

Computational Science, Ph.D.

Lee Swindlehurst, UCI Director

949-824-2818

computationalscience.uci.edu (<https://computationalscience.uci.edu/>)

Joint Doctoral Program with UC Irvine and San Diego State University

A joint offering with San Diego State University (SDSU), the Ph.D. program in Computational Science trains professionals capable of developing novel computational approaches to solve complex problems in both fundamental sciences and applied sciences and engineering. A program of study combining applied mathematics, computing, and a solid training in basic science culminates in doctoral research focused on an unsolved scientific problem.

The Ph.D. in Computational Science produces broadly educated, research-capable scientists that are well prepared for diverse careers in academia, industry, business, and government research laboratories.

Students are admitted into the joint program via a Joint Admissions Committee. Applicants apply to UCI directly using the UCI graduate application.

Applicants are expected to hold a Bachelor's degree in one of the science, technology, engineering, and mathematics (STEM) fields.

Applicants are evaluated on the basis of their prior academic record and their potential for creative research and teaching, as demonstrated in submitted materials. These materials include official university transcripts, three letters of recommendation, a Statement of Purpose, and a Personal History statement.

Program Requirements

The normative time to completion is five years. The maximum time to completion is seven years. A total minimum of 66 units of course work, independent study, and research must be completed. These units must be distributed as follows:

- Minimum of 18 units of graduate-level coursework as SDSU.
- Minimum of 24 units of graduate-level coursework at UCI.
- Minimum of 24 units of combined research, practicum, and dissertation research units at either institution.

Summer Research Survey

Students are required to attend the annual summer seminar series featuring participating faculty members describing their current research and possible projects.

Course Requirements

Core Courses at SDSU

MATH 636 - Mathematical Modeling OR MATH 638 - Continuous Dynamical Systems and Chaos

MATH 693B - Advanced Computational PDEs

COMP 605 - Scientific Computing

Elective Courses at SDSU

Students select 9 units from the following list, or appropriate substitutions, with the approval of the program director and their research mentor

AE 601 - Computational Fluid Mechanics

AE 641 - Structural Optimization

AE 670 - Optimal Control

BIOL 606 - Biological Data

BIOL 668 - Advanced Biological Data Analysis

BIOL 740 - Phylogenetic Systematics

BIOMI 608 - Programming Problems in Bioinformatics

CHEM 711 - Chemical Thermodynamics

CHEM 712 - Chemical Kinetics

CHEM 713 - Quantum Chemistry

CIVE 620 - Traffic Flow and Control

CIVE 697 - Traffic Signals Systems Operations and Control

COMP 526 - Computational Methods for Scientists

COMP 607 - Computational Database Fundamentals

COMP 670 - Seminar: Problems in Computational Science

CS 600 - Bioinformatics

CS 610 - Computational Genomics

CS 653 - Data Mining and Knowledge
 CS 666 - Advanced Distributed Systems
 CS 696 - Programming Problems in Bioinformatics
 EE 645 - Antennas and Wave Propagation
 EE 657 - Digital Signal Processing
 EE 658 - Advanced Digital Signal Processing
 EE 665 - Multimedia Wireless Networks
 EE 740 - Advanced Topics in Physical Electronics Antenna Design
 MATH 693A - Advanced Computational Optimization
 MATH 693B - Advanced Computational PDEs
 MB 610A-B - Advanced Topics in Molecular Biology
 ME 610 - Finite Element Methods
 PHYS 604 - Electricity and Magnetism
 PHYS 606 - Statistical Mechanics
 PHYS 608 - Classical Mechanics
 PHYS 610 - Quantum Mechanics
 STAT 657 - Statistical and Machine Learning Methods
 STAT 658 - Advanced Data Analytics
 STAT 676 - Bayesian Statistics
 STAT 678 - Survival Analysis
 STAT 700 - Data Analysis
 STAT 701 - Monte Carlo Methods
 STAT 702 - Data Mining

Core Courses at UCI

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| COMPSCI 206 | Principles of Scientific Computing |
| COMPSCI 271 | Introduction to Artificial Intelligence |
| ENGRCEE 290A | Machine, Model, and Statistical Learning I |
| STATS 201 | Statistical Methods for Data Analysis I |

