

# mathematics & finance:

# RiO

Research in Options

IMPA, Rio de Janeiro, Brazil - November 27<sup>th</sup> to December 3<sup>rd</sup>, 2015

# CERTIFICATE



We hereby certify that, **Bruno Dupire, Bloomberg - NY**, participated in the Mathematics & Finance: Research in Options 2015, held at Instituto Nacional de Matemática Pura e Aplicada - IMPA - Rio de Janeiro, from November 27 to December 3, 2015 and presented the following work: “**Tradable Estimates of Historical Volatility**”.

Rio de Janeiro, December 3, 2015.

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IMPA, Rio de Janeiro, Brazil - November 27<sup>th</sup> to December 3<sup>rd</sup>, 2015

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We hereby certify that, **Carlos Vázquez**, **Universidade da Coruña**, participated in the Mathematics & Finance: Research in Options 2015, held at Instituto Nacional de Matemática Pura e Aplicada - IMPA - Rio de Janeiro, from November 27 to December 3, 2015 and presented the following work: “***PDE Models and Numerical Methods for XVA Computing***”.

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We hereby certify that, **Carole Bernard, University of Waterloo**, participated in the Mathematics & Finance: Research in Options 2015, held at Instituto Nacional de Matemática Pura e Aplicada - IMPA - Rio de Janeiro, from November 27 to December 3, 2015 and presented the following work: “**Two- and Three- Fund Separation Theorems Under General Assumptions**”.

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We hereby certify that, **Chris Rogers, University of Cambridge**, participated in the Mathematics & Finance: Research in Options 2015, held at Instituto Nacional de Matemática Pura e Aplicada - IMPA - Rio de Janeiro, from November 27 to December 3, 2015 and presented the following work: “**Bermudan Options By Simulation**”.

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We hereby certify that, ***Claudia Sagastizábal***, Instituto Nacional de Matemática Pura e Aplicada, participated in the Mathematics & Finance: Research in Options 2015, held at Instituto Nacional de Matemática Pura e Aplicada - IMPA - Rio de Janeiro, from November 27 to December 3, 2015 and presented the following work: “***Introducing Uncertainty in Brazil's Oil Supply Chain***”.

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We hereby certify that, **David Meier, Brunel University London**, participated in the Mathematics & Finance: Research in Options 2015, held at Instituto Nacional de Matemática Pura e Aplicada - IMPA - Rio de Janeiro, from November 27 to December 3, 2015 and presented the following work: “**Factorization of the pricing kernel: A simplified approach**”.

Rio de Janeiro, December 3, 2015.

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We hereby certify that, **Jose Afonso Faias, Universidade Católica Portuguesa**, participated in the Mathematics & Finance: Research in Options 2015, held at Instituto Nacional de Matemática Pura e Aplicada - IMPA - Rio de Janeiro, from November 27 to December 3, 2015 and presented the following work: “**Moments of Prediction**”.

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We hereby certify that, **Juan Carlos Arismendi Zambrano**, **Universidade de Brasilia**, participated in the Mathematics & Finance: Research in Options 2015, held at Instituto Nacional de Matemática Pura e Aplicada - IMPA - Rio de Janeiro, from November 27 to December 3, 2015 and presented the following work: “**Seasonal Stochastic Volatility: Implications for the Pricing of Commodity Options**”.

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We hereby certify that, **Juan Pablo Luna**, Programa de Engenharia de Produção, participated in the Mathematics & Finance: Research in Options 2015, held at Instituto Nacional de Matemática Pura e Aplicada - IMPA - Rio de Janeiro, from November 27 to December 3, 2015 and presented the following work:  
**“Introducing Uncertainty in Brazil's Oil Supply Chain”.**

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IMPA, Rio de Janeiro, Brazil - November 27<sup>th</sup> to December 3<sup>rd</sup>, 2015

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We hereby certify that, **Lakshitha Wagalath**, **léseg School of Management**, participated in the Mathematics & Finance: Research in Options 2015, held at Instituto Nacional de Matemática Pura e Aplicada - IMPA - Rio de Janeiro, from November 27 to December 3, 2015 and presented the following work: “**Lost in Contagion: Building a Liquidation Index from Covariance Dynamics**”.

Rio de Janeiro, December 3, 2015.

A handwritten signature in black ink, appearing to read 'JZ'.

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We hereby certify that, **Lane Hughston, Brunel University London**, participated in the Mathematics & Finance: Research in Options 2015, held at Instituto Nacional de Matemática Pura e Aplicada - IMPA - Rio de Janeiro, from November 27 to December 3, 2015 and presented the following work: “**Market Price of Risk: Facts and Fallacies**”.

Rio de Janeiro, December 3, 2015.

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We hereby certify that, **Marco Avellaneda, Courant Institute of Mathematical Sciences**, participated in the Mathematics & Finance: Research in Options 2015, held at Instituto Nacional de Matemática Pura e Aplicada - IMPA - Rio de Janeiro, from November 27 to December 3, 2015 and presented the following work:  
**“Modelização de risco para carteiras de derivativos: uma visão holística”.**

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We hereby certify that, **Marco Frittelli**, **Unicersitá Degli Studi di Milano**, participated in the Mathematics & Finance: Research in Options 2015, held at Instituto Nacional de Matemática Pura e Aplicada - IMPA - Rio de Janeiro, from November 27 to December 3, 2015 and presented the following work: “**Model-Free Superhedging Duality**”.

Rio de Janeiro, December 3, 2015.

