THE OHIO STATE UNIVERSITY

GRADUATE PROGRAMS IN MATHEMATICS

An Overview for Prospective Students

Contents

General Information

Applications

The department invites applications to all degree programs once a year for admission to the autumn semester. Application deadline for full consideration for all degrees is **December 15th**. Later applications will be considered on a stand-by basis. Detailed information about the application procedure and expected preparations can be found at

https://math.osu.edu/grad/future/apply

Contacts

All inquiries from prospective students and communication about our program and application procedures should be directed to

grad-info@math.osu.edu

The email account will also be used to extend offers of admission and support, or inform students about their waitlist status.

Faculty & Research

Graduate Faculty

There are currently **66** professors on the Columbus campus serving as graduate faculty in the mathematics doctoral program as well as the master's programs. Additionally, there are 22 faculty on branch campuses who are also available (and frequently do) supervise theses and dissertations of graduate students on the main campus. Thus, doctoral and master's students in our program are able to choose among at least **88** expert researchers to serve as their dissertation or thesis advisors.

Our graduate faculty is actively engaged in creating a vigorous research environment through top-level research publications, an abundance of research seminars, numerous sources of grant support, a large visitor and post-doctoral program, frequently hosted conferences of national and international reach, as well as research collaborations all over the world.

Several joint faculty appointments between our department and departments in various life science disciplines, computer science, and statistics support and underscore interdisciplinary research opportunities in our research program. Other OSU units collaborating with professors in our department include, for example, the medical center, physics, engineering, and education.

Our faculty is also continuously engaged in developing new graduate degree programs or improving existing ones through special mentoring and scientific activities.

Opportunities in Breadth and Interaction

Thanks to the large size of our faculty nearly every area of mathematics is represented in our program. Particularly, our program is able to offer on a regular basis a wide variety of courses that provide our students with a broad intellectual formation and solid skill sets in many disciplines of mathematics.

The overall breadth of our research program offers unique opportunities for students who would like to explore different directions before committing to a specific research area as well as students who would like to work at the interface of several fields of mathematics.

In fact, much of the research represented in our program is characterized by the interaction of methods and perspectives of several overlapping areas of mathematics. This positions our graduates well in a scientific environment that demands more and more versatility of professional mathematicians in order to be successful in academic careers. Research in our program also, very often, connects to deeper mathematics questions arising in other disciplines leading to collaborations with other departments around campus. This opens additional career paths to students working in such interdisciplinary fields.

New Hires and Innovative Directions

New faculty hires over the last few years have additionally invigorated our research program by strengthening core areas and adding original new research directions. Several recent additions have emphasized research that combines computational methods with topics in pure mathematics, often with novel cross-disciplinary components.

Recent faculty hires have been in several different areas: topology (homotopy theory, modern low-dim invariants, probabilistic and applied topology, geometric groups theory), several modern directions of algebraic geometry (combinatorial, arithmetic, tropical), harmonic analysis, modern

algebra and representation theory (operator algebras, quantum groups, category theory), probability theory and statistical graph theory, computational mathematics (uncertainty quantification, fluid dynamics, data science) as well as other areas of applied mathematics such as signal processing.

Additionally, several faculty with very active research programs have joined our program in the last few years, strengthening research directions that are already represented in our program with well-established and renowned research groups. These areas of expansion include algebraic geometry, combinatorics, ergodic theory, dynamical systems, complex analysis, mathematical biology, and topology.

Traditional Strengths

Among the better known traditional strengths of our program are algebra and number theory, which have a long history at Ohio State starting with mathematicians Hans Zassenhaus, Henry Mann, and Arnold Ross. Over the decades our program has housed premier publications in number theory and group theory. Today our group in analytic number theory is highly visible in the scientific community, regularly organizes programs and conferences, and has a strong record of job placements of its graduates.

Another traditional strength of our program is in ergodic theory, including its intriguing intersections with number theory. This branch of mathematics is strongly represented in our program both by world renowned faculty as well as one of the larger groups of graduate students, who regularly go on to competitive post-doctoral programs and faculty positions.

Moreover, our topology group has a traditionally strong presence with many students, faculty, and post-docs, particularly in the specialties geometric group theory, low-dimensional and quantum topology, and various other directions in algebraic and differential topology.

Our *Center for Topological and Geometric Data Analysis*, a collaboration between the Mathematics, Computer Science, and Statistics Departments on campus, has attracted over $4 million in federal and individual funding, which not only makes it the premier center for the topic in the country but also benefits graduate students in the area through fellowship support.

The *Mathematical Biosciences Institute* (MBI, see http://mbi.osu.edu/) at Ohio State – one of the seven major NSF-funded mathematical sciences institutes in the United States – is the focal point of our large research group in mathematical biology. It includes about ten mathematics professors in addition to numerous interdisciplinary appointments and affiliated faculty from other departments. Much of the mathematics involved in this area ties into our prolific research groups in PDE, dynamical systems, and applied mathematics, but also benefits from collaboration with life science departments, medical units across campus, and a large number of post-docs visiting the MBI each year. Similarly, other faculty working in applied mathematics and numerical analysis maintain lively collaborations with Ohio State's large engineering and computer science departments.

