

# Alexandra Seceleanu

## Curriculum Vitae

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### Research interests

Commutative algebra and algebraic geometry, with emphasis on homological methods and their connections to algebraic geometry; computational algebra.

### Education

- 2005–2011 **PhD in Mathematics**, *University of Illinois*, Urbana–Champaign.
- 2003–2005 **Master of Science**, *Școala Normală Superioară București (SNSB)*, Romania.  
Concentration in Algebra–Geometry–Topology
- 2000–2005 **Bachelor of Science**, *University of Bucharest*, Romania.  
Majors: Mathematics and Computer Science

### Academic Appointments

- Jan–Apr 2024 **Research Member**, *The Simons-Laufer Research Institute (MSRI)*, Berkeley, California.
- 2021–present **Associate Professor**, *University of Nebraska–Lincoln*, Lincoln, Nebraska.
- 2015–2021 **Assistant Professor**, *University of Nebraska–Lincoln*, Lincoln, Nebraska.
- 2012–2015 **Edith T. Hitz Research Assistant Professor**, (*postdoctoral position*) *University of Nebraska–Lincoln*, Lincoln, Nebraska.
- Aug–Dec 2012 **Postdoctoral Research Member**, *The Mathematical Sciences Research Institute (MSRI)*, Berkeley, California.
- 2011–2012 **Postdoctoral Research Fellow**, *University of Nebraska–Lincoln*, Lincoln, Nebraska.

### Honors and Awards

- 2020 **College Distinguished Teaching Award** conferred by the College of Arts and Sciences.
- 2018 **Harold and Esther Edgerton Junior Faculty Award** conferred by the University of Nebraska for creative research, extraordinary teaching abilities, and academic promise.
- 2011 **Irving Reiner Memorial Award** for outstanding scholastic achievement in algebra.
- 2005–2008 **Illinois Distinguished Fellowship**, University of Illinois at Urbana–Champaign.

### Grants

- 2023–2024 **NSF Conference Grant** DMS–2324929 (with co-PI Haydee Lindo).
- 2021–2024 **NSF Investigator Grant** DMS–2101225.
- 2020–2023 **NSF Conference Grant** DMS–1953096 and **NSA Conference Grant**
- 2018–2019 **NSF Conference Grant** DMS–1811000 (with co-PI's from UNL and Kansas State).
- 2018 **Epscor First Award** OIA–1557417 granted by Nebraska Epscor.
- 2016–2021 **NSF Investigator Grant** DMS–1601024.

