

**UNIVERSITY OF WYOMING
DEPARTMENT OF MATHEMATICS & STATISTICS
GRADUATE PROGRAMS
2017-18**



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Part A. Graduate Programs, Setting, and Admissions

1. Overview

The Department of Mathematics & Statistics at the University of Wyoming (UW) is a collection of friendly, easygoing people dedicated to excellence in the mathematical and statistical sciences. Our faculty combine a passion for teaching with a deep commitment to research of the highest quality. The department takes great pride in the preparation its students receive for successful careers in the mathematical sciences; our graduates have prospered in a variety of academic, governmental, and industrial positions. Active research areas in the department include algebraic combinatorics; applied statistics; polyhedral and finite geometry; biological and geophysical modeling; complex analysis; linear algebra; mathematical and computational fluid mechanics; nonlinear partial differential equations; operator theory; numerical analysis; and stochastic analysis.

The department offers PhD and MS & MA degrees in mathematics and MS degrees in statistics. Our graduate program is designed to be flexible enough to meet students' individual interests while maintaining enough structure to guarantee graduate degrees of high quality. The math degrees and their requirements reflect our belief that mathematicians should have a solid foundation in core areas of algebra, analysis, and applied mathematics, as well as the experience of a more intensive investigation and discovery in a specialization. The statistics MS program offers an applied track aimed at preparing students for diverse career opportunities and a statistics track that is designed to prepare students for further study and PhD programs in statistics. All of our degree programs feature intimate classes and lots of interaction with faculty. Virtually all of our graduate students are supported by teaching assistantships or research assistantships.

Think UW might be right for you? Contact us and tell us about yourself!Email gauss@uwyo.edu

Phone 307-766-4221

Web www.uwyo.edu/math

2. Laramie and the University of Wyoming

Nestled between two mountain ranges in southeastern Wyoming, UW offers varied academic and lifestyle opportunities including year-round cultural and recreational activities. UW is located in Laramie, a town of just more than 30,000 people with a unique blend of sophistication and western hospitality.

2.1. **About Laramie.** Laramie is located 49 miles from the state capital of Cheyenne and 130 miles from Denver, Colorado. Laramie sits 7,200 feet above sea level on the eastern edge of a large plateau called the Laramie Plains. UW students and visitors enjoy both a special blend of Laramie's western hospitality and the comfortable sophistication that comes from the influence of a major university.

USEFUL LINKS

City of Laramie: www.ci.laramie.wy.usChamber of Commerce: www.laramie.org

Albany County Tourism Board: www.visitlaramie.org

2.2. **About UW.** UW is Wyoming's only provider of baccalaureate and graduate education, research, and outreach services. UW combines major-university benefits and small-school advantages, with more than 180 programs of study, an outstanding faculty, and world-class research facilities all set against the idyllic backdrop of southeastern Wyoming's rugged mountains and high plains. UW draws over 13,500 students from all 50 states and more than 90 countries.

USEFUL LINKS

University of Wyoming: www.uwyo.edu

Campus Map & Tour: www.uwyo.edu/uw/tour

UW Visitors Page: www.uwyo.edu/uw/aboutuw/

3. The Mathematics & Statistics Department

Although the numbers vary somewhat from year to year, the department is home to 25 research faculty, 7 permanent lecturers, 1-2 post-docs, and 32–40 graduate students. Frequent short- and long-term visitors from other departments enliven the intellectual life of the department, and a handful of part-time and adjunct faculty also contribute to our teaching mission. The department is housed in Ross Hall, at the center of the Laramie campus of UW.

3.1. **Recognition & Support.** In recent years, a number of our faculty have earned recognition for their research and educational activities. National and international recognitions include the *Israel Halperin Award* (Canadian Operator Theory Symposium, 2015), a prestigious *von Neumann Fellowship* (Institute for Advanced Study, 2014–15), a highly competitive *CAREER Award* (National Science Foundation, 2009–14), a *New Directions Professorship* (Institute for Mathematics and its Applications, 2008–9), and a *Centennial Fellowship* (American Mathematical Society, 2000). In addition, the UW math & stats department boasts three winners (1994, 2005, 2007) of the *Burton Jones Award for Distinguished Teaching of College and University Mathematics* awarded annually by the Mathematical Association of America—Rocky Mountain Section. At UW, the math & stats department is home to multiple recipients (four winners since 1998) of the *George Duke Humphrey Award*—UW's highest award for faculty: in addition to acclaim as a teacher, winners must have achieved distinction as a scholar and have given distinguished service to the university. In addition, **seven** winners of UW's *Ellbogen Award for Meritorious Classroom Teaching*—the university's most prestigious teaching award—currently call UW Math & Stats home. UW Math & Stats also currently claims **two** winners of UW's *Ellbogen Lifetime Teaching Award* recognizing “the long, distinguished and exemplary career of one senior faculty member who has excelled as a teacher at the University of Wyoming.” Our various research, education, and outreach activities have been supported by the US National Science Foundation (NSF), the US Department of Energy (DoE), the National Aeronautics and Space Administration (NASA), the Air Force Office of Scientific Research (AFOSR), the Simons Foundation, the National Security Agency (NSA), and the UW School of Energy Resources.

