

## **Personal Data**

Born in Cuneo (Italy) on September 28th 1966.

Current address: Dipartimento di Matematica Università di Torino, Via Carlo Alberto 10 10123  
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## **Current Employment**

Since April 1999 assistant professor of Probability and Statistics at Dipartimento di Matematica,  
Università di Torino

## **Education**

1991: Italian Laurea in Physics summa cum laude at the University of Torino with a thesis on the  
kinetics of cellular ionic channels.

1998: PhD title in Computational Mathematics and Operation Research at the University of Milano

## **Schools, Workshops and Talks**

I took part in a series of National and International Schools on various aspects of Probability and  
Statistics, some of which I contributed to organize. Among them:

“European Summer School on Markov Chain Monte Carlo Methods”, Skorpning-Aalborg (DK) within  
Programme “Highly Structured Stochastic Systems”, August 1998

Workshop “GROSTAT II” on Algebraic Methods in Statistics, IUT-STID Université de Nice – Sphia  
Antiplois – Sophia Antipolis, September 1998

“Workshop on Numerical Dynamical Systems”, Dipartimento di Matematica Politecnico di Milano,  
June 1999

Mini-course “Random Graphs and their applications to Neural Networks”, Dipartimento di Matematica  
Università di Torino, May 2008

Workshop “Optimal Stopping and Applications”, Dipartimento di Matematica Università di Torino,  
May 2015

I took part in more than 20 international conferences or congresses where I presented communications,  
among which:

Neuronal Coding Workshop 1999, Osaka (Japan), October 1999

12<sup>th</sup> European Simulation Symposium ESS 2000, Amburgo (D), September 2000

VI World Congress of Probability and Statistics, Barcellona (E), July 2004

Biocomp 2005, Vietri (SA), December 2005

Prague Stochastics 2006, Praga (CZ), August 2006

UpOn, 5th International Conference on Unsolved Problems on Noise, Lyon (F), June 2008

Stochastic Resonance SR 2008, Perugia, Italy, August 2008

2011 Joint Mathematics Meetings JMM, New Orleans (LA), January 2011

## Grants

September 1992 – August 1993: INFM research grant from INFM (Italian National Institute of Mathematical Physics) at Dipartimento di Fisica Università di Genova.

November 1998 – April 1998: research grant from CNR (Italian National Research Council) at Dipartimento di Matematica Università di Torino.

In July 2010 she received a grant from INDAM-GNCS within the program Visting Professors for hosting professor Priscilla E. Greenwood, Arizona State University.

## Research projects

She took part in several national research projects, among which

- “Does noise simplify or complicate the dynamics of nonlinear systems?”, 2004, INDAM
- “Numerical, analytical and simulation methods to recognize the phenomena that causes the reliability in the neuronal signal transmission.”, PRIN(MIUR) 2003-2005
- “Mathematical methods to analyze the information content of interspike time series in small simulated or observed neural networks.”, PRIN(MIUR) 2005-2007
- “Joint Activities between the Mathematics Department of Torino University and Lund University”, Progetto Congiunto Italia-Svezia nell’ambito della Convenzione stipulate tra il Dipartimento di Matematica dell’Università di Torino e l’Università di Lund 2008

## Services

Organization for some years of the seminar activity in Probability and Statistics at the Dipartimento di Matematica Università di Torino.

Participation to the scientific and local organizing committees for the School “Does noise simplify or complicate the dynamics of nonlinear systems” and the Workshop “Nonlinear Dynamics and Noise in Biological Systems” held at the Mathematics Department of Torino University in April 2004 within the corresponding INDAM project.

Co-organizer of the mini-courses “Random Graphs and their applications to Neural Networks” and “Dynamical Systems and their Applications” held at the Mathematics Department of Torino University in May 2008.

Referee for the international journals “Biological Cybernetics”, “BioSystems”, “Mathematical Biosciences and Engineering”, “Scandinavian Journal of Statistics”, “Statistics in Medicine”, “The Open Mathematics Journal” and for AMS.

Collaboration in 1999-2000 with the publishing house UTET for the revision of the Mathematics items in the fifth edition of “Grande Dizionario Enciclopedico”.

Collaboration with the publishing house Pearson Italia for the revision of

- R. Johnson, "Probabilità e Statistica per l'Ingegneria e le Scienze", 2007
- M.M. Triola and M.F. Triola, "Statistica per le discipline biosanitarie", 2009 and "Fondamenti di Statistica per le discipline biomediche", 2013.

