#### **CUNY GRADUATE CENTER MATH**

CUNY GRADUATE CENTER MATH REPRESENTS A PREMIER DESTINATION FOR ADVANCED MATHEMATICAL STUDIES WITHIN THE CITY UNIVERSITY OF NEW YORK SYSTEM. KNOWN FOR ITS RIGOROUS CURRICULUM, DISTINGUISHED FACULTY, AND VIBRANT RESEARCH COMMUNITY, THE CUNY GRADUATE CENTER OFFERS GRADUATE PROGRAMS THAT PREPARE STUDENTS FOR ACADEMIC, INDUSTRIAL, AND GOVERNMENTAL CAREERS IN MATHEMATICS. THIS ARTICLE EXPLORES THE STRUCTURE AND OFFERINGS OF THE GRADUATE PROGRAMS IN MATHEMATICS AT THE CUNY GRADUATE CENTER, HIGHLIGHTING KEY ASPECTS SUCH AS DEGREE OPTIONS, RESEARCH OPPORTUNITIES, FACULTY EXPERTISE, AND CAREER PATHWAYS. ADDITIONALLY, IT PROVIDES INSIGHTS INTO ADMISSIONS REQUIREMENTS, FUNDING OPTIONS, AND RESOURCES AVAILABLE TO STUDENTS. WHETHER PROSPECTIVE STUDENTS SEEK TO PURSUE A MASTER'S OR Ph.D. IN MATHEMATICS, UNDERSTANDING THE COMPREHENSIVE ENVIRONMENT AT CUNY GRADUATE CENTER MATH IS ESSENTIAL. THE FOLLOWING SECTIONS OUTLINE THE CRITICAL COMPONENTS THAT DEFINE THIS RENOWNED PROGRAM.

- OVERVIEW OF CUNY GRADUATE CENTER MATH PROGRAMS
- Admissions and Application Process
- FACULTY AND RESEARCH AREAS
- CURRICULUM AND DEGREE REQUIREMENTS
- FUNDING AND FINANCIAL SUPPORT
- STUDENT RESOURCES AND COMMUNITY
- CAREER PROSPECTS AND ALUMNI OUTCOMES

### OVERVIEW OF CUNY GRADUATE CENTER MATH PROGRAMS

THE CUNY GRADUATE CENTER MATH DEPARTMENT OFFERS ADVANCED GRADUATE EDUCATION THROUGH ITS MASTER OF ARTS (M.A.) AND DOCTOR OF PHILOSOPHY (PH.D.) PROGRAMS IN MATHEMATICS. THESE PROGRAMS ARE DESIGNED TO CULTIVATE DEEP THEORETICAL UNDERSTANDING AND PRACTICAL PROBLEM-SOLVING SKILLS IN VARIOUS FIELDS OF MATHEMATICS. THE GRADUATE CENTER'S MATH PROGRAMS EMPHASIZE A BALANCE BETWEEN PURE AND APPLIED MATHEMATICS, ENCOURAGING STUDENTS TO ENGAGE IN INTERDISCIPLINARY RESEARCH AND COLLABORATIVE PROJECTS. STUDENTS BENEFIT FROM THE GRADUATE CENTER'S URBAN LOCATION IN NEW YORK CITY, WHICH PROVIDES ACCESS TO DIVERSE ACADEMIC AND PROFESSIONAL OPPORTUNITIES.

#### **DEGREE OPTIONS**

THE PRIMARY ACADEMIC TRACKS WITHIN THE CUNY GRADUATE CENTER MATH DEPARTMENT INCLUDE:

- MASTER OF ARTS (M.A.) IN MATHEMATICS: DESIGNED FOR STUDENTS SEEKING FOUNDATIONAL GRADUATE STUDIES OR PREPARATION FOR DOCTORAL WORK.
- **DOCTOR OF PHILOSOPHY (Ph.D.) IN MATHEMATICS:** FOCUSED ON ORIGINAL RESEARCH AND ADVANCED COURSEWORK TO DEVELOP EXPERTISE AND CONTRIBUTE TO THE FIELD.