3.2. **Research Centers & Affiliations.** One of the distinctive strengths of the UW math & stats department is its broad portfolio of interdisciplinary research. Our faculty have active and ongoing research collaborations with UW faculty in Electrical & Computer Engineering, Zoology & Physiology, Mechanical Engineering, Geology & Geophysics, Computer Science, and Civil Engineering, to name a few. Reflecting these collaborations, the UW math department has an diverse array of research connections across campus, in the Rocky Mountain region, and across the nation and world.

School of Energy Resources: UW has a long history of excellence in energy-related research, and the School of Energy Resources (SER)—formed in 2006—serves as an organizing center for UW's activities in energy-related education, research and outreach. SER directs and integrates cutting-edge energy research and academic programs at UW and bridges academics and industry through targeted outreach programs. Mathematics is an integral part of the SER program; one of our professors is an *SER Professor* and a number of other faculty have research interests that connect with SER initiatives.

Program in Ecology: UW's Program in Ecology (PiE), is an interdisciplinary graduate program that draws faculty from a number of colleges. The research interests of participating faculty span a broad range of organisms, environments, analytical tools, and spatial and temporal scales; this research includes mathematical modeling and analysis. One of the math department's professors is on the PiE faculty.

Rocky Mountain Mathematics Consortium: UW is a long-standing member of the *Rocky Mountain Mathematics Consortium* (RMMC), a confederation of universities in the mountain west region of the United States. The RMMC publishes the well-known *Rocky Mountain Mathematics Journal*, as well as the *Journal of Integral Equations and Applications* and the *Journal of Commutative Algebra*. In addition, an enduring tradition of this organization is an annual graduate-level summer school program at UW. These summer schools bring renowned mathematicians from around the world to Laramie and attract graduate students from across the western United States and beyond. Recent summer schools have focused on the following mathematical topics.

- *Functional Analytic and Statistical Methods in Error Prediction with Applications* (2016),
- *The Structure of C^* -algebras* (2015),
- *Stochastic Equations for Complex Systems: Theory & Applications* (2014),
- *Algebraic Graph Theory* (2013), and
- *Mathematical Modeling in Ecology & Epidemiology* (2012).

FRAMEWORK: With the Department of Applied Mathematics & Statistics at the Colorado School of Mines in Golden, Colorado, UW Math & Stats is a partner in the *Front Range Applied Mathematics Exchanges & Workshops* (FRAMEWORK) program. This NSF-funded program aims to broaden the education of doctoral students in the mathematical sciences. In addition to course exchange programs, FRAMEWORK provides a number of internship opportunities for students to explore the applications and uses of the mathematical sciences in non-academic settings.

National Center for Atmospheric Research: UW is a member of the University Corporation for Atmospheric Research, a nonprofit consortium of more than 75 universities offering PhDs in the atmospheric and related sciences. UCAR manages the National Center for Atmospheric Research (NCAR), headquartered in nearby Boulder, Colorado. NCAR is the nation's premier center for research in meteorology, climate science, atmospheric chemistry, solar-terrestrial interactions, environmental and related societal impacts. UW Math has a strong connection to NCAR through its *Institute for Mathematics Applied to Geosciences* (IMAGE) and the recent development of the NCAR-Wyoming supercomputer center in Cheyenne, Wyoming.

Institute for Mathematics and its Applications: The *Institute for Mathematics and its Applications* (IMA) is a research institute funded by the National Science Foundation; the institute sponsors a variety of thematic programs, conferences, short courses, and “hot topics” workshops. The IMA is physically located on the campus of the University of Minnesota in Minneapolis, Minnesota. UW is an *IMA Participating Institution*, and this means that UW graduate students have special funding and access opportunities for IMA programs, either in Minneapolis or on the campuses of other participating institutions.

