

Research Interest: Algebra and Combinatorics. In algebra, I am mostly interested in the study of the phenomenon of non-uniqueness of factorizations into irreducibles in integral domains and finite-rank monoids using techniques of combinatorics, linear algebra, and number theory. My research in combinatorics focuses on matroids and posets. I am also interested in polyhedral geometry and cluster algebras.

Scientific Publications

31. *When is a Puiseux monoid atomic?*
(with S. T. Chapman and M. Gotti)
The American Mathematical Monthly (to appear)
ArXiv link: <https://arxiv.org/pdf/1908.09227.pdf>
30. *Geometric and combinatorial aspects of submonoids of a finite-rank free commutative monoid*
Linear Algebra and Its Applications, Vol. **604** (2020) 146–186.
29. *Factorization in upper triangular matrices over information semialgebras*
(with N. R. Baeth)
Journal of Algebra, Vol. **562** (2020) 466–496.
28. *On 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.
27. *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.
26. *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.
25. *The elasticity of Puiseux monoids*
(with C. O’Neill)
Journal of Commutative Algebra, Vol. **12** (2020) 319–331.
24. *Factorization invariants of Puiseux monoids generated by geometric sequences*
(with S. T. Chapman and M. Gotti)
Communications in Algebra, Vol. **48** (2020) 380–396.
23. *On the atomicity of monoid algebras*
(with J. Coykendall)
Journal of Algebra, Vol. **539** (2019) 138–151.
22. *Systems of sets of lengths of Puiseux monoids*
Journal of Pure and Applied Algebra, Vol. **223** (2019) 1856–1868.
21. *Increasing positive monoids of ordered fields are FF-monoids*
Journal of Algebra, Vol. **518** (2019) 40–56.
20. *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.

19. *On positroids induced by rational Dyck paths (Extended Abstract)*
Séminaire Lotharingien de Combinatoire, Vol. **80B** (2018) 12pp.
18. *Puiseux monoids and transfer homomorphisms*
Journal of Algebra, Vol. **516** (2018) 95–114.
17. *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.
16. *Dyck paths and positroids from unit interval orders*
(with A. Chavez)
Journal of Combinatorics Theory Series A, Vol. **154** (2018) 507–532.
15. *Atomicity and boundedness of monotone Puiseux monoids*
(with M. Gotti)
Semigroup Forum, Vol. **96** (2018) 536–552.
14. *On the atomic structure of Puiseux monoids*
Journal of Algebra and Its Applications Vol. **16** (2017) 1750126.
13. *Dyck paths and positroids from unit interval orders (Extended Abstract)*
(with A. Chavez)
Séminaire Lotharingien de Combinatoire, Vol. **78B** (2017) 12pp.

Doctoral Dissertation

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

Undergraduate Thesis

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

Manuscripts Submitted to Peer-Reviewed Journals

10. *On strongly primary monoids, with a focus on Puiseux monoids*
(with A. Geroldinger and S. Tringali)
ArXiv link: <https://arxiv.org/pdf/1910.10270.pdf>
9. *Positroids induced by rational Dyck paths*
ArXiv link: <https://arxiv.org/pdf/1706.09921.pdf>
8. *Atomic and antimatter semigroup algebras with rational exponents*
ArXiv link: <https://arxiv.org/pdf/1801.06779.pdf>
7. *Tilings and matroids on the lattice points of a regular simplex*
(with H. Polo)
ArXiv link: <https://arxiv.org/pdf/1802.05633.pdf>
6. *On the additive structure of algebraic valuations of cyclic free semirings*
(with J. Correa-Morris)
ArXiv link: <https://arxiv.org/pdf/2008.13073.pdf>

5. *Other-half-factoriality in commutative monoids and integral domains*
(with S. T. Chapman, J. Coykendall, and W. W. Smith)

Manuscripts Under Preparation

4. *Atomicity in subrings and extension rings*
(with J. Coykendall and R. Hasenauer)
3. *Bounded and finite factorization domains*
(with D. F. Anderson)
2. *Half-factorial sets on monoids and integral domains*
(with S. T. Chapman)
1. *On the atomicity of positive monoids and semirings*
(with S. T. Chapman and M. Gotti)