

## CURRICULUM VITAE

### Personal

*Name:* Jorge KURCHAN

*Birth date:* September 4<sup>th</sup> 1959

*Birth place:* Buenos Aires, Argentina

*Citizenship:* Argentinian/Italian

*Marital status:* Single

*Home address:* 22 rue Bobillot ,  
Paris 75013, France.

*Work address:* Laboratoire de Physique Statistique,  
École Normale Supérieure,  
24 rue Lhomond - 75231 Paris Cedex 5 - FRANCE

### Education and Degrees

*Licenciado en Física:* Universidad Nacional de Buenos Aires, 1985

*Doctor en Física :* Universidad Nacional de Buenos Aires, 1989.  
*(Ph.D. degree)* Thesis “Collective Coordinates in Many Body Problems”  
Supervisor: Prof. D.R. Bes.

## Research Activities

### A. Chronology

- 1985-1989    Scholarship. Department of Physics, National Atomic Energy Commission, Buenos Aires, Argentina.
- 1989-1990    Scholarship. Nuclear Physics Department , The Weizmann Institute of Science, Israel.
- 1990-1992    Scholarship. Istituto Nazionale di Fisica Nucleare. Universita di Roma I.
- 1992-1994    Research contract. Istituto Nazionale di Fisica Nucleare. Universita di Roma I.
- 1994-1996    Chercheur Associe,. Ecole Normale Superieure. Paris.
- 1996-2001    Charge de Recherches. CNRS.
- 2001-        Directeur de Recherches. CNRS.

## Teaching

1980-1984 Teacher of Mathematics, primary school.

1982-1985 Teacher of Physics. High School.

1993-1994 Theoretical Physics course.  
Universita di Roma I (with M. Virasoro)

1998/1999 Graduate course on Disordered systems.  
ENS-Lyon.

2000 'Tutorat' third year course.  
ESPCI

## Theses

- 2001 Ludovic Berthier (with Jean-Louis Barrat)  
*Driven dynamics of glassy systems: From spin glasses to complex fluids*
- 2004 Sorin Tanase-Nicola.  
*Rare and Unstable Trajectories. Localisation methods for transition paths and computation of Lyapunov exponents.*
- 2004 Ivan Junier  
*Insight in out of equilibrium systems*
- 2007 Julien Tailleur  
*Grandes dviations, physique statistique et systmes dynamiques*
- 2011 Romain Mari  
*Transition vitreuse et transition de blocage : les solides désordonnés entre champ moyen et dimension finie*
- 2012 Massimiliano Picciani (with Manuel Athenes)  
*Rare events in many-body systems : reactive paths and reaction constants for structural transitions*
- 2013 Khanh Dang Nguyen Thu Lam  
*Grandes dviations Physique statistique Systmes dynamiques*
- 2015 Tommaso Brotto  
*Population genetics and statistical mechanics*
- 2016 Thibaud Maimbourg (with Francesco Zamponi)  
*Exact solution of hard spheres dynamics in high dimensions.*

## **Administration**

- 2008-2010    Conseil de Planification Scientifique  
                 Institut Henri Poincare
- 2010-2013    Directeur Adjoint  
                 Institut Henri Poincare
- 2014-            Directeur  
                 Laboratoire de Physique Statistique, ENS Paris

## **Prizes:**

- Prix Jean Langlois de Diffusion de la Recherche (2002)  
Prix Langevin Societe Francaise de Physique (2002)  
Prix Servant de la Academie des Sciences (2005)