## Publications appeared or accepted

\* denotes graduate student coauthor, † denotes undergraduate student coauthor

- 2023    36 *Duality for asymptotic invariants of graded families* (with M. DiPasquale, T. Nguyễn), Adv. Math. 430 (2023), Paper No. 109208.
- 35 *Lefschetz properties of some codimension three Artinian Gorenstein algebras* (with N. Abdallah, N. Altafi, A. Iarrobino, J. Yaméogo), J. Algebra 625 (2023), 28–45.
- 34 *Cohomological blow ups of graded artinian Gorenstein algebras along surjective maps* (with A. Iarrobino, P. Macias Marques, C. McDaniel and J. Watanabe), Int. Math. Res. Not. IMRN 2023, no. 7, 5816–5886.
- 33 *Axial constants and sectional regularity of homogeneous ideals* (with M. DeBellevue\*, A. Lebovitz†, Y. Li†, M. Lotfi†, S. Mohite†, X. Pan†, M. S. Pathak†, S. Roshan Zamir\*, S. X. Zhang†), Proc. Amer. Math. Soc. 151 (2023), no. 4, 1363–1378.
- 32 *Computing rational powers of monomial ideals* (with P. Dongre†, B. Drabkin, J. Lim†, E. Partida†, E. Roy†, D. Ruff†, T. Tang), J. Symbolic Comput. 116 (2023), 39–57.
- 2022    31 *Convex bodies and asymptotic invariants for powers of monomial ideals* (with J. Camarheiro†, B. Drabkin, D. Fragozo†, W. Frendreiss†, D. Hoffman†, T. Tang, S. Yang†), J. Pure Appl. Algebra 226 (2022), no. 10, paper no. 107089.
- 30 *Rees algebras of filtrations of covering polyhedra and integral closure of powers of monomial ideals* (with G. Grisalde\* and R. Villarreal), Res. Math. Sci. 9 (2022), no. 1, paper no. 13. 13 (05).
- 29 *Connected sums of graded artinian Gorenstein algebras and Lefschetz properties* (with C. McDaniel, A. Iarrobino), J. Pure Appl. Algebra 226 (2022), no. 1, 106787.
- 2021    28 *Canonical resolutions over Koszul algebras* (with E. Faber, M. Juhnke-Kubitzke, H. Lindo, C. Miller, R. R.G.), Women in Commutative Algebra—Proceedings of the 2019 WICA Workshop, Springer, Cham, 2021.
- 27 *Symbolic Rees algebras* (with E. Grifo), Commutative Algebra 343–371, Springer, Cham, 2021.
- 26 *Consequences of the packing problem* (with H. Bodas†, B. Drabkin, C. Fong†, S. Jin†, J. Kim†, W. Li†, T. Tang, B. Williams†), J. Algebraic Combin. 54 (2021), no. 4, 1095–1117.
- 25 *Singular loci of reflection arrangements and the containment problem* (with B. Drabkin\*), Math. Z. 299 (2021), no. 1-2, 867–895.
- 2020    24 *Quadratic Gorenstein rings with many surprising properties* (with J. McCullough), Arch. Math. (Basel) 115 (2020), no. 5, 509–521 – named distinguished article by the editors.
- 23 *Symbolic powers of codimension two Cohen-Macaulay ideals* (with S. Cooper, G. Fattabbi, E. Guardo, A. Lorenzini, J. Migliore, U. Nagel, J. Szpond, A. Van Tuyl), Comm. Algebra. 48 (2020), no 11, 4663–4680.
- 22 *Implicitization of tensor product surfaces via virtual projective resolutions* (with E. Duarte), Math. Comput. (2020), 89 (2020), no. 326, 3023–3056.
- 21 *Betti numbers of symmetric shifted ideals* (with J. Biermann, H. De Alba Casillas, F. Galetto, S. Murai, U. Nagel, T. Römer, A. O’Keefe), J. Algebra 560 (2020), 312–342.
- 20 *Frieze varieties: A characterization of the finite-tame-wild trichotomy for acyclic quivers* (with K. Lee, L. Li, M. Mills and R. Schiffler), Adv. Math. 367 (2020), 107130.

