

Associate Professor of Physics, *Massachusetts Institute of Technology*

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## Research interests

Non-equilibrium statistical mechanics; Complex systems; Biophysics; Bacterial motion; Active matter; Large Deviations; Dynamical phase transitions; Field theory; Dynamical systems.

## Higher Education - Diploma

- 2014 : [Habilitation thesis \(HDR\)](#), *Université Paris-Diderot*.
- 2007 : Ph.D. in Theoretical Physics, *Université Pierre et Marie Curie*.
- 2004 : Master in Theoretical Physics (5th year), *École Normale Supérieure, Paris*.
- 2004 : “Agrégation de Mathématiques” (the highest degree a prospective teacher can obtain)
- 2003 : Master in Physics, 4th year degree of *Université d’Orsay*.
- 2003 : Master in Mathematics, 4th year degree of *Université Pierre et Marie Curie*
- 2002 : Bachelor in Physics, 3rd year degree of *Université d’Orsay*.
- 2002 : Bachelor in Mathematics, 3rd year degree of *Université Pierre et Marie Curie*.
- 2001-2005 : *École Normale Supérieure de Cachan*
- 1998 : scientific Baccalauréat

## Employment & Research experience

- 2022/[...] : Associate Professor of Physics, *MIT*, Physics department
- 2018/2022 : Director of research at CNRS, *Université Paris Diderot*, Laboratoire MSC, Physics department
- 2011-2018 : Tenured researcher at CNRS, *Université Paris Diderot*, Laboratoire MSC, Physics department
- 2010-2011 : EPSRC Postdoctoral Fellow, School of Physics and Astronomy, *University of Edinburgh*
- 2007-2010 : Postdoctoral Research Associate, School of Physics and Astronomy, *University of Edinburgh*, Supervisors M. Cates & M. R. Evans
- 2004-2007 : Ph.D. in Theoretical Physics, supervisor : J. Kurchan, *ESPCI*
- V-VII 2003 : Master Internship, *Boston University*, supervisors : P. Krapivsky and S. Redner.
- IX 2002-IV 2003 : Part-time internship, *Laboratoire Kastler-Brossel*, ENS, supervisors : G. Nogues and J.-M. Raymond.
- VI-VIII 2002 : 3rd year internship, *Laboratoire Kastler-Brossel*, ENS, supervisor : G. Nogues.

## Awards and prizes

- Invited to participate to the special issue « *Emerging talents* » for the 50 years of Journal of Physics
- « 2009 Journal of Physics A Best Paper Prize », jointly obtained with J. Kurchan and V. Lecomte
- « 2007 JSTAT prize for young scientists » jointly obtained with V. Lecomte

## Teaching

- 2024 : MIT graduate & undergraduate course 8-08/8-S421. Lectures on “Statistical Mechanics 2”
- 2023 : MIT graduate course 8-333. Lectures on “Statistical Mechanics of Particles”
- 2022 : MIT graduate course 8-333. Recitations on “Statistical Mechanics of Particles”
- 2022 : Guest speaker for MIT 8-398 and 8-590 MIT graduate courses
- 2022 & 2023 : Lectures on “Active matter and collective behaviours” Master ICFP, 5th year of University (Universities UP-SU-UPS-PSL)
- 2017/2021 : Lectures on “Non-Equilibrium and Active systems” Master PCS, 5th year of University (Universities P6-P7-P11-Polytechnico di Torino)
- 2016/2017 : Lectures on “Non-Equilibrium Dynamics” Master MSA and PTSC/PCS, 5th year of University (Universities P6-P7-P11-Polytechnico di Torino)
- 2014/2016 : Lectures on “Non-Equilibrium Dynamics” Master MSA, 5th year of University (Universities P6-P7-P11)
- 2011/2014 : Lab work in Fluid Dynamics in Master IPE, 5th year of Université Paris-Diderot
- 2009/2010 : Teaching assistant, Statistical Physics (4<sup>th</sup> year), University of Edinburgh
- 2008/2010 : Teaching assistant, Mathematics for Physicists (4<sup>th</sup> year), University of Edinburgh
- 2005/2007 : Teaching assistant (Moniteur), Mathematics for Physicists (2nd year), Université Pierre et Marie Curie
- 2005/2006 : Teaching assistant (Moniteur), Matlab (4th year), Université Pierre et Marie Curie
- 2004/2005 : Oral examination in informatics (1st year), Lycée St-Louis

## Conferences–Organisation

10. Kyoto (Japan), July 2023. Satellite meeting of StatPhys28 on “Frontiers in nonequilibrium physics: active matter, topology and beyond”
9. Member of the International Advisory Committee of STATPHYS28, 2023.
8. Dijon (France) 2021, Program committee of “French Regional Conference on Complex Systems FRCCS 2021”
7. Paris (France) January 2021, Day 2 of the conference “Inhomogeneous Random Systems”, topic : “Statistical Physics of Active Matter”
6. Les Houches (France) Aout-Sept. 2018, Summer school “Active Matter and Non-equilibrium physics”
5. Paris (France) Sept. 2018, “A conference in honor of Luca Peliti”
4. Aspen (USA) January 2018, conference “Fundamental Problems in Active Matter”
3. Orsay (France) 2017, Active Matter colloquium, Congrès de la SFP.
2. Lausanne (Suisse) Mars 2017, workshop “Microswimmers, Self-Propelled Particles, and Active Matter” au CECAM
1. Leiden (The Netherland) 2015, workshop on “Active Liquids” at the Lorentz center.   
 ęcritem Strasbourg (France) 2015, Active Matter colloquium, congrès de la SFP.

