Michael DeBellevue

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EDUCATION

University of Nebraska-Lincoln, Lincoln, Nebraska, USA

- Ph.D. in Mathematics — August 2022
  - Advisors: Mark Walker and Alexandra Seceleanu
  - Dissertation available online at https://digitalcommons.unl.edu/dissertations/AAI29323722/
  - Minor: Music
- M.S. in Mathematics — May 2019

University of Texas at Arlington, Arlington, Texas, USA

- Honors B.S. in Mathematical Biology
- B.A. in Music Composition — May 2017

WORK AND RESEARCH EXPERIENCE

Philip T. Church Postdoctoral Fellow

- Syracuse University Mathematics Department — August 2022 - Present
  - 9 teaching contact hours per semester

Graduate Teaching Assistant

- University of Nebraska-Lincoln Mathematics Department — August 2017 - August 2022
  - Approximately 4 teaching contact hours per week
  - Duties include lesson planning, assignment and exam writing and grading, and individually helping students in office hours and the UNL math resource center

Data Science Intern — June - August 2019

- Ocuvera
  - Project: Detection of chairs in depth camera images
  - Developed Working Prototype
  - Tested deployment to multiple edge platforms

Undergraduate Researcher

- Carnegie Mellon University Mathematics REU — June 2016 - July 2016
  - Project: Fractal Behavior of the Fibonomial Triangle
  - Wrote code to develop and test conjecture
  - Co-wrote and published paper on findings

Undergraduate Research Fellow

- University of Texas at Arlington Honors College — Summer 2015
  - Project: Optimal Control Theory and Tuberculosis Vaccination

Research Fellow - Undergraduate Training in Theoretical Ecology Research Program — Summer 2015
University of Texas at Arlington Math Department
  - Project: Assessing Tuberculosis Vaccine Strategies via Mathematical Modeling

PAPERS

"A comparison of dg algebra resolutions with prime residual characteristic", with J. Pollitz, https://arxiv.org/abs/2108.12512, The Quarterly Journal of Mathematics, 2023.

"Axial constants and sectional regularity of homogeneous ideals ", with Polymath, a large-scale research experience for undergraduates, arXiv:2110.13782, 2021, to appear in Proceedings of the AMs.

"Fractal Behavior of the Fibonomial Triangle Modulo Prime p, Where the Rank of Apparition of p is p+1, with E. Kryuchkova, *The Fibonacci Quarterly*, (2018) Volume 56 no. 2, pg. 113-120.

PAPERS IN PREPARATION

"Graded Deviations, Rigidity, and the Koszul Property", based on dissertation research

"Shifts of Deviations and the Radical of the Homotopy Lie Algebra"

AWARDS

Linda Bors Fellowship - University of Nebraska Lincoln — Fall 2020
Awarded for academic merit - one of three recipients

Outstanding Qualifying Exam - University of Nebraska Lincoln	Spring 2018
Outstanding Mathematics Senior - University of Texas at Arlington	Spring 2017
Honors - Budapest Semesters in Mathematics	Fall 2016
Honors Distinction Scholarship - University of Texas at Arlington	Fall 2013

Awarded for academic merit - one of five recipients

PRESENTATIONS

Rigidity of Graded Deviations and the Slope of an Algebra
- AMS Fall Sectional Meeting Special Special Session on Building Bridges Between Commutative Algebra and Nearby Areas — October 2022
- Route 81 Conference, Queen's University — September 2022
- Homological Commutative Algebra and Related Topics, Geoergia Southern University — June 2022
- AMS Spring Eastern Virtual Sectional Meeting Special Session on Homological Methods in Commutative Algebra — March 2022

Using Divided Powers to Fix Problems with Derivations in Positive Characteristic — February 2022
- Commutative Algebra Regional Expository Seminar

Deviations, Rigidity, and Koszulness — November 2021
- Commutative and Homological Algebra Market Presentations

Graded Deviations and the Koszul Property
- Texas Tech Algebra and Number Theory Seminar — October 2021
- AMS Fall Central Sectional Meeting Special Session on Homological Methods in Commutative Algebra — October 2021
- UNL Commutative Algebra Seminar — September 2021

Computing Ext 3 Different Ways — March 2021
- Commmutative Algebra Regional Expository Seminar
- UNL Commutative Algebra Reading Seminar

Algebras with Finite Off-Diagonal Deviations
- UNL Commutative Algebra Reading Seminar

Algebraic Sets and the Relative Point of View — October 2020
- South Dakota School of Mines

Graded Resolutions of Graded Modules — September 2020
- UNL Commutative Algebra Reading Seminar

Graded Rings and Modules — September 2020
- UNL Commutative Algebra Reading Seminar

Homological Tools to Detect Complete Intersections — March 2020
- UNL Commutative Algebra Reading Seminar

Differential Forms and De Rham Cohomology — February 2020
- UNL Graduate Student Seminar