In addition, several smaller, but nonetheless very active, research groups complement the wide spectrum of mathematics represented in our program. These encompass, for example, logic and foundations, real and complex analysis, differential geometry and geometric analysis, non-commutative geometry and operator algebra, representation and Lie theory, ring and group theory, as well as mathematical physics and financial mathematics.

Exploring our Faculty

The attached list of current and incoming graduate faculty at our department contains keyword descriptions of their research as well as their contact information. Interested students should feel free to contact faculty directly with questions about their research. (The organization by subject area in the list may at times be arbitrary since research areas have become more and more cross-disciplinary).

The *Invitations to Mathematics* is a weekly student colloquium with lectures delivered by members of our graduate faculty and visited by all beginning doctoral students. The lectures series has helped students gain an early overview of research conducted in our program and connected them to future dissertation advisors. Browsing the lecture announcements and abstracts may serve as an additional source of topics that are researched at our department.

Miscellaneous Highlights

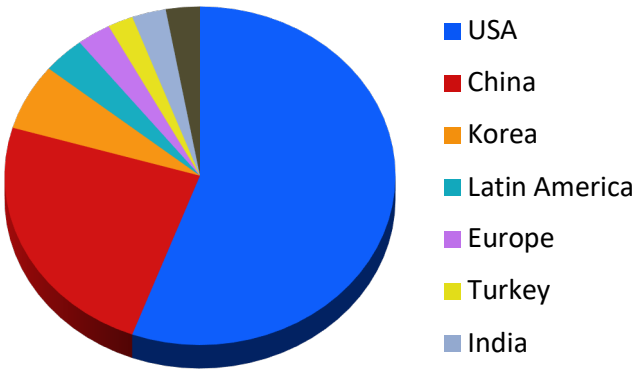
Here a few more facts that underline the high level and significant impact of the research conducted at our department:

- **Eight** of our junior faculty have won prestigious *NSF-CAREER* awards in the last five years. Over the recent years **five** of our incoming faculty were awarded the prestigious *Sloan Fellowships*.
- **Thirteen** of our faculty members are *Fellows of the American Mathematical Society*.
- Moreover, **four** faculty in our program are *AAAS Fellows*, one of whom is serving as chair-elect of the mathematics section of AAAS. Also **one** of our faculty is a member of the *National Academy of Science,* and several more members of our program have had prestigious invitations as speakers to the *International Congress of Mathematicians* in recent years.
- The *Mathematics Research Institute* (MRI, see http://www.mri.osu.edu) combines department and college resources as well as external grants to fund a variety of conferences, special years on selected topics, visitor programs, seminars, and travel support.
- In recent years **four** *Field Medalists* have visited our department for special lectures, namely, *Edward Witten*, *Elon Lindenstrauss*, *Alain Connes*, and *Terence Tao*.

Graduate Student Life

Demographics

There are more than 150 students in our graduate program, of which over 120 are pursuing doctoral degrees with the remainder in the MMS or MAQRM programs. Nearly a quarter of our graduate students are female. The nationalities represented in our department are illustrated in the chart on the right. Students enter the program coming from a wide range of institutions, from small liberal arts colleges to large research universities and with similarly diverse educational backgrounds, including both Bachelor's and Master's degrees. Our program thus has ample experience and resources to accommodate students' widely varying academic and personal backgrounds.



Community and Informal Training

Student-driven and organized activities define much of the social and academic environment of graduate students in our department. They both promote and are evidence of a cohesive, cooperative, and supportive graduate student community.

For example, the local chapter at OSU for the *Association for Women in Mathematics* (AWM) was founded by our graduate students. It maintains an active program including invited speakers, panel discussions, and information sessions. The chapter is advised by Professor Keyfitz, a former president of the AWM.

In addition, graduate students established the *Mathematics Graduate Student Association* (MGSA) as a registered student organization which is conducting student-only lectures on a broad range of subjects as well as social events.

There are many further settings for more research-oriented interactions as well. Particularly, there are at least half a dozen exclusively student run and attended seminars that provide informal and low pressure venues to learn about basic notions and explore research topics.

Additionally, informal working seminars in various research areas involve a mix of faculty, post-docs, and graduate students and facilitate approaches to research in a vertically integrated fashion

Students often collaborate with faculty from other departments at Ohio State but also faculty at other institutions. It is also not unusual for students in our program to collaborate on research projects and to coauthor published articles.

The *Invitations to Industry* initiative connects current graduate students to opportunities in the private sector and helps them to prepare for careers outside of academia. Activities includes a seminar series by graduate degree holders working in industry, coding camps, and negotiation of internships. The initiative is organized by the Ohio State sponsored *Erdős Institute* (erdosinstitute.org).