## Popularization of science

- 2023, [Interview on France Culture](#), for the show “La Série Documentaire”.
- 2023, “Journées X-ENS”, conference on active matter for Prep School teachers
- 2020, “Conférence les sciences au dessert”, together with O. Dauchot, Carrefour des sciences et des arts, Cahors
- 2019, “Experimental conference series”, together with O. Dauchot, Institut Pierre-Gilles de Gennes, Paris
- 2019, “Lunch-time seminar”, Master ICFP, Paris
- 2018, “Happy hours conferences”, together with O. Dauchot, Institut des Systèmes Complexes, Paris

## Publications

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You can find most of my publications on [arXiv](#). Furthermore, for published articles, clicking on my name should open the corresponding webpage. Updated info can also be found on my [Google scholar page](#)

## Peer-reviewed publications

*Submitted :*

- P83. D. Martin, G. Spera, H. Chaté, C. Duclut, C. Nardini, [J. Tailleur](#), F. van Wijland,  
*Fluctuation-Induced First Order Transition to Collective Motion*,  
Journal of Statistical Mechanics 084003, (2024)
- P82. A. Dinelli, J. O’Byrne, J. Tailleur,  
*Fluctuating hydrodynamics of active particles interacting via chemotaxis and quorum sensing : static and dynamics*
- P81. O. Granek, Y. Kafri, M. Kardar, S. Ro, A. Solon, J. Tailleur,  
*Inclusions, Boundaries and Disorder in Scalar Active Matter*

*Published :*

- P80. G. Spera, C. Duclut, M. Durand, [J. Tailleur](#),  
*Nematic Torques in Scalar Active Matter : when Fluctuations Favor Polar Order and Persistence*,  
Physical Review Letters **132**, 078301 (2024)
- P79. Y. Zhao, C. Kurzthaler, N. Zhou, J. Schwarz-Linek, C. Devailly, J. Arlt, J. Huang, W. C. K. Poon, T. Franosch, V. A. Martinez, [J. Tailleur](#),  
*Quantitative characterization of run-and-tumble statistics in bulk bacterial suspensions*,  
Physical Review E **109**, 014612 (2024)
- P78. C. Kurzthaler, Y. Zhao, N. Zhou, J. Schwarz-Linek, C. Devailly, J. Arlt, J. Huang, W. C. K. Poon, T. Franosch, [J. Tailleur](#), V. A. Martinez,  
*Characterization and Control of the Run-and-Tumble Dynamics of Escherichia Coli*  
Physical Review Letters **132**, 038302 (2024)
- P77. A. Dinelli, J. O’Byrne, A. Curatolo, Y. Zhao, P. Sollich, [J. Tailleur](#),  
*Non-reciprocity across scales in active mixtures*,  
Nature Communications **14**, 7035 (2023)
- P76. B. Benvegnen, O. Granek, S. Ro, R. Yaacoby, H. Chaté, Y. Kafri, D. Mukamel, A. Solon, [J. Tailleur](#),  
*Metastability of Discrete-Symmetry Flocks*,  
Physical Review Letters **131**, 218301 (2023)