Lattice Polytopes Part III: Brion's Formula — October 2019
- UNL Commutative Algebra Reading Seminar

Perfectoids I: Tasting the Ingredients — April 2019
- UNL Commutative Algebra Reading Seminar

Alexander Duality and Linear Resolutions — November 2018
- UNL Commutative Algebra Reading Seminar

What are Stanley-Reisner Rings and Alexander Duality? — November 2018
- UNL Commutative Algebra Reading Seminar

Fibonomial Coefficients and the Fibonomial Triangle — November 2018
- UNL Discrete Mathematics Seminar

September 2018

How the NSA Compromised Cryptographic Security: The story of the Elliptic Curve deterministic random bit generator
- UNL Graduate Student Seminar

An introduction to regular rings, hypersurfaces, and matrix factorizations   September 2018
- UNL Commutative Algebra Reading Seminar

Symmetry in Sound: Abstract Algebra in Music of the Past Century   April 2018
- UNL Graduate Student Seminar

TEACHING EXPERIENCE	**As the Instructor of Record at Syracuse University**

As the Instructor of Record at Syracuse University
- **MATH 285 Calculus II**   Fall 2022
  - 28 Students
  - 21 Students
- **MATH 285 Calculus I**   Fall 2022
  - 23 Students

As the Instructor of Record at the University of Nebraska-Lincoln
- **MATH 314 Linear Algebra**
  - 31 Students   Spring 2021
- **MATH 203 Contemporary Math**
  - 30 students & 28 students   Fall 2021
  - 34 students & 30 students   Fall 2019
  - 28 students   Spring 2019
- **MATH 101 College Algebra**   Fall 2018
  - 42 students

As a Teaching Assistant
- **MATH 221 Differential Equations Recitation**
  - 20 & 23 & 19 students   Spring 2020
- **MATH 107 Calculus II Recitation**
  - 13 students   Summer 2018
  - 30 students & 30 students   Fall 2017
- **MATH 208 Calculus III Recitation**
  - 26 & 25 & 25 students   Fall 2020
  - 29 students & 29 students   Spring 2018
- **MATH 106R Calculus I Recitation**
  - (2 Sections) 22 students & 23 students   Spring 2018
  - (2 Sections) 22 students & 28 students   Fall 2017

As a Grader
- **MATH 850 Discrete Math I (graduate level)**   Fall 2020
- **MATH 309 Introduction to Proofs**   Spring 2021

MENTORING EXPERIENCE

Polymath REU- Computational Algebra   Summer 2021
Met with students twice a week to discuss research projects. Read and critiqued student drafts. Moderated student conversation on online collaboration platform.

Homological Algebra Reading Course   Summer 2020
Organized informal reading course with other graduate students. Prepared course notes, gave weekly presentations over reading.

Algebra Qualifying Exam Workshop   Summer 2020
Led 10 Active Learning Study Sessions for 15 Graduate Students. Critiqued Student Solutions. Sorted Past Exam Questions by Topic into a Database.

Directed Reading Program
Weekly individual meetings with undergraduate students to discuss assigned reading. Assigned Problem sets, discussed solutions with students. Advised Final Project
- Modern Graph Theory (Bollabas)   Spring 2020
  - Final Project: Wrote Code to Test an Open Conjecture
- Commutative Algebra (Atiyah-Macdonald)   Fall 2020 - Spring 2021
  - Final Project: Gave Presentation on Topological Rings at Graduate Student Seminar
- Introduction to Graph Theory (West)   Fall 2021

Graduate Peer Mentor   2019-2020
Regular meetings with first year graduate student to provide support and advice.

PROFESSIONAL ACTIVITIES

Special Session Organizer, 2023 Spring Central Sectional Meeting   Spring 2023

- Invited speakers, set schedule, facilitated talks

URiCA conference co-organizer Spring 2022
- Invite speakers, set schedule for conference for early-career commutative algebraists

NCUWM Conference Volunteer January 2022
- Staffed information room, networking room for conference for undergraduate women in mathematics

First year graduate student orientation co-organizer August 2021
- week-long orientation prepares new graduate students at the University of Nebraska Mathematics department for their coursework and teaching duties
- I planned the schedule, ran training sessions, and organized evening social events

Commutative Algebra Regional Expository Seminar Co-founder and Organizer Fall 2020-Present
- Seminar focuses on introductory material for early-career graduate students from midwestern universities
- Handled scheduling and inviting speakers, designed online post-talk social event

Commutative Algebra Reading Seminar Organizer and web-designer Fall 2020 - Spring 2021
- a graduate-student led seminar focused on expository talks and student research
- Invited speakers, Designed new website

University of Nebraska Lincoln Math Day Volunteer 2017-2021

COMPUTER SKILLS

Macaulay2	Very familiar
LaTeX	Very familiar
Linux terminal scripting (Bash)	Familiar
Python	Familiar
C++	Some experience
HTML	Some experience