BOTH DEGREE PROGRAMS OFFER FLEXIBILITY IN COURSEWORK AND RESEARCH, ALLOWING STUDENTS TO TAILOR THEIR STUDIES TO SPECIFIC INTERESTS SUCH AS ALGEBRA, ANALYSIS, GEOMETRY, TOPOLOGY, AND APPLIED MATHEMATICS.

### ADMISSIONS AND APPLICATION PROCESS

ADMISSION TO THE CUNY GRADUATE CENTER MATH PROGRAMS IS COMPETITIVE AND REQUIRES A STRONG ACADEMIC BACKGROUND IN MATHEMATICS OR A CLOSELY RELATED DISCIPLINE. APPLICANTS MUST DEMONSTRATE READINESS FOR GRADUATE-LEVEL STUDY AND RESEARCH THROUGH PRIOR COURSEWORK, LETTERS OF RECOMMENDATION, AND STANDARDIZED TEST SCORES WHEN APPLICABLE.

# APPLICATION REQUIREMENTS

PROSPECTIVE STUDENTS MUST SUBMIT THE FOLLOWING MATERIALS AS PART OF THEIR APPLICATION:

- 1. OFFICIAL TRANSCRIPTS FROM ALL UNDERGRADUATE AND GRADUATE INSTITUTIONS ATTENDED.
- 2. LETTERS OF RECOMMENDATION, TYPICALLY FROM FACULTY FAMILIAR WITH THE APPLICANT'S MATHEMATICAL ABILITIES.
- 3. Personal statement outlining research interests, academic goals, and motivation for pursuing graduate study
- 4. GRE GENERAL TEST SCORES; THE GRE MATHEMATICS SUBJECT TEST MAY BE REQUIRED OR RECOMMENDED DEPENDING ON THE PROGRAM YEAR.
- 5. Proof of English proficiency for international applicants, such as TOEFL or IELTS scores.

APPLICATIONS ARE REVIEWED HOLISTICALLY, WITH ATTENTION TO ACADEMIC PERFORMANCE, RESEARCH POTENTIAL, AND FIT WITH FACULTY EXPERTISE.

## FACULTY AND RESEARCH AREAS

THE CUNY GRADUATE CENTER MATH DEPARTMENT BOASTS A DISTINGUISHED FACULTY ENGAGED IN DIVERSE RESEARCH DOMAINS. FACULTY MEMBERS ARE RECOGNIZED FOR THEIR CONTRIBUTIONS TO BOTH THEORETICAL AND APPLIED MATHEMATICS, OFFERING STUDENTS MENTORSHIP AND COLLABORATION OPPORTUNITIES ACROSS MULTIPLE SPECIALTIES.

#### KEY RESEARCH FIELDS

RESEARCH AT THE GRADUATE CENTER COVERS A BROAD RANGE OF MATHEMATICAL DISCIPLINES, INCLUDING BUT NOT LIMITED TO:

- ALGEBRA AND NUMBER THEORY
- ANALYSIS AND PARTIAL DIFFERENTIAL EQUATIONS
- GEOMETRY AND TOPOLOGY
- PROBABILITY AND STOCHASTIC PROCESSES
- MATHEMATICAL PHYSICS
- APPLIED AND COMPUTATIONAL MATHEMATICS

FACULTY RESEARCH OFTEN INTERSECTS WITH OTHER SCIENTIFIC AREAS, PROMOTING INTERDISCIPLINARY STUDIES THAT ENHANCE THE SCOPE AND IMPACT OF MATHEMATICAL INQUIRY.

# CURRICULUM AND DEGREE REQUIREMENTS

THE CURRICULUM FOR CUNY GRADUATE CENTER MATH PROGRAMS IS STRUCTURED TO PROVIDE RIGOROUS TRAINING IN ADVANCED MATHEMATICAL THEORY AND RESEARCH METHODOLOGIES. DEGREE REQUIREMENTS VARY BETWEEN THE M.A. AND Ph.D. PROGRAMS BUT GENERALLY INCLUDE CORE COURSEWORK, QUALIFYING EXAMINATIONS, AND A RESEARCH DISSERTATION FOR DOCTORAL CANDIDATES.