Member of the teaching board of the PhD program in Mathematics of the University of Torino from 2001 to 2008

Co-organizer of the mini-course on Structural Equation Modeling and their applications in Epidemiology "I modelli di equazioni strutturali (SEM): uso del software MPLUS ed applicazioni epidemiologiche", Mathematics Department of Torino University, June 2015

Member since 2012 of the Scientific Committee of the Master program in Data Analysis for Business Intelligence organized jointly by the University of Torino and COREP.

### **Collaborations**

Prof. L. Sacerdote, Dipartimento di Matematica Università di Torino

Dott. C. Zucca, Dipartimento di Matematica Università di Torino

Dott. R. Sirovich, Dipartimento di Matematica Università di Torino

Dott. R.M. Mininni, Dipartimento di Matematica Università di Bari

Prof. A. Rolando, Dipartimento di Biologia Animale e dell'Uomo, Università di Torino

Prof. D.R. Chialvo, Dept. of Physiology Northwestern University, Chicago

Prof. P.E. Greenwood, Department of Mathematics and Statistics Arizona State University, Tempe

Dott. M. Beccuti Dipartimento di Informatica Università di Torino

Dott. F. Cordero Dipartimento di Informatica Università di Torino

Dott. G. Miglio Dipartimento di Scienza e Tecnologia del Farmaco Università di Torino

### **Other activities (attività di terza missione)**

Participation to the Workshop "La matematica conta!" organized by Fondazione Agnelli and Centro Scienza Torino at the Car Museum in Torino for children of the last two years of primary schools in Piedmont

Organization of the activities held by the Mathematics Department of Torino University to the 2013 and 2014 editions of "Notte dei Ricercatori" in Torino

Activities concerning Mathematics within the editions 2013 and 2014 of the project "Bambini e bambine. Un giorno all'Università" (Male and female children. One day at the University).

Divulgative talks for high school students:

- "There are three kind of lies: lies, damned lies and statistics"... Davvero?, conference at classical high school "Vincenzo Gioberti" Torino, 2012

- “Porte, giochi e compleanni: la Probabilità è (anche) un paradosso” (Doors, games and anniversaries: Probability is (also) a paradox?), conference at classical high school “Vincenzo Gioberti” Torino, 2013 and 2014
- “Matematica e...: un ponte tra scienze diverse” (Mathematics and...: a bridge between different sciences), conference at classical high school “Vincenzo Gioberti” Torino, 2015

## Teaching activity

I have been teaching probability and statistics courses at bachelor, master and doctoral levels since 1999 (see Campusnet for the most recent ones).

I have been advisor for more than forty bachelor theses in Mathematics and in Mathematics for Finance and Insurance and master theses in Mathematics on subjects both in Probability and in Statistics.

I have also given Probability and Statistics courses within the training programs for high school teachers PAS (2013 and 2014) and TFA (2014 and 2015) organized jointly by the University of Torino, the University of Piemonte Orientale and Torino Polytechnic.

## Research interests

- First passage time problems for stochastic processes through barriers from the analytical and the computational point of view with applications to neuronal modelling
- Diffusion processes with jumps
- Stochastic resonance problems in neuronal modelling
- Parameter estimation for stochastic processes
- Study and application of information measures for stochastic processes

More recently:

- Application of multivariate Statistics to problems in Biology, Clinical sciences and Epidemiology, for example
  - SEM (Structural equation modelling)
  - Mediation analysis
  - Multiple outcome regression analysis
  - Survival models

## Papers

Nizzari M., Sesti F., Giraudo MT, Virginio C., Cattaneo A., Torre V. [Single-channel properties of cloned cGMP-activated channels from retinal rods. pp.69-74. In PROCEEDINGS - ROYAL SOCIETY. BIOLOGICAL SCIENCES - ISSN:0962-8452 vol. 254/1993](#)

Giraudo MT, Sacerdote L. Some remarks on First-Passage-Time for Jump-Diffusion Processes. pp.518-523. In Cybernetics and Systems 96 - ISBN:9783852061337 vol. 1 1996

Giraudo MT, Sacerdote L. [1997. Jump-Diffusion processes as models for neuronal activity.. pp.75-82. In BIOSYSTEMS - ISSN:0303-2647 vol. 4.1997](#)

Giraudo MT, Sacerdote L. [Simulation methods in neuronal modeling. pp.77-83. In BIOSYSTEMS - ISSN:0303-2647 vol. 48 1998](#)

