CURRICULUM VITAE

1. Personal Details

- Name: Miquel Montero.
- Place and date of birth: Barcelona (Spain), July 29, 1970.
- Nationality: Spaniard.
  E-mail: miquel.montero@ub.edu

2. Education

- Bachelor's Degree in Physics. Universitat de Barcelona (1991).
- Master's Degree in Theoretical Physics. Universitat de Barcelona (1993).
- PhD (*cum laude*) in Physics, "European Doctor" award. Universitat de Barcelona (1998).

3. Teaching Positions

- Partial-time adjunct professor, Departament de Física Fonamental, Universitat de Barcelona, 1998-1999.
- Assistant professor, Departament de Física Fonamental, Universitat de Barcelona, 1999-2002.
- Partial-time adjunct professor, Departament de Física Fonamental, Universitat de Barcelona, 2002-2003.
- Partial-time non-permanent associate professor, Departament de Física Fonamental, Universitat de Barcelona, 2003-2010.
- Associate professor, Departament de Física Fonamental, Universitat de Barcelona, 2010-present day.

4. Language Skills

- Spanish and Catalan: bilingual skills (*Catalan for teachers* level, Universitat de Barcelona).
- English: advanced level.
- Italian: good level.
- German: medium level (3rd level at the *Escola d'Idiomes Moderns*, Modern Language School, Universitat de Barcelona).
- French: low level.

5. Teaching

- *Thermodynamics*, undergraduate course, Physics Faculty, Universitat de Barcelona, fall semester, 1998, and spring semester 2006-2010.
- *Extension of Theoretical Mechanics*, undergraduate course, Physics Faculty, Universitat de Barcelona, spring semester, 1999 and 2000.
- *Quantum Physics*, undergraduate course, Physics Faculty, Universitat de Barcelona, fall semester, 1999 to 2004, 2006, and spring semester, 2006, 2008-2010.
- *Workshop of Modelling and Simulation I*, undergraduate course, Polytechnic School (Studies of Computer Science), Universitat Pompeu Fabra, second semester, 2003.
- *Mathematical methods I*, undergraduate course, Physics Faculty, Universitat de Barcelona, fall semester, 2004.
- *Laboratory of Quantum Physics*, undergraduate course, Physics Faculty, Universitat de Barcelona, fall semester, 2004, 2007-2009.
- *Applications of Stochastic Processes to Financial Problems*, graduate course, Physics Faculty, Universitat de Barcelona, 2006.

6. Research Positions

- Pre-doctoral fellow, Generalitat de Catalunya, 1993 to 1997.
- Full-time assistant researcher, Fundació Bosch i Gimpera, 1998.

7. Research Visits

- Dipartimento di Fisica, Università Degli studi di Roma “La Sapienza”, Rome (Italy): from February 20 to June 15, 1995.
- Departament d’Economia, Universitat Pompeu Fabra (Barcelona): from January 25 to September 30, 2001.
- Dipartimento di Fisica e Tecnologie Relative, Università Degli studi di Palermo, Palermo (Italy): from January 23 to January 27, 2006.
- Instituto universitario de física fundamental y matemáticas, Universidad de Salamanca (IUFFM): from January 19 to 24, 2009.

8. Grants

- Comissionat per Universitats i Recerca: Grant for obtaining the doctoral degree, Universitat de Barcelona, Barcelona, Spain, 1994-1997.
- Comissionat per Universitats i Recerca: Travel grant for a four month visit at Dipartimento di Fisica, Università Degli studi di Roma “La Sapienza”, Rome, Italy, 1995.
- Universitat de Barcelona: Travel grant for attending the meeting “The first World Congress of the Bachelier Finance Society”, Paris, France, 2000.

- Research DG, European Commission: Fee and subsistence grant for attending the meeting “Sixth International Conference on Computing in Economics and Finance”, Barcelona, Spain, 2000.
- Universitat de Barcelona: Inscription fees for attending German courses at *Escola d’Idiomes Moderns,* Modern Language School, Barcelona, Spain, 1999-2002.

9. List of Publications in Books

- M. Montero, *Search for Monochromatic Gravitational-Wave Signals in Data of the Cryogenic Detector “Explorer”*, doctoral thesis, **ISBN** 84-475-1999-6, (Universitat de Barcelona, Barcelona, 1999).
- A. Kohatsu-Higa, M. Montero, “Malliavin Calculus in Finance”, in *Handbook of Numerical Methods in Finance*, Svetlozar T. Rachev (ed.), **ISBN** 0-8176-3219-0 (Birkhäuser, Boston, 2004).

