

MATHEMATICS (GRADUATE FIELD)

Program Website (<http://www.math.cornell.edu/>)

Field Description

The graduate program in the field of mathematics at Cornell leads to the Ph.D. degree, which takes most students six years of graduate study to complete. Students are not accepted for an M.S. degree. One feature that makes the program at Cornell particularly attractive is the broad range of interests of the faculty (<https://math.cornell.edu/research/>). The department has outstanding groups in the areas of algebra, algebraic geometry, analysis, applied mathematics, combinatorics, dynamical systems, geometry, logic, Lie groups, number theory, probability, and topology. The field also maintains close ties with distinguished graduate programs in the fields of applied mathematics (<https://catalog.cornell.edu/graduate-school/applied-mathematics/>), computer science (<https://catalog.cornell.edu/graduate-school/computer-science/>), operations research (<https://catalog.cornell.edu/graduate-school/operations-research-information-engineering/>), and statistics and data science (<https://catalog.cornell.edu/graduate-school/statistics/>).

Data and Statistics

- Doctoral Program Statistics (<https://gradschool.cornell.edu/about/program-metrics-assessments-and-outcomes/doctoral-program-statistics/?SelectGradField=32>)

Field Manual

- Manual (<https://math.cornell.edu/math-graduate-handbook/>)

Subject and Degrees

Mathematics

- Mathematics (PhD) (<https://catalog.cornell.edu/programs/mathematics-phd/>)

Concentrations by Subject

Mathematics

- mathematics

Faculty

Marcelo Aguiar (<http://math.cornell.edu/marcelo-aguiar/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics:* mathematics
- **Research Interests:** Algebra, Combinatorics, Category Theory

Dan Mihai Barbasch (<http://math.cornell.edu/dan-m-barbasch/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics:* mathematics
- **Research Interests:** representation theory of reductive Lie groups

Yuri Berest (<http://math.cornell.edu/yuri-berest/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics:* mathematics
- **Research Interests:** PDE; algebra; mathematical physics

David S. Bindel (<http://www.cs.cornell.edu/~bindel/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics:* mathematics
- **Research Interests:** applied numerical linear algebra and scientific computing

Xiaodong Cao (<http://math.cornell.edu/xiaodong-cao/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics:* mathematics
- **Research Interests:** differential geometry; geometric analysis; nonlinear parabolic equations

Robert Connelly (<http://math.cornell.edu/robert-connelly/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics:* mathematics
- **Research Interests:** geometry; rigidity; topology

Anil Damle (<http://www.cs.cornell.edu/~damle/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics:* mathematics
- **Research Interests:** Scientific Computing

Kelly Delp (<http://math.cornell.edu/kelly-delp/>)

- **Campus:** Ithaca - (Minor Member)
- **Concentrations:** *Mathematics:* mathematics
- **Research Interests:** Geometry & Topology

Benjamin E Dozier (<http://math.cornell.edu/benjamin-dozier/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics:* mathematics
- **Research Interests:** Geometry, Dynamical systems, Riemann surfaces

Moon Duchin (<http://publicpolicy.cornell.edu/people/moon-duchin/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics:* mathematics
- **Research Interests:** Data science for democracy, computational social choice, geometry and redistricting. Science, technology, and society, computing and law, science policy, census data, privacy. Random walks and Markov chains, partition problems, networks, algorithmic fairness. Geometric group theory, geometric topology, hyperbolicity, metric geometry.

Christopher J. Earls (<http://www.cee.cornell.edu/faculty-directory/christopher-j-earls/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics:* mathematics
- **Research Interests:** Applied Mathematics, Physics, Theoretical and Applied Mechanics, Applied Information Systems, Systems Engineering, Civil & Environmental Engineering.