Giraudo MT, Sacerdote L. [An improved technique for the simulation of first passage times for diffusion processes. pp.1135-1163. In COMMUNICATIONS IN STATISTICS. SIMULATION AND COMPUTATION - ISSN:0361-0918 vol. 28 \(4\) 1999](#)

Giraudo MT [Study of stochastic resonance in processes with multiplicative noise by means of first passage times simulation. pp.589-592. In European Simulation Symposium ESS 2000 - ISBN:9781565551909 vol. 1 2000](#)

Giraudo MT [A similarity solution for the Ornstein-Uhlenbeck diffusion process constrained by a reflecting and an absorbing boundary. pp.47-63. RICERCHE DI MATEMATICA - ISSN:0035-5038 vol. XLIX \(1\) 2000](#)

Giraudo M.T. [A first passage time study of stochastic resonance for a diffusion process with multiplicative noise. In Quad. Dip. Mat. Università di Torino vol. 12/2000 2000](#)

Giraudo M.T., Sacerdote L. Zucca C. [A Monte Carlo Method for the Simulation of First Passage Time of Diffusion Processes.. DOI:10.1023/A:1012261328124. pp.215-231 METHODOLOGY AND COMPUTING IN APPLIED PROBABILITY - ISSN:1387-5841 vol. 3 \(2\) 2001](#)

Giraudo M.T., Sacerdote, L. and Sirovich, R. Effects of random jumps in a very simple neuronal diffusion model, Biosystems 67, 75-83 ISSN:0303-2647 2002

Giraudo M.T., Sacerdote, L. First entrance time distribution multimodality in a model neuron, Quad. Dip. Mat. Università di Torino, vol. 18 2002

Giraudo M.T., Sacerdote L. First entrance time distribution multimodality in a model neuron. In Quad. Dip. Mat. Università di Torino vol. 18/2002 2002

Giraudo M.T., Sacerdote L. Effects of a periodic stimulus on a neuronal diffusion model with signal-dependent noise. Biosystems. vol. 79, pp. 73-81, 2005.

Giraudo M.T., Sacerdote L. [Ghost stochastic resonance for a stochastic single neuron model. pp.299-312. In SCIENTIAE MATHEMATICAE JAPONICAE - ISSN:1346-0862 vol. 64 \(2\) 2006](#)

Giraud M.T., Sacerdote L. Ghost stochastic resonance for a single neuron model. *Sc. Math. Japonicae*. vol. 64 (2), pp. 299-312, 2006

Giraud M.T., Sacerdote, L. and Sicco, A. Ghost Stochastic Resonance for a neuron with a pair of periodic inputs. *Lect. Notes Comp. Science* vol. 4729, pp. 398-407, ISBN:9783540755548 2007.

Giraud M.T., Sacerdote, L. and Sirovich, R. Information measures in a small network of spiking neurons, *Scientiae Mathematicae Japonicae* 67 (2): 191-204 ISSN:1346-0862 2008.

Giraud M.T. An approximate formula for the first crossing time density of a Wiener process perturbed by random jumps, *Statistics and Probability Letters* 79: 1559-1567, 2009.

Giraud M.T., Mininni, R.M. and Sacerdote, L. **On the asymptotic behavior of the parameter estimators for some diffusion processes: application to neuronal models, *Ricerche di Matematica* 58 (1): 103-127, 2009.**

Giraud M.T., Greenwood P.E. and Sacerdote L. How sample paths of Leaky Integrate and Fire models are influenced by the presence of a firing threshold, *Neural Computation* 23(7): 1743-1767, 2011.

Negro M., Palestini C., Giraud M.T. and Rolando A. The effect of local environmental heterogeneity on alpine dung beetle diversity: a case study from the Ferret valley (Italian side of Monte Bianco), *European Journal of Entomology* 100: 91-98, 2011.

Lamorte A, Tullio M, Bar F, Mussa A, Giraud MT, Cardinale L, Pozzi R, Frascisco MF, Volpicelli G. Symptomatic undifferentiated hypotension in Emergency: the diagnostic usefulness of a focused multi-organ ultrasound assessment 7th Winfocus World Congress on Ultrasound in Emergency and Critical Care *Critical Ultrasound Journal* 2011 (3): 184.

Sacerdote, L. and Giraud, M.T. Stochastic Integrate and Fire Models: a review on mathematical methods and their applications, *Stochastic Differential Equation Models with Applications to the Insulin-Glucose System and Neuronal Modelling*, Springer Lecture Notes in Mathematics Biosciences (LNMBIOS) Series, 2012.