## **Editorial Work**

1. Co-Editor Europhysics Letters (2002-2005)
2. Co-Editor of Journal of Statistical Physics (2003-2014)

## Recent International Invited Talks

1. *Statistical Mechanics of Quantum Dynamics*  
25-28 May 2016 Mariehamn, Åland, Finland
2. *Physics Informed Machine Learning*  
Jan 19-21, 2016 in Santa Fe, NM
3. *114th Statistical Mechanics Conference*  
Rutgers University, USA, December 13 - 15, 2015.
4. *Summer School on Advances in Complex Systems*  
Como (Italy) 29 June 2015.
5. *Statistical mechanics and computation of large deviation rate functions.*  
École Normale Supérieure de Lyon, France, June 16-19 2015.
6. *International Workshop on Dynamics in Viscous Liquids IV*  
Montpellier, May 4-7, 2015.
7. *Colloquium Ehrenfestii - General Physics Colloquium*  
Leiden University, Netherlands, Nov 26 2014.
8. *StatPhys Kolkata VIII*  
Kolkata, India December 1 - 5, 2014
9. *Harvard Department of Physics Colloquium*  
Harvard University, Boston USA November 2014.
10. *Kinetically-constrained models, bootstrap percolation, mixed-order phase transitions, and large deviations*  
Tel-Aviv University 19 Oct 2014.
11. *Workshop Equilibration and Glassiness in Classical and Quantum Systems*  
St Catherine's College, Oxford, 26-27 Sept, 2014.
12. *Beg Rohu summer school: Nonequilibrium Statistical Mechanics and Active Matter*  
8-20 August 2014
13. *PASI on Particulate Media: From Fundamentals to Applications.*  
August 11th, 2014 La Plata, Argentina.

14. *Viewpoints on Emergent Phenomena in Non-equilibrium Systems*  
Higgs Centre for Theoretical Physics, JCMB, Edinburgh. June 2014
15. *Turbulence and amorphous materials*  
Eilat, Israel November 8, 2013.
16. *LAWN2013 Plenary talk*  
Cordoba, Argentina October 21, 2013
17. *Giovanni Paladini Memorial "Large Deviations and Rare Events in Physics and Biology"*  
Rome September 23, 2013.
18. *Imperial Workshop on Large Deviations*  
Imperial College, London, July 2013
19. *International workshop Thermalization: From glasses to black holes*  
Center for Theoretical Sciences (ICTS) in Bangalore, India, 10 June 2013
20. *Stochastic Thermodynamics*  
Nordita, Stockholm, from March 4 to March 15, 2013.
21. *Two talks: Morse theory and stochastic dynamics - Are cells computing the Large Deviation Function (of fitness)?*  
IAS Princeton, USA 22-24 January 2013.

## Patent

A new strategy for the separation of magnetically marked cells and macromolecules,  
J-L Iguain and J. Kurchan, see: <http://www.frinnov.com/index.php?wpe=a265>

## List of Publications

### a. Book

*Lecture Notes : The Treatment of Collective Coordinates in Many Body Problems, an Application of the BRST Invariance*  
World Scientific, Singapore (1990).  
D.R. Bes and J. Kurchan.

### b. Papers

1. *The Perturbative Treatment of a Superfluid System*  
D.R. Bes, J. Kurchan, M.T. Mehr and G. Zemba.  
Nucl.Phys. **A471**(1987)565
2. *Becchi-Rouet-Stora-Tyutin Treatment of Collective Coordinates*  
J. Kurchan, D.R. Bes and S. Cruz Barrios.  
Phys. Rev. **D38**(1988)3309.
3. *An Algebraic Method for the Treatment of Broken Symmetries in Many- Body Systems: A Simple Example*  
D.R. Bes, S. Cruz Barrios and J. Kurchan.  
Ann. of Phys. **194** (1989)227.
4. *A Systematic Treatment of Triaxial Systems at High Spins*  
J. Kurchan, D.R. Bes and S. Cruz Barrios.  
Nucl. Phys. **A509** (1990) 306.



5. *Semiclassical Approximations in the Coherent State Representation*  
J. Kurchan, P. Leboeuf and M. Saraceno.  
Phys. Rev. **A40** (1989)6800.
6. *Lecture Notes : The Treatment of Collective Coordinates in Many Body Problems, an Application of the BRST Invariance*  
World Scientific, Singapore (1990).  
D.R. Bes and J. Kurchan.  
(Approximately the same content as the Ph.D. thesis).
7. *The BRST treatment of collective rotational coordinates in axially-symmetric systems*  
D.R. Bes , R. DeLuca and J. Kurchan.  
Phys. Lett. **B248** (1990)1.
8. *Critical Capacity of Constrained Perceptrons*  
J. Kurchan and E. Domany.  
J. Phys. **A23** (1991) L847.
9. *Critical Capacity of Noisy and Asymmetrically Constrained Perceptrons*  
J. Kurchan and E. Domany.  
J. Phys. **A24** (1991) 1947.
10. *Phase Space Localization: Topological Aspects of Quantum Chaos*  
P. Leboeuf, J. Kurchan, M. Feingold and D.P. Arovas.  
Phys. Rev. Lett. **65** (1990) 3076.
11. *Replica Trick to Calculate Means of Absolute Values: Applications to Stochastic Equations*  
J. Kurchan  
J. Phys. **A24** (1991) 4969.
12. *Topological Aspects of Quantum Chaos*  
P.Leboeuf, J. Kurchan, M. Feingold and D. Arovas.  
Chaos **2** (1) (1992) 125.
13. *Supersymmetry in Spin Glass Dynamics*  
J. Kurchan  
Journal de Physique **I 2** (1992) 1333.
14. *On the Computation of Static Quantities from Dynamics in Spin Glasses*  
S. Franz and J. Kurchan.  
Europhys. Lett. **20** (1992) 197.