#### COURSEWORK AND EXAMINATIONS

STUDENTS TYPICALLY COMPLETE A SET OF CORE COURSES THAT COVER FUNDAMENTAL AREAS SUCH AS REAL ANALYSIS, ABSTRACT ALGEBRA, AND TOPOLOGY. BEYOND THE CORE, STUDENTS SELECT ELECTIVES ALIGNED WITH THEIR RESEARCH INTERESTS. QUALIFYING EXAMS ASSESS STUDENTS' MASTERY OF ESSENTIAL TOPICS AND READINESS TO UNDERTAKE INDEPENDENT RESEARCH.

### RESEARCH AND DISSERTATION

Ph.D. candidates engage in original research under faculty supervision, culminating in a dissertation that contributes new knowledge to the field of mathematics. The process includes proposal development, comprehensive examinations, and final defense before a committee of experts.

### FUNDING AND FINANCIAL SUPPORT

FINANCIAL AID IS A CRITICAL COMPONENT OF GRADUATE EDUCATION AT THE CUNY GRADUATE CENTER MATH DEPARTMENT. VARIOUS FUNDING MECHANISMS ARE AVAILABLE TO SUPPORT STUDENTS THROUGHOUT THEIR STUDIES.

#### TYPES OF FUNDING

- FELLOWSHIPS: MERIT-BASED AWARDS THAT PROVIDE STIPENDS AND TUITION COVERAGE.
- RESEARCH ASSISTANTSHIPS: Positions assisting faculty with research projects, offering financial support and professional experience.
- TEACHING ASSISTANTSHIPS: OPPORTUNITIES TO GAIN TEACHING EXPERIENCE WHILE RECEIVING STIPENDS AND TUITION REMISSION.
- EXTERNAL SCHOLARSHIPS AND GRANTS: ASSISTANCE IN APPLYING FOR EXTERNAL FUNDING SOURCES RELEVANT TO MATHEMATICS GRADUATE STUDENTS.

SECURING FUNDING ENHANCES THE GRADUATE EXPERIENCE BY ALLOWING STUDENTS TO FOCUS ON THEIR ACADEMIC AND RESEARCH PURSUITS.

# STUDENT RESOURCES AND COMMUNITY

THE GRADUATE CENTER FOSTERS A SUPPORTIVE ACADEMIC COMMUNITY FOR MATHEMATICS STUDENTS THROUGH VARIOUS RESOURCES AND OPPORTUNITIES FOR ENGAGEMENT. THESE RESOURCES AIM TO ENRICH THE GRADUATE EXPERIENCE AND FACILITATE PROFESSIONAL DEVELOPMENT.

#### ACADEMIC AND PROFESSIONAL SUPPORT

- ACCESS TO EXTENSIVE LIBRARY COLLECTIONS AND ONLINE MATHEMATICAL DATABASES.
- SEMINARS, COLLOQUIA, AND WORKSHOPS FEATURING INTERNAL AND EXTERNAL EXPERTS.
- COLLABORATIVE STUDY GROUPS AND STUDENT ORGANIZATIONS FOCUSED ON MATHEMATICS.
- CAREER SERVICES INCLUDING RESUME WORKSHOPS, NETWORKING EVENTS, AND JOB PLACEMENT ASSISTANCE.

THESE RESOURCES CONTRIBUTE TO A DYNAMIC ENVIRONMENT WHERE STUDENTS CAN THRIVE ACADEMICALLY AND PROFESSIONALLY.

### CAREER PROSPECTS AND ALUMNI OUTCOMES

GRADUATES OF THE CUNY GRADUATE CENTER MATH PROGRAMS PURSUE DIVERSE CAREER PATHS IN ACADEMIA, INDUSTRY, GOVERNMENT, AND BEYOND. THE PROGRAM'S RIGOROUS TRAINING EQUIPS STUDENTS WITH ANALYTICAL SKILLS AND EXPERTISE SOUGHT AFTER IN MULTIPLE SECTORS.