- 19 *Generalized minimum distance functions and algebraic invariants of Geramita ideals* (with S. Cooper, Ş. Tohăneanu, M. Vaz Pinto and R. Villarreal), Adv. in Appl. Math. 112 (2020) 101940.
- 2019 18 *Negative curves on symmetric blowups of the projective plane, resurgences and Waldschmidt constants* (with Th. Bauer, S. Di Rocco, B. Harbourne, J. Huizenga, T. Szemberg), Int. Math. Res. Not. IMRN 2019, no. 24, 7459–7514.
- 17 *Calculations involving symbolic powers* (with B. Drabkin\*, E. Grifo\*, B. Stone), JSAG Journal of Software for Algebra and Geometry, vol. 9, no.1 (2019), 71–80.
- 16 *Determinants of incidence and Hessian matrices arising from the vector space lattice* (with S. Nasseh and J. Watanabe), J. Commutative Algebra, vol. 11, no. 1 (2019), 131–154.
- 2018 15 *A tight bound on the projective dimension of four quadrics* (with C. Huneke, J. McCullough and P. Mantero), J. Pure Appl. Algebra 222 (2018), no. 9, 2524–2551.
- 2016 14 *The Waldschmidt constant for squarefree monomial ideals* (with C. Bocci, S. Cooper, E. Guardo, B. Harbourne, M. Janssen, U Nagel, A. Van Tuyl, T. Vu), J. Algebraic Combin. 44 (2016), no. 4, 875–904.
- 13 *Ordinary and symbolic Rees algebras of Fermat point configurations* (with U. Nagel), J. Algebra 468 (2016), 80–102.
- 12 *Multiple structures with arbitrarily large projective dimension on linear subspaces* (with C. Huneke, J. McCullough and P. Mantero), J. Algebra 447 (2016), 183–205.
- 2015 11 *Resurgences for ideals of special point configurations in  $\mathbb{P}^N$  coming from hyperplane arrangements* (with M. Dumnicki, B. Harbourne, U. Nagel, T. Szemberg, H. Tutaj-Gasinska), J. Algebra 443 (2015), 383–394.
- 10 *A homological criterion for the failure of containment between symbolic and ordinary powers of ideals of points in  $\mathbb{P}^2$* , J. Pure Appl. Algebra 219 (2015), no. 11, 4857–4871.
- 9 *A multiplicity bound for graded rings and a criterion for the Cohen-Macaulay property* (with C. Huneke, J. McCullough and P. Mantero), Proc. Amer. Math. Soc. 143 (2015), no. 6, 2365–2377.
- 8 *Containment counterexamples for ideals of various configurations of points in  $\mathbb{P}^N$*  (with B. Harbourne), J. Pure Appl. Algebra 219 (2015), 1062–1072.
- 2014 7 *Syzygies and singularities of tensor product surfaces of bidegree  $(2, 1)$*  (with H. Schenck and J. Validashti), Math. Comp. 83 (2014), 1337–1372.
- 2013 6 *The projective dimension of codimension two algebras presented by quadrics* (with C. Huneke, J. McCullough and P. Mantero), J. Algebra 393 (2013), 170–186.
- 5 *Bounding projective dimension* (with J. McCullough) - Commutative Algebra, Springer-Verlag London Ltd., London, 2013.
- 2012 4 *Syzygy theorems via comparison of order ideals on a hypersurface* (with P.A. Griffith), J. Pure Appl. Algebra 216 (2012), 468–479.
- 2011 3 *Inverse systems, Gelfand-Tsetlin patterns and the weak Lefschetz property* (with B. Harbourne and H. Schenck) J. London Math. Soc., 84 (2011), 712–730.
- 2 *Ideals with large projective dimension and regularity* (with J. Beder, J. McCullough, L. Nunez-Betancourt, B. Snapp, B. Stone), J. Symb. Comput. 46 (2011), 1105–1113.
- 2010 1 *The Weak Lefschetz Property and powers of linear forms in  $K[x, y, z]$*  (with H. Schenck), Proc. Amer. Math. Soc. 138 (2010), 2335–2339.

## Writing contributions to the profession

- 1 *When life gives you lemons, make mathematicians* (with K. Adaricheva, B. Brubaker, P. Devlin, S. J. Miller, V. Reiner, A. Sheffer, Y. Zeytuncu), Notices of the American Mathematical Society, March 2021.

## Teaching Experience

All course listed below were taught as *instructor of record* with full course responsibilities.