Elective Courses at UCI

Students select 8 units from the following list, or appropriate substitutions, with the approval of the program director and their research mentor

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| BME 232 | Introduction to Computational Biology |
| BME 233 | Dynamic Systems in Biology and Medicine |
| BME 238 | Spectroscopy and Imaging of Biological Systems |
| CHEM 230 | Classical Mechanics and Electromagnetic Theory |
| CHEM 231A | Fundamentals of Quantum Mechanics |
| CHEM 231B | Applications of Quantum Mechanics |
| CHEM 232A | Thermodynamics and Introduction to Statistical Mechanics |
| CHEM 232B | Advanced Topics in Statistical Mechanics |
| CHEM 250 | Computational Chemistry |
| CHEM 250L | Computational Chemistry Laboratory |
| COMPSCI 211A | Visual Computing |
| COMPSCI 221 | Information Retrieval, Filtering, and Classification |
| COMPSCI 242 | Parallel Computing |
| COMPSCI 261 | Data Structures |
| COMPSCI 263 | Analysis of Algorithms |
| COMPSCI 265 | Graph Algorithms |
| COMPSCI 266 | Computational Geometry |
| COMPSCI 268 | Introduction to Optimization |
| COMPSCI 273A | Machine Learning |
| COMPSCI 274A | Probabilistic Learning: Theory and Algorithms |
| COMPSCI 274B | Learning in Graphical Models |
| COMPSCI 276 | Causal and Probabilistic Reasoning with Graphical Models |
| COMPSCI 278 | Probability Models |

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| COMPSCI 284A | Artificial Intelligence in Biology and Medicine |
| COMPSCI 284C | Computational Systems Biology |
| EECS 203A | Digital Image Processing |
| EECS 215 | Design and Analysis of Algorithms |
| EECS 227 | Cyber-Physical System Design |
| EECS 240 | Random Processes |
| EECS 242 | Information Theory |
| EECS 250 | Digital Signal Processing I |
| EECS 280A | Advanced Engineering Electromagnetics I |
| EECS 280B | Advanced Engineering Electromagnetics II |
| EECS 282 | Monolithic Microwave Integrated Circuit (MMIC) Analysis and Design II |
| ENGRCEE 250 | Finite Element Method in Structural Engineering |
| ENGRCEE 270 | Flood Risk and Modeling |
| ENGRCEE 273 | Watershed Modeling |
| ENGRCEE 274 | Climate Data Analysis |
| ENGRCEE 292 | Wavelets in Hydrology, Engineering, and Geoscience |
| ENGRMAE 230A | Inviscid Incompressible Fluid Mechanics I |
| ENGRMAE 230B | Viscous Incompressible Fluid Mechanics II |
| ENGRMAE 270A | Linear Systems I |
| STATS 202 | Statistical Methods for Data Analysis II |
| STATS 230 | Statistical Computing Methods |

Research Units at SDSU

COMP 897 - Doctoral Research

COMP 898 - Practicum

COMP 899 - Dissertation

Research Units at UCI

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| COMPSCI 298 | Thesis Supervision |
| COMPSCI 299 | Individual Study |
| ENGR 299 | Individual Research |

Practicum and Doctoral Research

Dissertation research is carried out at either UCI or SDSU, or at an industry or national laboratory under the supervision of the Doctoral Advisor. While conducting dissertation research, students must enroll in the appropriate research units at the campus of the Doctoral Advisor. If research is done outside of UCI or SDSU, students should register in-absentia if appropriate.

Research Report Exam

The student is expected to pass the Research Report Exam within three years of admittance. This examination consists of a term research project supervised by a faculty mentor. The student is required to prepare a written account of research work performed and its results, and offer an oral presentation before the members of the Doctoral Committee. The student must submit a paper based on their research report before giving the oral presentation to the Doctoral Committee. Should a student fail the Research Report Exam, one retake is allowed.

Dissertation Proposal

Students must submit a dissertation proposal to the doctoral committee by the end of their third year in the program. This proposal should take the form of a scientific grant proposal to a major funding agency. It should describe the research project that the student intends to carry out and upon which their doctoral dissertation will be based. The student must also offer an oral presentation of the proposal before the Computational Science faculty. Upon successful completion of this presentation, the student will be recommended for advancement to candidacy for the doctoral degree.