Parodi E, Giraud MT, Davitto M, Ansaldi G, Mondino A, Garbarini L, Franzil A, Mazzone R, Russo G, Ramenghi U. Reticulocyte Parameters: Markers of Early Response to Oral Treatment in Children With Severe Iron-deficiency Anemia. *J Pediatr Hematol Oncol*. 2012 Aug;34(6):e249-52. PubMed PMID: 22810756.

[Giraud MT, Sacerdote L, Sirovich R Non-Parametric Estimation of Mutual Information through the Entropy of the Linkage ENTROPY - ISSN:1099-4300 vol. 15: 5154-5177 DOI:10.3390/e15125154.](#)

Priola AM, Priola SM, Volpicelli G, Giraud MT, Martino V, Fava C, Veltri A [Accuracy of 64-row multidetector CT in the diagnosis of surgically treated acute abdomen J Clin Imag 2013 \(37\): 902-907.](#)

Volpicelli G Lamorte A Tullio A Cardinale L Giraud MT Stefanone V Boero E Nazerian P Pozzi R Frascisco MF Point-of-care multiorgan ultrasonography for the evaluation of undifferentiated hypotension in the emergency department *Intensive Care Med* 2013 DOI 10.1007/s00134-013-2919-7

Parodi E, Lanza M, Ricotti E, Ferro F, Montin D, Giraud MT, Ramenghi U [Circulating Follicular Helper T Cells in children with Immune Thrombocytopenic Purpura. In HAEMATOLOGICA - ISSN:0390-6078 vol. 98\(s1\):127 2013](#)

Giraud MT, Patemi e matemi: alcuni aspetti dell'improbabile legame tra matematica e psicanalisi. In "Associazione Subalpina Mathesis e Seminario di Stota delle matematoche "Tullio Viola"- Conferenze e Seminari 2012-2013" p. 91-106, F. Ferrara, L. Giacardi, M. Mosca Ed., KWB 2013

Miglio G, Romanò A, Sabatino A, Cordero F, Beccuti M, Giraud MT, Veglia E, Fantozzi R [The Mode of Action of Dimethyl Fumarate: Protein Succination and Anti-Pyroptotic Effects. In PA2 ONLINE 2014 vol. 12 \(3\): 1-2](#)

Giraud MT, Marchisio M, Pardini C [Tutoring con le nuove tecnologie per ridurre l'insuccesso scolastico e favorire l'apprendimento della matematica nella scuola secondaria 2014 In Didamatica 2014 Informatica per la Didattica - Atti pp.834-843 ISBN:9788898091317](#)

Priola AM, Priola SM, Giraud MT, Gned D, Ducco L, Moretti F, Veltri A Diffusion-weighted MR Imaging of the Thymus in Patients with Generalized Myasthenia Gravis: Usefulness of ADC Values in Distinguishing Lymphoid Hyperplasia, Normal Thymus, and Thymoma RSNA 2014: 218 Radiological Society of North America

Priola AM, [Priola SM](#), [Giraud MT.](#), Usefulness of CT in differentiating lymphoid thymic hyperplasia from true thymic hyperplasia: added value of thymic measurements and CT attenuation [Am. J. Roentgenol.](#) 2015 204(1):W113-4.

Priola AM, [Priola SM](#), [Giraud MT](#), [Gned D](#), [Giardino R](#), [Marci V](#), [Errico L](#), [Veltri A](#). Chemical-shift and diffusion-weighted magnetic resonance imaging of thymus in myasthenia gravis: usefulness of quantitative assessment. [Invest Radiol.](#) 2015 50(4):228-38.

Ricceri F, Fasanelli F, Giraud MT, Sieri S, Tumino R, Mattiello A, Vagliano L, Masala G, Quirós RJ, Travier N, Sánchez M-J, Larranaga N, Chirlaque M-D, Ardanaz E, Tjonneland A, Olsen A, Overvad K, Chang-Claude J, Kaaks R, Boeing H, Clavel-Chapelon F, Kvaskoff M, Dossus L, Trichopoulou A, Benetou V, Adarakis G, Bas Bueno-de-Mesquita H, Peeters PH, Sund M, Andersson a, Borqqquist s, Butt S, WeiderpassE, Skeie G, Khaw K-T, Travis RC, Rinaldi S, Romieu I, Gunter M, Kadi M, Riboli E, Vineis P, Sacerdote C Risk of second primary malignancies in women with breast cancer: results from the European Prospective Investigation into Cancer and Nutrition (EPIC). *Int J Cancer* Aug 15;137(4):940-8. doi: 10.1002/ijc.29462 2015. Epub 2015 Feb 13