### At the University of Nebraska-Lincoln:

MATH 106 Calculus I (large lecture)	Fall 2023
MATH 189H The Joy of Numbers (honors curriculum course)	Fall 2014
MATH 208 Analytic Geometry and Calculus III	Spring 2013
MATH 310 Introduction to Modern Algebra	7 times
MATH 314/814 Linear Algebra	3 times
MATH 314H Honors Applied Linear Algebra (honors curriculum course)	Spring 2017
MATH 325 Introduction to Real Analysis	Fall 2017, Spring 2021
MATH 407 Mathematics for High School Teaching I	Spring 2018
MATH 415/815 Linear Transformations	Spring 2023
MATH 417 Group Theory	Spring 2013
MATH 435 Math in the City <sup>2</sup>	Fall 2013
MATH 805T Discrete Mathematics for Teachers	Summer 2016
MATH 817 Introduction to Modern Algebra I (graduate course)	Fall 2018, 2022
MATH 818 Introduction to Modern Algebra II (graduate course)	Spring 2017, 2019
Co-instructor for MATH 896 Mathematics Literature Seminar (graduate course)	Summer 2014
MATH 901 Modern Algebra I (graduate course)	Fall 2020
MATH 902 Modern Algebra II (graduate course)	Spring 2020, 2021
MATH 905 Commutative Algebra (graduate course)	Fall 2017
MATH 918 Computational Algebra (graduate topics course)	Fall 2013
MATH 918 Geometry of Syzygies (graduate topics course)	Spring 2016
MATH 918 The Lefschetz Properties (graduate topics course)	Fall 2019

### At the University of Illinois at Urbana-Champaign:

MATH 231 Calculus II, <i>Calculus &amp; Mathematica</i> <sup>1</sup>	Fall 2008, Fall 2009
MATH 181 A Mathematical World	Summer 2006

<sup>1</sup> Course uses *Mathematica* to aid visualization and develop conceptual understanding.

<sup>2</sup> Capstone course on topics in mathematical modeling in collaboration with local institutions.

## Teaching Development and Awards

- 2020 College Distinguished Teaching Award, UNL College of Arts and Sciences.
- 2018 Roger Wiegand Award for contributions to the UNL mathematics graduate program.
- 2017–2018 Completed the *Peer Review of Teaching Project*, a year-long program centered around (re)designing a course, implementing it and constructing a teaching portfolio.
- 2014 Certificate of Recognition for Contributions to Students recipient, UNL.
- 2010 Nominated for teaching award within the Mathematics Department, UIUC.
- 2008,2009 Appeared on the List of Teachers Ranked as Excellent by their students, UIUC.

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## Graduate Students Supervised

- 2016–present Thesis advisor and supervisory committee (co-)chair for
- Benjamin Drabkin (Ph.D. 2020)
  - Andrew Conner (M.S. 2020)
  - Erica Hopkins (Ph.D. 2021), co-advised with Mark Walker
  - Michael DeBellevue (Ph.D. 2022), co-advised with Mark Walker
  - Nikola Kuzmanovski (since 09/2023), co-advised with Jamie Radcliffe
  - Shah Roshan Zamir (since 04/2021)
  - Juliann Geraci (since 05/2022)

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## Postdoctoral Mentoring

- 2021–2022 Alessandra Costantini, supported by an AWM mentoring travel grant
- 2023–2026 Lauren Cranton Heller

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## Undergraduate Research Supervised

- 2023–2024 *Abstract Algebra and U.S. National Security: Transitioning Use of the RSA Algorithm in Post-Quantum Cryptography* – honors thesis by Helena Holland
- 2023 *Polymath Jr: Strength and Symmetry of Polynomials* – 23 students
- research presentation at JMM 2024
- 2021 *Hessian matrices in three dimensions* – Turner Blick, supported by a UCARE grant
- research presentation at the UNL Summer Research Symposium
- 2021 *Polymath Jr: Computational Algebra* – 22 students
- produced a research publication and presentations at the Young Mathematicians Conference 2021, JMM 2023
- 2020 *Polymath Jr: Monomials, Convex Bodies and Optimization* – 29 students
- produced three publications and presentations at JMM 2021, 2022, MathFest 2021 (outstanding presentation award)
- 2017 *The Waldschmidt constant and symbolic powers of monomial ideals* – Diana Zhong
- presented a talk at the Central States Mathematics Undergraduate Conference
- 2015 *Tropical rank for phylogenetic metrics* – Cashous Bortner, Kaylee Homolka, William Morgan, Jack Rodenburg
- in the framework of the Collaborative Research Project in mathematics
- 2013–2015 *Unimodality for independence sequences of well-covered graphs of small type*
- undergraduate thesis by Joey Becker – supported by a UCARE grant
- 2014 *The Rollercoaster Conjecture* – poster presented by Joseph Becker
- UNL Research Fair Undergraduate Poster Session
- 2014 *Sustainability of Nebraska Groundwater Reservoirs* – Angie Loong, Katie Pawlowski, Helen Pitts, Jacqui Voss and Shalima Zalsha
- Nebraska Undergraduate Conference for Women in Mathematics
  - UNL Research Fair Undergraduate Poster Session