AMS, MAA, SIAM, AWM, ASA: The math & stat department at UW is an institutional member of the American Mathematical Society, the Society for Industrial and Applied Mathematics, the Mathematical Association of America, the Association for Women in Mathematics, and the American Statistical Association. UW Math hosted a regional MAA conference in Laramie in the spring of 2014.

3.3. **Facilities.** The math & stats department is located in Ross Hall (a one-time women's dormitory named for the first female governor in United States) in the center of UW's main Laramie campus. Graduate students typically share offices in Ross Hall, and most of these offices are intermingled with the faculty offices. Ross Hall houses a lounge, a classroom, two seminar rooms, a conference room, and computational classroom all reserved solely for department use. In addition, Ross Hall houses UW's math tutoring center (the *Math Assistance Center*) for undergraduates, and the university runs a recently refurbished food court (coffee shop, deli, salad bar, taco stand) on the ground level. UW libraries provide world-class library resources to faculty and students in the department; virtually all journals are accessible online, the library will electronically deliver scans of older articles through their “Request it” service. Rare items not on the UW campus may be obtained quickly through the interlibrary loan program and/or the prospector network—a coalition of libraries across the front range of Colorado and Wyoming. High power computational facilities are available on campus through *Mount Moran* (an approximately 90 TFLOPS high performance cluster for modeling, data analysis and data-mover nodes, a shared pool of 350TB of network attached high performance disks), housed on campus, and through UW's partnership with the NCAR–Wyoming Supercomputing Center.

3.4. **Seminars & Colloquia.** The department hosts frequent lectures by local and visiting mathematicians. Regular seminars in the department include the following.

- Algebra, Combinatorics, & Number Theory
- Analysis
- Computational & Applied Math
- Statistics
- Grad Student Seminar
- Colloquium and Fisk Lecture Series

UW Mathematics & Statistics Colloquia are intended to showcase recent mathematical and statistical developments of broad interest. These talks are aimed at the whole department, and graduate students are encouraged and expected to participate in these lectures and to interact with the visitors. The Fisk Lecture Series, endowed by a generous gift to the department, began in 2014; this lecture series brings mathematicians and scientists of the highest caliber to UW's math department. Since 2005, the department Colloquium and Fisk Lectures have hosted a long list of distinguished mathematical visitors from many, many institutions including New York University, MIT, Caltech, UC-Davis, UC-San Diego, UC-Santa Barbara, UCLA, the University of Utah, Notre Dame, the University of Arizona, Indiana University, the University of Michigan, the University of Illinois, the University of Wisconsin, the University of Minnesota, North Carolina State University, the University of North Carolina, Carnegie Mellon University, the University of Colorado, the University of Missouri, Texas A&M University, Penn State University, Oregon State University, Macalester College, Arizona State University, the University of Toronto, the University of Rochester, the University of Vermont, Southern Methodist University, Washington State University, Colorado State University, and the Colorado School of Mines.

UW faculty and students also participate regularly in a regional seminar.

- Rocky Mountain Algebraic Combinatorics Seminar (4–6pm, alternating Fridays, at Colorado State University in Fort Collins, Colorado.)

4. Admissions

4.1. Basic Requirements: Mathematics Programs. To be competitive for admission, applicants must have strong backgrounds in mathematics. Generally, this means a bachelor's degree in mathematics or a closely related discipline. All applicants should have substantial coursework beyond the calculus sequence; courses in differential equations, linear algebra, and, in particular, courses in abstract algebra and analysis are highly recommended. A solid performance on the GRE Subject Test in Mathematics can demonstrate the applicant's mastery of these subjects. The GRE Subject Test in Mathematics is therefore recommended but not required. The GRE General Test is required, with a minimum Quantitative Reasoning score of 157 and Verbal score of 143.

4.2. Basic Requirements: Statistics Programs. The prerequisite for admission to graduate study is an undergraduate degree from an accredited institution, including work in mathematics through calculus III, Linear Algebra and at least one second-level class in statistical methods. Prospective students are encouraged to have had Math Analysis and upper level

introduction to probability and mathematical statistics. Test scores from the GRE general test are required.

4.3. International Applicants.

4.3.1. *Math.* International applicants are required to take the TOEFL exam and earn a minimum score 76 on the iBT. The TOEFL requirement may be waived if a student comes from an English speaking country or has earned a degree from an accredited institution with instruction in English within a year of applying. ETS reports only TOEFL scores taken within two years of date of request.

4.3.2. *Statistics.* The minimum score for the TOEFL is 600 (100 Internet-based Test) or for IELTS minimum score is 6.0. Students who do not have prerequisites in mathematics and statistics may make up this deficiency at the beginning of their graduate program; however, such work does not count toward graduation requirements.