Advancement to Doctoral Candidacy

After successful completion of the dissertation proposal and certification that all other requirements are fulfilled, the student is advanced to candidacy at both campuses. Students not registered at UCI will need to formally advance to candidacy in the summer term. Advancement to candidacy for the Ph.D. must occur at least one term prior to dissertation defense.

Dissertation and Final Oral Examination

On completion of the research, the student prepares the dissertation in accordance with UCI regulations. A final draft of the dissertation is presented to each member of the doctoral committee at least three weeks prior to the final oral examination. The oral defense is held on the campus of the primary faculty advisor. Students must follow UCI filing deadlines. Students are required to be registered for Dissertation Research (3 units) at SDSU and Dissertation Research (4 units) simultaneously at UCI during the semester in which they present their doctoral defense. Alternatively, students can request filing fee status at UCI in the quarter in which they present their doctoral defense.

University of California, Irvine Faculty

Mohammad A. Al Faruque, Ph.D. University of Kaiserslautern, *Chair of Emulex Career Development and Associate Professor of Electrical Engineering and Computer Science; Mechanical and Aerospace Engineering* (system-level design, embedded systems, cyber-physical-systems, multi-core systems)

Jun F. Allard, Ph.D. University of British Columbia, *Assistant Professor of Mathematics; Physics and Astronomy* (Mathematical and computational biology, biopolymers, biomembranes, force-sensitive biomolecular bonds)

Ioan Andricioaei, Ph.D. Boston University, *Professor of Chemistry* (Theoretical Chemistry and Biophysics: Developing novel theoretical techniques and applying computer and modeling methods to describe, in terms of dynamics and thermodynamics, biologically important molecular processes, with the aim to complement, enhance or predict experimental findings.)

Pierre F. Baldi, Ph.D. California Institute of Technology, *UCI Chancellor's Professor of Computer Science; Biological Chemistry; Biomedical Engineering; Developmental and Cell Biology* (Bioinformatics, computational biology, AI and machine learning with particular emphasis on: Deep Learning, Neural Networks, Reinforcement Learning, and their Theoretical Foundations and Applications)

Kieron Burke, Ph.D. University of California, Santa Barbara, *Professor of Chemistry; Physics and Astronomy* (Physical chemistry and chemical physics, polymer, materials, nanoscience, theoretical and computational)

Filippo Capolino, Ph.D. University of Florence, Italy, *Professor of Electrical and Computer Science* (Optics/electromagnetics in nanostructures and sensors, antennas/microwaves, RF and wireless systems)

Ann Marie Carlton, Ph.D. Rutgers University, *Associate Professor of Chemistry* (Atmospheric chemistry, aerosol liquid water, cloud processing, secondary organic aerosol)

Peter Chang, M.D. Northwestern University, *Assistant Professor in Residence of Radiological Sciences; Computer Science; Pathology and Laboratory Medicine*

Olivier Cinquin, Ph.D. University College London, *Assistant Professor of Developmental and Cell Biology* (Mathematical modeling of networks, systems biology)

Donald A. Dabdub, Ph.D. California Institute of Technology, *Professor of Mechanical and Aerospace Engineering; Civil and Environmental Engineering* (Mathematical modeling of urban and global air pollution, dynamics of atmospheric aerosols, secondary organic aerosols, impact of energy generation on air quality, chemical reactions at gas-liquid interfaces)

Kristen Davis, Ph.D. Stanford University, *Assistant Professor of Civil and Environmental Engineering; Earth System Science* (Coastal Dynamics)

Franco De Flaviis, Ph.D. University of California, Los Angeles, *Professor of Electrical Engineering and Computer Science* (microwave systems, wireless communications, electromagnetic circuit simulations)

Russell L. Detwiler, Ph.D. University of Colorado Boulder, *Associate Professor of Civil and Environmental Engineering* (groundwater hydrology, contaminant fate and transport, subsurface process modeling, groundwater/surface-water interaction)

Efi Foufoula-Georgiou, Ph.D. University of Florida, *Distinguished Professor of Civil and Environmental Engineering* (hydrology and geomorphology with emphasis on modeling the interactions between the atmosphere, land, and the terrestrial environment at plot to large-watershed scale)

Filipp Furche, Ph.D. University of Karlsruhe, *Professor of Chemistry* (Physical chemistry and chemical physics, theoretical and computational)