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## Conference Organization

- 2024 Co-organizer for the *Women in Commutative Algebra III* workshop at Casa Matemática Oaxaca, Mexico.
- 2024 Co-organizer for the *Connections* workshop in the framework of the Commutative Algebra thematic program at MSRI, Berkeley.
- 2024 Co-organizer for two special sessions *Group Actions in Commutative Algebra* and *Poly-math Jr REU Student Research* at the Joint Mathematics Meetings, San Francisco.
- 2023 Co-organizer for the *Women in Commutative Algebra II* workshop at CIRM, Trento, Italy.
- 2023 Co-organizer for a research conference on *Unexpected and Asymptotic Properties of Projective Varieties* at the University of Nebraska–Lincoln.
- 2021 Co-organizer for a special session on *Commutative Algebra* at the AMS Sectional Meeting at Creighton University.
- 2019 Co-organizer for a special session on *Recent Advances in Homological and Commutative Algebra* at the Joint Mathematics Meetings, Baltimore, MD.
- 2018 Co-organizer for a focused research group on *Investigating Linear Codes via Commutative Algebra* at BIRS, Banff, Canada.
- 2017 Co-organizer for a special session on *Commutative Algebra* in the framework of the AWM Research Symposium at UCLA.
- 2014 Co-organizer for a special session on *Commutative Algebra and Algebraic Geometry* at the AMS Sectional Meeting at Texas Tech University.

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## Selected Presentations

- 12/2023 Syracuse University mathematics colloquium.
- 10/2023 AMS Sectional Meeting, Creighton University, Omaha.
  - *Special Session on Varieties with unexpected hypersurfaces, geproci sets and their interactions*
  - *Special Session on Commutative Algebra, differential operators, and singularities*
- 10/2023 Fellowship of the Ring international commutative algebra seminar.
- 09/2023 AWM Symposium, Clark Atlanta University, Atlanta.
  - *Special Session on Combinatorial and Homological Methods in Commutative Algebra*
- 06/2023 National School on Algebra lecture series, University of Bucharest.
- 05/2023 MSRI graduate school colloquium, Notre Dame University.
- 05/2023 Fields Institute – Lefschetz Properties in Algebra, Geometry, Topology and Combinatorics, Toronto, Canada.
- 03/2023 IIT Bombay international commutative algebra seminar, (online).
- 03/2023 Cleveland State University mathematics colloquium.
- 01/2023 AMS Joint Mathematics Meeting, Boston.
  - *Special Session on The combinatorics and geometry of Jordan type and Lefschetz properties*
- 01/2023 CIRM – Commutative Algebra – Written Geometry, Luminy, France.
- 11/2022 MFO – General Projections of Algebraic Varieties, Oberwolfach, Germany.
- 09/2022 INdAM – The Strong and Weak Lefschetz Properties, Cortona, Italy.