- P75. B. Benvegnen, H. Chaté, P. Krapivsky, [J. Tailleur](#), A. Solon, *Flocking in One Dimension : Asters and Reversals*, Physical Review E **106**, 054608 (2022)
- P74. Y. Ben Dor, Y. Kafri, M. Kardar, [J. Tailleur](#), *Passive objects in confined active fluids : a localization transition*, Physical Review E **106**, 044604 (2022)
- P73. O. Granek, Y. Kafri, [J. Tailleur](#), *The Anomalous Transport of Tracers in Active Baths*, Physical Review Letters **129**, 038001 (2022)
- P72. A. Solon, H. Chaté, J. Toner, [J. Tailleur](#), *Susceptibility of Polar Flocks to Spatial Anisotropy*, Physical Review Letters **128**, 208004 (2022)
- P71. Y. Ben Dor, S. Ro, Y. Kafri, M. Kardar, [J. Tailleur](#), *The far-reaching influence of boundaries on shaping bulk behavior of active matter*, Physical Review E **105**, 044603 (2022)
- P70. J. O'Byrne, Y. Kafri, [J. Tailleur](#), F. van Wijland, *Time-irreversibility in active matter : from micro to macro*, Nature Review Physics **4**, 167-183 (2022)
- P69. J. U. Klamsner, O. Dauchot, [J. Tailleur](#), *Kinetic Monte-Carlo Algorithms for Active-Matter systems*, Physical Review Letters, **127**, 150602 (2021)
- P68. D. Martin, H. Chaté, C. Nardini, A. Solon, [J. Tailleur](#), F. van Wijland, *Fluctuation-induced phase separation in metric and topological models of collective motion*, Physical Review Letters **126**, 148001 (2021)
- P67. D. Martin, J. O'Byrne, M. E. Cates, É. Fodor, C. Nardini, [J. Tailleur](#), F. van Wijland *Statistical Mechanics of Active Ornstein Uhlenbeck Particles* Physical Review E **103**, 032607 (2021)
- P66. S. Ro, Y. Kafri, M. Kardar, [J. Tailleur](#), *Disorder-Induced Long-Ranged Correlations in Scalar Active Matter*, Physical Review Letters **126**, 048003 (2021)
- P65. J. O'Byrne, [J. Tailleur](#), *Lamellar to micellar phases and beyond : when tactic active systems admit free-energy functionals*, Physical Review Letters **125**, 208003 (2020)
- P64. A. I. Curatolo, N. Zhou, Y. Zhao, C. Liu, A. Daerr, [J. Tailleur](#), J.-D. Huang, *Cooperative pattern formation in multi-species bacterial colonies*, Nature Physics **16**, 152-1157 (2020)
- P63. M. Thetiot, S. A. Freeman, T. Roux, A.-L. Dubessy, M.-S. Aigrot, Q. Rappeneau, F.-X. Lejeune, [J. Tailleur](#), N. Sol-Foulon, C. Lubetzki, A. Desmazieres, *An alternative mechanism of early nodal clustering and myelination onset in GABAergic neurons of the central nervous system*, Glia **68**, 1891-1909 (2020)
- P62. R. Zakine, Y. Zhao, M. Knezevic, A. Daerr, Y. Kafri, [J. Tailleur](#), F. van Wijland, *Surface Tensions between Active Fluids and Solid Interfaces : bare vs dressed*, Physical Review Letters **124**, 248003 (2020)
- P61. P. Bohec, [J. Tailleur](#), F. van Wijland, A. Richert, F. Gallet, *Distribution of active forces in the cell cortex*, Soft Matter **15**, 6952-6966 (2019)

- P60. D. Geyer, D. Martin, [J. Tailleur](#), D. Bartolo,  
*Freezing a Flock : Motility-Induced Phase Separation in Polar Active Liquids*,  
Phys. Rev. X 9, 031043 (2019)
- P59. E. Woillez, Y. Zhao, Y. Kafri, V. Lecomte, [J. Tailleur](#),  
*Activated escape of a self-propelled particle from a metastable state*,  
Phys. Rev. Lett. 122, 258001 (2019)
- P58. T. Nemoto, E. Fodor, M. E. Cates, R. L. Jack, [J. Tailleur](#),  
*Optimizing active work : dynamical phase transitions, collective motion and jamming*,  
Physical Review E 99, 022605 (2019)
- P57. E. Fodor, H. Hayakawa, [J. Tailleur](#), F. van Wijland,  
*Non-Gaussian noise without memory in active matter*,  
Physical Review E 98, 062610 (2018)
- P56. F. Ginot, A. Solon, Y. Kafri, C. Ybert, [J. Tailleur](#), C. Cottin-Bizonne,  
*Sedimentation of self-propelled Janus colloids : polarization and pressure*,  
New Journal of Physics 20, 115001 (2018)
- P55. A. P. Solon, J. Stenhammar, M. E. Cates, Y. Kafri, [J. Tailleur](#),  
*Generalized thermodynamics of Motility-Induced Phase Separation : Phase equilibria, Laplace pressure, and change of ensembles*,  
New Journal of Physics 20, 075001 (2018).
- P54. M. Kourbane-Houssene, C. Érignoux, T. Bodineau, [J. Tailleur](#),  
*Exact Hydrodynamic Description of Active Lattice Gases*,  
Phys. Rev. Lett. 120, 268003 (2018)
- P53. T. Bertrand, Y. Zhao, O. Bénichou, [J. Tailleur](#), R. Voituriez,  
*Optimized Diffusion of Run-and-Tumble Particles in Crowded Environments*,  
Phys. Rev. Lett. 120, 198103 (2018)
- P52. A. P. Solon, J. Stenhammar, M. E. Cates, Y. Kafri, [J. Tailleur](#),  
*Generalized Thermodynamics of Phase Equilibria in Scalar Active Matter*,  
Phys. Rev. E. 97, 020602(R) (2018)
- P51. Y. Fily, Y. Kafri, A. Solon, [J. Tailleur](#), A. Turner,  
*Mechanical pressure and momentum conservation in dry active matter*  
J. Phys. A. 51, 044003 (2018), special issue on *Emerging Talents*
- P50. K. Aubertin, [J. Tailleur](#), C. Wilhelm, F. Gallet,  
*Impact of a mechanical shear stress on intracellular trafficking*,  
Soft Matter 13, 5298-5306 (2017)
- P49. M. Hennes, [J. Tailleur](#), G. Charron, A. Daerr,  
*Surfactant-induced colony surfing of Bacillus Subtilis in humid environment*,  
Proc. Natl. Acad. Sci. USA 114, 5958 (2017)
- P48. C. Nardini, E. Fodor, E. Tjhung, F. van Wijland, [J. Tailleur](#), M. E. Cates,  
*Entropy production in field theories without time reversal symmetry : Quantifying the non-equilibrium character of active matter*,  
Physical Review X 7, 021007 (2017)
- P47. E. Fodor, C. Nardini, M. E. Cates, [J. Tailleur](#), P. Visco, F. van Wijland,  
*How far from equilibrium is active matter ?*  
Phys. Rev. Lett. 117, 038103 (2016), . Highlighted in [Physics](#)
- P46. N. Nikola, A. P. Solon, Y. Kafri, M. Kardar, [J. Tailleur](#), R. Voituriez ,  
*Active particles on curved surfaces : Equation of state, ratchets, and instabilities*,  
Phys. Rev. Lett. 117, 098001 (2016),