Robert Benny Gerber, Ph.D. University of Oxford, *Professor of Chemistry* (Vibrational spectroscopy, chemical reaction dynamics, biological molecules, molecular dynamics)

Wayne B. Hayes, Ph.D. University of Toronto, *Associate Professor of Computer Science* (Biomedical Informatics and Computational Biology, Computer Vision Scientific and Numerical Computing)

Alexander Ihler, Ph.D. Massachusetts Institute of Technology, *Associate Professor of Information and Computer Science* (Artificial intelligence and machine learning, focusing on statistical methods for learning from data and on approximate inference techniques for graphical models)

Perry Johnson, Ph.D. John Hopkins University, *Assistant Professor of Mechanical and Aerospace Engineering* (turbulent flows, particle-laden and multiphase flows, turbulent boundary layers, large-eddy simulations, scientific computing)

Frihjf Kruggel, M.D., Ph.D. Ludwig Maximilian University of Munich, *Professor of Biomedical Engineering; Electrical Engineering and Computer Science* (Biomedical signal and image processing, anatomical and functional neuroimaging in humans, structure-function relationship in the human brain)

Arthur D. Lander, Ph.D. University of California, San Francisco, *Donald Bren Professor and Professor of Developmental and Cell Biology; Biomedical Engineering; Logic and Philosophy of Science; Pharmacology* (Systems biology of development, pattern formation, growth control)

Marco Levorato, Ph.D. University of Padua, *Associate Professor of Computer Science; Electrical Engineering and Computer Science* (artificial intelligence and machine learning, networks and distributed systems, statistics and statistical theory, stochastic modeling, signal processing)

Mo Li, Ph.D. University of Michigan, *Assistant Professor of Civil and Environmental Engineering* (ultra-damage-tolerant and multifunctional composite materials for protective and resilient structures, built environments, and energy infrastructure)

Feng Liu, Ph.D. Princeton University, *Professor of Mechanical and Aerospace Engineering* (Computational fluid dynamics and combustion, aerodynamics, aeroelasticity, propulsion, turbomachinery aerodynamics and aeromechanics)

John S. Lowengrub, Ph.D. Courant Institute of Mathematical Sciences, *UCI Chancellor's Professor of Mathematics; Biomedical Engineering; Chemical Engineering and Materials Science* (Applied and computational mathematics, mathematical and computational biology)

Ray Luo, Ph.D. University of Maryland, College Park, *Professor of Molecular Biology and Biochemistry; Biomedical Engineering; Chemical Engineering and Materials Science* (Protein structure, non-covalent associations involving proteins)

Vladimir A. Mandelshtam, Ph.D. Institute of Spectroscopy, Academy of Sciences of USSR, *Professor of Chemistry* (Theoretical and Computational Chemistry)

Craig C. Martens, Ph.D. Cornell University, *Professor of Chemistry* (Theoretical Chemistry, Chemical Physics)

Eric D. Mjolsness, Ph.D. California Institute of Technology, *Professor of Computer Science; Mathematics* (Applied mathematics, mathematical biology, modeling languages)

David L. Mobley, Ph.D. University of California, Davis, *Associate Professor of Pharmaceutical Sciences; Chemistry* (Chemical biology, physical chemistry and chemical physics, theoretical and computational)

Mathieu Morlighem, Ph.D. Ecole Centrale Paris, *Vice Chair and Associate Professor of Earth System Science*

Seyed Ali Mortazavi, Ph.D. California Institute of Technology, *Assistant Professor of Developmental and Cell Biology* (Functional genomics to study transcriptional regulation in development)

Shaul Mukamel, Ph.D. Tel Aviv University, *UCI Distinguished Professor of Chemistry; Physics and Astronomy* (Physical chemistry and chemical physics, polymer, materials, nanoscience, theoretical and computational)

Alexandru Nicolau, Ph.D. Yale University, *Department Chair and Professor of Computer Science; Electrical Engineering and Computer Science* (Architecture, parallel computation, programming languages and compilers)

Qing Nie, Ph.D. Ohio State University, *Chancellor's Professor, Developmental & Cell Biology* (Computational Biology; Systems Biology; Stem Cells; Regulatory Networks; Stochastic Dynamics; Scientific Computing and Numerical Analysis)

