

WILLIAM D. TAYLOR

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EDUCATION

Doctor of Philosophy in Mathematics

University of Arkansas - May 2018 (projected)
Advisor: Mark Johnson
Thesis: Interpolating Between Multiplicities and F-thresholds
Emphasis: Commutative Algebra

Master of Science in Mathematics

University of Nevada, Reno - May 2010
Thesis: Finding Minimal n -power Extensions of Groups
Emphasis: Pure Mathematics, Applied Mathematics

Bachelor of Arts in Mathematics, *summa cum laude*

University of Nevada, Reno - May 2008
Thesis: p -adic Recurrence Relations
Emphasis: Minor in Economics

PAPERS

2017 - **On Lower Bounds for s -multiplicities**

With Lance Edward Miller • Submitted; arXiv:1708.06273

2017 - **Interpolating Between Hilbert-Samuel and Hilbert-Kunz Multiplicities**

Submitted; arXiv:1706.07445

2017 - **The s -multiplicity Function of 2×2 Determinantal Rings**

With Lance Edward Miller • To appear in P. Am. Math. Soc.; arXiv:1708.06287

2016 - **F -singularities Under Generic Linkage**

With Linquan Ma, Janet Page, Rebecca R.G., Wenliang Zhang • To appear in J. of Algebra; arXiv:1607.03972

2010 - **Finding Minimal n -power Extensions of Groups (Master's Thesis)**

2008 - **Finding p -adic Square Roots (Bachelor's Thesis)**

INVITED TALKS

New Closures Related to s -multiplicity

April 2018 • AMS Sectional Meeting, Vanderbilt University

Bounds for and Computations of s -multiplicity

January 2018 • JMM-AMS Special Session on Commutative Algebra in All Characteristics

Calculating Interpolating Multiplicities Using Geometry and Combinatorics

November 2017 • Algebra Seminar, University of Kansas

Multiplicity Interpolation and a Generalization of a Conjecture of Watanabe-Yoshida

October 2017 • Algebra Seminar, Georgia State University

Generalizing Multiplicity Using Interpolation

September 2017 • AMS Sectional Meeting, University of North Texas

INVITED TALKS (CONT.)

Interpolating Between Hilbert-Samuel and Hilbert-Kunz Multiplicities

April 2017 • KUMUNUjr, University of Nebraska

Interpolating between Hilbert-Samuel and Hilbert-Kunz multiplicity

February 2017 • University of Arkansas Algebra Seminar

F-singularities of the Generic Link

April 2016 • KUMUNUjr, University of Nebraska

F-singularities of the Generic Link

February 2016 • University of Arkansas Algebra Seminar

Why Polynomial Coefficients Matter

October 2015 • University of Arkansas Math Club

Ein's Lemma in Postive Characteristic

September 2015 • OMNI Graduate Student Seminar, University of Arkansas

Rees Algebras

February 2015 • OMNI Graduate Student Seminar, University of Arkansas

Balancing Studying and Teaching as a Graduate Student

October 2014 • University of Arkansas Mathematics Department First-Year Student Seminar

Integral Closure of Ideals

February 2014 • OMNI Graduate Student Seminar, University of Arkansas

An Introduction to Group Theory and the Theory of n -power Extensions

Spring 2012 • University of Arkansas Math Club

CONTRIBUTED TALKS AND POSTERS

Interpolating between Hilbert-Samuel and Hilbert-Kunz multiplicity (Poster)

March, October 2017 • SLAM 2017, University of New Mexico; KUMUNU 2017, University of Kansas

Painting Cubes

April 2014 • MAA Sectional Meeting General Mathematics Session

Test Taking Strategies

December 2013 • University of Arkansas Mathematics Department First-Year Student Seminar

Complex Fractions: What They Are and How To Teach Them

Spring 2010 • Univeristy of Nevada Education class

Finding Square Roots of p -adic Numbers

January 2009 • Joint Mathematics Meetings Special Session on Algebra

TEACHING EXPERIENCE

Teaching Assistant - Department of Mathematical Sciences, University of Arkansas

Fayetteville, Arkansas • August 2011-Present

Developed and taught a summer integral calculus course, including writing lesson plans, constructing, proctoring, and grading tests and quizzes, and addressing student concerns outside of the lecture times, with the result that many of my students did well in a course that is typically difficult to take in a condensed summer form. Taught sections of the calculus sequence, precalculus, finite math, and college algebra, teaching classes up to five days a week and implementing inquiry-based-learning activities to enhance student success. Led a total of ten calculus recitation sections over four semesters, in which I was responsible for addressing concerns and questions the students had regarding the material covered in previous lectures.

TEACHING EXPERIENCE (CONT.)

Substitute Teacher - Washoe County School District

Washoe County, Nevada • September 2010-August 2011

Taught high school math classes and elementary school classes when the regular teacher was unavailable. Engaged up to thirty students at a time, often for the whole day, while teaching the lesson the regular teacher would have taught.

Mathematics Tutor - W. D. Tutoring

Reno, Nevada • September 2010-August 2011

Tutored middle school, high school, and adult students in mathematics, including test preparation, homework help, and general skills improvement, usually significantly improving the students performance and aptitude. Handled the making and organizing of appointments, setting pricing schedules, and transportation logistics.

