

# Matheus R. Grasselli

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CONTACT INFORMATION      The Fields Institute for Research in Mathematical Sciences  
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RESEARCH INTERESTS      Mathematical finance, utility theory, optimal investment, interest rate modeling, computational economics, information geometry, quantum information.

EDUCATION      **King's College London**, London, United Kingdom  
*PhD in Mathematics*      **September 1998 – December 2001**

- Thesis title: Classical and Quantum Information Geometry
- Supervisor: Raymond F. Streater

**University of São Paulo**, São Paulo, Brazil  
*BSc in Physics (Honors - first class)*      **February 1994 – December 1997**

PROFESSIONAL EXPERIENCE      **The Fields Institute**, Toronto, Canada  
Deputy Director      **January 2012 – present**

**McMaster University**, Hamilton, Canada  
Associate Professor and Sharcnet Chair in Financial Mathematics      **July 2008 – present**  
Assistant Professor and Sharcnet Chair in Financial Mathematics      **May 2003 – June 2008**  
Postdoctoral Fellow in Financial Mathematics      **January 2002 – April 2003**

PUBLICATIONS      **Books**

*Numerical Mathematics*, (with D. Pelinovsky) Jones and Bartlett Publishers, Boston, 2008.

**Published and Accepted papers**

*An agent-based computational model for bank formation and interbank networks*, (with O. Ismail), to appear in SIAM Handbook on Systemic Risk, Jean-Pierre Fouque and Joseph Langsam (editors), Cambridge University Press, 2012.

*Stock loans in incomplete markets*, (with C. G. Velez), to appear in Applied Mathematical Finance, 2012.

*Getting real with real options: a utility-based approach for finite-time investment in incomplete markets*, Journal of Finance, Business, and Accounting, 38 (5) & (6), 740764, 2011.

*Indifference price for general semimartingales*, (with S. Biagini and M. Frittelli), Mathematical Finance, **21** (3), 423–446, 2011.

*The Fields Institute thematic program on Quantitative Finance: foundations and applications - January to June, 2010*, (with T. Hurd), Quantitative Finance **11** (1), 21-29, 2011.

*Dual connections in nonparametric classical information geometry*, Annals of the Institute for Statistical Mathematics, **62** (5), 873–896, 2010.

*Risk Aversion and Block Exercise of Executive Stock Options*, (with V. Henderson) Journal of Economic Dynamics and Control, **33**, 109-127, 2009.

*A policyholder's utility indifference valuation for guaranteed annuity options*, (with S. Silla) Mathematical Methods in Economics and Finance, **3**(2), 61-80, 2008.

*Indifference pricing and hedging of volatility derivatives*, (with T.R. Hurd), Applied Mathematical Finance, **4** (4), 303–317, 2007.

*Wiener Chaos and the Cox–Ingersoll–Ross model*, (with T.R.Hurd), Proc. Roy. Soc., **461**, No. 2054, 459–479, 2005.

*Duality, monotonicity and the Wigner-Yanase-Dyson metrics*, IDAQP, **7**, No. 2, 215–232, 2004.

*Hydrodynamics in an External Field*, (with R.F. Streater), Rep. Math. Phys., **50**, No 1, 13-40, 2002.

*On the Uniqueness of the Chentsov Metric in Quantum Information Geometry*, (with R.F. Streater) IDAQP, **4**, No. 2, 173-182, 2001.

*Infinite Dimensional Quantum Information Geometry*, in **Disordered and Complex Systems**, ed. A.C.C. Coolen, L. Hughston, P. Sollich, R.F. Streater, Amer. Institute of Physics, 2000.

*The Uniqueness of the Chentsov Metric*, (with R.F. Streater) in **Disordered and Complex Systems**, ed. A.C.C. Coolen, L. Hughston, P. Sollich, R.F. Streater, Amer. Institute of Physics, 2000.

*The Quantum Information Manifold for  $\varepsilon$ -Bounded Forms*, (with R.F. Streater) Rep. Math. Phys., **46**, No. 3, 325-335, 2000.

### Submitted papers

*An analysis of the Keen model for credit expansion, asset price bubbles and financial fragility*, (with B. Costa Lima), submitted to Mathematics and Financial Economics, 2011.

