

Leo Livshits

Curriculum Vita

PERSONAL DATA

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EDUCATION

Ph.D.	<i>University of Toronto</i>	1991
M.Sc.	<i>University of Toronto</i>	1986
B.Mat.	<i>University of Waterloo</i>	1985

POSITIONS HELD

Professor	<i>Colby College</i>	2008-present
Associate Professor	<i>Colby College</i>	2001-2008
Assistant Professor	<i>Colby College</i>	1994-2001
Visiting Scholar	<i>Carleton University</i>	1998-1999
Assistant Professor	<i>Bishop's University</i>	1992-1994
Assistant Professor	<i>Central Michigan University</i>	1991-1992

RESEARCH PUBLICATIONS

Accepted for publication

1. "Positive Matrix Semigroups with Binary Diagonals"
(with Gordon MacDonald and Heydar Radjavi)
To appear in *Journal of Positivity*
2. "Cantor Groups"
(with Chris Dow (student) and Ben Mathes)
To appear in *College Mathematics Journal*
3. "Universal bounds for matrix semigroups"
(with Gordon MacDonald and Heydar Radjavi)
To appear in *Studia Mathematica*
4. "Multiplicative diagonals of matrix semigroups"
(with Gordon MacDonald and Heydar Radjavi)
To appear in *Electronic Journal of Linear Algebra*

Appeared

1. “Semigroups of operators with nonnegative diagonals”
(with Semigroup Working Group at LAW’08, Kranjska Gora)
Linear Algebra and Its Applications, 433, # 11-12, 2080-2087 (2010)
2. “A Kadison Transitivity Theorem for C*-semigroups”
(with G.W. MacDonald, L. Marcoux, H. Radjavi)
Journal of Functional Analysis, 254, #1, 246-266 (2008)
3. “Approximate permutability of traces on semigroups of matrices”
(with J. Bernik, R. Drnovšek, T. Košir, M. Mastnak, M. Omladič, and H. Radjavi)
Operators and Matrices, 1, #4, 455-467 (2007)
4. “Topologically transitive matrix semigroups”
(with G.W. MacDonald, H. Radjavi)
Operators and Matrices, 1, # 2, 165-179 (2007)
5. “Semitransitive subspaces of operators”
(with Semitransitivity Working Group at LAW’05, Bled)
Electronic Journal of Linear Algebra, 15, 225-238 (2006)
6. “Schur algebras over function algebras”
(with S-C. Ong, S-W. Wang)
Houston Journal of Mathematics, 30, # 4, 1195-1217 (2004)
7. “On decomposability of periodic semigroups of non-negative matrices”
Linear Algebra and Its Applications, 383, 163-174 (2004)
8. “Operator semigroups for which reducibility implies decomposibility”
(with G.W. MacDonald, B. Mathes, H. Radjavi)
Positivity, 7, # 3, 195-202 (2003)
9. “Matrix semigroups with commutable rank”
(with G.W. MacDonald, B. Mathes, J. Okniński, H. Radjavi)
Semigroup Forum, 67, 288-316 (2003)
10. “An irreducible semigroup of non-negative square-zero operators”
(with R. Drnovšek, D. Kokol-Bukovšek, G. W. MacDonald, M. Omladič, H. Radjavi)
Journal of Integral Equations and Operator Theory, 42, 449-460 (2002)
11. “On band algebras”
(with G.W. MacDonald, B. Mathes, H. Radjavi)
Journal of Operator Theory; 46, #3: 545-560 (2001)
12. “Banach space duality in absolute Schur algebras”
(with S-C. Ong, S-W. Wang)
Journal of Integral Equations and Operator Theory, 41, # 3: 343-359 (2001)
13. “n-Transitivity and the complementation property”
(with G. W. MacDonald)
Linear Algebra and Its Applications, 329: 157-169 (2001)
14. “Cone-transitive matrix semigroups”
(with G.W. MacDonald, H. Radjavi)
Linear and Multilinear Algebra, 47, 313-350 (2000)