15. *Barriers and Metastable States as Saddle Points in the Replica Approach*  
J. Kurchan, G. Parisi and M. Virasoro.  
Journal de Physique I (France) **3** (1993), 1819.
16. *Analytical solution of the off-equilibrium dynamics of a long range spin-glass model*  
L.F. Cugliandolo and J. Kurchan;  
Phys. Rev. Lett. **71**, (1993) 173.
17. *Evidence of Aging in Mean-Field Spin-Glass Models*  
L.F. Cugliandolo, J. Kurchan and F. Ritort;  
Phys. Rev. **B 49** (1993) 6331.
18. *On the out of Equilibrium Dynamics of the Sherrington-Kirkpatrick Model*  
L.F. Cugliandolo and J. Kurchan;  
J. Phys. **A 27** (1994), 5749.
19. *Off equilibrium dynamics and aging in unfrustrated systems*  
L.F. Cugliandolo and J. Kurchan and G. Parisi;  
J. Physique I (France) **4** (1994) 1641.
20. *A Statistical investigation of bidirectional associative memories (BAM)*  
J. Kurchan and L. Peliti and M. Saber;  
J. Physique I (France) **4** (1994) 1627.
21. *Matrix Models as solvable glass models*  
L.F. Cugliandolo and J. Kurchan, G. Parisi and F. Ritort;  
Phys. Rev. Lett. **74** (1995) 1012.
22. *Weak-ergodicity breaking in mean-field spin-glass models*  
L.F. Cugliandolo and J. Kurchan;  
Philos. Magaz. **B71** (1995) 501.
23. *On the non-equilibrium order parameter in long-range spin-glasses*  
A. Baldassarri, L.F. Cugliandolo and J. Kurchan and G. Parisi.  
J. Phys. **A 28** (1995), 1831.

24. *A mean-field hard spheres model of glass*  
L.F. Cugliandolo, J. Kurchan, R. Monasson et G. Parisi.  
*J. Phys. A* **29**, (1996) 1347.
25. *Large time off-equilibrium dynamics of a manifold  
in a random potential*  
L.F. Cugliandolo, J. Kurchan et P. Le Doussal;  
*Phys. Rev. Lett.* **76**, (1996) 2390.
26. *Phase-space geometry and slow dynamics*  
J. Kurchan et L. Laloux  
*J. Phys.* **A29**, (1996) 1929.
27. *Mode-Coupling Approximations, Glass Theory and Disordered systems*  
J.P. Bouchaud, L.F. Cugliandolo, J. Kurchan et M. Mézard.  
*Physica* **A226**, (1996) 243.
28. *Out of equilibrium dynamics in spin-glasses and other glassy systems*  
J-P Bouchaud, L. F. Cugliandolo, J. Kurchan and M. Mézard  
to appear in *Spin-glasses and random fields*, A. P. Young ed. (World Scientific, Singapore).
29. *Glassy behaviour in disordered systems with nonrelaxational dynamics*  
L. F. Cugliandolo, J. Kurchan, P. Le Doussal and L. Peliti;  
*Phys. Rev. Lett.* **78**, (1997) 350.
30. *Energy flow, partial equilibration and effective temperatures in  
systems with slow dynamics*  
L. F. Cugliandolo, J. Kurchan and L. Peliti;  
*Phys. Rev.* **E55**, (1997) 3898.
31. *Aging in lattice-gas models with constrained dynamics*  
J. Kurchan, M. Sellitto and L. Peliti  
*Europhys. Lett.* **39** (1997) 365.
32. *Fluctuation-Dissipation theorems and entropy production in relaxational systems*  
L. F. Cugliandolo, D.S. Dean and J. Kurchan  
*Phys. Rev. Lett.* **79**, (1997) 2168.
33. *Canonically invariant formulation of Langevin and Fokker-Planck Equations*  
O. Cepas and J. Kurchan  
*Eur. Phys. J. B* **2**, (1998) 221.