Francois W. Primeau, Ph.D. Massachusetts Institute of Technology, *Professor of Earth System Science*

Michael S. Pritchard, Ph.D. University of California, San Diego, *Associate Professor of Earth System Science*

Roger H. Rangel, Ph.D. University of California, Berkeley, *Professor of Mechanical and Aerospace Engineering* (Fluid dynamics and heat transfer of multiphase systems including spray combustion, atomization and metal spray solidification, applied mathematics and computational methods)

Elizabeth L. Read, Ph.D. University of California, Berkeley, *Assistant Professor of Chemical Engineering and Materials Science; Molecular Biology and Biochemistry* (Dynamics of complex biochemical systems, regulation of immune responses)

Eric Rignot, Ph.D. University of Southern California, *Donald Bren Professor of Earth System Science* (Glaciology, climate change, radar remote sensing, ice sheet modeling, interferometry, radio echo sounding, ice-ocean interactions)

Timothy Rupert, Ph.D. Massachusetts Institute of Technology, *Assistant Professor of Mechanical and Aerospace Engineering; Chemical Engineering and Materials Science* (Mechanical behavior, nanomaterials, structure property relationships, microstructural stability, grain boundaries and interfaces, materials characterization)

Manabu Shiraiwa, Ph.D. Max Planck Institute for Chemistry, *Associate Professor of Chemistry* (Atmospheric Chemistry, Heterogeneous and Multiphase Chemistry, Aerosol Particles, Reactive Oxygen Species, Kinetic Modeling)

Hal S. Stern, Ph.D. Stanford University, *Professor of Statistics; Cognitive Sciences* (Bayesian methods, model diagnostics, forensic statistics, and statistical applications in biology/health, social sciences, and sports)

Lizhi Sun, Ph.D. University of California, Los Angeles, *Professor of Civil and Environmental Engineering; Chemical Engineering and Materials Science* (Micro- and nano-mechanics, composites and nanocomposites, smart materials and structures, multiscale modeling, elastography)

A. Lee Swindlehurst, Ph.D. Stanford University, *Professor of Electrical Engineering and Computer Science* (Signal processing, estimation and detection theory, applications in wireless communications, geo-positioning, radar, sonar, biomedicine)

Kevin Thornton, Ph.D. University of Chicago, *Associate Professor of Ecology and Evolutionary Biology School of Biological Sciences* (Genome evolution, gene duplication, population genetics, adaptation)

Douglas J. Tobias, Ph.D. Carnegie Mellon University, *Professor of Chemistry* (Atmospheric and environmental, chemical biology, physical chemistry and chemical physics, theoretical and computational)

Isabella Velicogna, Ph.D. Università degli Studi di Trieste, *UCI Chancellor's Fellow and Professor of Earth System Science*

Nalini Venkatasubramanian, Ph.D., University of Illinois at Urbana-Champaign, *Professor of Computer Science* (Distributed Systems Middleware, Multimedia Systems and Applications, Mobile and Pervasive Computing, Formal Methods, Data Management, and Grid Computing)

Jasper A. Vrugt, Ph.D. University of Amsterdam, *Associate Professor of Civil and Environmental Engineering; Earth System Science* (Complex systems, modeling, statistics, hydrology, geophysics, ecology, data, optimization, hydropower, data assimilation)

Yun Wang, Ph.D. Pennsylvania State University, *Associate Professor of Mechanical and Aerospace Engineering* (Fuel cells, computational modeling, thermo-fluidics, two-phase flows, electrochemistry, Computational Fluid Dynamics (CFD), turbulent combustion)

Zhiying Wang, Ph.D. California Institute of Technology, *Assistant Professor of Electrical Engineering and Computer Science* (information theory, coding theory for data storage, modeling, compression, and computation for genomic data)

Daniel Whiteson, Ph.D. University of California, Berkeley, *Professor of Physics and Astronomy; Logic and Philosophy of Science* (Particle Physics: Experimental High Energy Physics, structure of matter and the nature of its interactions at the very smallest scales)

Dominik Franz X. Wodarz, Ph.D. University of Oxford, *Professor of Ecology and Evolutionary Biology; Mathematics; Program in Public Health* (Dynamics of virus infections and the immune system, dynamics of cancer and its treatment, and general evolutionary dynamics and population dynamics)