15. “On operator bands”
(with R. Drnovšek, G.W. MacDonald, B. Mathes, H. Radjavi, P. Šemrl)
Studia Mathematica, 139, # 1: 91-100 (2000)
16. “On transitive linear semigroups”
(with R. Drnovšek, G.W. MacDonald, B. Mathes, H. Radjavi, P. Šemrl)
Linear Algebra and Its Applications, 305: 67-86 (2000)
17. “Transitive linear semigroups”
Obzornik za matematiko in fiziko, 46, # 2: 53-56 (1999)
18. “Reducible semigroups of idempotent operators”
(with G.W. MacDonald, B. Mathes, H. Radjavi)
Journal of Operator Theory, 40, # 1: 35-69 (1998)
19. “Continuity of Schur block-multiplication maps with respect to various operator topologies”
Journal of Operator Theory, 34: 17-56 (1995)
20. “A note on 0 – 1 Schur multipliers”
Linear Algebra and Its Applications, 222: 15-22 (1995)
21. “Block-matrix generalizations of finite-dimensional Schur products and Schur multipliers”
Linear and Multilinear Algebra, 38: 59-78 (1994)
22. “On invertibility of the map $T \longrightarrow STS^{-1} + S^{-1}TS$ ”
(with S.-C. Ong)
Linear Algebra and Its Applications, 183: 117-129 (1993)
23. “Locally finite-dimensional spaces of operators”
Proceedings of AMS, 119, #1: 165-169 (1993)

Papers in preprint form

1. “Construction of Jordan-form made easy”
(with G.W. MacDonald, B. Mathes, H. Radjavi)

CONFERENCE AND WORKSHOP PRESENTATIONS

1. “Matrix Semigroups with binary diagonals”
Coimbra Meeting on 0-1 Matrix Theory and Related Topics
University of Coimbra, Portugal (2010)
2. “When “nearly” is close enough: collections of non-negative matrices that are near to those with standard triangularization, have standard triangularization of their own.”
Invited speaker
5-th International Linear Algebra Workshop
Kranjska Gora, Slovenia (2008)
3. “Playing with the Bands in the 60’s:
Heydar Radjavi and Semigroups of Idempotents”
Invited Speaker
International Linear Algebra Conference in Honor Of Heydar Radjavi’s 70-th Birthday
Bled, Slovenia (2005)

4. “Matrix semigroups with multiplicative diagonals”
11-th Conference of the International Linear Algebra Society (ILAS)
University of Coimbra, Portugal (2004)
5. “Matrix semigroups with multiplicative DIAPRs, and other childish pursuits”
Invited speaker
AARMS Research Session in Linear Algebra; APICS Mathematics, Statistics and Computer Science conference
UPEI, Charlottetown, PE, Canada (2003)
6. “Linear semigroups with commutable rank”
Invited speaker and research group leader
International Linear Algebra Workshop
Bled, Slovenia (2002)
7. “ On decomposable semigroups of nonnegative matrices satisfying the equation $A^n = A$ ”
9-th Conference of the International Linear Algebra Society (ILAS)
Technion, Haifa, Israel (2001)
8. “Banach space duality in absolute Schur algebras”
Great Plains Operator Theory Symposium (2000)
9. “Transitive linear semigroups”
Invited speaker and research group leader
International Linear Algebra Workshop
Bled, Slovenia (1999)
10. “Reducibility and triangularizability of semigroups of idempotent operators”
Canadian Operator Theory Symposium
Charlottetown, PEI, Canada (1999)
11. “Minimal transitive semigroups of operators”
Invited speaker
Canadian Mathematical Society Meeting, Special Session
Saint John, NB, Canada (1998)
12. “Reducibility of Operator Bands”
Great Plains Operator Theory Symposium (1996)
13. “Block-matrix generalizations of of infinite-dimensional Schur products and Schur multipliers”
Canadian Operator Theory Symposium (1993)
14. “Locally finite-dimensional spaces of operators”
Great Plains Operator Theory Symposium (1992)
15. “Continuity properties of Schur multipliers with respect to weak, strong and norm topologies on $\mathcal{B}(\mathcal{H})$ ”
Canadian Operator Theory Symposium (1992)