34. *Fluctuation Theorem for stochastic dynamics*  
J. Kurchan  
*J. Phys. A* **31** (1998)3719 .
35. *Thermal properties of slow dynamics*  
L.F. Cugliandolo and J. Kurchan  
*Physica A* **263** (1999) 242.
36. *Mean-field theory of temperature cycling experiments in spin-glasses*  
L.F. Cugliandolo and J. Kurchan  
*Phys. Rev.* **B60**,(1999) 922.
37. *Rheology, and how to stop aging*  
J. Kurchan  
*Jamming and Rheology: Constrained Dynamics on Microscopic and Macroscopic Scales* eds. Liu, A. & Nagel, S. R., Taylor and Francis, London (2001) S. F. Edwards, A. Liu and R. S. Nagel Eds.
38. *Response Function of Coarsening Systems*  
L. Berthier, J-L Barrat and J. Kurchan  
*Eur. Phys. J. B* **11**, (1999) 635-641.
39. *A Search for Fluctuation-Dissipation Theorem Violations in Spin-Glasses from Susceptibility Data*  
L. F. Cugliandolo, D. R. Grempel, J. Kurchan and E. Vincent  
*Europhys. Lett.* **48**, (1999) 699.
40. *Emergence of macroscopic temperatures in systems that are not thermodynamical microscopically: towards a thermodynamical description of slow granular rheology*  
Jorge Kurchan  
*J. Phys. (Cond. Mat.)* **29** (2000) 6611.
41. *Two-time scales, two-temperature scenario for nonlinear rheology*  
Ludovic Berthier, Jean-Louis Barrat and Jorge Kurchan  
*Phys. Rev.* **E 61**, (2000) 5464.
42. *A scenario for the dynamics in the small entropy production limit*  
Leticia F. Cugliandolo and Jorge Kurchan  
*Journal of the Phys. Soc. Japan, Supp. A* **69**, (2000) 247.
43. *Metastable states in glassy systems*  
Giulio Biroli and Jorge Kurchan  
*Phys. Rev.* **E 64**, 16101 (2001).

44. *Edwards measures for powders and glasses*  
A. Barrat, J. Kurchan, V. Loreto and M. Sellitto  
Phys. Rev. Lett. **85**, 5034 (2000)
45. *Dynamic ultrametricity in spin glasses*  
Ludovic Berthier, Jean-Louis Barrat and Jorge Kurchan  
Phys. Rev. **E 63**, 16105 (2001)
46. *A Quantum Fluctuation Theorem*  
Jorge Kurchan  
cond-mat/0007360
47. *Phase separation in a chaotic flow*  
Ludovic Berthier, Jean-Louis Barrat and Jorge Kurchan  
Phys. Rev. Lett. **86**, 2014 (2001)
48. \* *Recent theories of glasses as out of equilibrium systems*  
Jorge Kurchan  
Special issue 'Physics of Glasses' of  
Comptes Rendus de Physique de l'Academie des Sciences **IV** (2001) 239.
49. *Edwards' measures: a thermodynamic construction  
for dense granular media and glasses*  
A. Barrat, J. Kurchan, V. Loreto and M. Sellitto  
Phys. Rev. **E 63**, 51301 (2001)
50. *Testing the thermodynamic approach to dense granular matter with a numerical model  
of a decisive experiment.*  
Nature **415** (2002) 614
51. *Elementary constraints on autocorrelation function scalings.*  
Jorge Kurchan  
Phys. Rev. **E 66**, 17101 (2002)
52. *Dense granular media as athermal glasses.*  
Jorge Kurchan  
J. Phys.: Condens. Matter **12** (2000) 6611
53. *Strong Soret effect in one dimension.*  
Adan Garriga, Jorge Kurchan, Felix Ritort  
J. Stat. Phys., **106** (2002)

