

Boyu Li

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Citizenship Status

Canadian citizen

Position

Assistant Professor, New Mexico State University	2023 - present
Post-doctoral researcher, University of Windsor	2023
Post-doctoral researcher, University of Waterloo	2021 –2022
Pacific Institute for Mathematical Sciences post-doctoral fellowship, University of Victoria	2018 –2021

Education

University of Waterloo Ph.D. Pure Mathematics Advisor: Kenneth Davidson Thesis: Regular Dilation on Semigroups	2018
University of Waterloo M.Math. Pure Mathematics, Thesis option. Advisor: Alexandru Nica Thesis: Asymptotic Distribution for Block Statistics on Noncrossing Partitions.	2013
University of Waterloo B.Math. Honour Co-op , Graduated with Distinction – Dean’s Honor List Governor General’s Silver Medal (top 3 of the graduating class) Majors: Pure Mathematics, Combinatoric and Optimization, Mathematical Finance	2012

Publications

Submitted

1. Boyu Li, Poisson transforms on right-angled Artin monoids, <https://arxiv.org/abs/2504.00127>
2. Anna Duwenig and Boyu Li, The Zappa-Szep product of twisted groupoids, <https://arxiv.org/abs/2406.00466>

Published

3. Robert S. Fong, Boyu Li, and Peter Tiño, Linear Simple Cycle Reservoirs at the edge of stability perform Fourier decomposition of the input driving signals. *Chaos* 35(4), no. 043109, 2025
4. Robert S. Fong, Boyu Li, and Peter Tiño, Universality of Real Minimal Complexity Reservoir, Accepted to *the 39th Annual AAAI Conference on Artificial Intelligence (AAAI-25)*
5. Anna Duwenig and Boyu Li, Imprimitivity theorems and self-similar actions on Fell bundles, *Journal of Functional Analysis*, 288(2), no. 110699, 2025
6. Boyu Li, Robert S. Fong, and Peter Tiño, Simple Cycle Reservoirs are Universal, *Journal of Machine Learning Research*, 25(158):1–28, 2024.
7. Boyu Li and Dilian Yang, Wold Decomposition and C^* -envelopes of Self-Similar Semigroup Actions on Graphs, *Journal of Mathematical Analysis and Application*, 537(2), no. 128395, 2024

8. Anna Duwenig and Boyu Li, Equivalence of Fell bundles is an equivalence relation, *Münster Journal of Mathematics* 16(1):95-145, 2023
9. Boyu Li and Dilian Yang, Zappa-Szép actions of groups on product systems, *Journal of Operator Theory*, 88(2):247-274, 2022
10. Anna Duwenig and Boyu Li, The Zappa-Szép product of a Fell bundle and a groupoid, *Journal of Functional Analysis*, 282(1), no. 109268, 2022
11. Marcelo Lacá and Boyu Li, Dilation theory for right LCM semigroup dynamical systems, *Journal of Mathematical Analysis and Application*, 505(2), no. 125586, 2022
12. Boyu Li, Wold decomposition on odometer semigroups, *Proceedings of the Royal Society of Edinburgh*, 152(3):738-755, 2022
13. Boyu Li, C^* -envelope and dilation theory of semigroup dynamical systems, *Integral Equations and Operator Theory*, 93 (3), no. 19, 2021
14. Marcelo Lacá and Boyu Li, Amenability and functoriality of right-LCM semigroup C^* -algebras. *Proceedings of American Mathematical Society*, 148(12):5209-5224, 2020
15. Boyu Li, Regular dilation and Nica-covariant representation on right LCM semigroups. *Integral Equations and Operator Theory*, 91(4), no. 36, 2019
16. Kenneth R. Davidson, Adam Dor-on and Boyu Li, Structure of Free Semigroupoid Algebras, *Journal of Functional Analysis*, 277(9):3283-3350, 2019
17. Boyu Li, Regular Dilation on Graph Products of $\mathbb{N}$, *Journal of Functional Analysis*, 273(2):799-835, 2017
18. Boyu Li, Normal Extensions of Representations of Abelian Semigroups. *Canadian Mathematical Bulletin*, 59:564-574, 2016.
19. Boyu Li, Regular Representations of Lattice Ordered Semigroups, *Journal of Operator Theory* 76(1):33-56, 2016

Grants and Fellowship

NSF-BSF DMS-2350543: Semigroup Operator Algebras - Representations, Boundaries and Dynamics, 2024 - 2027, \$254,546.00

Zuckerman Postdoctoral Scholar, 2023 - 2026 (declined)

Conference Presentations

Invited Talks

Zappa-Szép product with a twist, *International Workshop on Operator Theory and its Applications*, University of Twente, 2025

A journey in dilation theory, *Canadian Operator Symposium – Kenfest*, University of Waterloo, 2025

Universality of Real Minimal Complexity Reservoir, *Analysis Seminar*, Baylor University, 2025

Universality of Real Minimal Complexity Reservoir, *Analysis Seminar*, Drexel University, 2025

What is a Zappa-Szép Product, *Israeli Noncommutative Analysis seminar*, Technion/Haifa University, 2024

Universality of simple cycle reservoirs using dilation theory, *Department of Mathematical Sciences Colloquium*, NMSU, 2024

Zappa-Szép product of groupoids and beyond, *Brazo's Analysis Seminar*, 2024

Zappa-Szép Product, Self-Similar Action, and Imprimitivity Theorems, *NMSU Department of Mathematical Sciences Colloquium*, 2023

Examples of self-similar actions and imprimitivity theorems, *Canadian Mathematical Society Summer Meeting – C^* -algebras and applications session*, 2023

Imprimitivity theorems arising from self-similar actions, *University of Victoria Operator Theory Seminar*, 2022

