin (*Mathematics*) B.S., University of Science and Technology of China 1992; M.S., 1995.
Thesis: Bloch-Kato Conjecture for the Adjoint of $H^1(X_o(N))$ with Integral Hecke Algebra.

Doctor of Philosophy *continued*

Elliot Lipeles (*Physics*) B.A., University of Chicago 1995.
Thesis: A Study of the Fully Differential Inclusive Semileptonic *B* Meson Decay Rate.

Kimball L. Martin (*Mathematics*) B.S., M.S., University of Maryland, Baltimore 1999.
Thesis: Four-dimensional Galois Representations of Solvable Type and Automorphic Forms.

Peter A. Mastromarino *(Physics)* B.A., Princeton University 1999.
Thesis: A Precision Low-Energy Measurement of the Weak Mixing Angle in Møller Scattering.

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Thesis: RG-Flows, ADS/CFT Correspondence and Stability of Black Branes.

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Thesis: Data Analysis of and Results from Observations of the Cosmic Microwave Background with the Cosmic Background Imager.

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Thesis: H_o from Cosmic Background Imager Observations of the Sunyaev-Zel'dovich Effect in Nearby Clusters.

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Thesis: Evidence for the Josephson Effect in Quantum Hall Bilayers.

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Thesis: Development of Micro-Electromechanical Systems in GaN.

Doctor of Philosophy *continued*

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Thesis: Poisson Structures for PDEs Associated with Diffeomorphism Groups.

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Thesis: Generalized Foulkes' Conjecture and Tableaux Construction.

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Thesis: Polarizing ^{3}He by Spin Exchange with Potassium.

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Thesis: Testing Gauge/Gravity Duality: The Eleven-Dimensional PP-Wave.

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Thesis: Gamma-Ray Burst Afterglows: Constraining Physical Parameters and Fireball Model Assumptions.

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