54. *Supersymmetry, replica and dynamic treatments of disordered systems: a parallel presentation*  
Jorge Kurchan  
cond-mat/0209399, to appear in Journal of Markov Processes and Related Fields.
55. *Tailoring symmetry groups using external alternate fields.*  
I. Junier and J. Kurchan  
cond-mat/0209231, Europhysics Letters **63** 715 (2003)
56. *Statistical-mechanical formulation of Lyapunov exponents.* Sorin Tanase-Nicola and Jorge Kurchan  
cond-mat/0210380, J. Phys. **A36**, 10299 (2003)
57. *Topological methods for searching barriers and reaction paths .*  
Sorin Tanase-Nicola and Jorge Kurchan  
cond-mat/0302448, Phys. Rev. Lett **91** (2003).
58. *Putting hydrodynamic interactions to work: tagged particle separation.*  
Jose Luis Iguain and Jorge Kurchan,  
cond-mat/0211243, Europhysics Letters **63** (5) 715 (2003)
59. *Dynamics and geometric properties of the k-Trigonometric model*  
F.Zamponi, L.Angelani, L.F.Cugliandolo, J.Kurchan, G.Ruocco  
cond-mat/0304399, J Phys. **A36** 8565 (2003)
60. *Metastable states, transitions, basins and borders at finite temperatures .*  
Sorin Tanase-Nicola and Jorge Kurchan  
cond-mat/0311273, Journal of Statistical Physics, 116 (5): 1201 (2004).
61. *Microscopic realizations of the Trap Model.*  
I. Junier and J. Kurchan  
cond-mat/0311158, J. Phys. **A 37**, 3945 (2005)
62. *In and out of Equilibrium*  
J. Kurchan  
Nature **433** 222 (2005)
63. *Building a Thermodynamics on sand*  
*In: 'Stealing the Gold'.*  
N. Goldenfeld, P. Goldbart and D. Sherrington Eds.  
Oxford University Press, (2005).

64. *Fourier law in a momentum-conserving chain*  
C.Giardina', J.Kurchan  
cond-mat/0502485 (2005), J. Stat. Mech. 05009 (2005)
65. *Kramers equation and supersymmetry.*  
Julien Tailleur, Sorin Tanase-Nicola, Jorge Kurchan  
cond-mat/0503545 (2005), J. Stat. Phys. **122**, 557 (2006)
66. *Shear-thickening and entropy-driven reentrance,*  
Mauro Sellitto, Jorge Kurchan,  
cond-mat/0507128, Phys. Rev. Lett. **95** 236001 (2005)
67. *Fluctuation theorem for non-equilibrium relaxational systems driven by external forces,*  
F.Zamponi, F.Bonetto, L.F.Cugliandolo, J.Kurchan,  
cond-mat/0504750, J. Stat. Mech. (2005) P09013
68. *Nonequilibrium work relations,*  
J. Kurchan,  
cond-mat/0511073, J. Stat. Mech P07005 (2007)
69. *Direct evaluation of large-deviation functions*  
C Giardina, J Kurchan and L Peliti  
Phys. Rev. Lett. **96** 120603 (2006)
70. *Probing rare physical trajectories with Lyapunov weighted dynamics*  
Julien Tailleur and Jorge Kurchan  
Nature Physics **3** 203 (2007)
71. *A Landscape Analysis of Constraint Satisfaction Problems.*  
Florent Krzakala and Jorge Kurchan  
cond-mat/0702546, Phys. Rev. **E76** 21122 (2007)
72. *Gallavotti-Cohen theorem, Chaotic Hypothesis and the zero-noise limit.*  
Jorge Kurchan  
cond-mat/0612397, J. Stat. Physics, **138** 1307 (2007)
73. *Duality and exact correlations for a model of heat conduction.*  
C. Giardin, J. Kurchan, F. Redig  
cond-mat/0612198 and J. Math. Phys. **48** 33301 (2007)

74. *Mapping out of equilibrium into equilibrium: the macroscopic fluctuations of simple transport models.*  
J. Tailleur, J. Kurchan and V. Lecomte  
cond-mat/07054033 and Phys. Rev. Lett., **99** 150602 (2007)
  
