

Curriculum Vitae

Mario Roy

Contact Information:

Department of Mathematics
Glendon College, York University
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Citizenship: Canadian

Birthplace: Québec, Canada

Languages spoken: French, English, German, and intermediate Spanish

Degrees:

Ph.D.	Mathematics	University of Göttingen (Germany)	2000
		Advisor: Manfred Denker	
M.Sc.	Mathematics	Université Laval (Québec, Canada)	1997
		Advisor: Thomas J. Ransford	
B.Sc.	Physics	Université Laval	1995

Employment History:

2009– Associate Professor, Glendon College
2015–2016 Associate Principal, Academic, Glendon College
2013–2015 Associate Principal, Academic and Research, Glendon College
2005–2009 Assistant Professor, Glendon College
2004–2005 Postdoctoral Fellow, Université Laval
2002–2004 Postdoctoral Fellow, Concordia University (Montréal, Canada)
2001–2002 Visiting Assistant Professor, University of North Texas
(Denton, Texas, USA)

Scholarly and Professional Academic Activities:

Publications: (in mathematics, authors are ordered in alphabetical order, irrespective of their contribution)

Volumes published: 2

Papers published in refereed journals: 16

Papers published in non-refereed conference proceedings: 1

Volumes in preparation: 1

Papers in preparation: 2

Volumes published:

1. M. Urbański, M. Roy, S. Munday, “Noninvertible Dynamical Systems — Volume 2: Finer Thermodynamic Formalism – Distance Expanding Maps and Countable State Subshifts of Finite Type, Conformal GDMSs, Lasota-Yorke Maps and Fractal Geometry”, *De Gruyter Expositions in Mathematics* **69/2**, 2022.
2. M. Urbański, M. Roy, S. Munday, “Noninvertible Dynamical Systems — Volume 1: Ergodic Theory – Finite and Infinite, Thermodynamic Formalism, Symbolic Dynamics and Distance Expanding Maps”, *De Gruyter Expositions in Mathematics* **69/1**, 2021.

Papers published in refereed journals:

1. A. Ghenciu, S. Munday, M. Roy, “The Hausdorff dimension spectrum of conformal graph directed Markov systems and applications to nearest integer continued fractions”, *Journal of Number Theory*, **175** (2017), 223–249.
2. A. Ghenciu, D. Mauldin, M. Roy, “Conformal graph directed Markov systems: beyond finite irreducibility”, *Journal of Fractal Geometry*, **3 (3)** (2016), 217–243.
3. A. Ghenciu, M. Roy, “Bowen’s formula for shift-generated finite conformal recursive constructions”, *Real Analysis Exchange*, **40 (1)** (2015), 99–112.
4. A. Ghenciu, M. Roy, “Gibbs states for non-irreducible countable Markov shifts”, *Fundamenta Mathematicae*, **221 (3)** (2013), 231–265.
5. M. Roy, “A new variation of Bowen’s formula for graph directed Markov systems”, *Discrete and Continuous Dynamical Systems — Series A*, **32 (7)** (2012), 2533–2551.
6. M. Roy, M. Urbański, “Random graph directed Markov systems”, *Discrete and Continuous Dynamical Systems — Series A*, **30 (1)** (2011), 261–298.
7. M. Roy, M. Urbański, “Multifractal analysis for conformal graph directed Markov systems”, *Discrete and Continuous Dynamical Systems — Series A*, **25 (2)** (2009), 627–650.
8. M. Roy, H. Sumi, and M. Urbański, “ λ -topology vs. pointwise topology”, *Ergodic Theory and Dynamical Systems* **29 (2)** (2009), 685–713.

