

**CURRICULUM VITAE**  
of Maurizio Serva

**General data and current position:**

- Maurizio Serva, born in Rome on 5th July 1959. Address: Via Castello 1, 67010, Coppito, L'Aquila.
- Associate Professor in Mathematical Physics at the Dipartimento di Ingegneria e Scienze dell'Informazione e Matematica (DISIM), Università dell'Aquila, 67010 Coppito, L'Aquila. E-mail: serva@univaq.it.
- Languages: Italian, English, Portuguese, French, Spanish and Malagasy.

**Education:**

- Laurea (*cum laude*) in Physics, University of Rome "La Sapienza", 26th July 1984. Title of the thesis: *L'Impulso in Meccanica Stocastica*. Supervisor: Marcello Cini.
- *Doktor der Naturwissenschaften* (Doctor Rerum Naturalium), University of Bielefeld, Germany, 20th August 1990. Title of the thesis: *Stochastic Processes; a Possible Language for Quantum Mechanics*. Supervisor: Philippe Blanchard. Note: *ausgezeichnet* (excellent).

**Career:**

- Civil service as auxiliary operator for fire prevention of the Italian Forest Rangers, October 1981 - September 1982.
- Guest researcher at the Research Center on Stochastic Processes Bi.Bo.S., University of Bielefeld (Germany), January 1985 - September 1985.
- Fellowship from Istituto Nazionale per la Fisica Nucleare for research at the University of Rome "La Sapienza", October 1985 - September 1987.
- Associate Researcher of the Centre National de la Recherche Scientifique at the Laboratory of Theoretical Physics, Luminy (Marseille), October 1987 - March 1988.
- Fellowship from Consiglio Nazionale delle Ricerche at the Research Center on Stochastic Processes Bi.Bo.S., University of Bielefeld (Germany), July 1988 - June 1990.
- Senior Researcher in Mathematical Physics at the University of L'Aquila, June 1990 - May 2015.
- Italian qualification as associate professor in Mathematical Physics achieved in December 2013 and, from May 2015 to present, Associate Professor in Mathematical Physics at the University of L'Aquila.
- Italian qualification as full professor in Mathematical Physics achieved in November 2020.

**Visits and fellowships:**

- Guest professor at the Institut Supérieur Polytechnique de Madagascar in Antananarivo (sabbatical), November 1994 - October 1995.
- Guest researcher at the Research Center BiBoS in Germany, the Federal University of Minas Gerais in Brazil and the University of Fribourg in Switzerland (sabbatical), November 2008 - October 2009.
- Guest professor at the Universidade Federal do Rio Grande do Norte in Brazil (sabbatical), October 2012 - September 2013.
- Guest professor at the Université de Toliara (Madagascar) and at the Institut Supérieur Polytechnique de Madagascar in Antananarivo (sabbatical), November 2018 - May 2019.
- Moreover short visits at various Universities and Institutions. Among others, the Federal University of Alagoas in Brazil, the Research Center BiBoS in Germany, the Polytechnic of Antananarivo in Madagascar, the University of Stockholm, the Nordita Institute in Copenhagen, the University of Fribourg in Switzerland, the Federal University of Minas Gerais in Brazil, the Centre National de la Recherche Scientifique at the Laboratory of Theoretical Physics, Luminy (Marseille), the University of Toliara in Madagascar and the Federal University of Rio Grande do Norte in Brazil.

**Scientific output:**

- Present research: Quantitative Linguistics and Evolution Models in Biology and Linguistics.
- Previous research: Stochastic Methods in Quantum Mechanics, Foundations of Quantum Mechanics and Classical Limit, Dynamical Systems and Information Theory, Statistical Mechanics of Disordered Systems, Classical and Quantum Statistical Mechanics on Networks and Fractals, Stochastic Models in Finance, Epidemics Models in Biology, Reaction-Diffusion Models in Physics and Biology, Non-Markovian Random Walks and Anomalous Diffusion.
- Author of 112 scientific papers published in international journals. Also author of papers in volume, conference proceedings and popularization papers.