- 03/2022 AMS Sectional Meeting, (online).  
- *Special Session on Combinatorial Methods in Commutative Algebra*
- 02/2022 MFO – Interpolation, Approximation and Algebra, Oberwolfach, Germany.
- 02/2022 Women in Commutative Algebra and Algebraic Geometry, (online), Fields Institute.
- 11/2021 AMS Sectional Meeting, (online).  
- *Special Session on Hyperplane Arrangements in Connection with Commutative Algebra*
- 08/2021 SIAM Conference on Applied Algebraic Geometry, (online).  
- *Minisymposium on Commutative Algebra and its Applications*
- 05/2021 AMS Sectional Meeting, (online).  
- *Special Session on Women in Commutative Algebra - 100 years of Idealtheorie in Ringbereichen*
- 01/2021 AMS-MAA Joint Mathematics Meeting, (online).  
- *Special Session on Commutative Algebra Meets Representation Theory*
- 12/2020 Cleveland State University mathematics colloquium, (online).
- 12/2020 Algebra, Geometry, and Combinatorics colloquium, (national online seminar).
- 09/2020 AMS Sectional Meeting, (online).  
- *Special Session on Free Resolutions, Combinatorics, and Geometry*  
- *Special Session on Commutative Algebra*  
- *Special Session on Recent Developments in Commutative Algebra*
- 07/2020 Fellowship of the ring national commutative algebra seminar, organized by MSRI.
- 10/2019 CIRM – Lefschetz properties in Algebra, geometry and Combinatorics II, Luminy, France.
- 07/2019 SIAM Conference on Applied Algebraic Geometry, Bern, Switzerland.  
- *Minisymposium on Syzygies and Applications to Geometry*
- 04/2019 Graduate Workshop in Commutative Algebra for Women and Mathematicians of Other Minority Genders, Minneapolis, MN.
- 04/2019 AWM Research Symposium, Houston, TX.  
- *Special Session on Commutative Algebra*
- 12/2018 Canadian Math Society winter meeting, Vancouver, BC, Canada.  
- *Special Session on Symbolic and Regular Powers of Ideals*
- 11/2018 Geometric Methods in Representation Theory conference, Iowa City, IA.
- 10/2018 MFO – Asymptotic Invariants of Homogeneous Ideals, Oberwolfach, Germany.
- 06/2018 BIRS workshop – New Trends in Syzygies, Banff, Canada.
- 04/2018 Commutative Algebra workshop, Charlottesville, VA.
- 03/2018 AMS Sectional Meeting, Columbus, OH.  
- *Special Session on Lefschetz Properties*
- 10/2017 Structures on Free Resolutions, Lubbock, TX.
- 09/2017 AMS Sectional Meeting, Denton, TX.  
- *Special Session on Commutative Algebra*
- 08/2017 SIAM Conference on Applied Algebraic Geometry, Atlanta, GA.  
- *Minisymposium on Free Resolutions Governed by Geometric and/or Combinatorial Data*
- 07/2017 Stillman's Conjecture and Other Progress on Free Resolutions, Berkeley, CA.
- 06/2017 Commutative Algebra Meeting Algebraic Geometry, Bucharest, Romania.
- 05/2017 CMO – Symbolic and Ordinary Powers of Ideals, Oaxaca, Mexico.