Part B. Research & Degree Programs

5. Research Themes

For administrative purposes, the department is structured into four research groups. However, these divisions can be somewhat artificial as faculty interests often stretch across several interconnected subdisciplines of the mathematical and statistical sciences.

5.1. **Algebra, Combinatorics, & Number Theory.** A major thrust of the research in the ACNT group at UW is in aspects of algebraic combinatorics. This branch of mathematics focuses on the interplay between algebra and combinatorics. Mathematical activity on this boundary between disciplines can be quite fruitful as algebraic techniques can sometimes shed new light on combinatorial problems and, conversely, techniques from combinatorics can be used to attack problems in abstract algebra. Finite geometry and graph theory provide a rich variety of problems in which this interplay is explored. Additional research interests in the group include matrix theory, convex geometry, and representation theory.

Faculty: McAllister, Moorhouse, Shader, Williford

5.2. **Analysis.** The research interests of the analysis group touch a fairly broad range of both pure and applied mathematical topics. Nonlinear partial differential equations are a focal point of several group members' research. Many physical phenomena (e.g., the dynamics of fluids) generate systems of nonlinear partial differential equations as models, and a careful mathematical study of these model equations often begins with specialized tools built from a foundation of real, complex, and functional analysis. The group also boasts expertise in other aspects of functional analysis, in particular, in operator theory and operator algebras. Additional research in the analysis group includes elements of harmonic analysis, control theory, probability & stochastic differential equations, and several complex variables.

Faculty: Bessaih, Jafari, Lyng, Niu

5.3. **Computational & Applied Mathematics.** A majority of the UW faculty in our Computational & Applied Mathematics group focus their work around the use of modern computing technology to attack substantial problems in engineering and the sciences. Scientific computing is now a well-established pillar of modern scientific inquiry (alongside experimentation and theory), and members of our group both participate directly in these inquiries and also work to develop and understand the underlying mathematical basis for the algorithms that form the foundation of the discipline. In concert with these computational activities, the group also develops and works to validate mathematical models for diverse physical and biological phenomena. Additionally, members of this group have expertise in nonlinear dynamical systems, nonlinear partial differential equations, and modern asymptotic and probabilistic methods.

Faculty: Allen, Douglas, Furtado, Ginting, Heinz, Lee, Liu, Stanescu, Yeung

5.4. **Statistics.** Much of the research in the statistics group is applied and interdisciplinary. Indeed, the research has connections to applications in the life, physical, and social sciences, engineering, and medicine. The statistical interests of this group include time series, spatial statistics, multivariate statistics, survey design, sampling techniques, experimental design, and categorical data analysis, and mathematical statistics.

Faculty: Anderson-Sprecher, Bieber, Gerow, Piccorelli, Robinson, Wulff

6. Outline of Program Requirements

The sections below give an incomplete overview of the program requirements; a detailed description of the official requirements is contained in the University of Wyoming Bulletin.

6.1. **Mathematics Programs.** The math MS & PhD programs both start with the same basic requirements—a suite of six required *core courses* and a written exam, called the *foundation exam*. The core courses (two each in the areas of algebra, analysis, and computational & applied mathematics) form a broad foundation for future coursework and research in the program. The foundation exam, taken during the first year, is based on undergraduate-level linear algebra and advanced calculus; it is meant to ensure that all entering students have an appropriate preparation for graduate-level coursework.

6.1.1. *MS.* UW's math MS program requires 30 hours of graduate-level coursework with a cumulative GPA of at least 3.0. To accommodate the needs of different students, the department offers both thesis and non-thesis options.

6.1.2. *PhD.* The math PhD program requires 72 hours of coursework and dissertation research with a cumulative GPA of at least 3.0. At most 12 hours can be at the 4000 level, and at least 42 hours must come from formal 5000-level courses. For advanced graduate students, the department regularly offers special *topics courses* meant to expose students to active faculty research or to provide a forum for faculty and students to explore mathematical topics of mutual interest. A list of recent topics courses is given below.