*Chaotic interest rate calibration* (with T. Tsujimoto), submitted to SIAM Journal of Financial Mathematics, 2010.

### Technical Reports

*Credit Risk and Interest Rate Modeling* (with T. Hurd), McMaster University, 2008.

*Nonlinearity, correlation and the valuation of employee stock options*, McMaster University, 2005.

*Malliavin Calculus* (with T. Hurd), McMaster University, 2005.

*Monte Carlo methods for Exponential Hedging* (with T. Hurd), McMaster University, 2003.

### SUPERVISORY ACTIVITY

#### Postdoctoral Fellows

Huibin Cheng (with T. Hurd and T. Pirvu)	<b>July 2011 – present</b>
Klaas Schultze (with T. Hurd and T. Pirvu)	<b>July 2009 – 2011</b>
Cesar Gomes Velez (with T. Hurd)	<b>January 2008 – July 2009</b>
Alexey Kuznetsov (with T. Hurd)	<b>July 2004 – June 2006</b>

#### Students

Bernardo Costa Lima, PhD	<b>September 2008 – present</b>
Omneia Ismail, PhD	<b>September 2006 – present</b>
Elena Alexandru-Gajura, PhD	<b>September 2005 – October 2010</b>
Garance Staraci, visiting undergraduate (Stanford)	<b>May 2011 – August 2011</b>
Xiaohui Li, Master	<b>March 2007 – March 2010</b>
Tsunehiro Tsujimoto, visiting PhD (University of St Andrews)	<b>January 2009 – September 2010</b>
Vincent Leclerc, visiting undergraduate (École Polytechnique, Paris)	<b>May 2009 – August 2009</b>
Sebastiano Silla, visiting PhD (Università di Pisa)	<b>September 2005 – December 2008</b>
Michael Lukas, undergraduate	<b>May 2007 – August 2007</b>
Omneia Ismail, Master	<b>September 2005 – August 2006</b>
Lingling Wang, Master	<b>September 2004 – July 2006</b>
Chuang Yi, Master	<b>September 2003 – August 2005</b>

## TALKS

Since 2002 I have been an invited speaker in 17 international and 3 national conferences and workshops and have given contributed talks at 6 international conferences (including the past 4 Bachelier World Congresses). In the same period, I have given 30 invited research seminars at major international universities such as Cambridge, Carnegie Mellon, UCSB, Chicago, École Polytechnique, ETH Zurich, IMPA, Imperial College London, Kings College London, KTH Stockholm, Oxford, Pisa, and Princeton, as well as 14 invited research seminars at Canadian institutions, including two colloquium talks (McMaster and Western) and two talks at the Fields Institute Quantitative Finance Seminar Series. A complete list of all my conference presentations can be found at [www.math.mcmaster.ca/~grasselli/encounters.html](http://www.math.mcmaster.ca/~grasselli/encounters.html).

## ORGANIZING ACTIVITY

I was the principal organizer of the Fields Institute Thematic Program on Quantitative Finance: Foundations and Applications, which took place in Toronto from January - June, 2010. The other members of the organizing committee are Y. Ait-Sahalia (Princeton), V. Henderson (Oxford Man Institute), T. Hurd (McMaster), M. Rindisbacher (Toronto) and D. Rosen (R2 Financial Technologies)

I was the principal organizer of the Workshop on Quantum Information Geometry and Quantum Computing, held at McMaster and the Fields Institute in May, 2004. The other members of the organizing committee were M. B. Ruskai (Tufts) and D. Lidar (USC).

I was the organizer or co-organizer of several smaller quantitative finance meetings, including the Credit Risk session for the 13th INFORMS Applied Probability Conference (Ottawa, July, 2005), the Fields-Mitacs-Sharcnet Quantitative Finance Conference on Credit Risk (Western, November, 2005) and the two-day Project Meeting for Modelling Trading and Risk in the Market MITACS (McMaster, November, 2005).

## EDITORIAL ACTIVITY

In 2011-12, I served as Guest Editor for three special issues of the International Journal of Theoretical and Applied Finance.

From 2011 onwards, I serve as Managing Editor of the newly created book series Springer Briefs in Mathematical Finance.