## Some Abstracts in Congresses

Sacerdote, L. and Giraud, M.T. [Effects of random jumps on a neuronal diffusion model with reversal potential. p.43. In Book of Abstracts Prague Stochastics 2006 - ISBN:9788086732763 2006](#)

Sacerdote, L. Giraud, M.T. and Sirovich L. Information Measures in a Small Network of Spiking Neurons. pp.64-65. In BIOCAMP 2007 Collective Dynamics: Topics on Competition and Cooperation in the Biosciences Abstracts 2007

Chialvo, D.R. and Giraud, M.T. [Phantom Stochastic Resonance. p.14. In Stochastic Resonance 2008](#)

Sacerdote, L. and Giraud, M.T. [Some examples on the role of noise in neuronal modelling problems. p.118. In UPON 2008 Unsolved Problems on Noise](#)

Negro M., Caprio E., Andrà C., Giraud M. T., Rolando A. and Palestini C. [Rapporto tra ambiente e sport: quale consapevolezza hanno gli studenti universitari?. p.184. In ATTI DELLA SOCIETÀ ITALIANA DI ECOLOGIA - ISSN:1127-5006 vol. XXXIV \(Vol. n. 2\) 2010](#)

Caprio E., Negro M., Andrà C., Giraud M. T., Rolando A. and Palestini C. Environment and Sport: what are the impressions of university students?. p.24. In JOURNAL OF SPORTS MEDICINE AND PHYSICAL FITNESS - ISSN:0022-4707 vol. 50 (3, Suppl.1) 2010

Giraud MT, Sacerdote L., Sirovich R. and Zucca C. [Estimation of information measures in coupled diffusion neuronal models. p.228. In Abstracts of Papers Presented to the American Mathematical Society vol. Volume 32, Number 1, Issue 163 2011](#)

Caprio E., Andrà C., Giraud M. T., Negro M., Rolando A. and Palestini C. [Quali fattori condizionano il rapporto tra ambiente e sport negli studenti universitari?. p.218. In Ecologia e gestione ambientale 2012](#)

Fasanelli F, Ricceri F, Francia A, Zugna D, Giraud MT, Vineis P, Sacerdote C Dieta mediterranea e rischio di cancro del colon: un'analisi di mediazione XXXIX Congresso dell'Associazione Italiana di Epidemiologia, Milano, 2015

Ricceri F, Fasanelli F, Giraud MT, Vineis P, Sacerdote C Abitudini alimentari e disuguaglianza sociali: l'esperienza della collaborazione Epic-Italia XXXIX Congresso dell'Associazione Italiana di Epidemiologia, Milano, 2015

Ricceri F, Fasanelli F, Allione A, D'Errico A, Giraud MT, Matullo G, Rapallo F, Roggero M, Terracini L, Vineis P, Sacerdote C Uso della statistica algebrica per studiare l'interazione gene-gene VIII Congresso Nazionale SISMEC, Torino, 2015

## Preprint

Fasanelli F, Ricceri F, Sacerdote C, Giraud MT, Troncoso Baltar V Stress as mediator of the association between socio-economic status and type 2 diabetes : the EPIC-InterAct study 2015

Ricceri F, Sacerdote C, Giraud MT, Lenzo G, Galli M, De Bortoli E, Fasanelli F, Vineis P, Panico S Money, Brain and Heart: A study on the association between Socioeconomic Status and Cerebro and Cardiovascular Diseases within the EPICOR cohort 2015

## In press

Ricceri F, Giraud MT, Sieri S, Pala V, Masala G, Ermini I, Giurdanella MC, Martorana C, Mattiello A, Chiodini P, Vineis P, Sacerdote C Abitudini alimentari e disuguaglianze sociali: l'esperienza della collaborazione EPIC-Italia Epidemiologia e prevenzione 2015



**Curating books**

M. T. Girauda Curatela di "[Probabilità e Statistica per Ingegneria e Scienze](#)" pp.i / 1-xii / 517 - [ISBN:9788871923482](#) 2007

M. T. Girauda, R. Sirovich Curatela di "Statistica per le discipline biosanitarie" pp.i / 1-xiv / 530 - ISBN:9788871925394 2009

M. T. Girauda, R. Sirovich Curatela di "[Fondamenti di statistica. Per le discipline biomediche](#)" pp.1-271- [ISBN:9788871929538](#) 2013