

# Anna Brosowsky

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| <b>Contact Information</b> | 234 Avery Hall<br>1144 T St.<br>Lincoln, Nebraska<br>68588 USA  | Email: <a href="mailto:abrosowsky2@unl.edu">abrosowsky2@unl.edu</a><br>Phone: (609) 751-1342<br><a href="https://anna-brosowsky.github.io/">https://anna-brosowsky.github.io/</a><br><a href="https://orcid.org/0000-0001-5387-3049">https://orcid.org/0000-0001-5387-3049</a> |
| <b>Education</b>           | <b>University of Michigan</b><br>Ph.D. in Mathematics (May 2024)<br>Advisor: Karen E. Smith<br>Thesis Title: <i>The Cartier Core Map and F-Graded Systems</i><br>M.S. in Mathematics (December 2022)<br><br><b>Cornell University</b><br>May 2018<br>B.A. in Mathematics (Summa Cum Laude)<br>Minor in Computer Science   |  |
| <b>Employment</b>          | <b>University of Nebraska–Lincoln</b><br>August 2024–present  | NSF Postdoctoral Associate   |
| <b>Publications</b>        | A. Brosowsky, J. Page, T. Ryan, and K. E. Smith. <i>Geometry of smooth extremal surfaces</i> , Journal of Algebra, Vol 646 (2024) pp 376-411. arXiv:2110.15908, MR4711041<br><br>A. Brosowsky. <i>The Cartier core map for Cartier algebras</i> , Journal of Algebra, Vol 630 (2023) pp 274-296. arXiv:2203.01911, MR4586749<br><br>A. Brosowsky, S. Chepuri, and A. Mason. <i>Parametrizations of <math>k</math>-nonnegative matrices: cluster algebras and <math>k</math>-positivity tests</i> , Journal of Combinatorial Theory, Series A, Vol 174 (2020) article 105217. arXiv:1712.05037, MR4081512. |  |
| <b>Preprints</b>           | A. Brosowsky, H. Du, M. Krishna, S. Nair, J. Page, and T. Ryan. <i>Maximal skew sets of lines on a Hermitian surface and a modified Bron-Kerbosch algorithm</i> . Preprint, submitted. arxiv:2211.16580   |  |
| <b>Honors and Awards</b>   | 2024<br>2022<br>2018<br>2018  | Rackham Outstanding GSI Award<br>Gabrielle & Sophie Rainich Fellowship<br>Outstanding Poster Award, MAA Undergrad Poster Session, JMM<br>Elected to Phi Beta Kappa   |
| <b>Conference Talks</b>    | September 2024<br>KUMUNU, University of Missouri  | <i>Some two variable limit <math>F</math>-signatures</i>   |
|                            | May 2024<br>URiCA, University of Nebraska–Lincoln   | <i>Cartier algebras through the lens of <math>p</math>-families</i>  |
|                            | January 2024<br>Special Session on Recent Developments in Commutative Algebra at the JMM  | <i>Cartier algebras through the lens of <math>p</math>-families</i>  |

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|                         | October 2023   | <i>Cartier algebras through the lens of <math>p</math>-families</i><br>AMS Fall Central Sectional, Creighton University                             |
|                         | March 2023     | <i>The Cartier core map for Cartier algebras</i><br>AMS Spring Southeastern Sectional, Georgia Tech   |
|                         | October 2022   | <i>The Cartier core map for Cartier algebras</i><br>AMS Fall Western Sectional, University of Utah  |
|                         | September 2016 | <i>Recursions and Colored Hilbert Schemes</i><br>Women in Mathematics in the Northeast Conference, Smith College                                    |
|                         | August 2016    | <i>Poincaré Polynomial of Moduli Space via Weil Conjectures</i><br>Young Mathematician's Conference, Ohio State University                          |
| <b>Seminar Talks</b>    | November 2024  | <i>Cartier algebras through the lens of <math>p</math>-families</i><br>Arizona State University Number Theory & Algebra Seminar                     |
|                         | October 2024   | <i>Cartier algebras through the lens of <math>p</math>-families</i><br>University of Nebraska–Lincoln Commutative Algebra Seminar                   |
|                         | November 2023  | <i>Cartier algebras through the lens of <math>p</math>-families</i><br>Centro de Investigación en Matemáticas Alg. Geometry & Comm. Algebra Seminar |
|                         | October 2023   | <i>Cartier algebras through the lens of <math>p</math>-families</i><br>University of Utah Commutative Algebra Seminar                               |
|                         | September 2023 | <i>Cartier algebras through the lens of <math>p</math>-families</i><br>University of Michigan Commutative Algebra Seminar                           |
|                         | October 2022   | <i>The Cartier core map for Cartier algebras</i><br>University of Illinois at Chicago Commutative Algebra Seminar                                   |
|                         | September 2022 | <i>The Cartier core map for Cartier algebras</i><br>University of Michigan Commutative Algebra Seminar  |
|                         | September 2022 | <i>The Cartier core map for Cartier algebras</i><br>University of New Mexico Algebra & Geometry Seminar   |
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| <b>Posters</b>          | January 2023   | <i>The Cartier core map for Cartier algebras</i><br>AWM Poster Session at the JMM   |
|                         | May 2022       | <i>Cartier core map for Cartier algebras</i><br>KUMUNU Poster Session   |
|                         | January 2018   | <i>Cluster Algebras and <math>k</math>-positivity Tests</i><br>MAA Undergraduate Poster Session at the JMM  |
| <b>Expository Talks</b> | October 2024   | <i>Introduction to strong <math>F</math>-regularity</i><br>UNL Commutative Algebra Reading Seminar  |
|                         | November 2023  | <i>Measuring <math>F</math>-singularities numerically</i><br>UM Student Commutative Algebra Seminar   |

