

# Cashous Bortner

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<https://cashbortner.wordpress.ncsu.edu/>

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## RESEARCH INTERESTS

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Algebraic, geometric, and combinatorial approaches to mathematical biology; biochemical and physical dynamical systems; parameter identifiability; algebraic statistics.

## EDUCATION

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**Ph.D. in Mathematics**, North Carolina State University **May, 2022 (expected)**

Advisor: Seth Sullivant

Thesis: “Identifiability Analysis of Two Families of ODE Models”

**M.S. in Mathematics**, North Carolina State University **May, 2019**

**B.S. in Mathematics**, University of Nebraska-Lincoln **May, 2017**

## SUBMITTED PAPERS

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1. **Bortner, C.**, Gross, E., Meshkat, N., Shiu, A. & Sullivant, S. Identifiability of Linear Compartmental Tree Models. *Submitted to the Journal of Mathematical Biology*. Available from [arXiv:2106.08487](https://arxiv.org/abs/2106.08487) (2021).
2. **Bortner, C.** & Sullivant, S. Structural Identifiability of Series-Parallel LCR Systems. *Journal of Symbolic Computation*. **112**, 79–104 (2021).
3. **Bortner, C.** & Meshkat, N. Identifiable paths and cycles in linear compartmental models. *Accepted to the Bulletin of Mathematical Biology*. Available from [arXiv:2010.07203](https://arxiv.org/abs/2010.07203) (2022).
4. Bernstein, P., **Bortner, C.**, Coskey, S., Li, S. & Simpson, C. The Set Splittability Problem. *Australasian Journal of Combinatorics* **75**, 190–209. [https://ajc.maths.uq.edu.au/pdf/75/ajc\\_v75\\_p190.pdf](https://ajc.maths.uq.edu.au/pdf/75/ajc_v75_p190.pdf) (Oct. 2019).

## RESEARCH PRESENTATIONS

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- Pure Math Graduate Student Seminar, NCSU, September 27th, 2021
- Minisymposium on Algebra and Geometry of Dynamical Models, SIAM Conference on Applied Algebraic Geometry, August 19th, 2021.
- Joint Math Meetings Poster Presentation, January 6th, 2017.

## ACADEMIC HONORS, AWARDS, AND APPOINTMENTS

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<b>Fall 2021</b>	Funded by the Statistical and Applied Mathematical Sciences Institute Graduate Research Fellowship
<b>Fall 2020-Spring 2021</b>	Preparing the Professoriate Fellow
<b>Fall 2019-Summer 2020</b>	Funded by the NSF Standard Grant “Mathematical Phylogenetics”
<b>Spring 2017</b>	UNL Chair’s Prize for Outstanding Graduating Undergraduate
<b>Spring 2017</b>	UNL Parents’ Recognition Award for Outstanding Faculty and Staff

## TEACHING EXPERIENCE

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MA 103: Topics in Contemporary Mathematics	Spring 2022 (Instructor of Record, 100 students)
MA 103: Topics in Contemporary Mathematics Dist. Ed.	Spring 2022 (Instructor of Record, 52 students)
MA 131: Calculus I for Life and Management Sciences	Summer 2021 (Instructor of Record, 28 students)
MA 225: Foundations of Adv. Math	Spring 2021 (Instructor of Record, 20 students)
MA 225: Foundations of Adv. Math	Fall 2020 (Teaching Assistant, 20 students)
MA 403: Intro. to Modern Algebra	Fall 2020 (Teaching Assistant, 20 students)
MA 131: Calculus I for Life and Management Sciences	Summer 2019 (Instructor of Record, 7 students)
MA 131: Calculus I for Life and Management Sciences	Spring 2019 (Recitation Instructor, 82 students)
MA 141 IEP: Calculus I Intensive English Program	Spring 2019 (Instructor of Record, 7 students)
MA 141: Calculus I	Fall 2018 (Recitation Instructor, 87 students)
MA 131: Calculus I for Life and Management Sciences	Spring 2018 (Recitation Instructor, 78 students)
MA 121: Elements of Calculus	Fall 2017 (Teaching Assistant, 227 students)
MA 208h: Honors Calculus III (UNL)	Spring 2017 (Teaching Assistant, 20 students)
MA 107: Calculus II (UNL)	Fall 2016 (Recitation Instructor, 50 students)
MA 106: Calculus I (UNL)	Spring 2016 (Recitation Instructor, 50 students)
MA 106: Calculus I (UNL)	Fall 2015 (Recitation Instructor, 50 students)
MA 101: College Algebra (UNL)	Spring 2015 (Teaching Assistant, 30 students)
MA 101: College Algebra (UNL)	Fall 2014 (Teaching Assistant, 30 students)

## SERVICE, LEADERSHIP, AND PROFESSIONAL DEVELOPMENT

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- Co-president of Graduate Instructor Support & Tools, Fall 2021 - Present.
- Treasurer of the Math Graduate Student Association, Fall 2021 - Present.
- Mentor in the First Year Graduate Student MentoRing, Fall 2021 - Present.
- Workshop for Inclusive Teaching Practices, December 5th, 2020.
- Member of the Diversity, Equity, and Inclusion Committee, NCSU Math Department, Fall 2020 - Present.
- Co-founder of the Graduate Alliance for Mental Health in Academia, Fall 2020 - Present.
- Graduate Student Panelist at NCSU Mathematics Department Student Recruitment Weekend, Spring 2020 and 2021.
- Workshop on Supporting Students with Disabilities, NCSU GLBT Center, March 29th, 2019.
- Vice President and Graduate Student Association Liaison of the Math Graduate Student Association, Fall 2019 - Spring 2021.
- Member of the Special Projects Committee, NCSU Graduate Student Association, Fall 2019 - Spring 2021.
- Executive Committee Member of the Undergrads Union Grads Mentorship Organization, Fall 2019 - Present.
- Undergraduate Mentor in the Undergrads Union Grads Mentorship Organization, Fall 2018 - Present.
- QPR Suicide Prevention Training, Fall 2018.
- Volunteer at Math Doesn't Bug Me at BugFest, Fall 2017.

## SERVICE PRESENTATIONS

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- *What is a Preliminary Exam?*, Math Graduate Student Association, September 10th, 2021.
- *What is a Qualifying Exam?*, Math Graduate Student Association, May 12th, 2021.
- *What is a Dissertation?*, Math Graduate Student Association, April 2nd, 2021.
- *What is an REU?*, Undergrads Union Grads, January 27th, 2021.
- *Undergraduate Mentoring Panel*, Workshop for Inclusive Teaching Practices, December 5th, 2020.
- *Applying to Grad School*, Undergrads Union Grads, November 11th, 2020.
- *Learning L<sup>A</sup>T<sub>E</sub>X Tutorial*, Undergrads Union Grads, September 29th, 2020.

## SELECTED CONFERENCES ATTENDED

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- SIAM Conference on Applied Algebraic Geometry, August 2021.
- Triangle Lectures in Combinatorics, 2018, 2019, 2020.
- Triangle Area Graduate Mathematics Conference, 2018, 2019, 2020.
- AIM Workshop on Identifiability Problems in Systems Biology, American Institute of Mathematics, August 2019.
- Meeting on Applied Algebraic Geometry, Georgia Institute of Technology, April 2019.