COLLOQUIUM AND SEMINAR PRESENTATIONS

1. “Big ideas about little sets”
Department of Mathematics Colloquium
Bowdoin College (September 2010)

2. “Big ideas about little sets”
Department of Mathematics “What is ...” Colloquium
Colby College (October 2009)
3. “What can we learn from matrix diagonals?”
Department of Mathematics Colloquium
Colby College (February 2009)
4. “The effects of the transit of Venus, Earth’s irregularity over the Mohorovic discontinuity, and β -lactoglobulin deficiency on the theory of commuting populations of square arrays of non-negative numbers.”
2004 Summer Seminar Series
Colby College (July 2004)
5. “Decomposing periodic semigroups of non-negative matrices”
Science Division lunch presentation
Colby College (April 2004)
6. “Non-negative matrices, many at a time”
Departmental Mathematics Colloquium
Colby College (2004)
7. “Complete decomposability of semigroups of non-negative matrices”
Invited seminar speaker
Department of Pure Mathematics
University of Waterloo
Waterloo, ON, Canada (2004)
8. “On operator bands”
Invited seminar speaker
Department of Pure Mathematics
University of Waterloo
Waterloo, ON, Canada (1999)
9. “About not exactly groups of matrices satisfying $A^2 = A$ exactly”
Invited colloquium speaker
Department of Mathematics
Central Michigan University
Mt. Pleasant, MI (1999)
10. “*One who dares to wander in vast matrix lands
A subject of great fascination shall find.
My heart goes aflutter at the mention of Bands,
of the non-rubber, non-wedding, non-musical kind.*”
L.L.
Natural Science Division lunchtime presentation
Colby College (1999)
11. “The second most famous equation in linear algebra”
Mathematics Department Colloquium
Colby College (1999)
12. “Weighted Voting Systems”
Departmental Mathematics Colloquium
Colby College (1996)

13. “Recent results on Schur products”
Colloquium speaker
Department of Mathematics
Bishop’s University
Lennoxville, PQ, Canada (1992)
14. “On invertibility of the map $T \rightarrow STS^{-1} + S^{-1}TS$ ”
Invited seminar speaker
Department of Mathematics
University of Toronto
Toronto, ON, Canada (1992)
15. A series of colloquium and seminar presentations on Schur products
Department of Mathematics
Central Michigan University
Mt. Pleasant, MI (1991-92)

CONFERENCES AND WORKSHOPS ATTENDED

1. Workshop on nonnegative matrices, Hamilton Institute, NUI-Maynooth, Ireland (2004)
2. 7-th workshop on numerical ranges and numerical radii (WONRA), University of Coimbra, Portugal (2004)
3. Deltech diversity workshop, Colby College (February 2004)
4. *World Mathematical Year 2000 Symposium on the Legacy of John Charles Fields*
5. *Canadian Operator Theory Symposium* (2000)
6. Workshop on incorporating technology into calculus instruction, Rockhurst College, Kansas City, MO (1998)
7. *Canadian Operator Theory Symposium* (1997)
8. *Canadian Operator Theory Symposium* (1996)
9. *Great Plains Operator Theory Symposium* (1995)
10. Workshop “*Mathematica in Calculus*,”
Bowdoin College (1995)

OTHER PROFESSIONAL ACTIVITIES

1. Refereed for *Proceedings of AMS*, *Journal of Linear Algebra and Its Applications*, *Operators and Matrices*, *Journal of the Korean Mathematical Society*, *International Journal of Mathematics and Mathematical Sciences*, *Houston Journal of Mathematics*.
2. Provided solutions to Problems in IMAGE Problems Corner (“IMAGE is the bulletin of the International Linear Algebra Society”)
 - (a) Problem 32-2 (proposed by Alexander Kovačec, Universidade de Coimbra, Coimbra, Portugal)
Published as the solution 31-2.2 in IMAGE 33, page 25, Fall 2004.
 - (b) Problem 32-6 (proposed by G. Trenkler, Universität Dortmund, Dortmund, Germany).
Published as the solution 32-6.1 in IMAGE 33, page 27, Fall 2004.
 - (c) Problem 32-7 (proposed by G. Trenkler, Universität Dortmund, Dortmund, Germany and by D. Trenkler, University of Ostanbrück, Ostanbrück, Germany).
Published as the solution 32-7.1 in IMAGE 33, page 31, Fall 2004.
 - (d) Problem 31-1 (an open problem proposed by J. Groß and G. Trenkler, Universität Dortmund, Dortmund, Germany).
Published as the sole solution 31-1.1 in IMAGE 32, page 20, April 2004.