## COMMON CAREER TRAJECTORIES

- ACADEMIC POSITIONS SUCH AS POSTDOCTORAL RESEARCHERS, LECTURERS, AND PROFESSORS.
- RESEARCH ROLES IN GOVERNMENT AGENCIES AND NATIONAL LABORATORIES.
- APPLIED MATHEMATICS AND DATA SCIENCE POSITIONS IN TECHNOLOGY, FINANCE, AND CONSULTING INDUSTRIES.
- FURTHER INTERDISCIPLINARY RESEARCH INVOLVING COMPUTATIONAL SCIENCE, ENGINEERING, AND PHYSICS.

THE SUCCESS OF ALUMNI REFLECTS THE STRENGTH OF THE CUNY GRADUATE CENTER'S MATH PROGRAMS IN PREPARING STUDENTS FOR IMPACTFUL CAREERS.

# FREQUENTLY ASKED QUESTIONS

### WHAT GRADUATE MATH PROGRAMS ARE OFFERED AT THE CUNY GRADUATE CENTER?

THE CUNY GRADUATE CENTER OFFERS A PHD PROGRAM IN MATHEMATICS, FOCUSING ON RESEARCH AREAS SUCH AS ALGEBRA, ANALYSIS, GEOMETRY, TOPOLOGY, AND APPLIED MATHEMATICS.

#### HOW CAN I APPLY TO THE CUNY GRADUATE CENTER MATH PHD PROGRAM?

TO APPLY, YOU NEED TO SUBMIT AN ONLINE APPLICATION THROUGH THE CUNY GRADUATE CENTER WEBSITE, INCLUDING TRANSCRIPTS, LETTERS OF RECOMMENDATION, A STATEMENT OF PURPOSE, AND GRE SCORES IF REQUIRED.

# WHAT RESEARCH OPPORTUNITIES ARE AVAILABLE FOR MATH GRADUATE STUDENTS AT CUNY GRADUATE CENTER?

MATH GRADUATE STUDENTS AT THE CUNY GRADUATE CENTER HAVE OPPORTUNITIES TO WORK WITH FACULTY ON RESEARCH

# ARE THERE TEACHING ASSISTANTSHIPS AVAILABLE FOR MATH GRADUATE STUDENTS AT CUNY GRADUATE CENTER?

YES, MANY MATH GRADUATE STUDENTS AT THE CUNY GRADUATE CENTER RECEIVE TEACHING ASSISTANTSHIPS, WHICH PROVIDE STIPENDS AND VALUABLE TEACHING EXPERIENCE.

# WHAT IS THE TYPICAL DURATION OF THE MATH PHD PROGRAM AT THE CUNY GRADUATE CENTER?

THE TYPICAL DURATION OF THE MATH PHD PROGRAM IS ABOUT 5 TO 6 YEARS, DEPENDING ON THE STUDENT'S RESEARCH PROGRESS AND DISSERTATION COMPLETION.

# DOES THE CUNY GRADUATE CENTER OFFER FUNDING OR FELLOWSHIPS FOR MATH GRADUATE STUDENTS?

THE CUNY GRADUATE CENTER OFFERS VARIOUS FUNDING OPTIONS, INCLUDING FELLOWSHIPS, TEACHING ASSISTANTSHIPS, AND RESEARCH ASSISTANTSHIPS TO SUPPORT MATH GRADUATE STUDENTS FINANCIALLY.

# WHAT KIND OF CAREER SUPPORT DOES THE CUNY GRADUATE CENTER PROVIDE FOR MATH GRADUATE STUDENTS?

THE GRADUATE CENTER PROVIDES CAREER SERVICES SUCH AS JOB PLACEMENT ASSISTANCE, WORKSHOPS, NETWORKING EVENTS, AND GUIDANCE FOR ACADEMIC AND INDUSTRY CAREERS IN MATHEMATICS.

# CAN MATH GRADUATE STUDENTS AT CUNY GRADUATE CENTER COLLABORATE WITH OTHER DEPARTMENTS OR INSTITUTIONS?

YES, MATH GRADUATE STUDENTS OFTEN COLLABORATE ACROSS DEPARTMENTS WITHIN CUNY AND WITH EXTERNAL INSTITUTIONS, ENHANCING INTERDISCIPLINARY RESEARCH AND PROFESSIONAL DEVELOPMENT.