Xiaohui Xie, Ph.D. Massachusetts Institute of Technology, *Professor of Computer Science; Developmental and Cell Biology* (computational biology, bioinformatics, genomics, neural computation, machine learning)

Charles S. Zender, Ph.D. University of Colorado Boulder, *Professor of Earth System Science; Computer Science*

San Diego State University Faculty

Reza Akhavan, Ph.D. University of Central Florida, Assistant Professor of Department of Civil, Construction, and Environmental Engineering (Construction Engineering and Management, Internet of Things (IoT), Data Analytics, Machine Learning, Robotics, Cyber-Physical Systems, Building Information Modeling (BIM))

Ashkan Ashrafi, Ph.D. University of Alabama, Huntsville, *Associate Professor of Electrical and Computer Engineering* (Digital and Statistical Signal Processing, Real-Time DSP, Biomedical Signal Processing, Fourier Analysis, Direct Digital Frequency Synthesizers, Multivariate Spectral Analysis, Hilbert Spaces, Matrix Theory and Applications)

Barbara Ann Bailey, Ph.D. North Carolina State University, *Associate Professor of Statistics* (Nonlinear Time Series, Dynamical Systems, and Clouds. Visualization of Nonlinear Models. Environmental Monitoring. Population Dynamics and Embryonic Mortality. Model Validation)

Arlette Baljon, Ph.D. University of Chicago, *Associate Professor of Physics* (Biophysics, Complex Networks, Polymer Science and computational soft matter physics)

Amneet Bhalla, Ph.D. Northwestern University, *Assistant Professor of Mechanical Engineering* (Fluid-Structure Interaction, Multiphase Flows, Aquatic Locomotion, Renewable Energy Device Modeling, Numerical Methods, High Performance Computing, Scientific Software Design)

Peter Blomgren, Ph.D. University of California, Los Angeles, *Professor of Mathematics* (Image Processing, Wave Propagation in Complex Media, Numerical Solutions of PDEs, Scientific Computing, Nonlinear Dynamical Systems)

Joaquin Camacho, Ph.D. University of California, Los Angeles, *Assistant Professor of Mechanical Engineering* (Multiphase Flows, Sustainable Energy, Nanomaterial Theory and Fabrication, Combustion, Aerosol Dynamics, Carbon Materials)

Margherita Capriotti, Ph.D. University of California, San Diego, *Assistant Professor of Aerospace Engineering* (Develop novel and efficient tools to characterize aerospace composite structures using wave propagation of different physical nature)