**Funded projects and scientific responsibilities:**

- From 1993 to 2003 member of the INFN (Istituto Nazionale Fisica Della Materia), Sezione G (Fisica Teorica e Cibernetica), Unità dell'Aquila.
- From January 1995 to December 1998 participant in the project *Meccanica Statistica e Sistemi Dinamici*, Iniziativa Specifica FI 11 - INFN.
- From January 1997 to December 2001 scientific supervisor of the line G1 of the INFN (Istituto Nazionale Fisica Della Materia), Sezione G (Fisica Teorica e Cibernetica), Unità dell'Aquila.
- From January 1998 to December 1998 scientific supervisor of the INFN project *Sistemi disordinati e processi stocastici in meccanica statistica e matematica finanziaria*.
- From December 1998 to October 2013, program participant in six PRIN projects (Progetti di Ricerca di Interesse Nazionale) named *Metodi analitici e stocastici in sistemi complessi* and *Metodi analitici e stocastici per lo studio di sistemi complessi*.
- From January 1999 to December 2000 scientific supervisor of the INFN project PAIS *Glassy Phase in Disordered Spin Systems*.
- From April 2008 to December 2012 head of the International Convention between the University of L'Aquila and the Federal University of Minas Gerais in Brazil.
- From September 2014 to August 2016 participant in the project *Propriedades Críticas de Sistemas de Não Equilíbrio* within PROJETOS MEC/MCTI/CAPES/CNPQ/FAPS - National Council for Scientific and Technological Development (CNPq) - Brazil.

**Organization of scientific meetings (from 1994):**

- International conference in honor of Marcello Cini *Mesoscopic Physics and Fundamental Problems in Quantum Mechanics* at the Department of Physics of the University of Rome "La Sapienza", (14-17 February 1994).
- International conference in honor of Giovanni Paladin *Disorder and Chaos* at the Department of Physics of the University of Rome "La Sapienza", (22-24 September 1997).
- International conference *Statistical Finance* at the Department of Physics of the University of Rome "La Sapienza", (12-13 March 1998).
- National conference *Sviluppi Recenti in Fisica Matematica* at the Department of Mathematics of the University of L'Aquila, (11-12 February 2009).
- *XIII-th Workshop on Quantitative Finance* at the Department of Mathematics of the University of L'Aquila, (25-27 January 2012).
- XIV-th international conference *Cognitive Modeling in Linguistics (CML-2013)* and I-st international conference *Cognitive Modeling in Science, Culture, Education (CMSCE-2013)*, Milano Marittima, (14-21 September 2013).
- XV-th international conference *Cognitive Modeling in Linguistics (CML-2014)* and II-nd international conference *Cognitive Modeling in Science, Culture, Education (CMSCE-2014)*, Izola, Slovenia, (6-13 September 2014).
- International conference *Non Standard Transport: from Anomalous Diffusion to Reaction Spreading in Heterogeneous Systems* at the Gran Sasso Science Institute (GSSI) of L'Aquila, (15-17 July 2015).
- XVI-th international conference *Cognitive Modeling in Linguistics (CML-2015)* and III-rd international conference *Cognitive Modeling in Science, Culture, Education (CMSCE-2015)*, Varna, Bulgaria, (14-21 September 2015).
- XVII-th international conference *Cognitive Modeling in Linguistics (CML-2016)* and IV-th international conference *Cognitive Modeling in Science, Culture, Education (CMSCE-2016)*, Lloret de Mar, Spain, (11-18 September 2016).
- International workshop *A day to commemorate Giovanni Paladin* at the Department of Mathematics of the University of L'Aquila, (11 November 2016).

- National conference *Probabilità, Rischio e Previsione: strumenti per la costruzione di una cultura dell'incertezza* at the Gran Sasso Science Institute (GSSI) of L'Aquila, (3-5 May 2017).
- XVIII-th international conference *Cognitive Modeling in Linguistics (CML-2017)* and V-th international conference *Cognitive Modeling in Science, Culture, Education (CMSCE-2017)*, Cascais, Portugal, (10-17 September 2017).
- XIX-th international conference *Cognitive Modeling in Linguistics (CML-2018)* and VI-th international conference *Cognitive Modeling in Science, Culture, Education (CMSCE-2018)*, Tel Aviv, Israel, (30 Sept. - 7 Oct. 2018).
- XX-th international conference *Cognitive Modeling in Linguistics (CML-2019)* and VII-th international conference *Cognitive Modeling in Science, Culture, Education (CMSCE-2019)*, Greece, (5-15 September 2019).
- XXI-th international conference *Cognitive Modeling in Linguistics (CML-2020)* and VI-th international conference *Cognitive Modeling in Science, Culture, Education (CMSCE-2020)*, Majorca, Spain, (postponed to autumn 2021).

