Associate Professor, University of Nebraska-Lincoln.

Ph. D.: The University of Utah, May 2015. Advisor: Professor Anurag K. Singh

B. S.: The Ohio State University, June 2010.

Appointments:
- Associate Professor, University of Nebraska-Lincoln, 2020–2024.
- SLMath Research Member, Spring 2024.
- Assistant Professor, University of Nebraska-Lincoln, 2020–2024.
- Investigador Titular A (tenure-track faculty), CIMAT, 2019–2020.
- NSF Postdoctoral Fellow, The University of Michigan, 2016–2019.
- RTG Assistant Professor, The University of Michigan, 2015–2016.
- Graduate Teaching/Research Assistant, The University of Utah, 2010–2015.
- Graduate Research Fellow, The University of Utah, 2014–2015.
- MSRI Program Associate, 2012–2013.
- Undergraduate Teaching Assistant, The Ohio State University, 2008–2010.

Grants and Fellowships:
- NSF CAREER award DMS-2044833, 2021–2026.
- NSF Conference grant DMS-2220824, 2022–2023.
- Sistema Nacional de Investigadores (Mexico), Level I, 2020–.
- UNL Research Development Fellows Program (RDFP), 2020–2021.
- AMS Simons travel grant, 2019–2021.
- AIM SQUARES grant, 2018–2020.
- NSF Postdoctoral Research Fellowship, 2016–2019.
- NSA Young Investigator Grant (awarded) 2016.

Publications and Preprints:
(1) Local cohomology of modular invariant rings with Kriti Goel and Anurag K. Singh, submitted, 12 pp., arXiv:2210.09351
(2) When are the natural embeddings of classical invariant rings pure?, with Melvin Hochster, Vaibhav Pandey, and Anurag K. Singh, *Forum of Mathematics, Sigma*, **11** (2023), e67.
(3) Resolutions of differential operators of low order for an isolated hypersurface singularity, with Rachel N. Diethorn, Claudia Miller, Nicholas Packauskas, Josh Pollitz, Hamidreza Rahmati, and Sophia Vassiliadou, to appear in *Michigan Mathematical Journal*, 53 pp., arXiv:2209.13110
(4) Nash blowups of toric varieties in prime characteristic, with Daniel Duarte and Luis Núñez-Betancourt, to appear in *Collectanea Mathematica*, 13 pp., arXiv:2208.05599
(5) Bernstein-Sato theory for singular rings in positive characteristic, with Luis Núñez-Betancourt and Eamon Quinlan-Gallego to appear in *Transactions of the American Mathematical Society*, 58 pp., arXiv:2110:00129
(6) Bernstein-Sato polynomials in commutative algebra, with Josep Àlvarez Montaner and Luis Núñez-Betancourt, *Commutative Algebra* (2021), 1–76, Springer.
(7) A Jacobian criterion for nonsingularity in mixed characteristic, with Melvin Hochster, to appear in *American Journal of Mathematics*, 26 pp., arXiv: 2106.01996
(8) A uniform Chevalley theorem for direct summands of polynomial rings in mixed characteristic, with Alessandro De Stefani and Eloísa Grifo, *Mathematische Zeitschrift*, **301** (2022), 4141–4151.
(9) Bernstein's inequality and holonomicity for certain singular rings, with Josep Àlvarez Montaner, Daniel J. Hernández, Luis Núñez-Betancourt, Pedro Teixeira, and Emily E. Witt, to appear in *International Mathematics Research Notices. IMRN*, 34 pp., arXiv:2103.02986
(10) Differential operators on classical invariant rings do not lift modulo p, with Anurag K. Singh, to appear in *Advances in Mathematics*, 38 pp. arXiv:2006.03029
(11) Extensions of Primes, Flatness, and Intersection Flatness, with Melvin Hochster, *Commutative Algebra: 150 years with Roger and Sylvia Wiegand*, (2021), 63–81.

(12) Lower Bounds on Hilbert-Kunz Multiplicities and Maximal F-signatures, with Yusuke Nakajima, Ilya Smirnov, Kei-ichi Watanabe, and Ken-ichi Yoshida, *Mathematical Proceedings of the Cambridge Philosophical Society*, **174** (2023), 247–271.