- 08/2016 CMO – Geometric Modeling and Approximation Theory, Oaxaca, Mexico.
- 07/2016 Commutative Algebra and its Interactions with Algebraic Geometry: Tight Closure, Linkage, and Syzygies, Ann Arbor, MI.
- 04/2016 AMS Sectional Meeting, Fargo, ND.  
- *Commutative Algebra & Interactions with Combinatorics and Algebraic Geometry*
- 04/2016 AMS Sectional Meeting, Salt Lake City, UT.  
- *Combinatorial and Computational Commutative Algebra and Algebraic Geometry*
- 03/2016 AMS Sectional Meeting, Athens, GA.  
- *Session on Commutative Algebra*  
- *Session on Combinatorial and Computational Algebra*
- 02/2016 MFO – Arrangements of subvarieties & their applications in algebraic geometry, Oberwolfach, Germany.
- 10/2015 KUMUNU, *University of Missouri*, Columbia, MO.
- 07/2015 Eighth International Congress of Romanian Mathematicians, Iași, Romania.
- 07/2015 Minimal free resolutions, Betti numbers, and combinatorics, Edinburgh, Scotland.
- 02/2015 MFO–Linear systems, symbolic powers and Waring problems, Oberwolfach, Germany.
- 01/2015 AMS-MAA Joint Mathematics Meeting, San Antonio, TX.  
- *Special session on Syzygies*
- 09/2014 AMS Sectional Meeting, Eau-Claire, WI.  
- *Special Session on New Developments in Toric Varieties*
- 01/2014 AMS-MAA Joint Mathematics Meeting, Baltimore, MD.  
- *Special Session on Homological and Characteristic  $p$  Methods*
- 10/2013 AMS Sectional Meeting, Louisville, KY.  
- *Special Session on Combinatorial Commutative Algebra*
- 10/2013 AMS Sectional Meeting, Louisville, KY.  
- *Special Session on Recent Advances in Commutative Algebra and its Applications*
- 09/2013 Interactions between Commutative Algebra and Algebraic Geometry II.  
Tulane University, New Orleans, LA
- 08/2013 SIAM Conference on Applied Algebraic Geometry, Fort Collins, CO.  
- *Minisymposium on Approximation Theory, Geometric Modeling, and Algebraic Geometry*  
- *Minisymposium on Computations and Effective Bounds in Commutative Algebra*
- 06/2013 AMS - RMS Joint International Meeting, Alba-Iulia, Romania.
- 09/2012 Focus Period Members' Seminar, *MSRI*, Berkeley.
- 04/2012 Algebra, Geometry and Combinatorics Day, *UIUC*, Champaign, IL.
- 03/2012 AMS Sectional Meeting, Lawrence, KS.  
- *Special session on Singularities in Commutative Algebra and Algebraic Geometry*
- 10/2011 AMS Sectional Meeting, Lincoln, NE.  
- *Special session on Algebraic Geometry and Graded Commutative Algebra*
- 07/2011 Seventh International Congress of Romanian Mathematicians, Braşov, Romania.
- 01/2011 AMS-MAA Joint Mathematics Meeting, New Orleans, LA .  
- *Special session on Commutative Algebra (Mathematics Research Communities)*
- 01/2010 AMS-MAA Joint Mathematics Meeting, San Francisco, CA.  
- *Special session on Commutative Algebra*



11/2009 AMS Sectional Meeting, Boca Raton, FL.  
- *Special session on Graded Resolutions*

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## Service to the Profession

Reviewer for the NSF Algebra and Number Theory Grant Program.

Reviewer for the NSF Graduate Research Fellowships Program.

Reviewer for the NSA Mathematical Sciences Grant Program.

Reviewer for the Simons Foundation Collaboration Grants for Mathematicians Program.

Reviewer for the Alexander von Humboldt Foundation fellowship program.

Referee for the following journals :

- Algebra and Number Theory,
- Archiv der Mathematik,
- Advances in Applied Mathematics,
- Compositio Mathematica,
- Contemporary Mathematics,
- Collectanea Mathematica,
- European Journal of Combinatorics,
- Geometriae Dedicata,
- Illinois Journal of Mathematics,
- International Journal of Algebra and Computation,
- International Mathematics Research Notices,
- Israel Journal of Mathematics,
- Journal of Algebra,
- Journal of Algebra and Its Applications,
- Journal of Algebraic Combinatorics,
- Journal of Commutative Algebra,
- Journal of Combinatorial Theory Series A,
- Journal of the London Mathematical Society,
- Journal of Pure and Applied Algebra,
- Journal of Software for Algebraic Geometry,
- Journal of Symbolic Computation,
- Mathematics of Computation,
- Mathematische Zeitschrift,
- Michigan Mathematical Journal,
- Portugaliae Mathematica,
- Proceedings of the American Mathematical Society,
- SIAM Journal on Applied Algebra and Geometry,
- Transactions of the American Mathematical Society.