- Ricardo Carretero, Ph.D. University College London, *Professor of Mathematics* (Nonlinear Dynamics, Nonlinear Waves, Bose-Einstein Condensation (BEC))
- Jose Castillo, Ph.D. University of New Mexico, *Professor of Mathematics* (Numerical Solution of Partial Differential Equations, Scientific Computing, and Modeling)
- Jianwei Chen, Ph.D. Chinese University of Hong Kong, *Associate Professor of Statistics* (Statistical Inferences for Nonlinear Dynamic Models, Bayesian Methods, MCMC, and Computational Statistics)
- Andy Cooksy, Ph.D. University of California, Berkeley, *Professor of Chemistry and Biochemistry* (Laser Spectroscopy, Reaction Dynamics, and Ab Initio Calculation of Free Radicals and Other Transient Molecule)
- Chris Curtis, Ph.D., University of Washington, *Assistant Professor of Mathematics* (Fluid Mechanics, Modeling and Simulation, Computational Fluid Dynamics and Numerical Simulation)
- Bryan Donyanavard, Ph.D., University of California, Irvine, *Assistant Professor of Computer Science* (Runtime Resource Management for Energy-Efficient Execution of Cyber-Physical Systems)
- Robert Edwards, Ph.D. University of Sussex, Brighton, England, *Professor of Computer Science* (Microbiology, Bioinformatics, and High Performance Computing)
- Juanjuan Fan, Ph.D. University of Washington, *Professor of Statistics* (Multivariate Failure Time Data, Tree Based Methods, Genetic Epidemiology)
- Uduak George, Ph.D. University of Sussex, Brighton, UK, *Assistant Professor of Mathematics and Statistics* (Mathematical biology, fluid dynamics, continuum mechanics of tissues, morphogenesis, solute transport)
- Jerome Gilles, Ph.D. Ecole Normale Supérieure, France, *Assistant Professor of Mathematics* (Applied Harmonic/Functional Analysis, Signal/Image Processing, data driven methods, Functional analysis)
- Kyle Hasenstab, Ph.D. University of California, Los Angeles, *Assistant Professor of Statistics* (Deep neural networks, medical image analysis, interpretability of AI algorithms, functional data analysis)
- Hajar Homayouni, Ph.D. Colorado State University, *Assistant Professor of Computer Science* (Data Quality Testing, Big Data, and Machine Learning)
- Ke Huang, Ph.D. University of Grenoble, France, *Assistant Professor of Electrical and Computer Engineering* (VLSI Testing, Fault Modeling and Diagnosis. Machine Learning, Data Mining. Trustworthy ICs. Computer-Aided Design)
- Gustav Jacobs, Ph.D., University of Illinois at Chicago, *Professor of Aerospace Engineering* (Computational Physics, High-Order Methods, Fluid and Plasma Dynamics)
- Calvin Johnson, Ph.D. University of Washington, *Professor of Physics* (Theoretical and Computational Nuclear Structure and Nuclear Astrophysics)
- Parag Katira, Ph.D. University of Florida, *Assistant Professor of Mechanical Engineering* (Biomolecular Motors, Cell Mechanics, Mechanosensing, Tissue Dynamics, Soft Matter Interactions, Design of Active Materials)
- Alicia Kinoshita, Ph.D. University of California, Los Angeles, *Associate Professor of Civil Engineering* (Hydrologic change in coupled human-natural systems)
- Sunil Kumar, Ph.D. Birla Institute of Technology and Science, India, *Professor of Electrical and Computer Engineering and Thomas G. Pine Faculty Fellow* (Wireless Networks, Multimedia Traffic, and Video Processing Techniques)
- Lyuba Kuznesova, Ph.D. Cornell University, *Assistant Professor of Physics* (Nanophotonics, ultrafast lasers, and cavity quantum electrodynamics and high energy short-pulse generation in fiber laser systems, mode-locking in quantum cascade lasers, blue LEDs, microcavities, and metamaterials)
- Richard Levine, Ph.D. Cornell University, *Professor of Statistics* (Markov Chain Monte Carlo Methods, Environmental Statistics, Biostatistics, Bayesian Decision Theory)
- Xiaobai Liu, Ph.D. Huazhong University of Science and Technology, China, *Associate Professor of Computer Science* (Computer Vision, Machine Learning, Computational Statistics and their applications to clinic diagnosis, sports, transportation, surveillance, video games and others)
- Antonio Luque, Ph.D. University of Barcelona, *Assistant Professor of Mathematics* (Applied Mathematics, Biophysics, Physical Virology+ theoretical and computational biophysics as well as mathematical modeling, molecular and physicochemical properties of viruses in viral ecology)

Sahar Ghanipoor Machiani, Ph.D. Virginia Tech University, *Assistant Professor of Civil, Construction, and Environmental Engineering* (Traffic Safety and Signal Operation, Human Behavior Modeling, Connected/Automated Vehicles, Evacuation Modeling Infrastructure-Based Safety Systems)

Marta Miletic, Ph.D. Kansas State University, *Assistant Professor of Civil, Construction, and Environmental Engineering* (Geotech Engineering)

Duy Nguyen, Ph.D. McGill University, Canada, *Assistant Professor of Electrical and Computer Engineering* (Signal Processing, Communications, and Information Theories for Wireless Systems and Networks)

Kenneth Nollett, Ph.D. University of Chicago, *Assistant Professor of Physics* (Theoretical and computational physics, spanning the interface between nuclear physics and astrophysics)

Christopher Paolini, Ph.D. San Diego State University, *Assistant Professor of Electrical and Computer Engineering* (Cyberinfrastructure, Computational Geochemistry and Combustion Science)

Pavel Popov, Ph.D. Cornell University, *Professor of Aerospace Engineering* (Computational combustion with applications to aerospace propulsion. His research interests include combustion instability in aerospace engines, stochastic modelling of turbulent combustion, plasma-combustion interactions simulation of multiphase flow, turbulence modelling and high-performance computing.)