- P45. A. I. Curatolo, M. R. Evans, Y. Kafri, [J Tailleur](#),  
*Multilane driven diffusive systems*,  
J Phys A 49, 095601 (2016), (Journal of Physics A Highlights of 2016 collection)
- P44. T. Laffargue, [J Tailleur](#), F. van Wijland,  
*Lyapunov exponents of stochastic systems-from micro to macro*,  
J. Stat. Mech. 034001 (2016),
- P43. A. P. Solon, J.-B. Caussin, D. Bartolo, H. Chaté, [J Tailleur](#),  
*Pattern formation in flocking models : A hydrodynamic description*,  
Phys. Rev. E 92, 062111 (2015),
- P42. A. P. Solon, [J Tailleur](#),  
*Flocking with discrete symmetry : the 2d Active Ising Model*,  
Phys. Rev. E 92, 042119 (2015),
- P41. A. P. Solon, M. E. Cates, [J Tailleur](#),  
*Active Brownian Particles and Run-and-Tumble Particles : a Comparative Study*,  
Eur. Phys. J. Special Topics **224**, 1231-1262 (2015).
- P40. A. P. Solon, J. Stenhammar, R. Wittkowski, M. Kardar, Y. Kafri, M. E. Cates, [J Tailleur](#),  
*Pressure and Phase Equilibria in Interacting Active Brownian Spheres*,  
Phys. Rev. Lett. **114**, 198301 (2015). Viewpoint in [Physics](#) by E. Bertin.
- P39. A. P. Solon, Y. Fily, A. Baskaran, M. E. Cates, Y. Kafri, M. Kardar, [J Tailleur](#),  
*Pressure is not a state function for generic active fluids*,  
Nature Physics **11**, 673-678 (2015).
- P38. T. Laffargue, P. Sollich, [J Tailleur](#), F. van Wijland,  
*Large-scale Fluctuations of Lyapunov Exponents in Diffusive Systems*,  
EPL **110**, 10006 (2015).
- P37. A. Solon, H. Chaté, [J Tailleur](#),  
*From Phase to Micro-Phase Separation in Flocking Models : The Essential Role of Non-Equilibrium Fluctuations*,  
Phys. Rev. Lett **114**, 068101 (2015).
- P36. M.E. Cates, [J Tailleur](#),  
*Motility-Induced Phase Separation*,  
Ann. Rev. Cond. Matt. Phys. **6**, 219-244 (2015).
- P35. J.-B. Caussin, A. Solon, A. Peshkov, H. Chaté, T. Dauxois, [J Tailleur](#), V. Vitelli, D. Bartolo,  
*Emergent spatial structures in flocking models : a dynamical system insight*,  
Phys. Rev. Lett. **112**, 148102 (2014).
- P34. A. Solon, [J Tailleur](#),  
*Revisiting the flocking transition using active spins*,  
Phys. Rev. Lett. **111**, 078101 (2013).
- P33. T. Laffargue, K. D. Nguyen Thu Lam, J. Kurchan, [J Tailleur](#),  
*Large deviations of Lyapunov exponents*,  
J. Phys. A **46**, 254002 (2013).
- P32. ME Cates, [J Tailleur](#),  
*When are active Brownian particles and run-and-tumble particles equivalent? Consequences for motility-induced phase separation*,  
EPL, **101** 20010 (2013).
- P31. VA Martinez, R Besseling, OA Croze, [J Tailleur](#), M Reufer, J Schwarz-Linek, LG Wilson, MA Bees, WCK Poon,  
*Differential Dynamic Microscopy : a High-Throughput Method for Characterizing the Motility of*