9. M. Roy, H. Sumi, and M. Urbański, “Analytic families of holomorphic iterated function systems”, *Nonlinearity* **21** (2008), 2255–2279.
10. M. Roy, M. Urbański, “Real analyticity of Hausdorff dimension for higher dimensional hyperbolic graph directed Markov systems”, *Mathematische Zeitschrift* **260** (1) (2008), 153–175.
11. D. Fiebig, M. Roy, “Factor theorems for locally compact Markov shifts II”, *Forum Mathematicum* **18** (2) (2006), 323–344.
12. L. Baribeau, M. Roy, “Analytic multifunctions, holomorphic motions and Hausdorff dimension in IFSs”, *Monatshefte für Mathematik* **147** (3) (2006), 199–217.
13. M. Roy, M. Urbański, “Regularity properties of Hausdorff dimension in infinite conformal IFSs”, *Ergodic Theory and Dynamical Systems* **25** (6) (2005), 1961–1983.
14. M. Roy, “Is the composition of two expansive maps expansive?”, *Topology and its Applications* **139** (1) (2004), 17–22.
15. M. Roy, M. Urbański, “Conformal families of measures for fibred systems”, *Monatshefte für Mathematik* **140** (2) (2003), 135–145.
16. M. Roy, “Fibrewise expansive systems”, *Topology and its Applications* **124** (3) (2002), 373–396.

Papers published in non-refereed conference proceedings:

1. M. Roy, “Les métriques riemanniennes et le théorème de Picard”, *Proceedings of the Canadian Undergraduate Mathematics Conference* (1995), 45–49.

Volumes in preparation:

1. M. Urbański, M. Roy, S. Munday, “Noninvertible Dynamical Systems — Volume 3: Analytic Endomorphisms of the Riemann Sphere”, *De Gruyter Expositions in Mathematics* **69/3**, to appear in 2023.

Papers in preparation:

1. M. Roy, M. Urbański, “Bowen’s formula for random conformal graph directed Markov systems satisfying a transversality condition”.
2. A. Ghenciu, M. Roy, “Entropy for boundedly supermultiplicative shifts”.

Postgraduate theses:

1. “On Gibbs Families for Fibrewise Expansive Systems”, Ph.D. thesis, University of Göttingen (2000). Advisor: Manfred Denker.
2. “La formule de Bowen”, M.Sc. thesis, Université Laval (1997). Advisor: Thomas Ransford.

Training of Students:

As part of the NSERC Undergraduate Student Research Awards (USRA) Program, I trained Dominique Brunet, an undergraduate student at Université Laval, during the Summer of 2005. I familiarised Dominique with (finite and infinite) iterated function systems and various fractal dimensions.

After completing a master’s degree at Université Laval, Dominique received an NSERC Ph.D. scholarship which he detained at the University of Waterloo. In 2012, he completed a Ph.D. on image processing using fractal geometry under the supervision of Edward R. Vrscay.

Seminar and Conference Presentations:

1. “Conformal Graph Directed Markov Systems: Recent Advances” (Invited Speaker), *Complex Analysis and Spectral Theory: A conference in celebration of Thomas Ransford’s 60th birthday*, Université Laval, May 24, 2018.
2. “Conformal Graph Directed Markov Systems: Recent Advances”, *Conference on Logic, Dynamics and Their Interactions, with a Celebration of the Work of Dan Mauldin*, University of North Texas, June 8, 2012.
3. “Bowen’s Formula for Shift-Controlled Finite Conformal Iterated Constructions”, *RTG Logic and Dynamics Seminar*, University of North Texas, February 24, 2012.
4. “A Variation of Bowen’s Formula for (Non-Necessarily Irreducible) Graph Directed Markov Systems”, *Workshop Thermodynamic Formalism, Geometry and Stochastics*, Oberwolfach (Germany), January 4, 2012.
5. “Languages, Symbolic Dynamics and Coding in Disk Drives”, *Conversazione*, Glendon, December 6, 2011.
6. “(Mis)Behavior of the pressure and Hausdorff dimension of the limit set of non-irreducible CGDMS”, *Millikan Lecture Series*, University of North Texas, October 16, 2009.
7. “A Topology for Conformal IFSs”, *Conference Dynamical Systems II*, University of North Texas, May 20, 2009.
8. “Behavior of Hausdorff dimension of limits sets of conformal IFSs”, *Conformal Structure and Dynamical Systems, CODY Summer School — Program Dynamical Systems*, University of Göttingen, July 4, 2008.

