

# Curriculum Vitae

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## Dr. Julien Tailleur

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Postdoc at *The University of Edinburgh*

## Research interests

Nonequilibrium Statistical Physics; Collective Motion in Biophysics (Bacteria and Molecular Motors); Large Deviations; Dynamical Phase Transition; Complex Systems; Field Theory

## Higher Education

- 2007 : Ph.D. of Theoretical Physics, *Université Pierre et Marie Curie*.
- 2004 : DEA (Master, 2<sup>nd</sup> year) of Theoretical Physics, *École Normale Supérieure, Paris*.
- 2004 : “Agrégation de Mathématiques” (competitive teacher recruitment exam in Mathematics)
- 2003 : Maîtrise (Master, 1<sup>st</sup> year) in Physics, *Université d’Orsay*.
- 2003 : Maîtrise (Master, 1<sup>st</sup> year) in Mathematics, *Université Pierre et Marie Curie*.
- 2002 : Licence (Graduation) in Physics, *Université d’Orsay*.
- 2002 : Licence (Graduation) in Mathematics, *Université Pierre et Marie Curie*.
- 2001-2005 : Student of the *École Normale Supérieure de Cachan*.
- 1998 : Scientific Baccalaureat

## Prizes

- “2007 JSTAT prize for young scientists”
- “*Journal of Physics A Best Paper Prize (2009)*”

## Research activities

- Since Nov. 2007: Postdoc at *The University of Edinburgh*, Edinburgh, UK
- Sept. 2004- Oct. 2007: Ph.D. in Theoretical Physics with J. Kurchan, *ESPCI*, Paris
- Jan.-Fev. 2004: Master Project with J. Kurchan, *ESPCI*, Paris
- May-July 2003: 4th year internship at *Boston University*, Boston, USA, with P. Krapivsky and S. Redner.
- Sept. 2002-Apr. 2003: internship at the *Laboratoire Kastler-Brossel*, (ENS, Paris) with G. Nogues and J.-M. Raymond.
- June-Aug. 2002 : 3rd year internship at the *Laboratoire Kastler-Brossel*, (ENS, Paris) with G. Nogues.
- July 1999: internship at *LURE* (Orsay, France) with F. Sirotti

## Publications

### Submitted

- P14. R.W. Nash, R. Adhikari, **J. Tailleur**, M.E. Cates, *Run-and-tumble particles with hydrodynamics: Sedimentation, trapping and upstream swimming*, submitted to Physical Review Letter

### Published

- P13. **J. Tailleur**, M.E. Cates, *Sedimentation, trapping, and rectification of dilute bacteria*, EPL **86**, 60002 (2009)
- P12. **J. Tailleur**, M.R. Evans, Y. Kafri, *Non-equilibrium phase transitions in tubulation by molecular motors*, Physical Review Letters **102**, 118109 (2009)
- P11. **J. Tailleur**, J. Kurchan, V. Lecomte, *Mapping out of equilibrium into equilibrium in one-dimensional transport models*, Journal of Physics A **41**, 50500 (2008)
- P10. **J. Tailleur**, M.E. Cates, *Statistical Mechanics of Interacting Run-and-Tumble Bacteria*, Physical Review Letters **100**, 218103 (2008)
- P9. **J. Tailleur**, J. Kurchan, V. Lecomte, *Mapping out of equilibrium into equilibrium: the macroscopic fluctuations of simple transport models*, Physical Review Letters **99**, 150602 (2007)
- P8. V. Lecomte, **J. Tailleur**, *A numerical approach to large deviations in continuous-time*, Journal of Statistical Mechanics: Theory and Experiment, P03004 (2007)
- P7. **J. Tailleur**, J. Kurchan, *Probing rare physical trajectories with Lyapunov weighted dynamics*, Nature Physics **3**, 203-207 (2007)
- P6. **J. Tailleur**, S. Tanase-Nicola, J. Kurchan, *Kramers equation and supersymmetry*, Journal of Statistical Physics **122**, 557-595 (2006)
- P5. P. L. Krapivsky, S. Redner, **J. Tailleur**, *Dynamics of an unbounded interface between ordered phases*, Physical Review E **69**, 026125 (2004)
- P4. P. Hyafil, J. Mozley, A. Perrin, **J. Tailleur**, G. Nogues, M. Brune, J. M. Raimond, S. Haroche, *Coherence preserving trap architecture for long-term control of giant Rydberg atoms*, Physical Review Letters **93**, 103001 (2004)