10. List of Publications in Reviews

- J.A. Lobo, M. Montero, “All-sky search algorithms for monochromatic signals in resonant bar gravitational wave detector data”, *Mon. Not. R. Astron. Soc.* **301**, 729-744 (1998).
- J. Perelló, J. M. Porrà, M. Montero, J. Masoliver, “Black-Scholes option pricing within Itô and Stratonovich conventions”, *Physica A* **278**, 260-274 (2000).
- J. Masoliver, M. Montero, J. M. Porrà, “A dynamical model describing stock market price distributions”, *Physica A* **283**, 559-567 (2000).
- J. Masoliver, M. Montero, McKane, A.; “Integrated random processes exhibiting long tails, finite moments and power-law spectra”, *Phys. Rev. E* **64**, 011110 (2001).
- M. Montero, J. Perelló, J. Masoliver, “Return or stock price differences”, *Physica A* **316**, 539-560 (2002).
- H. P. Bermin, A. Kohatsu-Higa, M. Montero, “Local Vega index and variance reduction methods”, *Math. Finance* **13**, 85-97 (2003).
- M. Montero, A. Kohatsu-Higa, “Malliavin Calculus applied to Finance”, *Physica A* **320**, 548-570 (2003).
- J. Masoliver, M. Montero, G. H. Weiss, “A continuous time random walk model for financial distributions”, *Phys. Rev. E* **67**, 021112 (2003).
- L. Palatella, J. Perelló, M. Montero, J. Masoliver, “Activity autocorrelation in financial markets. A comparative study between several models”, *Eur. Phys. J. B* **38**, 671-677 (2004).
- M. Montero, “Partial Derivative Approach for Option Pricing in a Simple Stochastic Volatility Model”, *Eur. Phys. J. B* **42**, 141-153 (2004).
- L. Palatella, J. Perelló, M. Montero, J. Masoliver, “Diffusion entropy technique applied to the study of the market activity”, *Physica A* **355**, 131-137 (2005).

- J. Masoliver, M. Montero, J. Perelló, “Extreme times in financial markets”, *Phys. Rev. E* **71**, 056130 (2005).
- M. Montero, J. Perelló, J. Masoliver, F. Lillo, S. Miccichè, R. N. Mantenga, “Scaling and data collapse for the mean exit time of asset prices”, *Phys. Rev. E* **72**, 056101 (2005).
- Masoliver, J.; Montero, M.; Perelló, J.; Weiss, G. H.; “The continuous time random walk formalism in financial markets”, *J. Econ. Behav. Organ.* **61**, 577-598 (2006).
- Perelló, J.; Montero, M.; Palatella, L.; Simonsen, I.; Masoliver, J.; “Entropy of the Nordic electricity market: anomalous scaling, spikes, and mean-reversion”, *J. Stat. Mech*., P11011 (2006).
- Masoliver, J.; Montero, M.; Perelló, J.; Weiss, G. H.; “The CTRW in finance: Direct and inverse problems with some generalizations and extensions”, *Physica A* **379**, 151-167 (2007).
- Montero, M.; “Volatility and dividend risk in perpetual American options”, *J. Stat. Mech*., P04002 (2007).
- Montero, M; Masoliver, J.; “Mean Exit Time and Survival Probability within the CTRW Formalism”, *Eur. Phys. J. B* **57**, 181-185 (2007).
- Montero, M; Masoliver, J.; “Nonindependent Continuous-Time Random Walks”, *Phys. Rev. E* **76**, 061115 (2007).
- Montero, M.; “Perpetual American options within CTRWs”, *Physica A* **387**, 3936-3941 (2008).
- Montero, M.; “Renewal equations for option pricing”, *Eur. Phys. J. B* **65**, 295-306 (2008).
- Montero, M.; “Perpetual American vanilla option pricing under single regime change risk: an exhaustive study”, *J. Stat. Mech*., P07016 (2009).
- Villarroel, J.; Montero, M.; “On properties of Continuous-Time Random Walks with Non-Poissonian jump-times”, *Chaos Solitons Fractals* **42**, 128-137 (2009).
- Villarroel, J.; Montero, M.; “On the effect of random inhomogeneities in Kerr media modelled by a nonlinear Schrödinger equation”, *J. Phys. B* **43**, 135404 (2010).

11. Miscellaneous Publications

- M. Montero, J. Solé, “La primera formulació de la mecànica estadística de l'equilibri", Revista de física, n. 4, 22-27 (1993).
- M. Koda, A. Kohatsu-Higa, M. Montero, “An Application of Stochastic Analysis to Financial Engineering”, Discussion Paper Series No. 980, (Institute of Policy and Planning Sciences, University of Tsukuba, Japan, 2002).