- Microorganism*,  
Biophysical Journal **103**, 1637 (2012).
- P30. FDC Farrell, [J Tailleur](#), D Marenduzzo, MC Marchetti,  
*Pattern formation in self-propelled particles with density-dependent motility*,  
Physical Review Letters **108**, 248101 (2012).
- P29. C Giardina, J Kurchan, V Lecomte, [J Tailleur](#),  
*Simulating rare events in dynamical processes*,  
Journal of Statistical Physics **145**, 787 (2011).
- P28. MR Evans, Y Kafri, KEP Sugden, [J Tailleur](#),  
*Phase diagram of two-lane driven diffusive systems*,  
Journal Statistical Mechanics P06009 (2011).
- P27. M Picciani, M Athenes, J Kurchan, [J Tailleur](#),  
*Simulating structural transitions by direct transition current sampling : the example of LJ38*,  
Journal of Chemical Physics **135**, 034108 (2011).
- P26. AG Thompson, [J Tailleur](#), ME Cates, RA Blythe,  
*Lattice Models of Nonequilibrium Bacterial Dynamics*,  
Journal of Statistical Mechanics P02029 (2011).
- P25. LG Wilson, VA Martinez, J Schwarz-Linek, [J Tailleur](#), PN Pusey, G Bryant, WCK Poon,  
*Differential Dynamic Microscopy of Bacterial Motility*,  
Physical Review Letters **106**, 018101 (2011).
- P24. ME Cates, D Marenduzzo, I Pagonabarraga, [J Tailleur](#),  
*Arrested phase separation in reproducing bacteria: a generic route to pattern formation ?*,  
Proceedings of the National Academy of Sciences USA **107**, 11715-11720 (2010). Viewpoint in [PNAS](#)  
by M. Brenner
- P23. HT Touchette, RJ Harris, [J Tailleur](#),  
*First-order phase transitions from poles in asymptotic representations of partition functions*,  
Physical Review E **81**, 030101 (2010).
- P22. AG Thompson, [J Tailleur](#), ME Cates and RA Blythe,  
*Zero-Range Process with Saturated Condensation: Steady State and Dynamics*,  
Journal of Statistical Mechanics P02013 (2010).
- P21. C Barrett-Freeman, MR Evans, D Marenduzzo, [J Tailleur](#),  
*The role of noise and advection in absorbing state phase transitions*,  
EPL **90**, 16003 (2010).
- P20. RW Nash, R Adhikari, [J Tailleur](#), ME Cates,  
*Run-and-tumble particles with hydrodynamics: sedimentation, trapping and upstream swimming*,  
Physical Review Letters **104**, 258101 (2010).
- P19. [J Tailleur](#), ME Cates,  
*Sedimentation, trapping, and rectification of dilute bacteria*,  
EPL **86**, 60002 (2009)
- P18. [J Tailleur](#), MR Evans, Y Kafri,  
*Non-equilibrium phase transitions in tubulation by molecular motors*,  
Physical Review Letters **102**, 118109 (2009)
- P17. [J Tailleur](#), J Kurchan, V Lecomte,  
*Mapping out of equilibrium into equilibrium in one-dimensional transport models*,  
Journal of Physics A **41**, 50500 (2008)
- P16. [J Tailleur](#), ME Cates,  
*Statistical Mechanics of Interacting Run-and-Tumble Bacteria*,  
Physical Review Letters **100**, 218103 (2008).

- P15. [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)
- P14. V Lecomte, [J Tailleur](#),  
*A numerical approach to large deviations in continuous-time*,  
Journal of Statistical Mechanics: Theory and Experiment, P03004 (2007)
- P13. [J Tailleur](#), J Kurchan,  
*Probing rare physical trajectories with Lyapunov weighted dynamics*,  
Nature Physics **3**, 203-207 (2007)
- P12. [J Tailleur](#), S Tanase-Nicola, J Kurchan,  
*Kramers equation and supersymmetry*,  
Journal of Statistical Physics **122**, 557-595 (2006)
- P11. PL Krapivsky, S Redner, [J Tailleur](#),  
*Dynamics of an unbounded interface between ordered phases*,  
Physical Review E **69**, 026125 (2004)
- P10. P Hyafil, J Mozley, A Perrin, [J Tailleur](#), G Nogues, M Brune, JM Raimond, S Haroche,  
*Coherence preserving trap architecture for long-term control of giant Rydberg atoms*,  
Physical Review Letters **93**, 103001 (2004)

