DEPARTMENT OF APPLIED MATHEMATICS

Applied Mathematics is the discipline of discovering, applying, and promoting the use of mathematics to model and solve practical problems in many disciplines, ranging from physical sciences and biology to medicine and industry.

Research

By nature, applied mathematics research is interdisciplinary. By exploiting the common underlying mathematical framework, we initiate the cross-fertilization of ideas and techniques from one discipline to another. Many of our faculty members are either joint or adjunct faculty in another department. The faculty is widely known for its research leadership and authorship of many research papers, textbooks, and monographs, and activity on editorial boards of leading journals.

Education

The Department of Applied Mathematics provides opportunities to its graduate students for significant scholarly activity and original research. Through classes and individual faculty mentoring, our students learn to model phenomena mathematically and to develop combined analytical and computational approaches for problem solving. They learn to communicate using the language of mathematics and the language of various applied disciplines, and to work with others to advance the frontiers of knowledge. They learn to respond to the mathematical needs of others by teaching, by mentoring undergraduates and each other, by working in industrial and government settings, and on outreach projects in local schools. Our students graduate with the knowledge, the experience, and the ability to be leaders in a society that exhibits increasing demands for competence in communication, computation, and quantitative analysis.

Applied and computational mathematics encompasses some of the most diverse and interdisciplinary research in the physical, engineering, and biological sciences. The program has received national and international acclaim, such as being ranked 4th in the nation in applied mathematics by the Faculty Scholarly Productivity Index (2007) and tied as the top applied mathematics program in the country by the National Research Council (2010).

The Department offers a broad curriculum of graduate courses in applied mathematics, and our faculty members have written many textbooks that are widely used here and at other institutions.

The Department also provides a core of undergraduate courses for students in the Applied and Computational Mathematical Sciences (ACMS) Bachelor's Degree program and teaches undergraduate and graduate service courses in applied mathematics for students from many other departments. The Department offers access to its courses through distance learning.

STUDENTS (Autumn 2019)

236 — Master of Science students

52 — PhD students

DEGREES AWARDED (2018-2019)

102 — Master of Science degrees

8 — PhD degrees

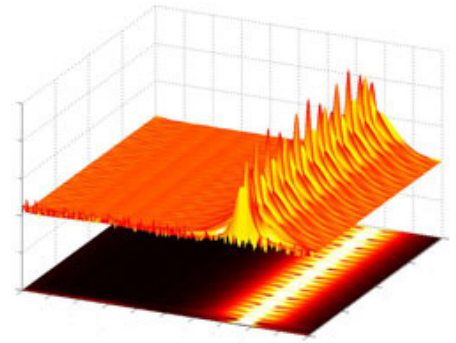### PRIMARY AREAS OF RESEARCH INCLUDE:

Cancer Modeling

Computational Neuroscience

Data Science

Financial Mathematics

Geophysical Fluid Dynamics and Atmospheric Sciences

Mathematical Ecology and Evolutionary Biology

Mode-locked Lasers and Photonic Devices

Non-equilibrium Thermodynamics of Living Cells, Statistical Mechanics, and Molecular Physics of Proteins

Nonlinear Wave Propagation, Solitons in Water Waves, Optical and Atomic Physics

Numerical Methods and Scientific Computing

Optimal Control and Numerical Optimization

Probability and Stochastic Processes

Riemann Surfaces and Symbolic Computation

Systems Biology, Metabolism and Signaling Networks, and Kinetics

Theory and Computation of Shock Waves, Interfaces and Free Surfaces

Faculty

The Department of Applied Mathematics has 16 faculty and 6 emeritus faculty. This small group of faculty has received an impressive collection of awards and honors, including:

1	Member of the National Academy of Sciences
2	Presidential Young Investigator Awards
3	National Science Foundation CAREER Awards
2	Guggenheim Fellows
2	Humboldt Foundation Awards
1	Sloan Foundation Fellow
1	Burroughs Wellcome Career Award
1	CoMotion Presidential Innovation Fellow
1	President of the Society for Industrial and Applied Mathematics
4	Fellows of the Society for Industrial and Applied Mathematics
1	Fellow of the American Physical Society
1	Fellow of the American Geophysical Union
2	Fellows of the American Mathematical Society
2	Fellows of the American Meteorological Society
9	Editors of leading journals
1	SIAM Activity Group on Financial Mathematics and Engineering Early Career Prize

Degree Options

At the University of Washington, AMATH graduate students find a culture of excellence and respect within a warm, collegial atmosphere that encourages exceptional research. We offer a broad curriculum of graduate courses in applied mathematics to provide students with the tools they need to succeed, and we offer different degree options tailored to our students' academic goals.

Applied Mathematics:
PhD
MS On Campus
MS Online
Scientific Computing Certificate

Computational Finance & Risk Management:
MS On Campus
MS Online
Certicate Programs

Self-starting mode-locked laser dynamics.

FACULTY (Autumn 2019)

7	Full Professors
4	Associate Professors
1	Acting Associate Professors
2	Assistant Professors
6	Research Associates
1	Instructor
8	Emeritus Professors
14	Adjunct Faculty

Nonlinear water waves off the coast of North Carolina during the Perfect Storm of 1991, a subject studied using advanced mathematical tools.
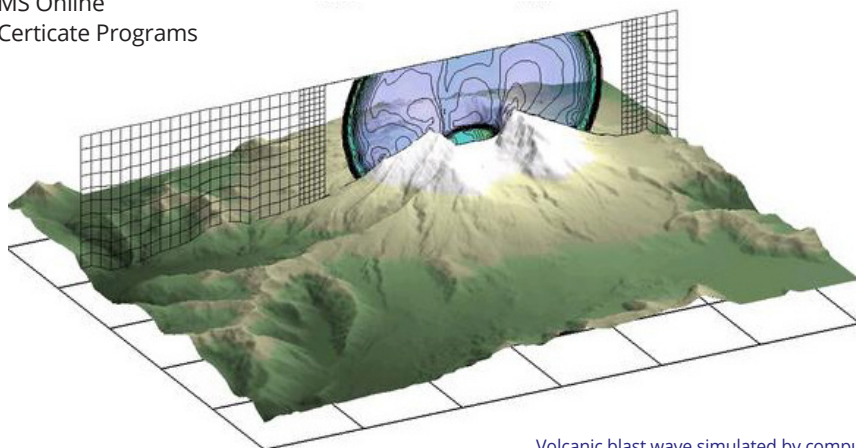
Volcanic blast wave simulated by computer using adaptive mesh refinement method.

last update: September 2019