Shared offices provide an environment in which groups easily form that work together on course assignments, exam preparations, or grading in the beginning years. Graduate students show support by helping each other through courses and examinations, peer-mentoring incoming students, and nominating each other for teaching awards.

Further informal and social interactions occur in the lounge rooms and daily tea area, during our annual departmental picnic and special events, as well as outside the department, encompassing a wide range of extracurricular activities.

Doctoral (Ph.D.) Program

The Doctor of Philosophy degree enables its recipients to conduct independent research, produce original scholarly work, and serve in faculty positions at colleges and universities. We believe that the Mathematics Graduate Program at The Ohio State University provides a tremendously broad and exciting range of high-caliber research opportunities and a faculty that is uniquely dedicated to graduate advising.

Doctoral students interested in careers in the private sector benefit from the Invitations to Industry initiative described above, our offerings in mathematical finance and actuarial sciences, as well as the fact that leadership qualities imbued by rigorous mathematical training at the doctoral level are highly sought after by industry employers.

Furthermore, faculty in our department have developed the curriculum for a separate track in our Ph.D. program for applied/interdisciplinary mathematics, which is currently moving through the university approval process and which is expected to be in place by Autumn 2020.

Academic Progression & Curriculum

The path to the Ph.D. degree is divided into two parts separated by the candidacy exam. During the first part students are expected to pass our qualifying course requirements in real analysis and abstract algebra as well as a further breadth course requirement. Qualifying examinations are optionally offered for students with prior background in these subjects. The candidacy examination, taken typically in the third year of study, requires a dissertation research proposal to be defended by the candidate. After that students focus almost entirely on research and writing their dissertation. The details of the various pre-candidacy requirements can be found at

http://math.osu.edu/grad/current/phd

Median time to graduation is currently around six years. Our faculty are constantly working on streamlining the training of students in order to achieve lower times to graduation while maintaining strong job placements and the integrity of the doctoral degree.

The doctoral completion rate (from entry to degree) has steadily improved over recent years and we currently estimate this ratio to be around or exceeding 75% – which is significantly above the national average of about 50%.

Financial Support

All graduate students in good academic standing are supported either as Graduate Teaching Associates (GTAs), Graduate Research Associates (GRAs), or as University Fellows (UF) during the regular academic year. In all cases support includes a full tuition waiver. Students who have been supported in the nine months of the preceding academic year also have an automatic summer tuition waiver regardless of summer support. Additionally, GA and UF support includes a generous (85%) subsidy of health insurance premiums. Beyond first year fellowships for selected students fulfilling university criteria, there are additional fellowship and support opportunities for more advanced students.

Every year the department offers between 25 and 40 fellowships that support students for one semester without teaching duties at regular stipend levels in order to allow them to focus on their research, complete their thesis or other academic projects, or travel to workshops and conferences. Additional fellowships are generated from a large NSF training grant in Pure and Applied Topology, several individual NSF CAREER grants, as well as large grants in computational mathematics.

During the 2017-18 academic year, an average of nearly 40% of our Ph.D. students were fully supported *without* teaching duties during regular terms (27% in Autumn and 51% in Spring).

Many more graduate faculty in our department hold research grants that can support students on GRAs. In addition, a limited number of teaching and research positions are available for summer

support each year. Typically, over 90% of all students who remain on campus over the summer and apply receive financial support from one of these sources.

Students in their dissertation years can also compete for the highly prestigious Presidential Fellowships which our graduate school awards to the very best students in the entire university. Our program is among the top seven programs on campus that win most of these awards every year.

Finally, the department makes travel funds available that allow students to visit conferences, workshops, and collaborators. Many students take advantage of this opportunity to connect to the larger scientific community, collaborate outside of the program, present their work, and thus improve their chances in securing academic jobs.

Graduations and Job Placements

Over the past four years our doctoral program has awarded on average about twenty Ph.D. degrees per year. The great majority of our graduating students have one or more articles published or in submission by the time of their graduation, and many have started active outside collaborations before moving on to their first academic job.

In 2018, two-thirds of our Ph.D. graduates won post-doctoral research positions at competitive schools, including *UCLA, Brown University, University of Michigan (2), Northwestern University*, *University of Vienna, EPF Lausanne, Free University at Berlin*, and others.

Placements in the previous seven years include, in addition, prestigious US schools such as *Princeton University, IAS Princeton, University of Chicago, Yale University, MSRI, Cal-Tech, University of Minnesota, University of Texas, Rutgers University, Duke University,* and *Vanderbilt University*. In previous years Ph.D. graduates have also gone on to research positions at renowned international schools such as *Technion-Israel , University of Bristol,* and *University of Southampton.*

Among these recent graduates, some have already gone on to tenure track professorships at major research schools such as, for example, *SUNY Stony Brook* and *Texas A&M*.

Other graduates continue academic careers as professors in smaller, teaching-oriented colleges and universities. Each year some of our students also enter private industry careers such as in software development, finance, and R&D, and occasionally some enter government agencies such as the NSA. Still others pursue additional doctoral degrees, for example, in physics or financial mathematics.