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We hereby certify that, **Matheus Grasselli, McMaster University**, participated in the Mathematics & Finance: Research in Options 2015, held at Instituto Nacional de Matemática Pura e Aplicada - IMPA - Rio de Janeiro, from November 27 to December 3, 2015 and presented the following work: ***“Inequality in a Monetary Dynamic Macroeconomic Model - Sorting out Piketty's View on Capital”***.

Rio de Janeiro, December 3, 2015.

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We hereby certify that, **Matjaž Omladič**, Institute of Mathematics, Physics and Mechanics - Ljubljana, participated in the Mathematics & Finance: Research in Options 2015, held at Instituto Nacional de Matemática Pura e Aplicada - IMPA - Rio de Janeiro, from November 27 to December 3, 2015 and presented the following work: “**What can Wikipedia and Google tell us about stock prices under different market regimes?**”.

Rio de Janeiro, December 3, 2015.

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We hereby certify that, **Mauricio Junca**, **Universidad de Los Andes-Colombia**, participated in the Mathematics & Finance: Research in Options 2015, held at Instituto Nacional de Matemática Pura e Aplicada - IMPA - Rio de Janeiro, from November 27 to December 3, 2015 and presented the following work: “**On de Finetti's problem under a Time of Ruin Constraint**”.

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We hereby certify that, **Max Oliveira de Souza**, **Universidade Federal Fluminense**, participated in the Mathematics & Finance: Research in Options 2015, held at Instituto Nacional de Matemática Pura e Aplicada - IMPA - Rio de Janeiro, from November 27 to December 3, 2015 and presented the following work:  
**“Evaluation of Optional Cancellation Contracts”**.

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We hereby certify that, **Nicole El Karoui**, **École Polytechnique**, participated in the Mathematics & Finance: Research in Options 2015, held at Instituto Nacional de Matemática Pura e Aplicada - IMPA - Rio de Janeiro, from November 27 to December 3, 2015 and presented the following work: “**TBA**”.

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We hereby certify that, **Rafael Moura Azevedo**, **Universidade Federal de Pernambuco**, participated in the Mathematics & Finance: Research in Options 2015, held at Instituto Nacional de Matemática Pura e Aplicada - IMPA - Rio de Janeiro, from November 27 to December 3, 2015 and presented the following work: “**Watching the News: Optimal Stopping Time and Scheduled Announcements**”.

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We hereby certify that, **Raphael Douady**, **Université Paris I - Sorbonne**, participated in the Mathematics & Finance: Research in Options 2015, held at Instituto Nacional de Matemática Pura e Aplicada - IMPA - Rio de Janeiro, from November 27 to December 3, 2015 and presented the following work: “**Nonlinear Factor Analysis by Polymodels**”.

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We hereby certify that, **Ryan Donnelly, Ecole Polytechnique Fédérale de Lausanne**, participated in the Mathematics & Finance: Research in Options 2015, held at Instituto Nacional de Matemática Pura e Aplicada - IMPA - Rio de Janeiro, from November 27 to December 3, 2015 and presented the following work:  
**“Enhancing Trading Strategies with Order Book Signals”.**

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We hereby certify that, **Sebastian Jaimungal**, **University of Toronto**, participated in the Mathematics & Finance: Research in Options 2015, held at Instituto Nacional de Matemática Pura e Aplicada - IMPA - Rio de Janeiro, from November 27 to December 3, 2015 and presented the following work: “**Trading Strategies Within the Edges of No-Arbitrage**”.

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We hereby certify that, **Stefano Pagliarani, École Polytechnique**, participated in the Mathematics & Finance: Research in Options 2015, held at Instituto Nacional de Matemática Pura e Aplicada - IMPA - Rio de Janeiro, from November 27 to December 3, 2015 and presented the following work: “**The Parabolic Taylor Formula of Implied Volatility**”.

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We hereby certify that, **Teemu Pennanen, King's College London**, participated in the Mathematics & Finance: Research in Options 2015, held at Instituto Nacional de Matemática Pura e Aplicada - IMPA - Rio de Janeiro, from November 27 to December 3, 2015 and presented the following work: "**Indifference Swap Rates in Incomplete Markets**".

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We hereby certify that, **Uwe Schmock, Vienna University of Technology**, participated in the Mathematics & Finance: Research in Options 2015, held at Instituto Nacional de Matemática Pura e Aplicada - IMPA - Rio de Janeiro, from November 27 to December 3, 2015 and presented the following work: “**Term structure of defaultable bonds, an approach with Jacobi processes**”.

Rio de Janeiro, December 3, 2015.

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We hereby certify that, **Wellington Luis de Oliveira**, Universidade do Estado do Rio de Janeiro, participated in the Mathematics & Finance: Research in Options 2015, held at Instituto Nacional de Matemática Pura e Aplicada - IMPA - Rio de Janeiro, from November 27 to December 3, 2015 and presented the following work: “**Introducing Uncertainty in Brazil's Oil Supply Chain**”.

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We hereby certify that, ***Xu Yang***, **IMPA - Pós-Doutorando**, participated in the Mathematics & Finance: Research in Options 2015, held at Instituto Nacional de Matemática Pura e Aplicada - IMPA - Rio de Janeiro, from November 27 to December 3, 2015 and presented the following work: “***Calibration of Local Volatility: an EnKF Approach***”.

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We hereby certify that, **Yuri Fahham Saporito, Fundação Getúlio Vargas**, participated in the Mathematics & Finance: Research in Options 2015, held at Instituto Nacional de Matemática Pura e Aplicada - IMPA - Rio de Janeiro, from November 27 to December 3, 2015 and presented the following work: “**Multiscale Stochastic Volatility Model for Joint Calibration of S&P 500 and VIX Options**”.

Rio de Janeiro, December 3, 2015.

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