#### Talks given in scientific conferences/workshops:

- About 30 conference talks and about 30 invited talks in various countries: Italy, Madagascar, Denmark, France, Germany, Brazil, Croatia, Romania, Sweden, Switzerland, Argentina, Finland and Indonesia. A partial list of conference talks follows.
- Invited talk *Stochastic interpretation of emission and absorption of the quantum of action* presented in the international meeting *NATO Advanced Research Workshop on Fundamental Aspects of Quantum Theory*. Como, Italy, (2-7 September 1985).
- Invited talk *Path integral over Poisson trajectories: analytical and numerical estimates of ground state energies* presented in the international conference *Stochastic Processes: Physics and Geometry*. Ascona/Locarno, Switzerland, (4-9 July 1988).
- Invited talk *Processi di Bernstein e meccanica quantistica* presented in the national conference *I Fondamenti della Meccanica Quantistica. Analisi Storica e Problemi Aperti*. Camerino, Italy, (31 October-3 November 1988).
- Invited talk *State vector collapse as a classical statistical effect of measurement* presented in the international conference *Quantum Theory Without Reduction*. Roma, Italy, (19-21 April 1989).
- Invited talk *Macroscopic quantum coherence as a test of quantum mechanics* presented in the conference *Foundations of Quantum Mechanics. Historical Analysis and Open Questions*. Lecce, Italy, (3-8 October 1993).
- Invited talk *Is macroscopic quantum coherence incompatible with macroscopic realism?* presented in the international conference *Mesoscopic Physics and Fundamental Problems in Quantum Mechanics*. Roma, Italy, (14-17 February 1994).
- Short talk *Ferrimagnetism in a disordered Ising model* presented in the national workshop *XIII Convegno di Fisica Teorica e Struttura della Materia*. Fai della Paganella, Italy, (6-9 April 1994).
- Invited talk *Modelli di vetri di spin: oltre il campo medio* presented in the workshop *I Convegno Nazionale di Fisica Statistica e dei Sistemi Complessi*. Parma, Italy, (24-26 June 1996).
- Invited talk *Cluster approximation for Ising spin glasses* presented in the international conference *Disorder and Chaos*. Roma, Italy, (22-24 September 1997).
- Invited talk *Multiscaling and clustering of volatility* presented in the *International Workshop on Econophysics and Statistical Finance*. Palermo, Italy, (28-30 September 1998).
- Invited talk *Classical limit: localization induced by noise* presented in the workshop *The Foundations of Quantum Mechanics. Historical Analysis and Open Questions*. Lecce, Italy, (13-16 October 1998).
- Invited talk *A stochastic model for multifractal behavior of stock prices* presented in the international conference *Perspectives in quantum field theory, statistical mechanics and stochastics*. Pontignano, Italy, (30 June-3 July 2002).
- Invited talk *Time series: facts and models* presented in the *International Econophysics Conference*. Bali, Indonesia, (29-31 August 2002).
- Invited talk *Prezzi reali dai dati di alta frequenza* presented in the workshop *Fisici in Finanza: Professione - Ricerca - Formazione* of the Network Applicativo e Industriale dell'INFM. Milano, Italy, (11 July 2003).
- Invited talk *Family trees: languages and genetics* presented in the international conference *Inhomogeneous Random Systems - Systemes Aleatoires Inhomogenes*. Parigi, France, (22-23 January 2008).
- Invited talk *Automated words stability and languages phylogeny* presented nella XI-th international conference *Cognitive Modeling in Linguistics (CML-2009)*. Costanta, Romania, (7-14 September 2009).
- Invited talk *Indo-European and Austronesian trees reconstruction* presented in the international conference *The Swadesh Centenary Conference*. Leipzig, Germania, (17-18 January 2009).