The department typically accommodates its recent graduates who are still looking for academic jobs with lecturer positions for at least a year until they find employments that align with their career goals.

Master of Mathematical Sciences

Since 2009 the Ohio State Mathematics Department offers a Master of Mathematical Sciences (MMS) degree. The MMS is a professionally-oriented, interdisciplinary two-year master's program that includes practical experiences and thesis research in collaboration with several partnering units on the Ohio State campus. The MMS currently encompasses the following three specialization tracks:

- Mathematical Biosciences (since 2009)
- Mathematics for Educators (since 2010)
- Computational Sciences (since 2012)

More detailed information about the degree and these tracks can be found at

http://math.osu.edu/grad/current/mms

The curriculum of each degree track consists of both core courses that provide targeted mathematical background as well as a palette of elective courses in partnering disciplines to which the acquired mathematical skills are applied. Furthermore, MMS students in all tracks will be involved in individual projects or practical experiences during the summer between their first and second year. Projects are supervised by both a mathematics advisor and, typically, a faculty member from a partnering department. Results from these experiences are incorporated in a thesis that is written and defended at the end of the second year of study.

The training provided by this degree program and the tangible outcomes of its hands-on experiences have helped graduates find placements in research and development-oriented positions in industry as well as challenging opportunities in the public sector and education. A large portion of graduates have also gained admission to competitive interdisciplinary Ph.D. programs.

The program is supported both by the vast opportunities for collaboration at OSU as well as an emphasis on flexibility in the choices of applications. Students are encouraged to make their own connections with units on campus and often succeed to expand the scope of the program with new creative collaborations fitting their particular specialization track.

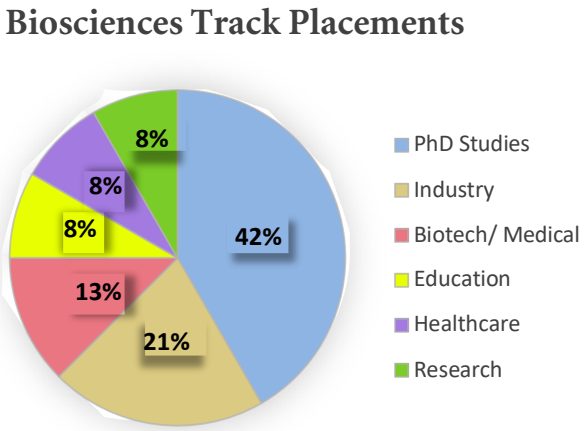
Students progressing in the MMS program receive financial support as Teaching Associates and may compete for the same university and departmental fellowships that are available to doctoral students (see previous section). The following paragraphs provide more specific information for each track.

Mathematical Biosciences

The Biosciences track, the first specialization introduced to the MMS degree, builds on a strong representation of our faculty in mathematical biology as well as the nationally renowned Mathematical Biosciences Institute (MBI). Research conducted at the MBI has led to many collaborations of our program with numerous life science departments on campus, the several research divisions of the OSU Wexner Medical Center, as well as off-campus facilities such as the Nationwide Children's Hospital or Stone Laboratory on Lake Erie.

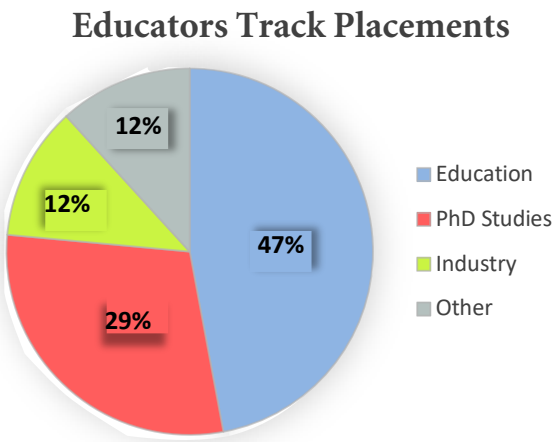
These connections provide a vast range of projects and mentors that students can choose from and the great majority of MMS projects and theses result in publications in mainstream scientific journals.

Students in this track will also participate in MBI activities such as summer research programs and colloquia. The training in this specialization aims to equip students with the skills to model problems in the life sciences in mathematical terms and solve these with analytical and numerical methods in order to explain, predict, or optimize underlying biological situations. The current emphasis is on continuous modeling, differential equations, and numerical analysis.



Prospective careers are in biomedical research and industry, employment in the public sector such as with Health and Human Services (HHS) or the Centers for Disease Control (CDC), or in education. The plurality of the graduates in this track enter PhD programs in applied and interdisciplinary mathematically-oriented fields. A more detailed break-down of placements is depicted in the chart on the right.

Mathematics for Educators



The Educators track of the MMS degree program serves current and prospective mathematics educators and collaborative users of core mathematics in both educational and industrial settings. The goal is to raise the mathematical formation of students and to enhance their ability to communicate mathematics at a level sought by public and private sector employers and advanced academic programs.