9. “Analytic families of holomorphic IFSs”, *Conformal Structure and Dynamical Systems, CODY Summer School — Program Towards Higher Dimensions*, University of Göttingen, June 23, 2008.
10. “Comportement de la dimension de Hausdorff chez diverses familles de systèmes itérés de fonctions”, *Séminaire d’analyse*, Université Laval, October 26, 2007.
11. “Properties of Hausdorff dimension in families of conformal IFS”, *Millikan Lecture Series*, University of North Texas, October 5, 2007.
12. “Properties of Hausdorff dimension in families of conformal IFS”, *Workshop on Dynamical Systems and Ergodic Theory*, University of Göttingen, July 27, 2007.
13. “Properties of Hausdorff dimension in families of conformal IFS and GDMS”, International Conference *Mathematics of Fractals*, University of Kyoto (Japan), September 5, 2006.
14. “Conformal iterated function systems”, *Mathematics Seminar*, Trent University (Peterborough, Canada), March 31, 2006.
15. “Les groupes discrets”, *Atelier de travail en analyse* (10-hour graduate lecture series), Université Laval, January–April 2005.
16. “Introduction aux systèmes dynamiques”, *Séminaire sur les mathématiques actuelles*, Université Laval, October 2004.
17. “On how potential theory sometimes pays back complex analysis”, *Millikan Lecture Series*, University of North Texas, December 2003.
18. “Breakdowns in the real-analyticity of the Hausdorff dimension of infinite IFSs”, *Seminar of dynamics*, Concordia University, October 2003.
19. “Random iteration of rational functions”, *Atelier de travail en analyse* (10-hour lecture series), Université Laval, April 2003.
20. “Éléments de preuve de la J-stabilité des familles analytiques de fonctions elliptiques hyperboliques”, *Séminaire d’analyse*, Université Laval, September 2002.
21. “J-structural stability of the families of hyperbolic elliptic functions”, *Séminaire de systèmes dynamiques*, Centre de Recherches en Mathématiques (Montréal), September 2002.
22. “Is the composition of two expansive maps expansive?”, *Summer Meeting of the Canadian Mathematical Society (CMS)*, Québec, June 2002.
23. “Families of Gibbs measures for fibred systems”, *Seminar of dynamics*, Concordia University, June 2002.
24. “The structure of the Fatou set — Herman rings”, *Complex Dynamics Reading Seminar*, University of North Texas, February 2002.
25. “Fibrewise expansive systems”, *Dynamics and Analysis Seminar*, University of North Texas, October 2001.

Research Funding:

External:

NSERC discovery grant # 327304 for the project
“Deterministic and random iterated function systems” 2006–2012
\$9,000/year

(NSERC stands for “Natural Sciences and Engineering
Research Council of Canada”.)

FQRNT postdoctoral research fellowship 2002–2004

(FQRNT stands for “Fonds Québécois de Recherche sur
la Nature et les Technologies”)

Internal:

Glendon Research Grant 2011–2012
\$1,500

Glendon Research Grant 2010–2011
\$2,500

Glendon Research Grant 2005–2007
\$2,000

Teaching at York University				
Academic Year	Term	Course	Credits	Title
2022–2023	Winter 2023	MATH 6XXX	3	Fields Academy Shared Graduate Course: Countable-State Thermodynamic Formalism & Its Application to CGDMSs
		MATH 2660	3	Linear Algebra II
		MATH 1950	3	Mathematics of Investment I
	Fall 2022	MATH 1670	3	Fundamentals of Mathematics (1st half)
2021–2022	Winter 2022	MATH 4000	3	Lectures dirigées en mathématiques
		MATH 1950	3	Mathematics of Investment I
2020–2021	Winter 2021	MATH 2670	3	Calcul des fonctions de plusieurs variables
		MATH 1950	3	Mathematics of Investment I
2019–2020	Winter 2020	MATH 6540	3	Topology I (graduate course)
		MATH 3400	3	Differential Equations
		MATH 1950	3	Mathematics of Investment I
2018–2019	Sabbatical	Leave		
2017–2018	Winter 2018	MATH 2680	3	Mathematics of Investment and Actuarial Science
		MATH 1940	3	Calculus II
		MATH 1930	3	Calculus I
	Fall 2017	MATH 2680	3	Mathematics of Investment and Actuarial Science
		MATH 1930	3	Calculus I
	Summer 2017	MATH 4000	3	Dynamical Systems (reading course)