Spring 2017: 5290: Harmonic Analysis (Jafari), 5490: Nonlinear Trajectory Generation & Control (Meyer),

Fall 2016: 5290: Markov Chains (Bessaih), 5490: Principles of Stochastic Modeling (Heinz), 5490: High Performance Computing (Douglas), 5590: Expander Graphs (Hall), 5590: Commutative Algebra (McAllister)

Spring 2016: 5490: Data Mining (Douglas), 5590: Game Theory (Williford)

Fall 2015: 5490: Error Estimation in Finite Element Methods (Ginting), 5290: Calculus of Variations (Polyakov), 5590: Representation Theory (McAllister)

Spring 2015: 5490: Mathematics of Flow in Porous Media (Allen), 5490: Data Mining (Douglas)

Fall 2014: 5290: Introduction to Stochastic Processes (Bessaih), 5490: Mathematical Biology (Liu), 5700: Topics in Combinatorics (Williford)

In addition to coursework requirements, PhD students in the department must complete a research tools requirement (e.g., reading knowledge of a foreign language in which there is a large mathematical literature) and pass

- (i) a written qualifying exam covering the material from the core course pair corresponding to the intended area of specialization, and
- (ii) an oral preliminary exam focusing on the specialized mathematical material supporting the dissertation plan.

The most important part of the PhD program is the dissertation; the dissertation, completed under the close supervision of a faculty advisor, distinguishes the PhD from other degrees. Students who earn this degree have demonstrated a comprehensive understanding of a large body of mathematics **and** a substantial measure of mathematical creativity. A list of recent graduates and their dissertation titles can be found in §7.4 below.

6.2. Statistics Programs.

6.2.1. *MS in Applied Statistics.* The MS Program in Applied Statistics aims give the student an extensive and broad background in statistical methods, data analysis, and written and oral presentation skills. This degree is a terminal experience in graduate statistical education and should not be viewed as preparatory for entrance into a Ph.D. program in statistics. Graduates will have the necessary background to work as data management specialists, statistical analysts, and as project managers within a wide range of research organizations. The degree requires 36 hours of coursework and and data analysis project.

6.2.2. *MS in Statistics.* The MS Program in Statistics is designed give the student a solid background in statistical theory and in statistical methods, and in technical reading and writing skills. This program represents the first two years of doctoral coursework necessary for entrance into a PhD program in statistics. Graduates will have the necessary background to further pursue the Ph.D. degree, to work in industrial or research organizations, or to teach in community college level institutions or as academic professionals in 4-college and universities. The degree requires 36 hours of coursework and a passing grade on a two-day qualifying examination.

7. Department Personnel

All offices are in Ross Hall (RH), email addresses are (unless otherwise noted) @uwo.edu, and phone numbers given as 6-xyzw may be reached from off-campus by dialing +1 (307) 766-xyzw.

7.1. Research Faculty.

Myron Allen (PhD, Princeton University, 1983)

Professor

Research Interests: Numerical analysis, mathematical modeling

RH228, 6-4286, allen

Myron Allen's mathematical interests include numerical analysis, mathematical modeling, and fluid mechanics in porous media. Applications of these areas include the analysis and prediction of contaminant flows in groundwater aquifers and flows of native and injected fluids in oil and gas reservoirs.

Richard Anderson-Sprecher (PhD, University of Iowa, 1990)

Professor

Research Interests: Statistics

RH332, 6-4229, sprecher

Richard Anderson-Sprecher's research interests include time series, spatial statistics, robust statistics, and he is especially interested in applications of statistics to problems in biological sciences and engineering.

Hakima Bessaih (PhD, Scuola Normale Superiore di Pisa, 1999)

Professor

Research Interests: Partial differential equations, probability theory and stochastic processes

RH210, 6-6213, bessaih

Hakima Bessaih's research interests include stochastic partial differential equations with applications in fluid mechanics, random dynamical systems, and more broadly, stochastic processes. Most recently, she has focused on the qualitative behavior of some Navier–Stokes and Euler-type PDEs driven by noise.

Stephen Bieber (PhD, University of California–Berkeley, 1979)

Professor

Research Interests: Statistics

RH334, 6-4229, bieber

Stephen Bieber's research interests include multivariate statistics and applications in the behavioral and social sciences.

Michelle Chamberlin (PhD, Purdue University, 2002)

Associate Professor

Research Interests: Mathematics education

RH221, 6-4017, mchambe5

Michelle Chamberlin's research in mathematics teacher education examines ways to enhance the effectiveness of mathematics and educational learning experiences of prospective and practicing teachers.

Craig Douglas (PhD, Yale University, 1982)

SER Professor

Research Interests: Numerical analysis

RH 227, 6-6580, cdoug1a6

Craig Douglas's research interests include eXtreme Technical Computing on parallel supercomputers and GP-GPUs, dynamic interactions between physical models, computation, and networks of sensors. He is an expert on multigrid methods and other numerical methods for solving partial differential equations.