#### Others (When relevant, the speaker's name is underlined)

- P9. Y. Ben Dor, [J. Tailleur](#), Y. Kafri,  
*Forces in dry active matter*,  
in Lecture notes of the Les Houches Summer School : Volume **112**, "Active Matter and Non-Equilibrium Statistical Physics", Oxford University Press
- P8. J. O'Byrne, A. Solon, [J. Tailleur](#), Y. Zhao,  
*An Introduction to Motility-Induced Phase Separation*,  
Chapter in the book "Out-of-Equilibrium Soft Matter : Active Fluids", to be published by the Royal Society of Chemistry
- P7. T. Speck, J. Tailleur, J. Palacci,  
*Focus on Active Colloids and Nanoparticles*,  
New Journal of Physics **22**, 060201 (2020)
- P6. Y. Ben Dor, J. Tailleur, Y. Kafri,  
*Forces in dry active matter*,  
Lecture notes of the Les Houches Summer School on "Active Matter and Non-Equilibrium Statistical Physics", To be published by Oxford University Press,
- P5. M. Hennes, J. Tailleur, G. Charron, A. Daerr,  
*Extraction du solvant d un hydrogel par des gouttes de bacteries B. subtilis*,  
Comptes-rendus de la 20e Rencontre du Non-Linéaire, (In press)
- P4. T. Laffargue, J. Tailleur,  
*Locating a regular needle in a chaotic haystack, and conversely, using Lyapunov Weighted Dynamics*,  
Comptes-rendus de la 17e Rencontre du Non-Linéaire, pp. 75-80 (Non-Lineaire Publications, Saint-Etienne du Rouvray, 2014)
- P3. J Tailleur, V Lecomte,  
*Simulation of large deviation functions using population dynamics*,  
AIP Conf. Proc, Vol 1091, pp. 212 (2009), MODELING AND SIMULATION OF NEW MATERIALS: Proceedings of Modeling and Simulation of New Materials: Tenth Granada Lectures
- P2. J Tailleur, J Kurchan,  
*Grandes déviations et chaoticité : étude à l'aide d'une dynamique biaisée*,  
Comptes-rendus de la 10e 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)

## Invited lectures

13. Beijing (China) 2024, “Active Matter :Interfaces and Boundaries”. Tutorial.
12. Les Houches (France) 2023, “Les Houches Theoretical Biophysics Summer School 2023”.
11. Orsay (France) 2022, School on “Disorder in Complex Systems”.
10. Cargese (France) 2021, School on “Glassy Systems And Interdisciplinary Applications”.
9. Quiberon (France) 2021, Beg Rohu School on “Statistical Mechanics and Emergent Phenomena in Biology”. Through zoom.
8. Bengaluru (India) 2020, School on “Fluctuations in Nonequilibrium Systems : Theory and applications”. Through zoom.
7. Munich (Germany) 2019, School on the “Physics of Life”
6. Cargese (France) 2017, School on “Microswimmers – From Single Particle Motion to Collective Behaviour”
5. New Orleans (USA) 2017, APS Tutorial on Active Matter
4. Zanzan (Iran) 2016, IASBS-ICTP School on “Active Matter and Chemotaxis”.
3. Beijing (China) 2015, CSRC introductory school.
2. Kyoto (Japan) 2015, Kyoto Winter School.
1. Saarbruecken (Germany) 2011, Structure formation and transport in complex systems.

## Conferences–Invited talks

44. Beijing (China) 2024. Active Matter :Interfaces and Boundaries. Invited talk.
43. Tokyo (Japan) 2023. StatPhys28. Invited talk.
42. Telluride (USA) 2023. Driven Self-assembling and Organizing non-equilibrium systems. Invited talk.
41. Leiden (The Netherlands) 2022. Active Matter : The Next 25 Years 2022. Invited talk.
40. Edinburgh (Scotland) 2022. Statistical mechanical theories of emergence in biological systems. Invited talk.
39. Paris (France) 2022, Journées de Physique Statistique
38. Spetses (Grece) 2021, News from Disordered Elastic Systems
37. Praha (Czech Republic) 2021, Liquid Matter Conference. Keynote speaker
36. Paris (France) 2021, ”Inhomogeneous Random Systems”. Through zoom
35. Santa Barbara (USA) 2020, Symmetry, Thermodynamics and Topology in Active Matter. Through zoom.
34. Paris (France) 2019, Non-equilibrium phase separation and self-assembly.
33. Roscoff (France) 2019, New Physics in Living Systems.
32. Orleans (France) 2019, Scaling limits and large deviations.
31. Beijing (China) 2019, Out of equilibrium soft matter systems—from driven to active systems.
30. Erice (Italy) 2018, Self-Organization in Active Matter : from Colloids to Cells.
29. Rehovot (Israel) 2018, Correlations, fluctuations and anomalous transport in systems far from equilibrium.