### Proceedings (the speaker's name is underlined)

- P3. **J. Tailleur**, V. Lecomte, *Simulation of large deviation functions using population dynamics*, Modeling And Simulation Of New Materials, AIP Conference Proceedings **1091**, 212 (2009)
- P2. **J. Tailleur**, J. Kurchan, *Grandes déviations et chaoticité : étude à l'aide d'une dynamique biaisée*, Comptes-rendus de la 10ième Rencontre du Non-linéaire, Paris (mars 2007), pp. 173-178 (Non-linéaire Publications, Orsay, 2007)
- P1. **J. Tailleur**, S. Tanase-Nicola, **J. Kurchan**, *Mapping Reaction Paths In Phase-Space*, International Journal of Modern Physics B **20**, 5254 (2006)

### Teaching

- Contribution to “Annales des concours”, ed. HK. in 2004, 2005 and 2006. Solution keys for national competitive examination for admission to the French “Grandes Ecoles”.

## Enseignement

- 2009/2010: Tutorials in Statistical Physics (4<sup>th</sup> year), University of Edinburgh
- 2009/2010: Tutorial in Mathematics for Physicists (4<sup>th</sup> years), University of Edinburgh
- 2009/2010: 30% of the lectures in Mathematics for Physicists (4<sup>th</sup> years), University of Edinburgh
- 2008/2009: Tutorial in Mathematics for Physicists (4<sup>th</sup> years), University of Edinburgh
- 2006/2007: Tutorial in Mathematics for Physicists (2<sup>nd</sup> year), Paris VI
- 2005/2006: Tutorial in Mathematics for Engineers (4<sup>th</sup> year), Paris VI
- 2005/2006: Tutorial in Mathematics for Physicists (2<sup>nd</sup> year), Paris VI
- 2004/2005: Tutorial in Informatics (1<sup>st</sup> year), Lycée St-Louis

## Talks

- Laboratoire de Physico-Chimie Théorique, *ESPCI*, Paris, France (2009)
- Laboratoire Matière et Systèmes complexes, *Université Paris 7*, Paris, France (2009)
- Institute of Theoretical Physics, *K.U.Leuven*, Leuven, Belgium (2009)
- Laboratoire de Physique Théorique et Modèles Statistiques, *Université d'Orsay*, Orsay, France (2009)
- Department of Mathematics, *Queen Mary*, London, UK (2008)
- Laboratoire de Physique Théorique et Modèles Statistiques, *Université d'Orsay*, Orsay, France (2008)
- Laboratoire de Physique, *École Normale Supérieure*, Lyon, France (2007)
- Mathematics Department, *King's College*, London, UK (2006)
- Laboratoire de Physico-Chimie Théorique, *ESPCI*, Paris, France (2006)
- Centre de Physique Théorique, *Campus de Luminy*, Marseille, France (2006)
- IMCCE, *Observatoire de Paris*, Paris, France (2006)
- Laboratoire de Physico-Chimie Théorique, *ESPCI*, Paris, France (2005)
- Laboratoire de Physique Théorique et Modèles Statistiques, *Université d'Orsay*, Orsay, France (2005)

## Conferences

### Invited talks

- “Steady-States, Fluctuations and Dynamics of Non-Equilibrium Systems”, Haifa & Rehovot, Israël (2009)

### Contributed talks

- “Many-Body Systems far From Equilibrium”, Dresde, Allemagne (2009)
- “Statistical Physics of Active Matter”, Paris, France (2009)
- “10<sup>th</sup> Granada Seminar on Computational and Statistical Physics”, Grenade, Espagne (2008)
- “StatPhys XXIII”, Gênes, Italie (2007)
- “10<sup>e</sup> Rencontres du non-linéaire”, Paris, France (2007)
- “Journées de Physique Statistique 2007”, Paris, France (2007)
- “Journées de Physique Statistique 2006”, Paris, France (2006)
- “Journées de Physique Statistique 2005”, Paris, France (2005)

### Posters

- “Relaxation Dynamics of Macroscopic Systems”, Cambridge, UK (2006)
- “Non-Equilibrium Dynamics of Interacting Particle Systems”, Cambridge, UK (2006)
- “First-Passage and Extreme Value Problems in Random Processes”, Cambridge, UK (2006)
- “Fundamental problems in statistical physics XI”, Louvain, Belgique (2005)

## Informatics

- Programmation en C/C++, Bash, awk, Caml
- Connaissance solide des systèmes linux

## References

- **Pr. M.E. Cates**  
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University of Edinburgh  
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- **Dr. J. Kurchan**  
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- **Pr. M.R. Evans**  
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- **Dr. F. Van Wijland**  
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- **Dr. Y. Kafri**  
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- **Dr. P. Krapivsky**  
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