Shangping Ren, Ph.D. University of Illinois at Urbana-Champaign, *Professor of Computer Science* (Cyber-Physical Systems, Real-Time Scheduling, and Cloud Computing)

Forest Rohwer, Ph.D. San Diego State University, *Professor of Biology* (Genomic Analysis of Phage, Diversity of Coral-associated Bacteria, Opportunistic Infections and Coral Disease)

Eric Sandquist, Ph.D. University of California, Santa Cruz, *Professor of Astronomy* (Physics of Stars and the Way They Age)

Anca Segal, Ph.D. University of Utah, *Professor of Biology* (The Mechanism of Site-Specific Recombination; Structure/Function Analysis of Recombination Proteins)

Ignacio Sepulveda, Ph.D. Cornell University, *Assistant Professor of Civil Engineering* (Coastal Hazards, Coastal Engineering, Tsunami Science, Seismology, Stochastic Calculus for Uncertainty Quantification, Remote sensing, Wave Mechanics, Inversions)

Arun Sethuraman, Ph.D. Iowa State University, *Assistant Professor of Bioinformatics* (Population Genomics, Evolution, Bioinformatics)

Satish Sharma, Ph.D. Banaras Hindu University, India, *Professor of Electrical and Computer Engineering* (Electromagnetics antennas and waves, microwave devices and systems)

Samuel Shen, Ph.D. University of Wisconsin, Madison, *Albert W. Johnson Distinguished Professor of Mathematics* (Statistical Climatology & Agroclimatology, Fluid Dynamics & Forced Nonlinear Waves)

Nicholas Shikuma, Ph.D. University of California, Santa Cruz, *Assistant Professor of Biology* (Molecular Mechanisms of Bacteria/Bacteriophage/Animal Interactions)

Usha Sinha, Ph.D. Indian Institute of Science, Bangalore, India, *Professor of Physics* (Medical and Imaging Physics, Magnetic Resonance Imaging (MRI), and Informatics)

Jeet Sukumaran, Ph.D. University of Kansas, *Assistant Professor of Biology* (Process-based modeling of macroevolutionary dynamics, diversification, and biogeography/phylogeography; species delimitation; host-parasite coevolution, phylogenetics)

Mauro Tambasco, Ph.D. University of Western Ontario, *Associate Professor of Physics* (Medical Physics: Biophysics effects of ionizing radiation in the presence of strong magnetic fields)

Naveen Vaidya, Ph.D. York University, Canada, *Assistant Professor of Mathematics* (Applied Mathematics, Mathematical Biology, Disease Modeling, Differential Equations)

Satchi Venkataraman, Ph.D. University of Florida, *Professor of Aerospace Engineering* (Structural Mechanics, Design Optimization, Composite Materials, Biomechanics)

Wei Wang, Ph.D. University of Nebraska, Lincoln, *Associate Professor of Computer Science* (Cyber-Physical Systems, Wireless Multimedia Networking, Breast Cancer Image Processing)

Qi Wang, Ph.D. Johns Hopkins University, *Assistant Professor of Aerospace Engineering* (Data Assimilation in Turbulent Environments, Adjoint-Based Optimization, Measurement-Enhanced Simulations, Drag Reduction and Optimal Sensor Placement, Pollution Source Localization in Stratified or Non-Stratified Turbulence)

Fridolin Weber, Ph.D. University of Munich, Germany, *Albert W. Johnson Distinguished Professor of Physics* (Superdense Matter, Astrophysics, General Relativity)

Tao Xie, Ph.D. New Mexico Institute of Mining and Technology, *Professor of Computer Science* (High-Performance Computing, Energy-Efficient Storage Systems, Parallel/Distributed Systems, and Security-Aware Scheduling)

Yang Xu, Ph.D. Penn State University, *Assistant Professor of Computer Science* (Cognitive science, computer science, linguistics and psychology)

Ahmad Bani Younes, Ph.D. Texas A&M University, *Assistant Professor of Aerospace Engineering* (Space research topics: including the development of fast and high fidelity gravity model for the earth anomalies; fast and efficient trajectories propagation for satellite motions; optimal control theory, and, algorithms development for optimization theory, perturbation theory, orbital motion, and very broadly algorithmic differentiation for automatically generating mixed sets of high-order partial derivatives.)