# Roberta Sirovich

Dipartimento di Matematica "G. Peano"
Università degli Studi di Torino
Via Carlo Alberto, 10, 10123, Torino
Tel: +39 011 6702937, Email: roberta.sirovich@unito.it

**Education & Positions**

- October 2006–Present. Researcher, Department of Mathematics "G. Peano", University of Torino, Italy.
- March 2006. PhD in Mathematics (University of Torino) and PhD in Molecular Biology (University J. Fourier, Grenoble, France) with the thesis titled "Mathematical Models for the Study of Synchronization Phenomena in Neuronal Networks".
- July 2001, Master Degree in Mathematics from the University of Torino. 110/110 cum laude.

**International Collaborations**

- February 2009–July 2009. One semester visiting at the Laboratoire de Probabilités et Modèles Aléatoires, Université Pierre et Marie Curie, Paris (France), invited by Prof. Michèle Thieullen and with a WWS grant from the University of Torino.
- February 2008. One month visiting at the Laboratoire de Probabilités et Modèles Aléatoires, Université Pierre et Marie Curie, Paris (France), invited by Prof. Michèle Thieullen.
- March 2007. One month visiting at the Institute of Physiology, Academy of Sciences of the Czech Republic, invited by Prof. Petr Lansky.
- January 2003–March 2006. PhD thesis cotutorship with the Laboratoire de Neurobiophysique, Inserm U318, University Joseph Fourier, Grenoble, France. Advisor Prof. A.E.P. Villa.

**Publications**

1. Approximate analysis of biological systems by hybrid switching jump diffusion (with A. Angius, G. Balbo, M. Beccuti, E. Bibbona, A. Horvath). *Submitted for publication*.
2. Analysis of Petri Net models through Stochastic Differential Equations (with M. Beccuti, E. Bibbona, A. Horvath, A. Angius, and G. Balbo), Proceedings of the International Conference on application and theory of Petri nets and other models of concurrency (ICATPN'14), Springer LNCS vol. 8489 (to appear), June 23-27, 2014, in Tunis, Tunisia.
3. Cooperative behavior in a jump diffusion model for a simple network of spiking neurons (with L. Sacerdote and A.E.P. Villa). *Mathematical Biosciences and Engineering*, Vol. 11(2), 2014.
4. Non–parametric Estimation of Mutual Information through the Entropy of the Linkage (with M.T. Giraudo and L. Sacerdote). *Entropy*, Vol. 15, 2013.
5. Signal estimation from intracellular recordings in the Feller neuronal model (with E. Bibbona and P. Lansky). *Physical Review E*, 81:031916-1-031916-13, 2010.
6. A copulas approach to neuronal networks models (with L. Sacerdote). *Journal of Physiology*, 104:223–230, 2010.
7. Altered molecular pathways in melanocytic lesions (with M. Scatolini, M. Mello Grand, E. Grosso, T. Venesio, A. Pisacane, A. Balsamo, M. Risio, G. Chiorino). *International Journal of Cancer*, 126:1869–1881, 2010.
8. Errors in estimation of the input signal for integrate-and-fire neuronal models (with E. Bibbona, P. Lansky, L. Sacerdote). *Physical Review E*, 78(1):1–10, 2008.
9. Information measures in a small network of spiking neurons (with M.T. Giraudo and L. Sacerdote). *Scientiae Mathematicae Japonicae*, 67:191–204, 2008.
10. Effect of increasing inhibitory inputs on information processing within a small network of spiking neurons (with L. Sacerdote and A.E.P. Villa). *Lecture Notes in Computer Sciences*, 4507:23–30, 2007.
11. Mathematical Models for the study of synchronization phenomena in neuronal networks. Ph. D. Thesis, 2006.
12. Stochastic leaky integrate and fire neuronal model: examples of its application to neuronal coding study (with L. Sacerdote and C. Zucca). *Proceedings of NeuroMat III: Computational Neuroscience*. V. Capasso Editor.
13. Noise induced phenomena in jump diffusion models for single neuron spike activity (with L. Sacerdote). *IJCNN2004 CD-ROM Conference Proceedings*, IEEE Catalog Number 04CH37541C, ISBN: 0-7803-8360-5.
14. Multimodality if the Interspike Interval Distribution in a simple jump-diffusion model (with L. Sacerdote). *Scientiae Mathematicae Japonicae*, 8:359–374, 2003.
15. A Wiener process with Inverse Gaussian time distributed jumps as a model for neuronal activity. *Proceedings of the 5th ESMTB Conference*, 2002, V. Capasso Editor.
16. Effects of random jumps on a very simple neuronal diffusion model (with M.T. Giraudo and L. Sacerdote. *BioSystems*, 67:74–83, 2002.

**Talks**

I presented my works at more than 20 international conferences or seminars. Some of them as an invited speaker.

**Teaching**

I have been teacher of probability and statistics courses at bachelor, master and doctoral levels. I have been advisor for several bachelor theses and master theses.