

# WILLIAM D. TAYLOR

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## EDUCATION

### Doctor of Philosophy in Mathematics

University of Arkansas - May 2018  
*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

## PROFESSIONAL EXPERIENCE

### Tennessee State University, Department of Mathematical Sciences

Assistant Professor • August 2018-Present

### University of Arkansas, Department of Mathematical Sciences

Instructor and Teaching Assistant • August 2011-July 2018

### University of Nevada, Reno, Department of Mathematics

Instructor and Teaching Assistant • August 2008-May 2010

## PAPERS

### Differentially Fixed Ideals in Toric Varieties

With Lance Edward Miller and Janet Vassilev • Preprint: <https://arxiv.org/abs/2212.02696>

### Fundamental Results on $s$ -closures

*J. Pure Appl. Algebra* **225** (2021), no. 4

### On Lower Bounds for $s$ -multiplicities

With Lance Edward Miller • *J. Algebra* **531** (2019), 165-183

### The $s$ -multiplicity Function of $2 \times 2$ Determinantal Rings

With Lance Edward Miller • *Proc. Amer. Math. Soc.* **146** (2018), no. 7, 2797-2810

### Interpolating Between Hilbert-Samuel and Hilbert-Kunz Multiplicities

*J. Algebra* **509** (2018), 212-239

### $F$ -singularities Under Generic Linkage

With Linquan Ma, Janet Page, Rebecca R.G., Wenliang Zhang • *J. Algebra* **505** (2018), 194-210

SERVICE

**Department Service**

Student Research Mentor • August 2018-Present • Tennessee State University

Mentored students doing undergraduate research projects. Advised them when selecting projects, finding sources, and preparing presentations.

**Department Service**

Student Advisor • August 2022-Present • Tennessee State University

Advised students in the mathematics and mathematics education programs. Worked with students who had difficult schedules or failed classes on their transcript to make a plan to successfully complete their program.

**University Committees**

Committee Member • August 2021-Present • Tennessee State University

Was a member of the faculty advisory board for CADENCE, a program aimed to improve student advisement. Brought the specific needs of the College of Life and Physical Sciences to the CADENCE organizers, including the need for STEM students to be advised by faculty members in their major starting from their first semester.

**Department Committees**

Committee Chair • August 2019-Present • Tennessee State University

Chaired the Calculus Committee during a time of transition to a new textbook, during which time we established the required sections from the text in TSU Calculus classes, determined the Learning Objectives for each course, and worked with the Assessment team to develop standardized assessment questions for the courses.

**Department Committees**

Committee Member • August 2018-Present • Tennessee State University

Was a member of the Curriculum, Handbook, and College Algebra Committees.

**NAM MATHFest**

Faculty Chaperone • September 2018 • Tennessee State University

Was part of a team of faculty members who escorted a large group of undergraduate students to the National Association of Mathematicians' MATHFest undergraduate conference in Atlanta, Georgia

**Algebra, Geometry, and Combinatorics Seminar**

Organizer • Fall 2018-Spring 2020 • Tennessee State University

Created a seminar, at which speakers gave presentations of general interest to faculty members in the areas of algebra, geometry, and combinatorics.

**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, a 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.

**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.

INVITED TALKS

***Ideals Fixed by Differential Operators***

March 2023 • AMS Sectional Meeting, Georgia Institute of Technology

***Rational Powers,  $s$ -Closures, and a Generalized Briançon-Skoda Theorem***

June 2020 • Early Commutative Algebra Researchers (eCARs)

***Multiplicities, Closures, and Interpolations in Characteristic  $p$  (6-Lecture Series)***

September-November 2018 • Algebra, Geometry, and Combinatorics Seminar, Tennessee State University

***Interpolating Between Tight and Integral Closure Using  $s$ -Closures***

October 2018 • Algebra Seminar, University of Arkansas

***Finite Generation of Rings of Toric Frobenius Operators***

April 2018 • KUMUNUjr, University of Nebraska

***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

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

April 2017 • KUMUNUjr, University of Nebraska

***$F$ -singularities of the Generic Link***

April 2016 • KUMUNUjr, University of Nebraska

***Ein's Lemma in Positive Characteristic***

September 2015 • OMNI Graduate Student Seminar, University of Arkansas