Wold decomposition and C^* -envelope from self-similar graphs, *Dilation and classification in operator algebra theory*, University of Copenhagen, 2022

Imprimitivity theorems arising from Zappa-Szép actions on Fell bundles, *Canadian Mathematical Society Summer Meeting – Advances in Operator Algebras session*, 2022

Dilation theory for right LCM semigroup dynamical systems, *Joint Mathematics Meeting – Advances in Operator Algebras session*, 2022

Zappa-Szép product, self-similar action, and equivalent groupoids, *Baylor University Seminar*, 2022

Zappa-Szép product, self-similar actions, and equivalent groupoids, *University of Waterloo Analysis Seminar*, 2022

Dilation theory of right LCM semigroup dynamical systems, *Canadian Mathematical Society Summer Meeting*, 2021

The Zappa-Szép product of a Fell bundle by a groupoid, *University of Wollongong Operator Algebra & Noncommutative Geometry seminar*, 2021

The Zappa-Szép product of a Fell bundle by a groupoid, *Canadian Mathematical Society Winter meeting – Operator Algebras Session*, 2020

The Zappa-Szép product of a Fell bundle by a groupoid, *Arizona State University C^* Seminar*, 2020

C^* -envelopes and semigroup dynamical systems, *University of Glasgow Analysis Seminar*, 2020

C^* -envelopes and semigroup dynamical systems, *University of Copenhagen Operator Algebra Seminar*, 2020 (cancelled due to COVID-19)

Amenable and Non-amenable Semigroups, *University of Waterloo Analysis Seminar*, 2019

Free Semigroupoid Algebras, *CMS Winter Meeting – Operator Algebra Session*, 2017

Contributed Talks

Universality of simple cycle reservoir using dilation theory, *Canadian Operator Symposium*, 2024

Universality of simple cycle reservoirs using dilation theory, *Joint UTEP/NMSU workshop*, 2023

Wold-decomposition on self-similar graphs, *Canadian Operator Symposium*, 2022

Wold decomposition on odometer semigroups, *Canadian Operator Symposium*, 2021

Dilation theory for right LCM semigroup dynamical systems, *University of Victoria Operator Theory Seminar*, 2021

The Zappa-Szép product of a Fell bundle by a groupoid, *University of Victoria Operator Theory Seminar*, 2020

Dilation on Semigroups, *University of Victoria Operator Theory Seminar*, 2018

Regular Dilation and Nica-covariant Representation on Right LCM Semigroups, *Canadian Operator Symposium*, 2018

Regular Dilation and Nica-covariant Representation on Right LCM Semigroups, *Canadian Abstract Harmonic Analysis Symposium*, 2018

Examples of Free Semigroupoid Algebras, *University of Waterloo Analysis Seminar*, 2018

Regular Dilation on Graph Products of N , *Canadian Operator Symposium*, 2017

Regular Dilation on Graph Products of N , *University of Waterloo Analysis Seminar*, 2017

Regular Representations of Lattice Ordered Semigroups. *Canadian Operator Symposium*, 2015

Regular Representations of Lattice Ordered Semigroups. *University of Waterloo Analysis Seminar*, 2015.

Teaching

New Mexico State University

- 2025
Calculus III (MATH 2530)
Mathematics for Machine Learning (MATH 4996/5996)
- 2024:
Calculus III (MATH 2530)
Calculus II (MATH 1521)
- 2023:
Calculus I (MATH 1511)
Calculus II (MATH 1521)

University of Waterloo

- Harmonic analysis (PMATH 833, graduate level, online)
- Measure and Integration (PMATH 451/651, 4th-year/graduate level, online)
- Calculus 3 For Honours Math (MATH 237)
- Applied Complex Analysis (PMATH 332, 3rd-year)

University of Victoria

- Introduction to Calculus (MATH 109)
- Calculus for Students in the Social and Biological Sciences (MATH 102)

Service

Journal Reviewer

- Journal of Functional Analysis
- Annals of Functional Analysis
- Advances in Operator Theory
- Results in Mathematics
- International Mathematics Research Notices
- Proceeding for American Mathematical Society
- Proceedings A of the Royal Society of Edinburgh
- Journal of Mathematica Analysis and Applications
- Indiana University Mathematics Journal
- Banach Journal of Mathematical Analysis
- Complex Analysis and Operator Theory
- Operators and Matrices

Junior Mentor at Operator Algebras Mentor Network

Reviewer on MathSciNet

Graduate Student Outreach

Dilation Theory for Small Matrices, *Graduate student seminar*, University of Victoria, 2020

Amenable and Non-Amenable Semigroups, *Graduate student seminar*, University of Victoria, 2019

Self-adjoint Non-self-adjoint Algebra, *Graduate student seminar*, University of Victoria, 2019

Asymptotic Distributions of Noncrossing Partitions, *Pure Math Graduate Student Colloquium*, University of Waterloo, 2014.

Awards

Graduate

Mathematics Doctoral Prize competition – Second Place, University of Waterloo	2019
Susan and Janos Aczel Graduate Scholarship, University of Waterloo	2016 - 2018
Ontario Graduate Fellowship	2015
Ontario Graduate Scholarship for international student, \$15,000	2013

Undergraduate

Governor General's Silver Medal, University of Waterloo, (top 3 among graduating class)	2012
Mike Vangoch Memorial Scholarship, University of Waterloo	2012
Putnam Team Member, University of Waterloo	2010, 2012
Putnam Competition Honourable Mention (Top 50 in north America)	2009
Dr. Nathan Mendelsohn Prize (top Putnam score among Canadian students)	2009
J.D. Kalbfleisch Scholarship for International Students, University of Waterloo	2008