Academic Year	Term	Course	Credits	Title
2016–2017	Winter 2017	MATH 3300	3	Introductory Topology I
		MATH 2660	3	Linear Algebra II
		MATH 1940	3	Calculus II
		MATH 1930	3	Calculus I
	Fall 2016	MATH 3400	3	Differential Equations
		MATH 1930	3	Calculus I
		MATH 1670	6	Fundamentals of Mathematics
		MATH 1660	3	Linear Algebra I
2015–2016	Winter 2016	MATH 2680	3	Mathematics of Investment and Actuarial Science
	Fall 2015	MATH 2680	3	Mathematics of Investment and Actuarial Science
	Summer 2015	MATH 4230	6	Complex Analysis
2014–2015	Winter 2015	MATH 1940	3	Calculus II
	Fall 2014	MATH 1930	3	Calculus I
2013–2014	Winter 2014	MATH 2680	3	Mathematics of Investment and Actuarial Science
	Fall 2013	MATH 2680	3	Mathematics of Investment and Actuarial Science
	Summer 2013	MATH 4300	3	Directed Readings
2012–2013	Winter 2013	MATH 1940	3	Calculus II
	Fall 2012	MATH 1930	3	Calculus I
2011–2012	Winter 2012	MATH 1940	3	Calculus II
		MATH 2680	3	Mathematics of Investment and Actuarial Science
	Fall 2011	MATH 1930	3	Calculus I
		MATH 2680	3	Mathematics of Investment and Actuarial Science

Academic Year	Term	Course	Credits	Title
2010–2011	Sabbatical	Leave		
2009–2010	Winter 2010	MATH 4240	3	Analyse réelle
		MATH 2670	3	Second-Year Calculus
	Fall 2009	MATH 4240	3	Analyse réelle
		MATH 2670	3	Second-Year Calculus
2008–2009	Winter 2009	MATH 3400	3	Differential Equations
		MATH 2680	3	Mathematics of Investment and Actuarial Science
		MATH 2670	3	Second-Year Calculus
	Fall 2008	MATH 2680	3	Mathematics of Investment and Actuarial Science
		MATH 2670	3	Second-Year Calculus
2007–2008	Winter 2008	MATH 6002	3	Ergodic Theory (graduate reading course)
		MATH 2670	3	Second-Year Calculus
		MATH 1940	3	Calculus II
	Fall 2007	MATH 2670	3	Second-Year Calculus
		MATH 1930	3	Calculus I
2006–2007	Winter 2007	MATH 6002	3	Iterated Function Systems (graduate reading course)
		MATH 4230	3	Analyse complexe
		MATH 1940	3	Calculus II
	Fall 2006	MATH 6340	3	Ordinary Differential Equations (graduate course)
		MATH 4230	3	Analyse complexe
		MATH 1930	3	Calculus I

Academic Year	Term	Course	Credits	Title
2005–2006	Winter 2006	POLS 4100	3	Independent Study in Political Science (reading course in statistics)
		MATH 3400	3	Differential Equations
		MATH 1940	3	Calcul différentiel et intégral II
		MATH 1670	3	Fundamentals of Mathematics
	Fall 2005	MATH 3320	3	Principles of Mathematical Analysis
		MATH 1670	3	Fundamentals of Mathematics

Teaching at Université Laval

Academic Year	Term	Course	Credit Number	Title
2004-2005	Fall 2004	MAT10363	3	Mathématiques de l'ingénieur