12. Contributions to Conferences

- M. Montero, “Cryogenic Antenna Response to a Realistic Gravitational Wave”, in Buitrago, J.; Mediavilla, E.; Oscoz, A.; (eds.), *General Relativity, Relativistic Astrophysics and Cosmology*, Proceedings of the *ERE-95* Conference, pp. 83-87 (World Scientific, Singapore, 1997).
- J. A. Lobo, M. Montero, “Search for Monochromatic Signals in the Data of the Gravitational Wave Antenna *Explorer*”, in J. A. Miralles, J. A. Morales, D. Sáez (eds.), *Some Topics on General Relativity and Gravitational Radiation*, Proceedings of the *ERE-96* Conference, pp. 301-208 (Editions Frontières, Paris, 1997).
- J. A. Lobo, M. Montero, “Extensive Search for Monochromatic Signals in the *Explorer* data”, in C. Bona, J. Carot, L. Mas , J. Stela (eds.), *Analytical and Numerical Approaches to Relativity: Sources of Gravitational Radiation*, Proceedings of the *ERE-97* Conference, pp. 19-24 (UIB, Palma de Mallorca, 1998).
- J. Masoliver, M. Montero, J. M. Porrà, “A dynamical model describing stock market price distributions”, poster, *The first World Congress of the Bachelier Finance Society* (Paris, France, from June 28, to July 1, 2000).
- A. Kohatsu-Higa, M. Montero, “An application of Malliavin Calculus to Finance”, RIMS Kokyuroku 1240, Proceedings of *Stochastic Numerics. Biannual meeting of the Research Institute for the Mathematical Sciences*, pp. 35-46 (Research Institute of Mathematical Sciences, Kyoto University, Kyoto 2001).
- A. Kohatsu-Higa, M. Montero, “Mesures de risc i anàlisi de sensibilitat”, in J. del Castillo, D. Nualart (eds.), *Seminari de Finances a Barcelona, curs 2001-2002*, pp. 59-76 (Institut d’Estudis Catalans, Barcelona, 2002).
- J. Masoliver, M. Montero, J. M. Porrà, “A dynamical model for stock market indices”, Seminars of Financial Mathematics, MEFF-UAM, 3rd volume, pp. 81-94 (Madrid, MEFF, 2003).
- J. Masoliver, M. Montero, J. Perelló, “The CTRWs in Finance: the mean exit time”, in Takayasu H. ed., *Practical Fruits of Econophysics*, Proceedings of the *The third Nikkei Econophysics Research Workshop and Symposium*, pp. 137-141 (Tokyo, Springer-Verlag, 2006).
- M. Montero, J. Perelló, J. Masoliver, “Mean Exit Time and Survival Probability within the CTRW Formalism”, poster, *Applications of Physics in Financial Analysis, APFA5*.
- Montero, M; “Perpetual American options within CTRWs: A naive approach”, talk, *Applications of Physics in Financial Analysis, APFA6*.
- Montero, M.; “Renewal equations for option pricing”, poster, *Arbeitskreis Physik sozio-ökonomischer Systeme, AKSOE 2008*.
- Montero, M.; “Predator-Prey Model for Stock Market Fluctuations”, talk, *International conference in Statistical Physics, SIGMAPHI 2008*.
- Montero, M.; “Predator-Prey Model for Stock Market Fluctuations”, talk, *Changing Cultures: Cultures of Change, ATACD 2009*.

13. Given Seminars

- "Search for Monochromatic Gravitational-Wave Signals in Data of the Cryogenic Detector Explorer", Departament de Física Fonamental, Universitat de Barcelona, 2001.
- "A Jump-diffusion Approach to Modeling Credit Risk and Valuing Defaultable Securities by Chunsheng Zhou", Departament d'Economia i Empresa, Universitat Pompeu Fabra, 2004.
- "Mean Exit Time and Survival Probability within the CTRW formalism", Dipartimento di Fisica e Tecnologie Relative, Università degli Studi di Palermo, Palermo (Italy), January 27, 2006.
- "Perpetual American vanilla option pricing under single regime change risk", Instituto Universitario de Física Fundamental y Matemáticas (IUFFM), Salamanca (Spain), January 21, 2009.