# ADDITIONAL RESOURCES

- 1. REAL ANALYSIS: MEASURE THEORY, INTEGRATION, AND HILBERT SPACES
- This book offers a comprehensive introduction to real analysis with a focus on measure theory and integration. It bridges the gap between undergraduate calculus and advanced graduate-level analysis. The text also introduces Hilbert spaces, providing foundational knowledge crucial for functional analysis and related fields.
- 2. ALGEBRAIC TOPOLOGY: AN INTRODUCTION TO CUNY GRADUATE CENTER MATHEMATICS

  DESIGNED FOR GRADUATE STUDENTS, THIS BOOK COVERS FUNDAMENTAL CONCEPTS OF ALGEBRAIC TOPOLOGY INCLUDING HOMOTOPY, HOMOLOGY, AND COHOMOLOGY THEORIES. IT EMPHASIZES APPLICATIONS RELEVANT TO CURRENT RESEARCH TRENDS AT THE CUNY GRADUATE CENTER. THE CLEAR EXPOSITION HELPS READERS DEVELOP INTUITION FOR TOPOLOGICAL INVARIANTS AND THEIR ALGEBRAIC COUNTERPARTS.
- 3. Advanced Probability Theory for Graduate Mathematics
  This text delves into probability theory with a rigorous measure-theoretic approach suitable for graduate studies. Topics include martingales, stochastic processes, and limit theorems. The book is aligned with the research interests and course offerings at the CUNY Graduate Center, providing a solid foundation for further study in stochastic analysis.
- 4. PARTIAL DIFFERENTIAL EQUATIONS: THEORY AND APPLICATIONS

FOCUSING ON THE THEORY AND METHODS FOR SOLVING PARTIAL DIFFERENTIAL EQUATIONS, THIS BOOK IS IDEAL FOR GRADUATE STUDENTS IN MATHEMATICS AND APPLIED SCIENCES. IT COVERS CLASSICAL AND MODERN TECHNIQUES, INCLUDING WEAK SOLUTIONS AND SOBOLEV SPACES. THE EXAMPLES AND EXERCISES REFLECT PROBLEMS STUDIED AT THE CUNY GRADUATE CENTER, PROMOTING BOTH UNDERSTANDING AND APPLICATION.

#### 5. FUNCTIONAL ANALYSIS AND OPERATOR THEORY

A THOROUGH INTRODUCTION TO FUNCTIONAL ANALYSIS, THIS BOOK EXPLORES BANACH AND HILBERT SPACES, LINEAR OPERATORS, AND SPECTRAL THEORY. EMPHASIZING THE INTERPLAY BETWEEN THEORY AND APPLICATIONS, IT PREPARES STUDENTS FOR RESEARCH IN ANALYSIS AND MATHEMATICAL PHYSICS. THE TEXT ALIGNS WITH THE CURRICULUM AND RESEARCH FOCUS AREAS AT THE CUNY GRADUATE CENTER.

#### 6. NUMBER THEORY AND ARITHMETIC GEOMETRY

This volume provides an in-depth study of modern number theory, including prime distributions, modular forms, and elliptic curves. It also introduces arithmetic geometry concepts relevant for advanced research. The content is tailored to graduate students and researchers affiliated with the CUNY Graduate Center's mathematics program.

#### 7. MATHEMATICAL LOGIC AND FOUNDATIONS

COVERING SET THEORY, MODEL THEORY, AND COMPUTABILITY, THIS BOOK IS A FOUNDATIONAL RESOURCE FOR GRADUATE STUDENTS IN MATHEMATICAL LOGIC. IT ADDRESSES BOTH CLASSICAL TOPICS AND RECENT DEVELOPMENTS IN THE FIELD. THE TEXT SUPPORTS THE RIGOROUS TRAINING OFFERED AT THE CUNY GRADUATE CENTER, FOSTERING CRITICAL THINKING AND FORMAL REASONING SKILLS.