Teaching Assistant - Department of Mathematics, University of Nevada, Reno

Reno, Nevada • August 2008-May 2010

Taught a total of three college algebra courses. Led recitation sessions in differential and integral calculus. Received an Honorable Mention Teaching Award for teaching excellence.

SERVICE

Celebration of Mind Mathematics Festival

Organizer • Fall 2014-Spring 2016 • University of Arkansas

Organized the execution of the 5th and 6th annual Celebration of Mind Mathematics Festivals at the University of Arkansas, which is a regional math outreach program with hundreds of attendees of many ages. Organized teams made up of members of the department to design and run booths, which demonstrated and explained various interesting mathematical concepts. Connected student teams with faculty advisors to assist and give feedback. Oversaw the introduction of a new activity where students could work for longer periods of time on more challenging problems. Created the Celebration of Mind Handbook which will assist future leaders in running the event.

Organized Mathematical Networking and Inquiry (OMNI) Seminar

Founder and Organizer • Spring 2014-Spring 2016 • University of Arkansas

Created a seminar for graduate students, with speakers selected from student volunteers and faculty. The seminar was conceived as a low-stress environment where students could practice giving both expository and research talks. It also included talks given by faculty over subjects of interest to the graduate student population.

Celebration of Mind Mathematics Festival

Booth Team Member • Fall 2012, Fall 2013 • University of Arkansas

Helped to design and execute two booths for the Celebration of Mind outreach program. In the first year, created a game that taught the concept of a recurrence relation by having participants randomly choose an target integer between 20 and 100 and then attempt to create a Fibonacci-type sequence containing the target by selecting the two starting integers in the sequence (which had to be between 1 and 10). Wrote a Python script that found the number of sequences that hit the possible target numbers in order to separate the targets into easy, medium, and hard categories. Made a similar game with Collatz sequences in order to share the famous Collatz Conjecture with attendees. In the second year, designed an implementation of the game "evens and odds".

HONORS AND AWARDS

Julia Hicks Endowed Graduate Teaching Award

2016-2017 • University of Arkansas

William Alton Anderson Endowed Scholarship in Arts & Sciences

2016 • University of Arkansas

Lawrence Jesser Toll, Jr. Endowed Fund

2015-2016 • University of Arkansas

John C. Massie Memorial Scholarship

2014-2015 • University of Arkansas

Lawrence Jesser Toll, Jr. Endowed Fund

2013-2014 • University of Arkansas

Atlantis Student Exchange Program Travel Award

2013 • University of Arkansas

Lawrence Jesser Toll, Jr. Endowed Fund

2012 • University of Arkansas

Jerry & Betty Wilson Scholarship

2009-2010 • University of Nevada, Reno

Jerry & Betty Wilson Scholarship

2008-2009 • University of Nevada, Reno

Senior Scholar - Top Graduating College of Science Senior

2008 • University of Nevada, Reno

Phi Kappa Phi Honor Society

2006 • University of Nevada, Reno

Eagle Scout rank

2005 • Boy Scouts of America, Northstar District

CONFERENCES AND WORKSHOPS ATTENDED

KUMUNU 2017

Hosted by University of Kansas • October 21-22, 2017 • Lawrence, Kansas

AMS Sectional Meeting

Hosted by University of North Texas • September 9-10, 2017 • Denton, Texas

KUMUNUjr 2017

Hosted by University of Nebraska • April 7-9, 2017 • Lincoln, Nebraska

KUMUNU 2016

Hosted by University of Kansas • October 1-2, 2016 • Lawrence, Kansas

Commutative Algebra and its Interactions with Algebraic Geometry: Tight Closure, Linkage, and Syzygies

Hosted by University of Michigan • July 7-12, 2016 • Ann Arbor, Michigan

KUMUNUjr 2016

Hosted by University of Nebraska • April 23-24, 2016 • Lincoln, Nebraska

Joint Math Meetings 2016

Hosted by American Mathematical Society and Mathematical Association of America • January 6-9, 2016
• Seattle, Washington

KUMUNU 2015

Hosted by University of Missouri • October 24-25, 2015 • Columbia, Missouri

CONFERENCES AND WORKSHOPS ATTENDED (CONT.)

Mathematics Research Communities: Commutative Algebra

Hosted by American Mathematical Society • June 7-13, 2015 • Snowbird Resort, Utah

Recent developments in positive characteristic techniques in commutative algebra: Frobenius Operators and Cartier Algebras

Hosted by Georgia State University • March 13-15, 2015 • Atlanta, Georgia

KUMUNUjr 2015

Hosted by University of Nebraska • April 25-26 • Lincoln, Nebraska

RTG Local Cohomology Workshop

Hosted by University of Illinois at Chicago • February 27-March 1, 2015 • Chicago, Illinois

KUMUNU 2014

Hosted by University of Missouri • September 27-28, 2014 • Columbia, Missouri

MAA Oklahoma-Arkansas Sectional Meeting

Hosted by Harding University • April 11-12, 2014 • Searcy, Arkansas

37th Spring Lecture Series

Hosted by University of Arkansas • April 12-14, 2012 • Fayetteville, Arkansas

Joint Mathematics Meetings 2012

Hosted by AMS-MAA • January 4-7, 2012 • Boston, Massachusetts

Joint Mathematics Meetings 2010

Hosted by AMS-MAA • January 13-16, 2010 • San Francisco, California

Joint Mathematics Meetings 2009

Hosted by AMS-MAA • January 5-8, 2009 • Washington, D.C.