Frederico Furtado (PhD, New York University, 1989)

Associate Professor

Research Interests: Partial differential equations

RH319, 6-4321, furtado

Fred Furtado's research focuses on nonlinear partial differential equations and fluid mechanics. In particular, he is interested in numerical and analytical approaches to study multi-phase flow problems.

Ken Gerow (PhD, Cornell University, 1992)

Professor & Associate Head

Research Interests: Statistics

RH3332, 6-4229, gerow

Ken Gerow's research includes sampling techniques, experimental design, and exploratory data analysis with an emphasis on applications in the biological sciences.

Victor Ginting (PhD, Texas A&M University, 2004)

Professor

Research Interests: Numerical Analysis

RH310, 6-4018, vginting

Victor Ginting's current research interest is in the mathematical and numerical aspects of multiscale phenomena as found in many applications, such as porous media flow.

Stefan Heinz (PhD, Heinrich-Hertz Institute, 1990)

Professor

Research Interests: Mathematical modeling

RH214, 6-4203, [heinz](#)

Stefan Heinz has research interests in mathematical modeling, multiscale processes, stochastic analysis, Monte Carlo simulations, computational fluid dynamics, turbulence, combustion, and multiphase flows.

Lynne Ipiña (PhD, New York University, 1986)

Associate Professor

Research Interests: Mathematics education

RH320, 6-2318, [ipina](#)

Lynne Ipiña is best known for her work in mathematics education. Her early participation in the national debate about calculus, especially as it involves writing and appropriate uses of technology, has evolved into an interest in graphical representation.

Farhad Jafari (PhD, University of Wisconsin, 1989)

Professor

Research Interests: Operator theory

RH229, 6-2383, [fjafari](#)

Farhad Jafari's mathematical interests include functional analysis and operator theory, semigroup theory, harmonic analysis, moment problems, and control theory. He is particularly interested in problems arising from mathematical physics.

Long Lee (PhD, University of Washington, 2002)

Associate Professor

Research Interests: Numerical analysis, mathematical modeling

RH212, 6-4368, [llee](#)

Long Lee's research interests span many areas, including numerical analysis, computational fluid dynamics, and numerical methods for nonlinear partial differential equations. Recently, his research interests have extended to inverse problems in seismology and geophysical flows.

Rongsong Liu (PhD, York University, 2006)

Associate Professor

Research Interests: Dynamical systems, mathematical biology

RH217, 6-3395, [rliu1](#)

Rongsong Liu's interests are mathematical biology, differential equations, dynamical systems, and their interface. Her research projects involve formulation, analysis and

applications of deterministic mathematical models for infectious diseases, and ecological systems.

Gregory Lyng (PhD, Indiana University, 2002)

Professor & Department Head

Research Interests: Partial differential equations

RH230, 6-3351, glyng

Gregory Lyng's mathematical interests are primarily in partial differential equations. He is especially interested in the existence & stability of traveling waves, Evans-function techniques, conservation & balance laws, gas dynamics, and shock waves.

Tyrrell McAllister (PhD, University of California–Davis, 2004)

Associate Professor

Research Interests: Discrete and polyhedral geometry, representation theory

RH317, 6-5359, tmcallis

Tyrrell McAllister studies convex and discrete geometry, with a focus on the theory of lattice-point enumeration in polyhedra and its applications to algebraic geometry, representation theory, and geometric invariant theory.

Eric Moorhouse (PhD, University of Toronto, 1987)

Professor

Research Interests: Finite geometry

RH216, 6-4394, moorhous

Eric Moorhouse's mathematical interests include projective geometry, codes and designs, non-associative structures, algebraic combinatorics, and information theory. He tries to use a variety of tools, both experimental (practical programming with computers) and theoretical (methods from group theory, algebraic geometry, number theory and mathematical logic).

Zhuang Niu (PhD, University of Toronto, 2005)

Associate Professor

Research Interests: C^* Algebras

RH311, 6-6887, zniu

Zhuang Niu's research interests are in operator algebras, K-theory, and dynamical systems, which are linked through the study of noncommutative topological spaces.

Annalisa Piccorelli (PhD, Case Western Reserve University, 2010)

Assistant Professor

Research Interests: Statistics

RH340, 6-2207, apiccore

Annalisa Piccorelli's research interests are in biostatistics. She has particular interest in joint modeling and prediction models of health outcomes.

Tim Robinson (PhD, Virginia Tech, 1997)

Professor

Research Interests: Statistics

RH335, 6-2497, tjrobin

Tim Robinson's research interests are in the design of experiments, response surface methodology, categorical data analysis and applications in engineering, medicine and the environment.