Joseph Yehuda Halpern (<http://infosci.cornell.edu/content/halpern/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics*: mathematics

Daniel S Halpern-Leistner (<http://pi.math.cornell.edu/m/People/bynetid/dsh233/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics*: mathematics
- **Research Interests:** moduli problems; geometric representation theory, derived algorithm geometry; derived categories of coherent sheaves

Timothy James Healey (<http://www.mae.cornell.edu/people/profile.cfm?netid=tjh10>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics*: mathematics
- **Research Interests:** elliptic partial differential equations; nonlinear elasticity and analysis

Tara S. Holm (<http://math.cornell.edu/tara-holm/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics*: mathematics
- **Research Interests:** symplectic geometry; algebraic topology; algebraic geometry

John Hamal Hubbard (<http://math.cornell.edu/john-h-hubbard/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics*: mathematics
- **Research Interests:** analysis; differential equations; differential geometry

Martin D. Kassabov (<http://www.mathlab.cornell.edu/m/People/bynetid/mdk35/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics*: mathematics
- **Research Interests:** topology; lie groups; representation theory; graph theory; geometric/combinatorial group theory

Jon M Kleinberg (<http://infosci.cornell.edu/content/kleinberg/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics*: mathematics
- **Research Interests:** Issues at the interface of networks and information, with an emphasis on the social and information networks that underpin the Web and other on-line media.

Robert D. Kleinberg (<http://infosci.cornell.edu/content/kleinberg-0/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics*: mathematics
- **Research Interests:** Algorithms and theoretical computer science, especially economic aspects of algorithms, online learning and its applications, random processes in networks.

Allen Knutson (<http://math.cornell.edu/allen-knutson/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics*: mathematics
- **Research Interests:** algebraic geometry and algebraic combinations

Lionel Levine (<http://math.cornell.edu/lionel-levine/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics*: mathematics
- **Research Interests:**

Adrian Lewis (<http://www.orie.cornell.edu/faculty-directory/adrian-s-lewis/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics*: mathematics

Yusheng Luo (<http://math.cornell.edu/yusheng-luo/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics*: mathematics
- **Research Interests:** Dynamics and Geometry

Kathryn P Mann (<http://math.cornell.edu/kathryn-mann/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics*: mathematics
- **Research Interests:** Geometric Topology

Jason F Manning (<http://math.cornell.edu/jason-manning/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics*: mathematics
- **Research Interests:** Geometric group theory, geometric topology

Karola Meszaros (<http://math.cornell.edu/karola-meszaros/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics*: mathematics
- **Research Interests:** Algebraic combinatorics and discrete geometry.

Justin T. Moore (<http://math.cornell.edu/justin-moore/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics*: mathematics
- **Research Interests:** set theory; combinatorics; logic

F. Camil Muscalu (<http://math.cornell.edu/camil-muscalu/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics*: mathematics
- **Research Interests:** mathematics

Anil Nerode (<http://www.mathlab.cornell.edu/m/People/bynetid/an17/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics*: mathematics
- **Research Interests:** mathematical logic; recursive functions, computer science

Michael Nussbaum (<http://math.cornell.edu/michael-nussbaum/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics*: mathematics
- **Research Interests:** statistics

Irena Vassileva Peeva (<http://math.cornell.edu/irena-peeve/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics*: mathematics
- **Research Interests:** algebra

Jamol J. Pender (<http://www.orie.cornell.edu/faculty-directory/jamol-j-pender/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics*: mathematics
- **Research Interests:** Applied Probability

Ravi Kumar Ramakrishna (<http://math.cornell.edu/ravi-ramakrishna/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics*: mathematics
- **Research Interests:** algebraic number theory

James Renegar (<http://www.orie.cornell.edu/faculty-directory/james-renegar/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics*: mathematics
- **Research Interests:** computational complexity; mathematical programming

Timothy R. Riley (<http://math.cornell.edu/timothy-riley/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics*: mathematics
- **Research Interests:** geometric group theory

Laurent Pascal Saloff-Coste (<http://math.cornell.edu/laurent-saloff-coste/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics*: mathematics
- **Research Interests:** analysis and probability

Gennady Samorodnitsky (<http://www.orie.cornell.edu/faculty-directory/gennady-samorodnitsky/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics*: mathematics
- **Research Interests:**

Reyer Sjamaar (<http://math.cornell.edu/reyer-sjamaar/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics*: mathematics
- **Research Interests:** lie groups; differential geometry

Slawomir Solecki (<http://math.cornell.edu/slawomir-solecki/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics*: mathematics
- **Research Interests:** mathematical logic

Philippe Sosoe (<http://math.cornell.edu/philippe-sosoe/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics*: mathematics
- **Research Interests:** probability, analysis, mathematical physics