Teaching at Concordia University

Academic Year	Term	Course	Credit Number	Title
2003-2004	Winter 2004	MAST 217	3	Introduction to Mathematical Thinking
	Fall 2003	MAST 232	3	Mathematics with Computer Algebra (Maple)
2002-2003	Winter 2003	MAST 232	3	Mathematics with Computer Algebra (Maple)
	Fall 2002	MAST 232	3	Mathematics with Computer Algebra (Maple)

Teaching at the University of North Texas

Academic Year	Term	Course	Credit Number	Title
2001-2002	Winter 2002	MATH 1720	3	Calculus II (2 sections)
	Fall 2001	MATH 1720	3	Calculus II
		MATH 1710	3	Calculus I

Service

2022–2023 Member of the Hiring Committee for a Contractually Limited Appointment in Mathematics, Glendon

2022 Member of the Adjudicating Committee for the Advancement to Candidacy of Professor Rémi Vivès (Department of Economics, Glendon)

2021–2022 Member of the Principal's Advisory Committee on Glendon's Repositioning

2020–2024 Chair, Mathematics Department, Glendon

07/2021–12/2022 Chair of Senate, York University

01/2020–06/2021 Vice-Chair of Senate, York University

2021 Referee for a paper submitted to the *Proceedings of the American Mathematical Society*

2020 Chair of the Adjudicating Committee for the Advancement to Candidacy of Professor Samia Challal (Department of Mathematics, Glendon)

2020 Referee for four papers submitted to the *Journal of Fractal Geometry*, *Studia Mathematica*, the *Journal of Geometric Analysis*, and the *European Journal of Physics*

2019 Referee for a paper submitted to the *Proceedings of the American Mathematical Society*

2018 Excel Training for the Master's of Public and International Affairs Students, Glendon

2016–2018 Chair, Mathematics Department, Glendon

2016–2018 Member of the Glendon Chairs' Caucus

2017–2018 Member of the Hiring Committee for a Tenure-Track, Teaching Stream Appointment in Mathematics, Glendon

2017–2018 Chair of the Adjudicating Committee for the Tenure and Promotion of Professor Angelo Dossou-Yovo (Department of International Studies, Glendon)

2017-2018 Member of the Adjudicating Committee for the Tenure and Promotion of Professor Aymen Karoui (Economics Department and International Studies Department, Glendon)

01/2014–06/2016 In the absence of a Chair, I administered Glendon's Department of English

2013–2016 Member of the Glendon Admissions Subcommittee

2013–2016 Glendon Senator on York University Senate

2013–2016 Member of APPRC (Academic Policy, Planning and Research Committee; one of York University Senate's committees)

- 2013–2016 Glendon Experiential Education Lead
- 2013–2015 Member of the Joint Subcommittee on Quality Assurance Programs, York University
- 2013–2015 Member of three Organized Research Unit (ORU) Boards (CRLCC, IRIS and Robarts), York University
- 2013–2015 Member of the Adjudication Committee for the Research Development Fellowship Programme, York University
- 11/2013–06/2014 In the absence of a Director, I administered the MA in Études françaises and the PhD in Études francophones, Glendon
- 2013–2014 In the absence of a Chair, I administered Glendon's Department of Multidisciplinary Studies
- 2013–2014 Member of the Hiring Committee for a Contractually Limited Appointment in Mathematics, Glendon
- 2013–2014 Member of the Glendon Principal Search Committee
- 2013–2014 Member of the NSERC Doctoral Scholarship Adjudication Files, York University
- 2013–2014 Member of the SSHRC Doctoral Scholarship Adjudication Files, York University
- 2012–2013 Guest of Honor for the Math-e-litics Competition (York Region)
- 2011–2013 Chair, Mathematics Department, Glendon
- 2011–2013 Member of the Curriculum Committee, Glendon
- 2011–2012 Member of the Tenure and Promotion Review Committee, Glendon
- 2011 Acting Chair, Mathematics Department, Glendon (from mid-April to July).
- 2011–2012 Referee for two papers submitted to the *Journal of Mathematical Analysis and Applications* and the *Real Analysis Exchange*
- 2010–2011 Referee for five papers submitted to *Nonlinearity*, *Ergodic Theory and Dynamical Systems* (2), the *Bulletin of the Belgian Mathematical Society*, and the *Indian Journal of Pure and Applied Mathematics*
- Summer 2010 External examiner of the M.Sc. Memoir written by Mr. Maxime Fortier Bourque from Université Laval
- 2006–2010 Vice-Chair of Glendon Faculty Council
- 2009–2010 Member of the Principal's Advisory Committee on Campus Development, Glendon