The program draws on the expertise of the Teaching & Learning department of the OSU College of Education and Human Ecology (EHE/T&L), the Mathematical Sciences Learning Center (MSLC), the department's eLearning group that was involved in the development of Massive Open Online Courses (MOOCs), as well as various other departments on campus such as Computer Science, Linguistics, Economics, and Communication. Many creative and innovative projects and theses have emerged from these activities and have provided insight into learning and cognition driven by quantitative analysis.

Emphasis in the course curriculum is placed on mathematical training with additional opportunities to participate in seminars offered by EHE/T&L. Although teacher licensure is not an objective of this degree program (as it may be for M.Ed. and MAT degrees) pathways to becoming licensed can be found in collaboration with EHE/T&L.

Career opportunities for graduates include doctoral programs in mathematics education and related fields, leadership positions in school districts, teaching faculty positions in community colleges, as well as employment in the private sector in jobs that require the communication of modern mathematics. A basic breakdown of job and academic placements of graduates from this track is illustrated in the chart above.

Computational Science

The youngest specialization in the MMS degree program takes advantage of the wide range of departments and units on campus that provide opportunities to collaborate on computational projects. Most prominently, the College of Engineering comprises eleven highly ranked departments (including Computer Science) with nearly 300 faculty. The Mathematics Department has collaborations with the College of Engineering that include, especially, the areas of computational topology, topological data analysis, and fluid dynamics. Other partnering units which may serve as sources of computational projects include the MBI, physical and mathematical sciences departments, as well as other related disciplines such as computer science and economics. Students can also gain access to the resources of the Ohio Supercomputer Center.

The curriculum of this track provides students with the mathematical tools in numerical analysis, finite element methods, and applied differential equations to tackle computational challenges in a broad range of applications. Electives for this track currently consist of a substantial list of mathematically-oriented courses offered by the College of Engineering as well as mathematics courses on computational methods. The former include subjects such as computational electromagnetics, mechanics, fluid and aerodynamics, as well as algorithms and graphics.

The track is currently under further development by a group of six computationally-oriented faculty at our department with the aim to significantly broaden the scope of electives and projects. New directions may include topological data analysis, computational geometry, computational number theory, signal processing, compressed sensing, or statistical mechanics. Students are encouraged to propose electives and research directions themselves.

The computational science track connects its students to a plethora of career paths in industry as well as government agencies with heavy computational and data analytic needs. Further, the combination of computational expertise and rigorous mathematical formation puts graduates in a strong position to enter competitive doctoral programs in applied mathematics and related fields.

Master of Actuarial and Quantitative Risk Management

The Master of Actuarial and Quantitative Risk Management (MAQRM) is a new graduate degree program which has been officially approved in March of 2016. This master's degree is based on a tremendously successful undergraduate degree program in actuarial sciences that our department has been offering for over 35 years.

The MAQRM provides a curriculum that combines training in modern mathematical finance and actuarial risk management - two areas that have become increasingly intertwined, creating a demand in graduates that have acquired expertise in both. The curriculum includes newly developed courses in risk management and financial stochastic calculus. Several of these courses will be taught by highly accomplished practitioners in the finance and actuarial science industries. In addition, students will be exposed to courses in actuarial sciences, financial economics, statistics, and numerical analysis. Sample curricula can be found at the following link:

https://math.osu.edu/grad/current/MAQRM

The program utilizes well-established connections to the statewide insurance industry, as well as other businesses involved in risk management, in order to create practical experiences and additional mentoring during the two years of study in the MAQRM. These connections will also be instrumental in job placements of graduates.

As opposed to the PhD and MMS programs, however, students in the MAQRM will not be supported by Graduate Associateships.

GRADUATE FACULTY LIST

Find below the current list of graduate faculty available for dissertation and thesis advising for all degrees. The list includes basic research interests as well as contact information. Prospective students should feel free to contact any faculty member about their research. Since most of our faculty are not directly involved in the admission process, any questions about applications should be directed by email to grad-info@math.osu.edu.

Number Theory

Cogdell, James — PhD: Yale University (1981)
COLUMBUS — cogdell.1@osu.edu — 614-292-8678
Research: *Number Theory, Analytic Number theory, L-functions - Converese Theorems.*

Hiary, Ghaith — PhD: University of Minnesota (2008)
COLUMBUS — hiary.1@osu.edu — 614-292-4013
Research: *Computational number theory, analytic number theory, random matrix models for L-functions, asymptotic analysis & interests in probability and numerical analysis.*

Holowinsky, Roman — PhD: Rutgers University (2006)
COLUMBUS — holowinsky.1@osu.edu — 614-292-3941
Research: *Number Theory: Analytic Methods, Automorphic forms, L-functions, Sieve Methods, Quantum Unique Ergodicity*

Luo, Wenzhi — PhD: Rutgers University (1993)
COLUMBUS — luo.43@osu.edu — 614-292-5751
Research: *Number Theory, Analytic and Arithmetic Theory of Automorphic Forms and Automorphic L-Functions*