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| November 2023                          | <i>Introduction to cohomological F-singularities</i> |
| UM Student Commutative Algebra Seminar |  |
| September 2023                         | <i>Introduction to liaison theory</i>                |
| UM Student Commutative Algebra Seminar |  |
| February 2023                          | <i>Workshop on Macaulay2</i>                         |
| UM Student Commutative Algebra Seminar |  |
| January 2023                           | <i>How to tell when an ideal is homogeneous</i>      |
| UM Student Commutative Algebra Seminar |  |
| October 2022                           | <i>Using volumes to compute properties of ideals</i> |
| UM Student Commutative Algebra Seminar |  |
| February 2022                          | <i>An Introduction to Determinantal Rings</i>        |
| UM Student Commutative Algebra Seminar |  |
| November 2021                          | <i>Cluster Algebras</i>                              |
| UM Student Commutative Algebra Seminar |  |
| December 2020                          | <i>Spectral Properties of Graph Laplacians</i>       |
| UM Student Combinatorics Seminar       |  |
| October 2022                           | <i>Introduction to Strong F-regularity</i>           |
| UM Student Commutative Algebra Seminar |  |
| November 2018                          | <i>Primary Decomposition</i>                         |
| UM Student Commutative Algebra Seminar |  |
| September 2017                         | <i>An Introduction to Gröbner Bases</i>              |
| Cornell Undergrad Math Club            |  |
| April 2017                             | <i>Graphs and Probability</i>                        |
| Cornell Undergrad Math Club            |  |

## Teaching Experience

### University of Michigan

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|---|--|
| Fall 2018, Winter 2019,<br>Winter 2020, Fall 2020,<br>Fall 2023 & Winter 2024 | Instructor of Record, Calculus I (Math 115)  |
| July 2022 & July 2023   | Math Level III Instructor, M-STEM Academies  |
| Fall 2022   | Grader, Commutative Algebra (Math 614)       |
| Fall 2019   | Instructor of Record, Calculus II (Math 116) |

### Cornell University

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|---|---|
| Spring 2016, Fall 2017,<br>& Spring 2018            | TA, Intro to Analysis of Algorithms (CS 4820) |
| Spring 2015, Fall 2015,<br>Spring 2016, & Fall 2016 | TA, Intro to Computing in Python (CS 1110)    |

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| <b>Professional Activities</b> | Fall 2023 – Winter 2024 | <b>Co-organizer</b> , UM Commutative Algebra Seminar   |
|                                | Fall 2022 – Winter 2024 | <b>Co-organizer</b> , UM Student Comm. Algebra Seminar   |
|                                | Fall 2022               | <b>Grad Student Mentor</b> , UM Math Intro Program<br>Instructor support position. Duties included: providing instructor observations & feedback, assisting with teaching team organization, and substitute teaching.  |
|                                | Fall 2022 – Winter 2024 | <b>Member</b> , UM Math Grad Student Advisory Committee<br>Bring grad student issues & concerns to Math Graduate Chair.  |
|                                | Winter 2022             | <b>Mentor</b> , UM Lab of Geometry<br>Co-supervised an undergrad research project on configurations of lines on smooth extremal surfaces; led to a preprint which has been submitted to a journal.   |
|                                | Fall 2021               | <b>Grad Co-coordinator</b> , Calculus I (Math 115)<br>Course organizational position. Duties included: writing homework assignments & exam questions, and providing instructor observations & feedback.  |
|                                | Fall 2020 – Winter 2024 | <b>Mentor</b> , Twoples Directed Reading Program<br>Each semester, get paired with an undergrad mentee from a school without a local DRP. Meet weekly on Zoom to supervise reading & final project.  |
|                                | May 2020 – 2022         | <b>Team Member</b> , UM Foundational Course Initiative<br>Part of a team revising Calculus I with a focus on student support. Helped with design & implementation of 3 new mastery assessments.  |
|                                | July 2018               | <b>Counselor</b> , MathPath Summer Camp<br>Assisted with office hours, math questions, and classes. Co-designed & co-taught a one week course on network flows. Supervised and looked after well-being of 11–14 year old campers both day-to-day and on outings. |
| <b>Relevant Skills</b>         | Languages:              | English (native speaker), German (basic)   |
|                                | Programming:            | Python, Java, Macaulay2, L <sup>A</sup> T <sub>E</sub> X   |