28. Paris (France) 2017, Life Sciences Workshop
27. New-Orleans (USA) 2017, APS March Meeting
26. Edinburgh (UK) 2017, New Directions in Theoretical Physics II
25. Hong-Kong (China) 2016, 9<sup>th</sup> Dynamics Days Asia-Pacific.
24. Lausanne (Switzerland) 2016, Biomimetic and living materials : active matter at high densities
23. Seoul (Korea) 2016, KIAS conference on statistical physics.
22. Roscoff (France) 2016, Out-of-Equilibrium & Active Soft Matter.
21. Les Houches (France) 2016, Dynamics and Information Processing : from Cells to Tissues.
20. Suzhou (China) 2015, Physics of Active Matter.
19. Paris (France) 2015, Interacting Particles Systems and Non-equilibrium Dynamics.
18. Berkeley (USA) 2015, Mini Stat Mech meeting.
17. Bad Honnef (Germany) 2014, 565th Heraeus Seminar on Statistical Physics of Self-Propelling Particles.
16. Firenze (Italy) 2014, Advances in Nonequilibrium Statistical Mechanics.
15. Santa-Barbara (USA) 2014, Cytoskeleton, Cells, Tissues and Flocks.
14. Seoul (Korea) 2013, Patterns & waves in populations of cells and active particles.
13. Kyoto (Japan) 2013, Frontier of Statistical Physics and Information Processing.
12. Warwick (UK) 2013, Models from Statistical Mechanics in Applied Sciences.
11. Baltimore (US) 2013, APS March Meeting 2013.
10. Orsay (France) 2013, Approche physique des communautés bactériennes.
9. Lyon (France) 2012, Computation of transition trajectories and rare events in non-equilibrium systems.
8. Haifa (Israel) 2012, Statistical mechanics of granular and molecular fluids.
7. Dresden (Germany) 2011, Collective Dynamics and Pattern Formation in Active Matter Systems.
6. Dresden (Germany) 2011, Large Fluctuations in Non-Equilibrium Systems.
5. Lyon (France) 2011, Computation of rare events.
4. Dallas (US) 2011, APS March Meeting 2011.
3. Haifa & Rehovot (Israël) 2009, Steady-States, Fluctuations and Dynamics of Non-Equilibrium Systems.
2. Warwick (UK) 2010, Mathematics of Evolutionary Dynamics.
1. Dresden (Germany) 2009, Many-body systems far from equilibrium : Fluctuations, slow dynamics and long-range interactions.

## Conferences–Contributed talks

25. Chicago (USA) 2022, APS. Contributed talk.
24. Venice (Italy) 2021, Stochastic Models and Experiments in Ecology and Biology. Contributed talk through zoom.
23. Lyon (France) 2015, GDR Phenix : fluides actifs. Contributed talk.

22. Paris (France) 2014, GDR Mephy : fluides actifs. Contributed talk.
21. Seoul (Korea) 2013, StatPhys 25. Contributed talk.
20. Bielefeld (Germany) 2012, Collective Motion in Biological Systems : from Data to Models. Contributed talk.
19. Vienna (Austria) 2011, 8th Liquid Matter Conference. Contributed talk.
18. London (UK) 2011, Mini-conference on statistical mechanics of glassy and disordered systems. Contributed talk.
17. Seoul (Korea) 2010, Nonequilibrium Statistical Physics of Complex Systems. Contributed talk.
16. Cairns (Australia) 2010, StatPhys 24. Contributed talk.
15. Hong-Kong 2010, StatPhysHK, Complexity, Computation, Information. Contributed talk.
14. Glasgow (UK) 2010, Individual and Collective Fluid Mechanics of Swimming Microorganisms. Contributed talk.
13. Edinburgh (UK) 2010, Cambridge-Edinburgh meeting. Contributed talk.
12. Lyon (France) 2009, Journées interfaces Physique Biologie du GDR Phénix. Contributed Talk.
11. Paris (France) 2009, Statistical Physics of Active Matter. Contributed talk.
10. Granada (Spain) 2008, 10th Granada Seminar on Computational and Statistical Physics. Contributed talk.
9. Genoa (Italia) 2007, StatPhys 23. Contributed talk.
8. Paris (France) 2007, 10e Rencontres du non-linéaire. Contributed talk.
7. Paris (France) 2007, Journées de Physique Statistique 2007. Contributed talk.
6. Cambridge (UK) 2006, First-Passage and Extreme Value Problems in Random Processes. Poster.
5. Cambridge (UK) 2006, Non-Equilibrium Dynamics of Interacting Particle Systems. Poster.
4. Cambridge (UK) 2006, Relaxation Dynamics of Macroscopic Systems. Poster.
3. Paris (France) 2006, ESPCI, Journées de Physique Statistique 2006. Contributed talk.
2. Leuven (Belgium) 2005, Fundamental problems in statistical physics XI. Poster.
1. Paris (France) 2005, ESPCI, Journées de Physique Statistique 2005. Contributed talk.