Park, Jennifer — PhD: Mass. Inst. Tech. (2014)
COLUMBUS — park.2720@osu.edu — 614- 688-5773
Research: *Number Theory and Algebraic Geometry, Algebraic Curves and Arithmetic Properties, Number and Function Fields.*

Friesen, Christian — PhD: Brown University (1989)
MARION — friesen.4@osu.edu — 614-292-9133
Research: *Algebraic & Computational Number Theory: continued fractions. class groups in quadratic function fields.*

Algebraic Geometry

Anderson, David — PhD: University of Michigan (2009)
COLUMBUS — anderson.2804@osu.edu — 614-292-5754
Research: *Algebraic geometry, Combinatorics, Representation theory, Schubert varieties and toric varieties, Equivariant cohomology and its applications*

Ban, Chunsheng — PhD: Purdue University (1990)
COLUMBUS — ban.1@osu.edu — 614-292-5331
Research: *Algebraic Geometry - Singularity Theory - Mathematical Finance.*

Cueto, Maria — PhD: Univ. of California at Berkeley (2010)
COLUMBUS — cueto.5@osu.edu — 614-688-5773
Research: *Algebraic Geometry, Combinatorics, Non-Archimedean Geometry, Tropical Geometry*

Clemens, Herb — PhD: Univ. of California at Berkeley (1966)
COLUMBUS — clemens.43@osu.edu — 614-292-2789
Research: *Algebraic Geometry, Geometry and deformation theory of complex projective varieties, Hodge theory, Algebraic Cycles*

Joshua, Roy — PhD: Northwestern University (1983)
COLUMBUS — joshua.1@osu.edu — 614-292-4014
Research: *Algebraic and Arithmetic Geometry, K-Theory, Singular Varieties, Computational aspects of geometry, Quantum computation*

Katz, Eric — PhD: Stanford University (2004)
COLUMBUS — katz.60@osu.edu — 614-247-1988
Research: *Tropical Geometry, Combinatorial Algebraic Geometry, Arithmetic & Enumerative Geometry,*

Tseng, Hsian-Hua PhD: Univ. of California at Berkeley (2005)
COLUMBUS tseng.109@osu.edu 614-292-5581
Research: *Algebraic Geometry, Symplectic Topology & Geometry, Mirror Symmetry, Gromov-Witten Theory*

Caibar, Mirel PhD: University of Warwick (1999)
MANSFIELD caibar.1@osu.edu 614-688-3177
Research: *Algebraic Geometry, Singularity Theory, Hodge Theory*

Kennedy, Gary PhD: Columbia University (1981)
MANSFIELD kennedy.28@osu.edu 419-755-4291
Research: *Algebraic Geometry, Enumerative geometry, Intersection theory*

Ring & Module Theory

Herzog, Ivo PhD: University of Notre Dame (1989)
LIMA herzog.23@osu.edu 419-995-8293
Research: *Ring Theory, Module and Representation Theory, Category Theory*

Rizvi, Syed Tariq PhD: McMaster University (1981)
LIMA rizvi.1@osu.edu 419-995-8211
Research: *Theory of Rings and Modules, Injective/Projective Modules, Baer Modules and Rings, Rickart Modules, Ring and Module Hulls and their applications.*

Roman, Cosmin PhD: The Ohio State University (2004)
LIMA roman.37@osu.edu 419-995-8644
Research: *Ring Theory, Module Theory, Injectivity-Like Properties , Relations Between Modules and Their Endomorphisms Ring, Theory of Rings and Modules*

Yousif, Mohamed PhD: University of Calgary (1986)
LIMA yousif.1@osu.edu 419-995-8368
Research: *Rings and Modules, Injective and Continuous Rings and Modules, Pseudo and Quasi-Frobenius Rings*

Loper, Kenneth PhD: University of Wisconsin (1985)
NEWARK loper.4@osu.edu 740-366-3321
Research: *Commutative Rings, Nagata & Kronecker Function Rings, Prüfer-like and almost Dedekind domains*

Pure & Applied Topology & Computational Geometry

Broaddus, Nathan PhD: Columbia University (2003)
COLUMBUS broaddus.9@osu.edu 614-292-0605
Research: *Geometric Group Theory, Topology, Low-dim Topology*

Davis, Michael PhD: Princeton University (1975)
COLUMBUS davis.12@osu.edu 614-292-4886
Research: *Topology, Geometric Group Theory, Aspherical Manifolds & Spaces, Non-positive Curvature*

Dey, Tamal PhD: Purdue University – Computer Science
COLUMBUS dey.8@osu.edu 614-292-3563
Research: *Computational geometry, computational topology, geometric modeling, computer graphics, mesh generation*

Fiedorowicz, Zbigniew PhD: University of Chicago (1975)
COLUMBUS fiedorowicz.1@osu.edu 614-292-0724
Research: *Algebraic Topology, Algebraic K-theory, Homotopy theory, Quantum Groups, Category Theory*

