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A stock-flow consistent macroeconomic model for asset price bubbles

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In this talk I first describe a stock-flow consistent model for an economy with households, firms, and banks in the form of a three-dimensional dynamical system for wages, employment, and firm debt. This is then extended by a fourth variable representing the flow of borrowing that is used purely for speculation on an existing financial asset, rather than productive capital investment. Finally, the system is augmented by introducing a price dynamics for the financial asset in the form of a standard geometric Brownian motion plus a downward jump modelled as a non-homogenous Poisson process whose intensity is an increasing function of the speculative ratio. The compensator for this downward jump then leads to the super-exponential growth characteristic of asset price bubbles. Moreover, when the bubble bursts the cost of borrowing in the real economy increases, leading to a feedback mechanism from the asset price dynamics to the original system. This is joint work with Bernardo Costa Lima and Adrien Nguyen Huu.

Matheus Grasselli earned an undergraduate degree in Physics from the University of Sao Paulo in 1997, and a Ph.D. in Mathematics from King's College London in 2002, for his thesis on Quantum and Classical Information Geometry under the supervision of Raymond Streater. After a postdoctoral fellowship, he was appointed Sharcnet Chair in Financial Mathematics at McMaster University in 2003, where he is currently a full Professor and co-director of PhiMac, the Financial Mathematics Laboratory. He has published research papers on information geometry, statistical physics, and numerous aspects of quantitative finance, including interest rate theory, optimal portfolio, real options executive compensation, and mathematical macroeconomics, as well as an undergraduate textbook on numerical methods. His consulting activities include projects with CIBC, Petrobras, EDF, and Bovespa. He is a regular speaker in both academic and industrial conferences around the world, and was the lead organizer of the Thematic Program on Quantitative Finance: Foundations and Applications, at the Fields Institute in 2010. Starting in 2011, he began serving as the first managing editor for the newly created book series Springer Briefs on Quantitative Finance. He has been the Deputy Director of the Fields Institute for Mathematical Sciences since January 2012.

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Refreshments will be provided

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