#### 8. COMPLEX ANALYSIS AND RIEMANN SURFACES

THIS BOOK EXPLORES COMPLEX FUNCTION THEORY WITH AN EMPHASIS ON RIEMANN SURFACES AND CONFORMAL MAPPINGS. IT COMBINES THEORETICAL RIGOR WITH GEOMETRIC INTUITION, SUITABLE FOR ADVANCED GRADUATE COURSES. THE MATERIAL COMPLEMENTS THE RESEARCH THEMES PURSUED BY THE CUNY GRADUATE CENTER'S MATHEMATICS COMMUNITY.

#### 9. COMBINATORICS AND GRAPH THEORY

FOCUSING ON COMBINATORIAL METHODS AND GRAPH THEORETICAL CONCEPTS, THIS BOOK SERVES AS A PRACTICAL GUIDE FOR GRADUATE STUDENTS. TOPICS INCLUDE ENUMERATION, CONNECTIVITY, AND GRAPH ALGORITHMS. THE TEXT IS DESIGNED TO SUPPORT COURSEWORK AND RESEARCH AT THE CUNY GRADUATE CENTER, HIGHLIGHTING APPLICATIONS ACROSS MATHEMATICS AND COMPUTER SCIENCE.

# **Cuny Graduate Center Math**

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cuny graduate center math: Foundations of Mathematics Andrés Eduardo Caicedo, James Cummings, Peter Koellner, Paul B. Larson, 2017-05-12 This volume contains the proceedings of the Logic at Harvard conference in honor of W. Hugh Woodin's 60th birthday, held March 27-29, 2015, at Harvard University. It presents a collection of papers related to the work of Woodin, who has been one of the leading figures in set theory since the early 1980s. The topics cover many of the areas central to Woodin's work, including large cardinals, determinacy, descriptive set theory and the continuum problem, as well as connections between set theory and Banach spaces, recursion theory, and philosophy, each reflecting a period of Woodin's career. Other topics covered are forcing axioms, inner model theory, the partition calculus, and the theory of ultrafilters. This volume should make a suitable introduction to Woodin's work and the concerns which motivate it. The papers

should be of interest to graduate students and researchers in both mathematics and philosophy of mathematics, particularly in set theory, foundations and related areas.

cuny graduate center math: The Creative Enterprise of Mathematics Teaching Research Bronislaw Czarnocha, William Baker, Olen Dias, Vrunda Prabhu, 2016-07-28 The Creative Enterprise of Mathematics Teaching Research presents the results and methodology of work of the teaching-research community of practice of the Bronx (TR Team of the Bronx). It has a twofold aim of impacting both teachers of Mathematics and researchers in Mathematics Education. This volume can be used by teachers of mathematics who want to use research to reflect upon and to improve their teaching craft, as well as by researchers who are interested in uncovering riches of classroom learning/teaching for research investigations. This book represents the results of a collaboration of instructors discussing their own instruction research, analyzed through a conceptual framework obtained via the synthesis of creativity research and educational learning theories, based upon the work of Piaget and Vygotsky. The editors see an urgent need for creative synthesis of research and teaching, an example of which is presented in the book. Two central themes of the book are the methodology of TR/NYCity model and creativity, more precisely, creativity of the Aha moment formulated by Arthur Koestler (1964) in a very profound but little known theory of bisociation exposed in his work "The Act of Creation". Incorporation of the theory of bisociation into classroom teaching of mathematics provides the key to enable students who may struggle with mathematics to engage their own creativity, become involved in their learning process and thus reach their full potential of excellence. Creativity in teaching remedial mathematics is teaching gifted students how to access their own giftedness.

cuny graduate center math: Real and Complex Dynamical Systems B. Branner, Poul Hjorth, 2013-03-14 This volume contains edited versions of 11 contributions given by main speakers at the NATO Advanced Study Institute on IReal and Complex Dynamical Systems in Hiller0d, Denmark, June 20th - July 2nd, 1993. The vision of the institute was to illustrate the interplay between two important fields of Mathematics: Real Dynamical Systems and Complex Dynamical Systems. The interaction between these two fields has been growing over the years. Problems in Real Dynamical Systems have recently been solved using complex tools in the real or by extension to the complex. In return, problems in Complex Dynamical Systems have been settled using results from Real Dynamical Systems. The programme of the institute was to examine the state of the art of central parts of both Real and Complex Dynamical Systems, to reinforce contact between the two aspects of the theory and to make recent progress in each accessible to a larger group of mathematicians.