(13) Faithfulness of top local cohomology modules in domains, with Melvin Hochster, *Mathematical Research Letters*, **27** (2020), no. 6, 1755–1765.

(14) Bernstein-Sato functional equations, V-filtrations, and multiplier ideals of direct summands, with Josep Àlvarez Montaner, Daniel J. Hernández, Luis Núñez-Betancourt, Pedro Teixeira, and Emily E. Witt, *Communications in Contemporary Mathematics* **22** (2022), 40 pp.

(15) A transformation rule for natural multiplicities, with Ilya Smirnov, *International Mathematics Research Notices. IMRN* (2022), no. 2, 999–1015.

(16) Derived functors of differential operators, *International Mathematics Research Notices. IMRN*, 2021, no. 7, 4920–4940.

(17) Polarization of neural ideals, with Sema Güntürkün and Jeffrey Sun, *Journal of Algebra and Its Applications*, **19** (2020), 2050146, 15 pp.

(18) Quantifying singularities with differential operators, with Holger Brenner and Luis Núñez-Betancourt, *Advances in Mathematics*, **358** (2019), 106843, 89 pp.

(19) Algebraic signatures of convex and nonconvex codes, with Carina Curto, Elizabeth Gross, Katherine Morrison, Zvi Rosen, Anne Shiu, and Nora Youngs, *Journal of Pure and Applied Algebra*, **223** (2019), 3919–3940.

(20) A Zariski–Nagata theorem for smooth $\mathbb{Z}$-algebras, with Alessandro De Stefani and Eloísa Grifo, *Journal für die reine und angewandte Mathematik*, **761** (2020), 123–140.

(21) Local Okounkov bodies and limits in prime characteristic, with Daniel J. Hernández, *Mathematische Annalen* **372** (2018), no. 1, 139–178.

(22) Mapping toric varieties into low dimensional spaces, with Emilie Dufresne, to appear in *Transactions of the American Mathematical Society*, 28 pp., arXiv:1602.07585

(23) Appendix to: On the behavior of singularities at the F-pure threshold, with Alessandro De Stefani, Jack Jeffries, Zhibek Kadyrsizova, Robert Walker, George Whelan; paper by Eric Canton, Daniel Hernández, Karl Schwede, Emily Witt, *Illinois Journal of Mathematics* **60** (2016), no. 3, 669–685.

(24) What makes a neural code convex?, with Carina Curto, Elizabeth Gross, Katherine Morrison, Mohamed Omar, Zvi Rosen, Anne Shiu, and Nora Youngs, *SIAM Journal of Applied Algebraic Geometry* **1** (2017), no. 1, 222–238.

(25) Separating invariants and local cohomology, with Emilie Dufresne, *Advances in Mathematics*, **270** (2015) 565–581.

(26) Multiplicities of classical varieties, with Jonathan Montaño and Matteo Varbaro, *Proceedings of the London Mathematical Society*, **110** (2015), no. 4, 1033–1055.

(27) Non-simplicial decompositions of Betti diagrams of complete intersections, with Courtney Gibbons, Sarah Mayes, Claudiu Raicu, Branden Stone, and Bryan White, *Journal of Commutative Algebra*, **7** (2015), no. 2, 189–206.

(28) The j-multiplicity of monomial ideals, with Jonathan Montaño, *Mathematical Research Letters*, **20** (2013) no. 4, 1–16.

Ph.D. Students:
- David Lieberman, Ph.D. 2024
- Jordan Barrett, current
- Nawaj KC, coadvised with Mark Walker, current
- Taylor Murray, current
- Shalom Echalaz, coadvised with Tom Marley, current
- Cleve Young, current

Undergraduate and masters Students:
- Luis Palacios, Masters, coadvised with Luis Núñez Betancourt, CIMAT, 2020.
- Sandra Sandoval, Licenciatura, coadvised with Luis Núñez Betancourt, CIMAT, 2020.
- Kasey Brabec, Undergraduate Practicum, 2023.
- Shelby Castle, Undergraduate Practicum, 2022.
- Uyen Tran, REU, coadvised with Eloísa Grifo, UNL, 2022.
- Fangu Chen and Alan Tang, REU, coadvised with Eric Canton and Eloísa Grifo, UM, 2019.
- Jeffrey Sun, REU, coadvised with Sema Güntürkün, UM, 2016.