14. Attendance to Conferences and Lectures

- Spanish Relativity Meetings, *ERE-94*, in Maó, Menorca (Spain), from September 12 to 14, 1994.
- Spanish Relativity Meetings, *ERE-95*, in La Laguna, Tenerife (Spain), from September 4 to 7, 1995.
- "Relativistic Kinetic Theory and Cosmology", CIRIT, Barcelona (Spain), from March 4 to 8, 1996.
- "Frames of Reference and the Relativistic Elasticity Theory", CIRIT, Barcelona (Spain), from March 11 to 15, 1996.
- "Mathematical aspects of theories of Gravitation", in the Stefan Banach International Mathematical Center, in Varsaw (Poland), from March 23 to 30, 1996.
- Spanish Relativity Meetings, *ERE-96*, in UIMP, València (Spain), from September 10 to 13, 1996.
- Spanish Relativity Meetings, *ERE-97*, in Palma de Mallorca (Spain), from September 16 to 19, 1997.
- The first World Congress of the Bachelier Finance Society, in Paris (France), from June 28 to July 1, 2000.
- Sixth International Conference on Computing in Economics and Finance, in Barcelona (Spain), from July 6 to 8, 2000.
- Summer School on Stochastics and Finance, in Barcelona (Spain), from September 3 to 7, 2001.
- Advanced Course in Stochastic Control and Mathematical Finance, in Barcelona (Spain), from July 22 to 24, 2004.
- Applications of Physics in Financial Analysis, *APFA5*, in Torino (Italy) from June 29 to July 1, 2006.
- Applications of Physics in Financial Analysis, *APFA6*, in Lisboa (Portugal), from July 4 to 7, 2007.
- Arbeitskreis Physik sozio-ökonomischer Systeme, *AKSOE 2008*, in Berlin (Germany), from February 25 to 29, 2008.

- International conference in Statistical Physics, *SIGMAPHI 2008*, in Kolympari (Greece), from July 14 to 18, 2008.
- Changing Cultures: Cultures of Change, *ATACD 2009*, in Barcelona (Spain), from December 10 to 12, 2009.

15. R+D Projects with Governmental Funding

- “Classic General Relativity and Cosmology”, PB93-1050 (Secretaría de Estado de Universidades e Investigación), from 1994 to 1997.
- “Development of present projects of investigation”, 1995SGR-00066 (Comissionat per Universitats i Recerca), from 1995 to 1997.
- “Gravitation, Cosmology and Stochastic Systems”, 1996SGR00048 (Comissionat per Universitats i Recerca), from 1996 to 1998.
- “Classic General Relativity and Cosmology”, PB96-0384 (Secretaría de Estado de Universidades e Investigación), from 1997 to 2000.
- “Gravitation, Cosmology and Stochastic Systems”, 1998SGR00015 (Comissionat per Universitats i Recerca), from 1998 to 2000.
- “Gravitation, Cosmology and Stochastic Systems”, 2000SGR00023 (Comissionat per Universitats i Recerca), from 2000 to 2002.
- “Random Dynamics in Complex Systems”, BFM2000-0795 (Secretaría de Estado de Educación, Universidades, Investigación y Desarrollo), from 2000 to 2003.
- “Gravitation, Cosmology and Stochastic Systems”, 2001SGR00061 (Comissionat per Universitats i Recerca), from 2001 to 2004.
- “Dynamical Aspects of Financial and other Complex Systems”, BMF2003-04574 (Secretaría de Estado de Política Científica y Tecnológica), from 2003 to 2006.
- “Applications of Statistical and Non-Linear Physics to Economy and Social Sciences”, FIS2004-22008-E (Subdirección General de Proyectos de Investigación), from 2004 to 2005.
- “Mathematical Physics Lab”, 2001SGR00061 (Departament d'Universitats, Recerca i Societat de la Informació), from 2005 to 2009.
- “Applications of Statistical and Non-Linear Physics to Economic and Social Problems”, FIS2005-25318-E (Comisión Interministerial de Ciencia y Tecnología), from 2005 to 2007.
- “Stochastic Dynamics in Financial and Economic Systems”, FIS2006-05204-E (Ministerio de Educación y Ciencia), from 2006 to 2009.
- “Applications of Statistical and Non-Linear Physics to Economy and Social Sciences”, SCO2006-2854-E (Ministerio de Educación y Ciencia), from 2006 to 2007.
- “Deterministic and Stochastic Integrable Differential Equations in Physics and Finances”, SA034A08 (Junta de Castilla y León), from 2008 to 2010.
- “Dynamics and Collective Phenomena in Social-Economical Systems”, FIS2008-01155-E (Ministerio de Ciencia e Innovación), from 2008 to 2009.
- “Mathematical Physics Lab”, 2009 SGR 417 (Agència de Gestió d'Ajuts Universitaris i de Recerca) from 2009 to 2013.