cuny graduate center math: Higher Genus Curves in Mathematical Physics and Arithmetic Geometry Andreas Malmendier, Tony Shaska, 2018-04-03 This volume contains the proceedings of the AMS Special Session on Higher Genus Curves and Fibrations in Mathematical Physics and Arithmetic Geometry, held on January 8, 2016, in Seattle, Washington. Algebraic curves and their fibrations have played a major role in both mathematical physics and arithmetic geometry. This volume focuses on the role of higher genus curves; in particular, hyperelliptic and superelliptic curves in algebraic geometry and mathematical physics. The articles in this volume investigate the automorphism groups of curves and superelliptic curves and results regarding integral points on curves and their applications in mirror symmetry. Moreover, geometric subjects are addressed, such as elliptic 3 surfaces over the rationals, the birational type of Hurwitz spaces, and links between projective geometry and abelian functions.

cuny graduate center math: Low-dimensional and Symplectic Topology Michael Usher, 2011 Every eight years since 1961, the University of Georgia has hosted a major international topology conference aimed at disseminating important recent results and bringing together researchers at different stages of their careers. This volume contains the proceedings of the 2009 conference, which includes survey and research articles concerning such areas as knot theory, contact and symplectic topology, 3-manifold theory, geometric group theory, and equivariant topology. Among other highlights of the volume, a survey article by Stefan Friedl and Stefano

Vidussi provides an accessible treatment of their important proof of Taubes' conjecture on symplectic structures on the product of a 3-manifold and a circle, and an intriguing short article by Dennis Sullivan opens the door to the use of modern algebraic-topological techniques in the study of finite-dimensional models of famously difficult problems in fluid dynamics. Continuing what has become a tradition, this volume contains a report on a problem session held at the conference, discussing a variety of open problems in geometric topology.

cuny graduate center math: Frontiers in Complex Dynamics Araceli Bonifant, Misha Lyubich, Scott Sutherland, 2014-03-16 John Milnor, best known for his work in differential topology, K-theory, and dynamical systems, is one of only three mathematicians to have won the Fields medal, the Abel prize, and the Wolf prize, and is the only one to have received all three of the Leroy P. Steele prizes. In honor of his eightieth birthday, this book gathers together surveys and papers inspired by Milnor's work, from distinguished experts examining not only holomorphic dynamics in one and several variables, but also differential geometry, entropy theory, and combinatorial group theory. The book contains the last paper written by William Thurston, as well as a short paper by John Milnor himself. Introductory sections put the papers in mathematical and historical perspective, color figures are included, and an index facilitates browsing. This collection will be useful to students and researchers for decades to come. The contributors are Marco Abate, Marco Arizzi, Alexander Blokh, Thierry Bousch, Xavier Buff, Serge Cantat, Tao Chen, Robert Devaney, Alexandre Dezotti, Tien-Cuong Dinh, Romain Dujardin, Hugo García-Compeán, William Goldman, Rotislav Grigorchuk, John Hubbard, Yunping Jiang, Linda Keen, Jan Kiwi, Genadi Levin, Daniel Meyer, John Milnor, Carlos Moreira, Vincente Muñoz, Viet-Anh Nguyên, Lex Oversteegen, Ricardo Pérez-Marco, Ross Ptacek, Jasmin Raissy, Pascale Roesch, Roberto Santos-Silva, Dierk Schleicher, Nessim Sibony, Daniel Smania, Tan Lei, William Thurston, Vladlen Timorin, Sebastian van Strien, and Alberto Verjovsky.