2009–2010 Referee for a paper submitted to the Journal of Mathematical Analysis and Applications

2007–2010 Chair of the Academic Technology Advisory Committee (ATAC), Glendon

2006–2010 Member of the Board of Friends of Glendon, a charitable organization which helps Glendon students in financial need through the awarding of scholarships, bursaries and emergency loans

2009 Member of the Merit Pay Committee for the academic year 2008–2009, Glendon

2009 Member of the Web Management Committee, Glendon

2008–2009 Referee for a paper submitted to Annales Polonici Mathematici

2005–2009 Examiner for the Certificate of Bilingual Excellence, Glendon

2005–2008 Member of the Policy and Planning Committee, Glendon

2007–2008 Member of the Board of the Entrepreneurial Club, Glendon

2006–2007 Treasurer of Friends of Glendon

2007–2008 Referee for two NSERC Discovery Grant applications

2007 Member of the Merit Pay Committee for the academic year 2006–2007, Glendon

02/2007 Examiner for the Certificate of Bilingual Excellence, Glendon.

2006 Member of the Adjudicating Committee for the tenure and promotion of Professor Alexander Nenashev (Mathematics Department, Glendon)

2006 Member of the File Preparation Committee for the tenure and promotion of Professor Alexander Nenashev (Mathematics Department, Glendon)

2006 Member of the Adjudicating and File Preparation Committees for the tenure and promotion of Professor Vincent Hildebrand (Economics Department, Glendon)

02/2006 Examiner for the Certificate of Bilingual Excellence, Glendon.

04/2005 Member of the jury, Undergraduate Mathematics Projects, Université Laval

Fall 2002 Co-organizer, Seminar on Dynamical Systems, CRM (Montréal, Canada)

04/2002 Member of the jury, 2002 Annual Integration Bee, University of North Texas

07/1999 Co-organizer, Conference on Dynamical Systems, University of Göttingen

07/1999 Organizer, Workshop on Fractal Geometry, University of Göttingen

06/1999 Co-organizer, Graduate Workshop on Dynamical Systems, University of Göttingen.

Merit Awards

- I have qualified for a half-course research-related release since this program was put in place in 2017–2018.
- I received the 2011–2012 Principal’s Teaching Excellence Award.
- I was awarded a half-course release to conduct my NSERC funded research program for the academic years 2007–2008 and 2009–2010.
- I have been awarded a merit pay each year for 8 years in a row since the year I was appointed at Glendon. (Merit pay was then abolished.)

Additional Education in Finance

- Working knowledge of mathematical and financial concepts applied to portfolio management: I followed a graduate course on financial mathematics at the University of Göttingen in 2001, course treating of stochastic processes describing the price of non-dividend-paying stocks and derivative securities depending on such stocks.
- Theoretical and practical knowledge of a large variety of financial instruments: I took several finance courses at the John Molson School of Business (Concordia University) in 2003–2004 (for instance, Theory of Finance, Theory of Capital Markets, Options and Futures).
- I passed the Level I exam in the Chartered Financial Analyst (CFA) Program.

Computing

Languages: Pascal, Fortran, Visual Basic, C, C++, Python.

Environments: UNIX, LINUX and Windows.

Softwares: MS Office, SAS, R, Latex, Mathematica and Maple.