Bryan Shader (PhD, University of Wisconsin, 1990)

Professor

Research Interests: Combinatorics, linear algebra

RH321, 6-6826, bshader

Bryan Shader's mathematical interests include combinatorial matrix theory, algebraic graph theory, and qualitative matrix analysis.

Dan Stanescu (PhD, Concordia University, 1999)

Associate Professor

Research Interests: Numerical analysis, computational fluid dynamics

RH218, 6-4380, stanescu

Dan Stanescu's research interests are centered around the the numerical simulation of fluid flow. He is also interested in the numerical modeling of stochastic differential equations, uncertainty quantification and mathematical biology.

Jason Williford (PhD, University of Delaware, 2004)

Associate Professor

Research Interests: Finite geometry, graph theory, association schemes

RH314, 6-2209, jwillif1

Jason Williford's mathematical interests center around the interplay between algebra, finite geometry, and combinatorics. In particular, he is interested in association schemes and coherent configurations. He also studies extremal problems in graph theory that can be approached using constructions from finite fields and geometries.

Shaun Wulff (PhD, Oregon State University, 1999)

Associate Professor

Research Interests: Statistics

RH336, 6-6483, wulff

Shaun Wulff's research interests are in linear models and mathematical statistics with applications in the social and physical sciences.

Man-Chung Yeung (PhD, University of California–Los Angeles, 1997)

Associate Professor

Research Interests: Numerical Analysis

RH 213, 6-4012, myeung

Man-Chung Yeung's research fields of interest are in iterative methods, preconditioning techniques, and parallel computations.

7.2. Lecturers.

David Anton (MS, Wyoming, 2007)

Senior Lecturer, Director of the Math Assistance Center,

RH029, 6-6577, danton

Nathan Clements (DA, Idaho State, 2012)

Assistant Lecturer

RH304, 6-5088, nclemen1

Scott Crawford (PhD, Texas A&M, 2012)

Assistant Lecturer

RH333, 6-3341, scrawfo8

Eric Quade (PhD, Wyoming, 2012)

Assistant Lecturer

RH207, 6-6432, equade

Jeff Selden (PhD, Arizona, 2004)

Associate Lecturer

RH 211, 6-2280, jselden

John Spitler (MS, Wyoming, 1998)

Senior Lecturer

RH 318, 6-4205, spitler

William Weber (MS, Wyoming, 1994)

Senior Lecturer

RH225, 6-6547, wsweber

7.3. Staff.

Lori Dockter

Office Associate, Senior

RH203, 6-6546, dockter1

Leslie Roan

Office Associate

RH202, 6-4221, lroan

7.4. **Recent Graduates.** The list below shows the thesis titles for some of our recent graduates. Initial placement is also indicated (when known).

2016: Mookwon Seo, PhD (Douglas)

“Implementations and Interpretations of the Talbot-Ogden Infiltration Model”

First Position: Analysis Engineer, Airloom, Inc.

2016: Dongyang Kuang, PhD (Lee)

“A particle method for the Euler–Poincaré equation and its applications in analysis of landmark based image templates”

First Position: Visiting Assistant Professor, Southern Utah University

Second Position: Postdoc, Mathematics, University of Ottawa

2016: Rachel Jennings, PhD (Liu & Lyng)

“Modeling the transmission and maintenance of low pathogenic avian influenza among wild birds with environmental heterogeneity and host conditions”

First Position: Postdoc, Population Medicine and Diagnostic Sciences, Cornell University

2016: Prosper Torsu, PhD (Aryana—*Petroleum Engineering & Ginting*)

“Uncertainty quantification and models of multiphase flow in porous media”

First Position: Assistant Professor (tenure track), California State U.–Bakersfield

2016: Quanling Deng, PhD (Ginting)

“Local conservation on continuous Galerkin finite element methods with applications”

First Position: Postdoc, Curtin University (Australia)

2015: Hayoung Choi, PhD (Jafari)

“Hamburger Moment Completions and Their Applications”

First Position: Lecturer, University of Wyoming

2015: Michael Huntington, PhD (Williford)

“A Turán Type Result and Generalized Friendship Graphs”

First Position: Math Teacher, STEM School & Academy, Highlands Ranch, CO

2015: Ahmad Jan, PhD (Allen)

“A Bayesian Framework for the Validation of Porous Media Flow Models at the Laboratory Scale”

First Position: Oak Ridge National Laboratory

2015: Curtis Nelson, PhD (B. Shader)

First Position: Faculty, Brigham Young University–Idaho

2015: Dephence Mwangoe, MS (Chamberlin)

“Investigation of High School Students’ Spatial Ability: A Study of Kenya’s High School Students’ Mathematics Performance”