Fowler, James PhD: University of Chicago (2009)
COLUMBUS fowler.291@osu.edu 614-292-4019
Research: *Topology, Geometric Topology of Manifolds, Geometric Group Theory, Surgery Theory, K-Theory, MOOCs*

Gogolyev, Andrey PhD: Pennsylvania State Univ (2009)
COLUMBUS gogolyev.1@osu.edu 614-292- 0348
Research: *Topology, Geometry, Dynamical Systems, Hyperbolic Dynamics*

Kerler, Thomas PhD: ETH-Zurich - Theor. Physics (1992)
COLUMBUS kerler.2@osu.edu 614-292-5252
Research: *Topology, 3-dim Manifolds and Knots Invariants, Topological Quantum Field Theories, Mapping Class Groups, Quantum Algebra*

Krishnan, Sanjeevi PhD: University of Chicago (2006)
COLUMBUS krishnan.118@osu.edu 614-292-8434
Research: *Algebraic Topology and Applications to Optimization, Data Analysis, and dynamics.*

Lafont, Jean-Francois — PhD: University of Michigan (2002)
COLUMBUS — lafont.1@osu.edu — 614-292-5814
Research: *Topology - Differential Geometry, Geometric Group Theory - K-Theory*

Mémoli, Facundo — PhD: University of Minnesota (2005)
COLUMBUS — memoli.2@osu.edu — 614-292-5585
Research: *Shape comparison & Matching, Computational Topology, Topological data analysis, Machine learning, clustering.*

Ogle, Crichton — PhD: Brandeis University (1984)
COLUMBUS — ogle.1@osu.edu — 614-292-0836
Research: *Topology - K-Theory*

Armond, Cody — PhD: Louisiana State University (2012)
MANSFIELD — armond.2@osu.edu — 614-292-7670
Research: *Algebraic Geometry and Topology, Knot & Graph Theory*

Chmutov, Sergei — PhD: Moscow State University (1985)
MANSFIELD — chmutov.1@osu.edu — 419-755-4287
Research: *Topology, Knot Theory, Quantum Invariants*

Chrisman, Micah — PhD: Univ of Hawai'i – Manoa (2006)
MARION — chrisman.76@osu.edu — 740-725-6023
Research: *Knot Theory, Low-Dimensional Topology, Virtual knots, Finite-type Invariants, Knot Concordance, Generalized Cohomology Theories.*

Harper, John — PhD: University of Notre Dame (2008)
NEWARK — harper.903@osu.edu — 740-755-7854
Research: *Topology, Homotopy Theory, Modules over Operads, K-Theory & TQ-Homology.*

Johnson, Niles — PhD: University of Chicago (2009)
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Research: *Topology, Categorical and Computational Aspects of Algebraic Topology, Picard/Brauer theory .*

Rao, Vidhyanath — PhD: Case Western Reserve (1981)
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Research: *Topology - Homotopy Theory - K-Theory*

Yau, Donald — PhD: Massachusetts Institute of Technology
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Research: *Topology, Algebra, Hom-Lie algebras, Deformations*

Differential Geometry

Derdzinski, Andrzej — PhD: Uniwersytet Wrocławski (1976)
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Research: *Differential Geometry - Einstein Manifolds*

Guan, Bo — PhD: University of Massachusetts (1992)
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Research: *Partial Differential Equations - Geometric Analysis*

Zheng, Fangyang — PhD: Harvard University (1989)
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Research: *Differential Geometry, Kaehler and Hermitian geometry, Nonpositively Curved Manifolds, Rigidity, Submanifolds*

Stenzel, Matthew — PhD: MIT (1990)
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Research: *Differential Geometry, Several Complex Variables*

Combinatorics, Probability & Graph Theory

Falkner, Neil — PhD: University of British Columbia (1978)
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Research: *Probability Theory, Brownian Motion*

Kahle, Matthew — PhD: University of Washington (2007)
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Research: *Combinatorics, Probability Theory, Geometric Group Theory, Mathematical Physics, Topology, Topological Data Analysis*

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Research: *Combinatorics - Probability Theory - Random Matrices - Number Theory*

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Sivakoff, David — PhD: University of California, Davis (2010)
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Research: *Stochastic Processes on Large Finite Graphs, Probability Theory, Applications to Percolation Models, Particle Systems, Epidemiology, Sociology, and Genetics.*

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Research: *Graph Theory, Combinatorics*

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Research: *Stochastic Analysis, Harmonic Analysis, Quantum Probability, Wick Products.*

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Research: *Discrete Mathematics, Graph Theory, Complex Networks, Optimization.*

Real & Complex Analysis

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Research: *Analysis, Asymptotics, Borel Summability, Analyzable Functions, Applications to PDE and difference equations, Time dependent Schrödinger equation, Surreal numbers.*