- Invited talk *Automated languages phylogeny from Levenshtein distance - Filogenia automatizada de línguas a partir da distância de Levenshtein*, IEAT International Conference, Instituto de Estudos Avançados Transdisciplinares, Belo Horizonte, Brazil, (26 August 2009).
- Invited talk *The phylogeny of Malagasy dialects* presented in the XII-th international conference *Cognitive modeling in linguistics (CML-2010)*. Dubrovnik, Croatia, (6-12 September 2010).
- Invited talk *Automated languages phylogeny from Levenshtein distance* presented in the workshop *XVI Convegno Nazionale di Fisica Statistica e dei Sistemi Complessi*. Parma, Italy, (22-24 June 2011).
- Invited talk *The origins of the Malagasy people, some certainties and a few mysteries* presented in the national conference *Concetti e Tecniche della Probabilità in Fisica, Biologia e Scienze Sociali*. Urbino, Italy, (3-5 September 2012).
- Talk *Two levels selection explains template coexistence in protocells* presented in the international conference *Statistical Mechanics of Biological Cooperativity*. Mariehamn, Åland, Finland, (22-25 May 2013).
- Invited talk *The trek of the bold and the timorous walkers* presented in the workshop *XIX Convegno Nazionale di Fisica Statistica e dei Sistemi Complessi*. Parma, Italy (25-27 June 2014).
- Invited talk *Asymptotic properties of a bold random walk* presented in the *Mini-Workshop on Anomalous Diffusion*. Bologna, Italy (5-6 March 2015).
- Invited talk *Neanderthals made successful sex with our African ancestors only ten times* presented in the international conference *Statistical Mechanics of non-Hamiltonian Systems*. Roma, Italy, (12-13 May 2015).
- Invited talk *The origins of the Malagasy people, some certainties and a few mysteries - As origens do povo malgaxe, algumas certezas e vários mistérios*, IEAT Grande Conferência, Instituto de Estudos Avançados Transdisciplinares, Belo Horizonte, Brazil, (11 August 2016).
- Invited talk *Recovering geography from lexical or genetic data* presented in the international conference *Thermodynamics and Statistical Mechanics of Small Systems*. Roma, Italy, (18-20 September 2017).
- Invited talk *From biology to linguistics, a long journey initiated with Luca* presented in the international conference *Paths in Statistical Physics* in honor of Luca Peliti for his 70th birthday. Paris, (6-7 September 2018).
- Invited talk *The Brownian motion of light-speed particles* presented in the cycle *Joint GSSI-TNT-La Sapienza Webinars on Statistical Mechanics* (12 February 2021).

### Teaching:

- *Classical Mechanics* and *Statistical Mechanics*, 1990-2003 and 2010-2012 at the University of L'Aquila.
- *Financial Mathematics, Time Series Analysis, Statistics for Biology and Mathematical Models of Financial Markets*, 2003-2010 at the University of L'Aquila.
- *Mathematical Models in Science* (2003-2004) and *Teaching of Financial Mathematics* (2007-2008) at SSIS (Scuola di Specializzazione all'Insegnamento Secondario).
- *Statistics for Biology, Classical Mechanics and Mathematical Physics*, 2013-2015 at the University of L'Aquila.
- *Mathematical Models for Biology and Probability and Statistics* for PhD students of the Federal University of Rio Grande do Norte (Brazil, 2013).
- *Rational Mechanics, Classical and Analytical Mechanics and Differential Equations of Mathematical Physics* 2015-2021 at the University of L'Aquila.
- Supervisor of Master and PhD theses in Physics and in Mathematics at the Universities of L'Aquila and Rome.
- From November 1994 to the end of October 1995 and again at different times from 2006 to 2009, trainer of teachers at the Institut Supérieur Polytechnique de Madagascar.
- Member of the board of the teachers of the PhD course of the University of L'Aquila named *Mathematics*, cycles from XXV to XXVIII starting in the years from 2009 to 2012 and of the board of the teachers of the PhD course of the University of L'Aquila named *Mathematics and Models*, cycles from XXIX to XXXVII starting in the years from 2013 to 2021/22.
- From 2015 member of the board of the teachers for the creation of the doctoral program of the Institut Supérieur Polytechnique de Madagascar in Antananarivo.
- In 2006, builder and from 2006 to now, director of a primary school in the village of Ambatomilo, in the South-West of Madagascar.

**Referee and reviews:**

- Referee of the research proposals submitted to the Brazilian INCT Program (National Institutes of Science and Technology, in Portuguese) of the National Council for Scientific and Technological Development (CNPq). This is the most important Brazilian funding program for research.
- Referee for the following journals: Journal of Statistical Mechanics, Physical Review journals, Reviews of Modern Physics, Physica A, Physica D, PloS One, Energy Economics, Communications in Nonlinear Science and Numerical Simulation and The European Physical Journal B.
- Co-founder and Editor in Chief of the review *Indian Ocean Review of Science and Technology* (IORST), ISSN: 2312-1874. The review is edited in Antananarivo (Madagascar). The first article was published in 2013.