

Research Interest

- Commutative Ring Theory: I mostly work on commutative rings and algebras, with special interest in monoid algebras and integral domains.
- Arithmetic and Factorization Theory: I am specially interested in establishing generalized versions of the classical Fundamental Theorem of Arithmetic (FTA) by allowing certain elements to have either multiple factorizations or no factorizations at all.
- Additive and Algebraic Combinatorics: I am interested in both the combinatorial structures of algebraic objects such that including (semi)lattices and finite-rank commutative monoids.

Scientific Publications

46. *Factoriality inside Boolean lattices*
(with K. Ajran)
Journal of Algebraic Combinatorics (to appear)
Preprint on arXiv: <https://arxiv.org/abs/2305.00413>
45. *On the ascent of almost and quasi-atomicity to monoid semidomains*
(with V. Gonzalez and I. Panpaliya)
Journal of Commutative Algebra (to appear)
Preprint on arXiv: <https://arxiv.org/abs/2501.04990>
44. *Arithmetic properties encoded in undermonoids*
(with B. Li)
Semigroup Forum (to appear)
Preprint on arXiv: <https://arxiv.org/abs/2412.11199>
43. *On three family of dense Puiseux monoids*
(with S. Chapman, M. Gotti, and H. Polo)
In: The Ideal Theory and Arithmetic of Rings, Monoids, and Semigroups (Eds. S. T. Chapman).
Contemporary Mathematics, Vol. **836**, Amer. Math. Soc., Providence, RI, 2026.
42. *On monoid algebras having every nonempty subset of $\mathbb{N}_{\geq 2}$ as a length set*
(with A. Geroldinger)
Mediterranean Journal of Mathematics, Vol. **22** (2025) 1–19.
41. *On the ascent of atomicity to monoid algebras*
(with H. Rabinovitz)
Journal of Algebra, Vol. **663** (2025) 857–881.
40. *Riemann zeta functions for Krull monoids*
(with U. Krause)
Journal of Number Theory, Vol. **262** (2024) 134–160.
39. *Atomicity in integral domains*
(with J. Coykendall)
In: Recent Progress in Rings and Factorization Theory (Eds. M. Brešar, A. Geroldinger, B. Olberding, and D. Smertnig), Springer Nature, Switzerland, 2024.
38. *Atomic semigroup rings and the ascending chain condition on principal ideals*
(with B. Li)
Proceedings of the American Mathematical Society, Vol. **151** (2023) 2291–2302.

37. *Integral domains and the IDF property*
(with M. Zafrullah)
Journal of Algebra, Vol. **614** (2023) 564–591.
36. *On the arithmetic of polynomial semidomains*
(with H. Polo)
Forum Mathematicum, Vol. **35** (2023) 1179–1197.
35. *On the atomic structure of torsion-free monoids*
(with J. Vulakh)
Semigroup Forum, Vol. **107** (2023) 402–423.
34. *On the subatomicity of polynomial semidomains*
(with H. Polo)
In: Algebra and Polynomials: Algebraic, Number Theoretic, and Topological Aspects of Ring Theory (Eds. J. L. Chabert, M. Fontana, S. Frisch, S. Glaz, and K. Johnson) pp. 197–212, Springer Nature, Switzerland, 2023.
33. *Hereditary atomicity in integral domains*
(with J. Coykendall and R. Hasenauer)
Journal of Pure and Applied Algebra Vol. **227** (2023) 107249.
32. *On the additive structure of algebraic valuations of polynomial semirings*
(with J. Correa-Morris)
Journal of Pure and Applied Algebra, Vol. **226** (2022) 107104.
31. *On semigroup algebras with rational exponents*
Communications in Algebra, Vol. **50** (2022) 3–18.
30. *Divisibility in rings of integer-valued polynomials*
(with B. Li)
New York Journal of Mathematics, Vol. **28** (2022) 117–139.
29. *Bounded and finite factorization domains*
(with D. F. Anderson)
In: Rings, Monoids, and Module Theory (Eds. A. Badawi and J. Coykendall) pp. 7–57.
Springer Proceedings in Mathematics & Statistics, Vol. **382**, Singapore, 2022.
28. *Length-factoriality in commutative monoids and integral domains*
(with S. T. Chapman, J. Coykendall, and W. W. Smith)
Journal of Algebra, Vol. **578** (2021) 186–212.
27. *Bi-atomic classes of positive semirings*
(with N. R. Baeth and S. T. Chapman)
Semigroup Forum, Vol. **103** (2021) 1–23.
26. *On strongly primary monoids, with a focus on Puiseux monoids*
(with A. Geroldinger and S. Tringali)
Journal of Algebra, Vol. **567** (2021) 310–345.
25. *When is a Puiseux monoid atomic?*
(with S. T. Chapman and M. Gotti)
The American Mathematical Monthly, Vol. **128** (2021) 302–321.
24. *Geometric and combinatorial aspects of submonoids of a finite-rank free commutative monoid*
Linear Algebra and Its Applications, Vol. **604** (2020) 146–186.