2014: Sudipta Mallik, PhD (B. Shader)

“New Probabilistic, Combinatorial and Algebraic Methods for Minimum Rank Problems”

First Position: Instructor, Northern Arizona University

2014: Keivan Hassani Monfared, PhD (B. Shader)

“The Jacobian Method: The art of finding more needles in nearby haystacks”

First Position: Visiting Assistant Professor, Western Illinois University

Second Position: Postdoc, Mathematics, University of Calgary

2014: Cara Wiblemo, PhD (Hobart)

“Automorphism Decompositions of Graphs”

First Position: Faculty, Laramie County Community College

2014: Bradley McCaskill, MS (Ginting)

“A Multiscale Domain Decomposition Method in Conservation Problems”

First Position: PhD Program, Mathematics, UW

2014: Alex Karanevich, MS (Williford)

“Load Balancing for Markov Chains with a Specified Graph”

First Position: PhD Program (Biostatistics), U. Kansas

2014: George Shakan, MS (Moorhouse)

“A Bound for the Sum of Dilates”

First position: PhD Program, U. Illinois at Urbana-Champaign

2014: Russell Johnson, MS (Polyakov)

“Stochastic Upscaling of Solutions of Differential Equations”

First Position: PhD Program, Mathematics, UW

2013: Michael Sollami, PhD (Douglas)

“Ternary Squarefree Words”

First Position: Mustbin, Inc.

2013: Stephen Garth, MS (Hall)

“Pairing-friendly Curves”

First Position: IT, Vanderbilt University

Second Position: PhD Program, Clemson U.

2013: Lawrence Bush, PhD (Ginting)

“On the Postprocessing Techniques of the Continuous Galerkin Finite Element”

2013: Joyce Rigelo, PhD (Pereira)

“A New Multiscale Mixed Method and Uncertainty Quantification Technique for Porous Media Flows”

First Position: Post-doc, Petroleum & Geosystems Engineering, U. Texas at Austin

2013: Saroj Aryal, PhD (Jafari)

“Sparse Moment Problems”

First Position: Assistant Professor (tenure track), Montana State U., Billings

2013: Jared Skinner, MS (Moorhouse)

“On the Free Closure of a Partial Linear Space”

First Position: Dart, Inc.

2013: Kevin Lenth, PhD (Polyakov)

“Application of a Perturbation Method to Nonlinear Stochastic PDEs”

First Position: Faculty, Casper College

Part C. Other Attractions

8. Nearby: the great outdoors and more

The nearby Medicine Bow National Forest and Rocky Mountains provide quick access to hiking, biking, fishing, hunting, or camping. Within 20 minutes, you can take on a challenging mountain bike ride, Nordic ski trail, or scale the massive rock monoliths of the Vedauwoo formation. Dive into great Rocky Mountain powder on the slopes of the Snowy Range Ski Area, just 40 minutes from campus. Denver is less than two-and-a-half hours away and offers big-city amenities: shopping, concerts, theatre, professional sporting events, and international flight connections.

Denver, CO	2–2½ hours.
Fort Collins, CO	1 hour.
Cheyenne, WY	45 minutes.
Snowy Range Ski Area	40 minutes.
Steamboat Ski Area	2¼ hours
Cross-Country skiing	20 minutes.
Vedauwoo	15 minutes.

Table 1. Approximate driving times from Laramie.

9. Athletics & Cultural Events

9.1. **Campus Recreation and Athletics.** UW is a member of the Mountain West Conference, and the Cowboys & Cowgirls compete in 15 total NCAA Division I sports. In addition, Campus Recreation offers a complete program of club and intramural sports, fitness facilities, and an active Outdoor Program. Half Acre Gym, one of the principal fitness and recreation facilities on campus, has recently undergone a \$27M renovation project.

USEFUL LINKS

UW Athletics: www.gowyo.com/Campus Recreation: www.uwo.edu/rec/

9.2. **Cultural and artistic life.** There is an active cultural and artistic scene in Laramie. The music department and the department of theatre and dance put on a wide variety of on-campus performances through out the year. These include many student-driven offerings as well as performances from eminent artists-in-residence, and an annual summer theatre and dance festival. In addition, UW sponsors an annual program of professional music and dance performances on campus. The Buchanan Center for the Performing Arts has recently undergone a \$35M renovation project to create a state-of-the-art performance venue.

USEFUL LINKS

UW Cultural Programs: www.uwo.edu/culturalprogramUW Theatre & Dance: www.uwo.edu/thd/whats-playing/