- (e) Problem 31-2 (posed by H. Ricardo, Medgar Evars College (CUNY) Brooklyn, New York).
Published as solution 31-2.2 as one of four published and mentioned solutions in IMAGE 32, page 22, April 2004.
- (f) Problem 31-3 (posed by Y. Tian, Queen’s University, Kingston, Canada).
One of four published and mentioned solutions in IMAGE 32, page 25, April 2004.

3. Reviewer for *AMS Mathematical Reviews* (1992-present)

Reviewed:

- 2005:** W. D. Banks and A. Harcharras, *Proc. Amer. Math. Soc.* **132** (2004), no. 7, 2121–2125; MR 2053985
- 2005:** Chaisuriya, P.; Ong, S.-C. *Southeast Asian Bull. Math.* **26** (2003), no. 6, 889–898. MR2021646
- 2005:** T. Shulman, *Methods Funct. Anal. Topology* **9** (2003), no. 3, 252–261; MR 2005901
- 2002:** Yang, Zhong-peng; Feng, Xiao-xia *Pure Appl. Math. (Xi’an)* **17** (2001), no. 1, 86–89 MR1827496
- 2002:** Ivanov I.G., Hasanov V.I., Minchev B.V., *Linear Algebra Appl.* **326** (2001), 27–44; CNO CMP 1 815 949
- 2001:** Perov, A. I., *Dokl. Akad. Nauk* **368** (1999), no. 5, 601–603; CNO CMP 1 748 505
- 2000:** P. Chaisuriya and S.-C. Ong, *SIAM J. Matrix Anal. Appl.* **20** (1999), no. 3, 596–605 (electronic); CNO CMP 1 685 044
- 2000:** A. J. B. Ward, *Internat. J. Math. Ed. Sci. Tech.* **29** (1998), no. 2, 179–186; MR 2000a:15026
- 1998:** K. Kitamura and Y. Seo, *Math. Japon.* **45** (1997), no. 2, 211–216; MR 98e:15033
- 1997:** M. Omladič and H. Radjavi, *Linear Algebra Appl.* **251** (1997), 59–72; MR 97k:47033
- 1997:** H. Neudecker, S. Liu and W. Polasek, *Statistics* **26** (1995), no. 4, 365–373; MR 97b:15033
- 1996:** M. Lacruz, *Linear Algebra Appl.* **219** (1995), 157–163; MR 96e:15046
- 1994:** E. Marques de Sá and M. -J. Sodupe, *Linear Algebra Appl.* **193** (1993), 1–9; MR 94i:15026
- 1994:** R. Mathias, *Linear Algebra Appl.* **184** (1993), 71–78; MR 94b:15019
- 1993:** È. I. Grudo, *Vestsī Akad. Navuk Belarusī Ser. Fiz. Mat. Navuk* **127** (1992), no. 1, 102–103; MR 93i:15018

4. Reviewer for *MAA Online*

Reviewed:

- (a) “The William Lowell Putnam Mathematical Competition, 1995-2000”, by K. S. Kedlaya, B. Poonen and R. Vakil
- (b) “The Cauchy-Schwarz Master Class,” by J. Michael Steele

5. Textbook reviewer for Springer (Key College Publishing)

Reviewed: “Basic Calculus: From Archimedes to Newton to its Role in Science”(2004)

OTHER PROFESSIONAL DEVELOPMENT

Society of Actuaries exams 100, 110, 130, 135, 140

PRESENT MEMBERSHIPS

- 1. Mathematical Association of America (MAA)
- 2. American Mathematical Society (AMS)
- 3. International Linear Algebra Society (ILAS)