23. *Factorization in upper triangular matrices over information semialgebras*
(with N. R. Baeth)
Journal of Algebra, Vol. **562** (2020) 466–496.
22. *The system of sets of lengths and the elasticity of submonoids of a finite-rank free commutative monoid*
Journal of Algebra and Its Applications, Vol. **19** (2020) 2050137.
21. *Irreducibility and factorizations in monoid rings*
In: Numerical Semigroups (Eds. V. Barucci, S. T. Chapman, M. D’Anna, and R. Fröberg) pp. 129–139.
Springer INdAM Series, Vol. **40**, Switzerland, 2020.
20. *On the molecules of numerical semigroups, Puiseux monoids, and Puiseux algebras*
(with M. Gotti)
In: Numerical Semigroups (Eds. V. Barucci, S. T. Chapman, M. D’Anna, and R. Fröberg) pp. 141–161.
Springer INdAM Series, Vol. **40**, Switzerland, 2020.
19. *The elasticity of Puiseux monoids*
(with C. O’Neill)
Journal of Commutative Algebra, Vol. **12** (2020) 319–331.
18. *Factorization invariants of Puiseux monoids generated by geometric sequences*
(with S. T. Chapman and M. Gotti)
Communications in Algebra, Vol. **48** (2020) 380–396.
17. *On the atomicity of monoid algebras*
(with J. Coykendall)
Journal of Algebra, Vol. **539** (2019) 138–151.
16. *Systems of sets of lengths of Puiseux monoids*
Journal of Pure and Applied Algebra, Vol. **223** (2019) 1856–1868.
15. *Increasing positive monoids of ordered fields are FF-monoids*
Journal of Algebra, Vol. **518** (2019) 40–56.
14. *How do elements really factor in $\mathbb{Z}[\sqrt{-5}]$?*
(with S. T. Chapman and M. Gotti)
In: Advances in Commutative Algebra (Eds. A. Badawi and J. Coykendall), pp. 171–195, Springer
Trends in Mathematics, Birkhäuser, Singapore, 2019.
13. *On positroids induced by rational Dyck paths (Extended Abstract)*
Séminaire Lotharingien de Combinatoire, Vol. **80B** (2018) 12pp.
12. *Puiseux monoids and transfer homomorphisms*
Journal of Algebra, Vol. **516** (2018) 95–114.
11. *Minimal presentations of shifted numerical semigroups*
(with R. Conaway, J. Horton, C. O’Neill, R. Pelayo, M. Williams, and B. Wissman)
International Journal of Algebra and Computation, Vol. **28** (2018) 53–68.
10. *Dyck paths and positroids from unit interval orders*
(with A. Chavez)
Journal of Combinatorial Theory Series A, Vol. **154** (2018) 507–532.
9. *Atomicity and boundedness of monotone Puiseux monoids*
(with M. Gotti)
Semigroup Forum, Vol. **96** (2018) 536–552.

8. *Dyck paths and positroids from unit interval orders (Extended Abstract)*
(with A. Chavez)
Séminaire Lotharingien de Combinatoire, Vol. **78B** (2017) 12pp.
7. *On the atomic structure of Puiseux monoids*
Journal of Algebra and Its Applications Vol. **16** (2017) 1750126.

Doctoral Dissertation

6. *Matroids and convex geometry in combinatorics and algebra*
eScholarship University of California (PhD Dissertation).

Undergraduate Thesis

5. *On delta sets and their realizable subsets in Krull monoids with cyclic class groups*
(with S. T. Chapman and R. Pelayo)
Colloquium Mathematicum, Vol. **137** (2014) 137–146.

Completed Manuscripts not yet Published

4. *On primality and atomicity of numerical power monoids*
(with A. Aggarwal and S. Lu)
Preprint on arXiv: <https://arxiv.org/abs/2412.05857>
3. *One-dimensional monoid algebras and ascending chains of principal ideals*
(with A. Bu, B. Li, and A. Zhao)
Preprint on arXiv: <https://arxiv.org/abs/2409.00580>
2. *On finitary power monoids of linearly orderable monoids*
(with J. Dani, L. Hong, B. Li, and S. Schlessinger)
Preprint on arXiv: <https://arxiv.org/abs/2501.03407>
1. *Divisibility and a weak ascending chain condition on principal ideals*
(with B. Li)
Preprint on arXiv: <https://arxiv.org/abs/2212.06213>

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