Noah Stephens-Davidowitz (<http://noahsd.com/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics*: mathematics
- **Research Interests:** Theory of Computation

Daniel L. Stern (<http://math.cornell.edu/news/new-faculty-daniel-stern/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics*: mathematics
- **Research Interests:** Differential geometry

Michael Eugene Stillman (<http://math.cornell.edu/michael-e-stillman/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics*: mathematics
- **Research Interests:** algebraic geometry; computational algebra

Steven H Strogatz (<http://math.cornell.edu/steven-strogatz/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics*: mathematics
- **Research Interests:** nonlinear dynamics and chaos; coupled oscillators

Edward B Swartz (<http://math.cornell.edu/edward-swartz/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics*: mathematics
- **Research Interests:** combinatorics and discrete geometry

Eva Tardos (<http://infosci.cornell.edu/content/tardos/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics*: mathematics
- **Research Interests:** Algorithm Design and Algorithmic Game Theory. Algorithmic game theory, an emerging new area of designing systems and algorithms for selfish users. My research focuses algorithms and games on graphs or networks. I am mostly interested in designing algorithms and games that provide provably close-to-optimal results.

Nicolas P Templier (<http://math.cornell.edu/nicolas-templier/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics*: mathematics
- **Research Interests:** number theory, automorphic forms, arithmetic geometry, ergodic theory, quantum chaos.

Alex John Townsend (<http://math.cornell.edu/alex-townsend/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics*: mathematics
- **Research Interests:** numerical analysis and scientific computing

Alexander B. Vladimirovsky (<http://math.cornell.edu/alexander-vladimirovsky/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics*: mathematics
- **Research Interests:** applied mathematics; numerical methods; dynamic systems; nonlinear PDEs; control theory

Rachel M. Webb (<http://math.cornell.edu/rachel-webb/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics*: mathematics
- **Research Interests:** Algebraic geometry, especially problems motivated by Gromov-Witten theory, including moduli of curves and maps

Marten Wegkamp (<http://stat.cornell.edu/people/faculty/marten-wegkamp/>)

- **Campus:** Ithaca - (Minor Member)
- **Concentrations:** *Mathematics*: mathematics
- **Research Interests:** Classification, Copula Modeling, Learning Theory, Empirical Process Theory, Machine Learning, Matrix Estimation and Completion, Model Selection and Aggregation, Nonparametric estimation

James Edward West (<http://math.cornell.edu/james-e-west/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics*: mathematics
- **Research Interests:** geometric topology; infinite-dimensional topology

Yunan Yang (<http://as.cornell.edu/people/yunan-yang/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics*: mathematics
- **Research Interests:** Numerical Analysis, Inverse Problems, Optimal Transportation, Machine Learning, and Nonconvex Optimization

Inna I. Zakharevich (<http://math.cornell.edu/inna-zakharevich/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics*: mathematics
- **Research Interests:** algebraic topology and algebraic K-theory

Xin Zhou (<http://math.cornell.edu/xin-zhou/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics*: mathematics
- **Research Interests:** Geometric Analysis; Calculus of Variations; General Relativity

David Zywina (<http://math.cornell.edu/david-zywina/>)

- **Campus:** Ithaca
- **Concentrations:** *Mathematics*: mathematics
- **Research Interests:** Number theory, arithmetic geometry My research is in number theory and more specifically in arithmetic geometry. I like to study the family of compatible Galois representations associated to various arithmetic objects (eg. abelian varieties, modular forms, Drinfeld modules); these representations encode much, if not all, of the arithmetic of the originally object. Galois representations can also be used to study the absolute the Galois group of the rational numbers, and I have recently been playing with some applications to the Inverse Galois Problem.

Application

Applicants must demonstrate mastery of the material required for an undergraduate major in mathematics. The mathematics field welcomes applications from and admits students with various mathematics backgrounds. The GRE Subject Test scores (minimum score 600) are required. Detailed academic requirements can be located in the graduate field handbook (<https://math.cornell.edu/math-graduate-handbook/>). Applicants must meet the minimum Graduate School Requirements (<https://gradschool.cornell.edu/career-and-professional-development/pathways-to-success/prepare-for-your-career/>), including the English Language Proficiency Requirement (<https://gradschool.cornell.edu/admissions/application-steps/required-tests/english-language-proficiency-requirement-2/>) for all applicants