75. *The out-of-equilibrium dynamics of the Sherrington-Kirkpatrick model*  
Cugliandolo LF and Kurchan J  
Journal of Physics **A 41** 324018 (2008)
  
76. *Constraint optimization and landscapes*  
F. Krzakala and J. Kurchan  
arXiv:0709.1023, EPJ 64 563 (2008)
  
77. *Thinking transport as a twist*  
C. Giardin and J. Kurchan  
Journal of Statistical Physics **135** 895 (2009)
  
78. *Simple Glass Models and their Quantum Annealing.*  
Thomas Jorg, Florent Krzakala, Jorge Kurchan and A. C. Maggs  
arXiv:0806.4144 and Phys. Rev. Lett. **101** 147204
  
79. *Jamming versus Glass Transitions*  
R. Mari, F. Krzakala, J. Kurchan  
Phys. Rev. Lett. **103** 025701 (2009)
  
80. *Mapping out of equilibrium into equilibrium in one-dimensional transport models.*  
Tailleur J, Kurchan J and Lecomte V  
J. Phys. A.41 505001 (2008)
  
81. *Six out of equilibrium lectures*  
arXiv:0901.1271 ,  
Les Houches Summer School 2008
  
82. *Irreversibility and self-organisation in hydrodynamic echo experiments*  
Gustavo During, Denis Bartolo, Jorge Kurchan  
Phys. rev. **E 79** 030101 (2009)



83. *Duality and hidden symmetries in interacting particle systems*  
Cristian Giardinà, Jorge Kurchan, Frank Redig, Kiamars Vafayi  
J Stat Phys **135** 25 (2009)
84. *Quantum energy gaps and first-order mean-field-like transitions*  
T. Jorg, F. Krzakala, J. Kurchan, A. C. Maggs, J. Pujos  
arXiv:0912.4865
85. *Quantum Annealing of Hard Problems*  
Thomas Jorg, Florent Krzakala, Jorge Kurchan, A. C. Maggs  
arXiv:0910.5644
86. *Order in extremal trajectories*  
Khanh-Dang Nguyen Thu Lam, Jorge Kurchan, Dov Levine  
J. Stat. Physics **137** 1079, arXiv:0907.1807
87. *Correlation length for amorphous systems*  
Jorge Kurchan, Dov Levine  
arXiv:0904.4850
88. *Glasses*  
Kurchan Jorge  
Editor(s): Duplantier B; Halsey TC; Rivasseau V  
Conference: Poincare Seminar on Glasses and Grains Location: Inst Henri Poincare,  
Paris, FRANCE Date: NOV 21, 2009  
*Glasses and grains* Book Series: Progress in Mathematical Physics **61** Pages: 1-24  
Published: 2011
89. *Do solids flow?*  
F. Sausset, G. Biroli, J. Kurchan,  
J Stat Phys **140** 718 (2010)
90. *Statistical mechanics of Monte Carlo sampling and the sign problem*  
Duering G.; Kurchan J.  
EPL **92** 2010

91. *Density of States of Colloidal Glasses*  
Ghosh Antina; Chikkadi Vijayakumar K.; Schall Peter; et al.  
Phys Rev Lett **105** 2010
  
92. *Simulating Rare Events in Dynamical Processes*  
Giardina Cristian; Kurchan Jorge; Lecomte Vivien; et al.  
J Stat Phys **145** 787-811 2011
  
93. *Dynamical transition of glasses: From exact to approximate*  
Mari Romain; Kurchan Jorge  
J Chem Phys **135** 2011
  
94. *Preface to Special Issue on Statistical Mechanics and Computational Physics*  
Binder Kurt; Krauth Werner; Kurchan Jorge; et al.  
J Stat Phys **144** 443 2011
  
95. *Simulating structural transitions by direct transition current sampling: The example of LJ(38)*  
Picciani Massimiliano; Athenes Manuel; Kurchan Jorge; et al.;  
J. Chem. Phys **135** 034108 (2011)
  
96. *Order in glassy systems*  
Kurchan Jorge; Levine Dov  
J Phys A **44** 2011
  
97. *Infinite family of second-law-like inequalities*  
Perez-Espigares, Carlos; Kolton, Alejandro B.; Kurchan, Jorge  
Phys Rev E **85** 031135 (2012)
  
