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## BIOGRAPHICAL SKETCH

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NAME <b>Maria Christina Mariani</b>		POSITION TITLE Distinguished Professor and Department Chair, Department of Mathematical Sciences, The University of Texas at El Paso.		
eRA COMMONS USER NAME (credential, e.g., agency login)				
EDUCATION/TRAINING ( <i>Begin with baccalaureate or other initial professional education, such as nursing. include postdoctoral training and residency training if applicable.</i> )				
INSTITUTION AND LOCATION		DEGREE (if applicable)	MM/YY	FIELD OF STUDY
University of Buenos Aires – Argentina		MS	1987	Mathematics
University of Buenos Aires – Argentina		MS	1995	Physics
University of Buenos Aires – Argentina		PhD	1993	Mathematics
				(graduation with highest honors in the three degrees)

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### A. Personal Statement

My work concentrates on nonlinear and stochastic problems with applications. I have special interest in applications to other disciplines. I have tried to make interdisciplinary connections since I believe that such work is fundamental to the progress of science.

In the interface of mathematics and financial markets I am working in new models for critical events that can also be applied in other disciplines, like Ising and Levy type models to estimate when a critical event may occur, and Hurst type methods to detect and measure memory effects.

In the interface of Mathematics, Physics and Geophysics, I have also been involved in the study of models for semiconductor devices and wave equations as the Painleve equations. I am working in models for seismic and explosive data, and studying the existence of solutions to the transient quantum hydrodynamic equations, specifically questions concerning long-time behavior.

### B. Positions and Honors

#### Positions and Employment (selected)

University of Buenos Aires, Associate Professor 1999 – 2002.

CONICET (Argentinean Equivalent of NSF): Permanent Researcher 1997 – 2004

Purdue University, Visiting Professor of Statistics and Mathematics, 2002-2003.

New Mexico State University, Associate Professor, 2005-2007.

New Mexico State University, Professor and Director of the Graduate Program, 2007-2009.

The University of Texas at El Paso, Professor and Department Chair, 2009 – present.

## **Other Experience and Professional Memberships (selected)**

Panelist of the NSF program in Applied Mathematics, 2005, 2006.

Panelist of the NSF program in Stochastic Systems, 2008.

Editorial Board Quantitative Finance, special issues (2010-2015)

American Mathematical Society

Mathematical Association of America

SACNAS

International Federation of Nonlinear Analysts

Unión Matemática Argentina

New Mexico State University Hispanic Caucus

## **Honors**

Shigeko K. Chan Distinguished Professor in Mathematical Sciences, University of Texas at El Paso, 2012.

College of Arts & Sciences Faculty Outstanding Achievement Award 2008, New Mexico State University.

Scientific Productivity Award, University of Buenos Aires 1993, 1994, 1995, 1996.

Best PhD Dissertation Award, University of Buenos Aires, 1994.

Graduation with highest honors, MS Mathematics, MS Physics, PhD Mathematics, University of Buenos Aires.

## **C. Selected Peer-reviewed Publications**

1. Numerical Solutions to an integro-differential parabolic problem arising in the pricing of financial options in a Levy market. I. Florescu, M.C. Mariani, G. Sewell. *Quantitative Finance* Vol. 14, 8 (2014) 1445–1452.

2. Local regression type methods applied to the study of Geophysics and high frequency financial Data. M.C. Mariani and K. Basu. To appear in *Physica A*

3. Levy models and scale invariance properties applied to Geophysics, M.C. Mariani, I. Florescu, I. SenGupta, M.P. Beccar Varela, P. Bezdek, L. Serpa (2013). *Physica A*, Vol. 392, 824-839

4. Ising type models applied to Geophysics and high frequency market data. M.C. Mariani, P. Bezdek, L. Serpa, I. Florescu (2012). *Physica A*, 390, 23 4396-4402

5. Solutions to an integro-differential parabolic problem arising in the pricing of financial options in a Levy market. I. and M.C. Mariani. *Electronic Journal of Differential Equations*, Vol. 2010(2010), No. 62, pp. 1-10.

6. Long correlations and Levy Models applied to the study of Memory effects in high frequency (tick) data. M.C. Mariani et al. *Physica A* 388, 8 (2009) 1659-1664.

7. A new Analysis of Intermittence, Scale Invariance and Characteristic Scales applied to the Behavior of Financial Indices near a Crash. M.C. Mariani and Y. Liu. *Physica A* 367 (2006) 345-352.

Author of 125 papers in international refereed journals as Forum Mathematicum, Journal of Mathematical Analysis and Applications, Physica A, International Journal of Theoretical and Applied Finance, International Journal of Quantum Chemistry, Nonlinear Analysis, International Journal of Computer Mathematics, Studia Mathematica.

## **D. Research Support**

### **Ongoing Research Support**

Investigating Premonitory Signals Using the Statistical Behavior of Very Large Seismic Time Series, CoS Multidisciplinary Pilot Program, 2015-2015.

Role: Co-PI

### **Completed Research Support (selected)**

Modeling High Frequency Data in Finance I, II, III, IV and V, NSF 2009-2014.

Role: Co-PI

Stochastic modeling, National Physical Science Consortium. 2007-2011

Role: PI

Modeling critical events, Minigrant from the College of Arts and Sciences, NMSU 2007-2008

Role: PI

Stochastic differential equations and applications, NSF ADVANCE projects NMSU, 2003-2006.

Role: PI

Semiconductor modeling, Antorchas Foundation: Argentina - Germany cooperation (Deutscher Akademischer Austauschdienst) 1999-2001.

Role: PI