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## University Service

2017–2019, Mathematics Department Executive Committee member (elected).

2023–2025 - *Revised bylaws, promotion and tenure guidelines, advised chair on annual reviews.*

2012–present Undergraduate Activities Committee member (co-chair 2016–17, chair 2017–20, 2023).  
- *Faculty advisor to Math Club & Pi Mu Epsilon.*

2023 Mathematics Department 125-year Celebration Committee member.

- 2019, 2022 Mathematics Department Tenure-track Search Committee member.
- 2022–2023 Undergraduate Program Committee
  - 2021 Focus group on envisioning the future of NSF Epscor (university-wide).
  - 2021 Edgerton award selection committee (university committee).
- 2020–2021 Graduate recruitment coordinator and Graduate Advisory Committee member.
- 2016–2022 AMS graduate student chapter faculty advisor.
- 2016–present Teaching mentor for several graduate students in mathematics
  - *Advised GTAs regarding course policies, instruction procedures and exams.*
- 2015–2017 Mathematics Department Graduate Advisory Committee member.
  - *Temporary advisor for eight graduate students in their first and second year of studies.*
- 2017 Ad-hoc Search Committee for the Chair of the Mathematics Department member.
- 2014–2017 Mentor for two undergraduate students in the Nebraska Math program
  - *Advised students regarding course selection and career options.*
- 2013 Undergraduate Creative Activities and Research interdisciplinary selection committee
  - *Reviewed research project proposals from undergraduate students for funding.*
- 2012 Nebraska Conference for Undergraduate Women in Math—organized faculty program.
- 2011, 2013 Putnam contest training – led problem solving sessions for UNL students.

## --- Outreach and Diversity Efforts

### Graduate Summer Schools

- June 2024 Lefschetz Properties School, Krakow, Poland
  - *Scheduled to delivered a lecture series aimed at graduate students and postdocs.*
- June 2023 National Algebra School, Bucharest, Romania
  - *Delivered a lecture series aimed at graduate students and postdocs.*
- May 2023 MSRI Summer School Commutative Algebra and its Interaction with Algebraic Geometry

### Undergraduate Research

- 2020–2023 Mentor for the Polymath Jr. undergraduate research program ~ 300 students each year.
  - *Mentored large groups of undergraduates on collaborative reserach.*
- 2017–2019 Organizer for the Central States Mathematics Undergraduate Conference.
  - *A conference showcasing research performed by undergraduate students.*
- 2015–2020 Organizer for the lecture series Career Perspectives in Mathematics.
  - *Featuring professional success stories from UNL mathematics alumni.*

### Women in Mathematics

- 10/2019 Project co-leader at the Women in Commutative Algebra (WICA) workshop.
- 04/2019 Invited speaker at the Graduate Workshop in Commutative Algebra for Women & Mathematicians of Other Minority Genders.
- 02/2019 Invited speaker by the Association for Women in Mathematics student chapter at the University of Kentucky.
- 09/2016 Invited speaker by the Association for Women in Mathematics student chapter at the University of Illinois at Urbana-Champaign.

## Mathematics Education

- 01/2014 Math in the City: connecting the classroom to the local community through mathematical modeling, *Joint Mathematics Meetings, Baltimore, MD*.  
- MAA special session on *Instructional Approaches to Increase Awareness of the Societal Value of Mathematics*
- 2013 Co-organizer for the *Math in the City Workshop* for external faculty development.

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## Computational Algebra Software Development

Software developer for the computer algebra program *Macaulay2*. Software packages developed or contributed to:

- Generic Initial Ideal,
- Regularity,
- Symmetric Polynomials,
- Big Ideals,
- Normal Toric Varieties,
- SymbolicPowers.