98. *Simulating Rare Events in Dynamical Processes*  
Giardina, Cristian; Kurchan, Jorge; Lecomte, Vivien; et al. J. Stat. Phys. **145** 787 (2011)
  
99. *Exact theory of dense amorphous hard spheres in high dimension I. The free energy*  
J Kurchan, G Parisi, F Zamponi  
Journal of Statistical Mechanics: Theory and Experiment 2012 (10), P10012 (2012)

100. *Large deviations of Lyapunov exponents*  
T Laffargue, Khanh Dang Nguyen Thu Lam, Jorge Kurchan and Julien Tailleur,  
J Phys A Mathematical and Theoretical 46.25 (2013): 254002
101. *Stochastic perturbation of integrable systems: a window to weakly chaotic systems*  
KDNT Lam, J Kurchan  
Journal of Statistical Physics 156 (4), 619-646 (2014)
102. *Non-equilibrium glass transitions in driven and active matter*  
L Berthier, J Kurchan  
Nature Physics 9 (5), 310-314 (2013)
103. *Exact theory of dense amorphous hard spheres in high dimension. II. The high density regime and the Gardner transition*  
J Kurchan, G Parisi, P Urbani, F Zamponi  
The Journal of Physical Chemistry B 117 (42), 12979-12994 (2013)
104. *Large deviations of Lyapunov exponents*  
T Laffargue, KDNT Lam, J Kurchan, J Tailleur  
Journal of Physics A: Mathematical and Theoretical 46 (25), 254002 (2013)
105. *Exact theory of dense amorphous hard spheres in high dimension. III. The full RSB solution*  
P Charbonneau, J Kurchan, G Parisi, P Urbani, F Zamponi  
arXiv preprint arXiv:1310.2549 (2013)
106. *Fractal free energy landscapes in structural glasses*  
P Charbonneau, J Kurchan, G Parisi, P Urbani, F Zamponi  
Nature communications 5 (2014)
107. *Population aging through survival of the fit and stable*  
T Brotto, G Bunin, J Kurchan  
Journal of Statistical Mechanics: Theory and Experiment 2016.3: 033302. (2016)
108. *Exact theory of dense amorphous hard spheres in high dimension. III. The full replica symmetry breaking solution*  
P Charbonneau, J Kurchan, G Parisi, P Urbani, F Zamponi  
Journal of Statistical Mechanics: Theory and Experiment 2014 (10), P10009 (2014)
109. *Athermal analogue of sheared colloidal suspensions*  
M Trulsson, M Bouzid, J Kurchan, E Clément, P Claudin, B Andreotti  
arXiv preprint arXiv:1411.7781, EPL (Europhysics Letters) 111.1 : 18001. (2015)

110. *Large deviations, metastability and selection*  
J Kurchan  
Physica A: Statistical Mechanics and its Applications 418, 170-188 (2015)
111. *Solution of the dynamics of liquids in the large-dimensional limit*  
T Maimbourg, J Kurchan, F Zamponi,  
Physical review letters 116.1 (2016): 015902, arXiv preprint arXiv:1507.03421 (2015)
112. *Extending the applicability of Thermal Dynamics to Evolutionary Biology.*  
T Brotto, G Bunin, J Kurchan  
arXiv preprint arXiv:15 (2015)
113. *Statics and dynamics of infinite-dimensional liquids and glasses: a parallel and compact derivation.*  
T Maimbourg, J Kurchan, F Zamponi,  
Journal of Statistical Mechanics: Theory and Experiment 2016.3 : 033210 (2016)
114. *Approximate scale invariance in particle systems: a large-dimensional justification.*  
T Maimbourg and J Kurchan  
Europhysics Letters (in press), arXiv preprint arXiv:1603.05023 (2016).
115. *Glass and Jamming Transitions: From Exact Results to Finite-Dimensional Descriptions.*  
P Charbonneau, J Kurchan, G Parisi, P Urbani, F Zamponi  
Annual Review of Condensed Matter Physics **8** 265 (2017)
116. *A model with Darwinian dynamics on a rugged landscape.*  
T Brotto, G Bunin, J Kurchan  
Journal of Statistical Physics **166**, 1065 (2017)
117. *Quantum bound to chaos and the semiclassical limit*  
J Kurchan  
arXiv preprint arXiv:1612.01278, 2016 - arxiv.org