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**cuny graduate center math:** Algebraic Topology Nils Baas, Eric Friedlander, Björn Jahren, Paul Arne Østvær, 2009-08-05 The 2007 Abel Symposium took place at the University of Oslo in August 2007. The goal of the symposium was to bring together mathematicians whose research efforts have led to recent advances in algebraic geometry, algebraic K-theory, algebraic topology, and mathematical physics. A common theme of this symposium was the development of new perspectives and new constructions with a categorical flavor. As the lectures at the symposium and the papers of this volume demonstrate, these perspectives and constructions have enabled a broadening of vistas, a synergy between once-differentiated subjects, and solutions to mathematical

problems both old and new.

cuny graduate center math: Mathematical Aspects of Computer and Information Sciences Ilias S. Kotsireas, Siegfried M. Rump, Chee K. Yap, 2016-04-16 This book constitutes the thoroughly refereed post-conference proceedings of the 6th International Conference on Mathematical Aspects of Computer and Information Sciences, MACIS 2015, held in Berlin, Germany, in November 2015. The 48 revised papers presented together with 7 invited papers were carefully reviewed and selected from numerous submissions. The papers are grouped in topical sections on curves and surfaces, applied algebraic geometry, cryptography, verified numerical computation, polynomial system solving, managing massive data, computational theory of differential and difference equations, data and knowledge exploration, algorithm engineering in geometric computing, real complexity: theory and practice, global optimization, and general session.

cuny graduate center math: Complex Geometry of Groups Angel Carocca, 1999 This volume presents the proceedings of the I Iberoamerican Congress on Geometry: Cruz del Sur held in Olmué, Chile. The main topic was The Geometry of Groups: Curves, Abelian Varieties, Theoretical and Computational Aspects. Participants came from all over the world. The volume gathers the expanded contributions from most of the participants in the Congress. Articles reflect the topic in its diversity and unity, and in particular, the work done on the subject by Iberoamerican mathematicians. Original results and surveys are included on the following areas: curves and Riemann surfaces, abelian varieties, and complex dynamics. The approaches are varied, including Kleinian groups, quasiconformal mappings and Teichmüller spaces, function theory, moduli spaces, automorphism groups, merican algebraic geometry, and more.

cuny graduate center math: Pedagogical Content Knowledge in STEM Stephen Miles Uzzo, Sherryl Browne Graves, Erin Shay, Marisa Harford, Robert Thompson, 2018-10-25 This volume represents both recent research in pedagogical content knowledge (PCK) in science, technology, engineering and math (STEM), as well as emerging innovations in how PCK is applied in practice. The notion of "research to practice" is critical to validating how effectively PCK works within the clinic and how it can be used to improve STEM learning. As the need for more effective educational approaches in STEM grows, the importance of developing, identifying, and validating effective practices and practitioner competencies are needed. This book covers a wide range of topics in PCK in different school levels (middle school, college teacher training, teacher professional development), and different environments (museums, rural). The contributors believe that vital to successful STEM education practice is recognition that STEM domains require both specialized domain knowledge as well as specialized pedagogical approaches. The authors of this work were chosen because of their extensive fieldwork in PCK research and practice, making this volume valuable to furthering how PCK is used to enlighten the understanding of learning, as well as providing practical instruction. This text helps STEM practitioners, researchers, and decision-makers further their interest in more effective STEM education practice, and raises new questions about STEM learning.

cuny graduate center math: Combinatorial and Additive Number Theory III Melvyn B. Nathanson, 2019-12-10 Based on talks from the 2017 and 2018 Combinatorial and Additive Number Theory (CANT) workshops at the City University of New York, these proceedings offer 17 peer-reviewed and edited papers on current topics in number theory. Held every year since 2003, the workshop series surveys state-of-the-art open problems in combinatorial and additive number theory and related parts of mathematics. Topics featured in this volume include sumsets, partitions, convex polytopes and discrete geometry, Ramsey theory, commutative algebra and discrete geometry, and applications of logic and nonstandard analysis to number theory. Each contribution is dedicated to a specific topic that reflects the latest results by experts in the field. This selection of articles will be of relevance to both researchers and graduate students interested in current progress in number theory.

**cuny graduate center math:** <u>Aspects of Infinite Groups</u> Benjamin Fine, 2008 This book is a festschrift in honor of Professor Anthony Gaglione's sixtieth birthday. This volume presents an

excellent mix of research and expository articles on various aspects of infinite group theory. The papers give a broad overview of present research in infinite group theory in general, and combinatorial group theory and non-Abelian group-based cryptography in particular. They also pinpoint the interactions between combinatorial group theory and mathematical logic, especially model theory.

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