- “Random Dynamics in Economical and Financial Systems”, FIS2009-09689 (Ministerio de Ciencia e Innovación), from 2010 to 2012.

16. R+D Projects with Non-Governmental Funding

- “Stochastic Behaviour of Notional Bond”, FBG-3061, Gaesco Gestión, S.A. S.G.I.I.C., 1998.
- “Study of the Statistical Arbitrage in several Financial Markets”, FBG-3774, Gaesco Gestión, S.A. S.G.I.I.C., from 2000 to 2001.
- “Statistical Optimization applied to Financial Markets”, FBG-301315, Gaesco Gestión, S.A. S.G.I.I.C., from 2001 to 2002.
- “Statistical Optimization applied to Financial Markets (II)”, FBG-301836, Gaesco Gestión, S.A. S.G.I.I.C., from 2002 to 2003.
- “Statistical Optimization applied to Financial Markets (III)”, FBG-302324, Gaesco Gestión, S.A. S.G.I.I.C., from 2003 to 2004.
- “Statistical Analysis of Price Dynamics in Farming Markets”, FBG-302828, Vall Companys S.A i Frimancha S.A., from 2004 to 2005.
- “Statistical Optimization applied to Financial Markets (IV)”, FBG-302877, Gaesco Gestión, S.A. S.G.I.I.C., from 2004 to 2005.
- “Statistical Optimization applied to Financial Markets (V)”, FBG-302877, Gaesco Gestión, S.A. S.G.I.I.C., from 2005 to 2006.
- “Statistical Analysis of Price Dynamics in Farming Markets (II)”, FBG-303305, Vall Companys S.A & Frimancha S.A., from 2005 to 2006.
- “Statistical Optimization applied to Financial Markets (VI)”, FBG-303775, Gaesco Gestión, S.A. S.G.I.I.C., from 2006 to 2007.
- “Statistical Analysis of Price Dynamics in Farming Markets (III)”, FBG-303776, Vall Companys S.A & Frimancha S.A, from 2006 to 2007.
- “Non-Linear Pig-Price Forecaster”, FBG-303824, Llotja Agropecuària Mercolleida S.A, 2006.
- “Statistical Analysis of Price Dynamics in Farming Markets (IV)”, FBG-304331, Vall Companys S.A & Frimancha S.A, de 2007 a 2008.
- “Statistical Optimization applied to Financial Markets (VII)”, FBG-304425, Gaesco Gestión, S.A. S.G.I.I.C., de 2007 a 2008.
- “Statistical Analysis of Price Dynamics in Farming Markets (V)”, FBG-304848, Vall Companys S.A., de 2008 a 2009.
- “Statistical Optimization applied to Financial Markets (VIII)”, FBG-305046, Gaesco Gestión, S.A. S.G.I.I.C., de 2008 a 2009.
- “Statistical Optimization applied to Financial Markets (IX)”, FBG-305579, Gaesco Gestión, S.A. S.G.I.I.C., de 2009 a 2010.
- “Maintenance and Performance Surveillance of Predictive Networks”, FBG-305932, Vall Companys S.A., 2010.

17. Technical Skills

- Computing languages: BASIC, COBOL, FORTRAN, C/C++, JAVA, HTML.
- Spreadsheet programs: Harvard Graphics, Lotus 1-2-3, Quattro Pro, Excel.
- Text editors: Wordperfect, TeX and LATeX, Word.

- Presentation graphics programs: PowerPoint.
- Mathematical tools: Derive Eureka, MathCAD, Mathematica, ODE, Reduce, and Maple.
- Operating systems (at user and system administrator level): DOS, UNIX, HP-UX, Windows 3.1x, Windows 9x/2000, Windows NT, Linux.
- Massive data analysis. Design and implementation of digital filters.
- Computational and numerical methods. Monte Carlo techniques.

18. Miscellaneous Information

- Referee for *Physica A*, *Physical Review E*, *Physical Review Letters*, *Journal of Banking and Finance*, and *Acta Aplicanda Mathemeticae* (declined).
- Member of the *Societat Catalana de Física*, Catalan Physical Society.
- System Manager of the Departament de Física Fonamental, Universitat de Barcelona, 1998-present day.
- R+D work for several firms: Gaesco Gestión, S.A. S.G.I.I.C., Vall Companys S.A., Frimancha S.A. and Mercolleida S.A.
- Positive assessment for Tenured Assistant Professor (ANECA, AQU) and Lecturer (ANECA, AQU) positions.

Barcelona, June 28, 2010.

Miquel Montero.