Koenig, Kenneth — PhD: Princeton University (2000)
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Research: *Several Complex Variables, Szegöő & Bergman Projections, ∂--Neumann problem*

Lang, Jan — PhD: Charles University, Prague (1996)
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Research: *Analysis, Differential Equations, Harmonic Analysis, Function Spaces, Integral Inequalities, PDE - Function Theory*

McNeal, Jeffery — PhD: Purdue University (1988)
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Research: *Several Complex Variables, Bergman Projections, Cauchy-Riemann Complexes, L^2-Cohomology on Complete Manifolds, ∂--Neumann problem*

Vivas, Liz — PhD: University of Michigan (2009)
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Research: *Holomorphic Dynamical Systems, Several Complex Variables, Complex Geometry & Affine Algebraic Geometry, Monge-Ampere equations and CR manifolds.*

Logic

Carlson, Timothy — PhD: University of Minnesota (1978)
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Research: *Combinatorics, Foundations of Mathematics & Logic, Ramsey Theory, Distributed Systems, Infinitary Combinatorics, Inner Model Theory*

Miller, Chris — PhD: Univ. Illinois, Urbana-Champaign (1994)
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Research: *Logic, Model Theory, Applications to Analytic Geometry & Geometric Measure Theory*

Partial Differential Equations

Costin, Rodica — PhD: Rutgers University (1997)
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Research: *Partial Differential Equations, Difference Equations, Orthogonal Polynomials, Asymptotic Analysis*

Keyfitz, Barbara — PhD: New York University (1970)
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Research: *Partial Differential Equations, Non-Linear PDE, Hyperbolic Conservation Laws*

Kodama, Yuji — PhD: Clarkson & Nagoya University (1980)
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Research: *Differential Equations, Mathematical Physics, Integrable Systems, Nonlinear PDEs, Lie Algebras, Field Theories, Applications to Physical and Engineering Problems, Topological Questions Related To Differential Equations*

Tanveer, Saleh PhD: California Institute of Technology (1984)
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Research: *Applied Mathematics, Asymptotics, Nonlinear Free boundary problems in Fluid Mechanics and Crystal Growth, PDEs in Fluid Mechanics & Mathematical Physics, Singularity & regularity questions in PDEs*

Tian, Fei-Ran PhD: New York University (1991)
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Research: *Partial Differential Equations, Zero Dispersion & Semi-Classical Limits, Whitham Equations, Modulation of Dispersive Oscillations, Free Boundary Problems*

Tiglay, Feride PhD: University of Notre Dame (2004)
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Research: *Partial Differential Equations, Mathematical Physics, Dynamical Systems, Wave Equations & Fluid Dynamics*

Mathematical Biology & Numerical Analysis

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Research: *Applied Mathematics, Mathematical Biology, Dynamical Systems, Circadian Rhythms, Probability Theory, Stochastic Processes on Random Graphs*

Chou, Ching-Shan PhD: Brown University (2006)
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Research: *Computational & Mathematical Biology, Systems Biology of Cell Polarity, Numerical Algorithms for Hyperbolic Problems, Conservation Schemes & Laws*

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Research: *Mathematical Biology, Mathematical Modeling of Cell Polarization & Chemotaxis, Differential Equations*

Friedman, Avner PhD: Hebrew University (1956)
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Research: *PDEs, Mathematical Biology, Stochastic differential equations, Control Theory, Free Boundary Problems*

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Research: *Dynamical Systems, Bifurcation Theory, Networks, Neuroscience, Symmetry in Chaos*

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Research: *Behavioral Ecology, Coerced Cooperation, Evolution of Cooperative Behavior, Mathematical Modeling*

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Research: *Partial Differential Equations, Mathematical Biology, Evolutionary Game Theory, Free-boundary Problems.*

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Research: *Partial Differential Equations, Applications in Population Biology, Nonlinear Elliptic and Parabolic Systems*

Terman, David PhD: University of Minnesota (1980)
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Tien, Joseph PhD: Cornell University (2007)
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Xiu, Dongbin PhD: Brown University (2004)
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Research: *Mathematical Biology & Medicine, Multiscale & hybrid modeling, Computation & Analysis, Moving boundary problems, Phase behavior & Stochastic methods in Biology*

Other Applied Mathematics
Mathematical Physics

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Research: *Differential Equations, Optimal Control*

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Ergodic Theory

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Representation Theory, Operator Theory, Harmonic Analysis

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Research: *Representation Theory, Representation Theory of Real Semisimple Lie Groups, Integrable Systems*

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Research: *Representation Theory of Infinite-Dimensional Quantum Groups, Classical and Quantum Integrable Systems*

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Research: *Applied Harmonic Analysis, Mathematical Signal Processing, Compressed Sensing*

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Research: *Non-commutative Geometry and Applications to Geometry, Topology and Number Theory*

Penneys, David — PhD: Univ. California, Berkeley (2012)
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Research: *Operator algebra, von-Neuman Subfactors, Fusion and Tensor Categories, Mathematical Physics, Non-commutative Geometry.*

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