## Seminars

68. Suzhou (China) 2024, School of Physical Science and Technology, Soochow University
67. Waltham (USA) 2023, Brandeis University MRSEC, Brandeis Department of Physics
66. Amherst (USA) 2023, Physics Condensed Matter Seminar, Umass Amherst
65. Cambridge (USA) 2022, Faculty lunch, MIT Department of Physics
64. Cambridge (USA), 2022, CMSA Active Matter seminar, Harvard University
63. NYC (USA) 2022, CCB Colloquium, Flatiron Institute
62. Lyon (France) 2022, Département de physique de l'ENS Lyon. Colloquium
61. Paris (France) 2022, Physics-Chemistry Seminar, Curie Institute, (PSL University)
60. Through zoom 2021, David & Edith Harris Physics Colloquium Series, MIT Department of Physics
59. Through zoom 2021, Biological Physics & Physical Biology Seminar series

58. Through zoom 2021, NSCS seminar series (Israeli Society of Nonlinear, Statistical, Complex, Biological and Soft-Matter Physics)
57. Through zoom 2021, Laboratoire PMMH (ESPCI)
56. Through zoom 2021, Laboratoire Jean Perrin (Sorbonne Université)
55. Through zoom 2021, “Cracking the glass problem” (Simons collaboration)
54. Through zoom 2020, Seminar of LPTMS (Université Paris Saclay)
53. Through zoom 2020, Theory club (University of Edinburgh)
52. Paris (France) 2020, Biophysics Seminar (Ecole Normale Supérieure)
51. Heidelberg (Germany) 2020, Structure Jour Fixe seminar, (University of Heidelberg). Through zoom.
50. Boston (USA) 2020, Department of Physics (MIT)
49. Haifa (Israel) 2019, Colloquium of the Physics Department (Technion)
48. Haifa (Israel) 2019, Biostat seminar (Technion)
47. Paris (France) 2019, Séminaire du cours de Jean-François Joanny (Collège de France)
46. Boston (USA) 2019, Department of Physics (MIT)
45. Eugene (US) 2019, Colloquium of the Physics Department (University of Oregon)
44. Berkeley (USA) 2019, Chemical engineering (University of Berkeley)
43. Paris (France) 2019, Popularization of science seminar (ESPCI)
42. Grenoble (France) 2019, LIPhy (Université Grenoble Alpes)
41. NYC (USA) 2018, Flatiron Institute, Centre for Computational Biology
40. NYC (USA) 2018, CSMR Seminar
39. NYC (USA) 2018, Applied Maths Seminar, Courant Institute
38. Paris (France) 2018, Institut Curie
37. Saclay (France) 2018, Ipht StatPhys seminar, CEA Saclay
36. Warwick (UK) 2018, Maths Forum, University of Warwick
35. Munich (Germany) 2017, Colloquium of Arnold Sommerfeld Center for Theoretical Physics (LMU)
34. Munich (Germany) 2017, Physics of Complex Biosystems (TUM)
33. Orsay (France) 2016, LPTMS (Université d’Orsay)
32. Paris (France) 2016, Séminaire du cours de Bernard Derrida (Collège de France)
31. Hong-Kong (China) 2015, Department of Physics (Hong-Kong Baptist University)
30. Oxford (UK) 2015, Rudolf Peierls Centre for Theoretical Physics (University of Oxford)
29. Saclay (France) 2015, Institut de Physique Théorique (CEA)
28. Hong-Kong (China) 2014, Department of Chemistry (Hong-Kong University)
27. Paris (France) 2014, LPTMC (Université Paris 6)
26. Grenoble (France) 2014, LIPhy (Université Joseph Fourier)
25. Roma (Italy) 2014, Dipartimento di Fisica (Università di Roma La Sapienza)
24. Tokyo (Japan) 2013, Sano Laboratory (the University of Tokyo)
23. Edinburgh (UK) 2013, School of Physics and Astronomy (University of Edinburgh)
22. Boston (USA) 2013, Physics Department (Boston University)
21. Nice (FR) 2012, Laboratoire Dieudonné (Université Nice Sophia Antipolis)

20. Lyon (FR) 2012, LPMCN (Université Lyon 1)
19. München (Allemagne) 2012, Biophys. dpmt (Technische Universität München)
18. Montpellier (FR) 2012, Laboratoire Charles Coulomb (Université Montpellier 2)
17. Noisy-Champ (FR) 2012, Centre d'Enseignement et de Recherche en Mathématiques et Calcul Scientifique (Ponts et Chaussées)
16. Saclay (FR) 2011, Institut de Physique Théorique (CEA)
15. Nottingham (UK) 2011, School of Physics and Astronomy (University of Nottingham)
14. Paris (France) 2010, Laboratoire de Physique Statistique (ENS)
13. Paris (France) 2009, Laboratoire de Physico-Chimie Théorique (ESPCI)
12. Paris (France) 2009, Laboratoire Matière et Système Complexes (Université Paris 7)
11. Orsay (France) 2009, Laboratoire de Physique Théorique (Université Paris XI)
10. Leuven (Belgium) 2009, Instituut voor Theoretische Fysica (KU Leuven)
9. London (UK) 2008, Department of Mathematics (Queen Mary)
8. Orsay (FR) 2008, LPTMS (Université Paris XI)
7. Lyon (France) 2007, Laboratoire de Physique (ENS Lyon)
6. London (UK) 2006, Mathematics Department (King's College London)
5. Paris (France) 2006, Laboratoire de Physico-Chimie Théorique (ESPCI)
4. Marseille (France) 2006, Centre De Physique Théorique (Université de Marseille)
3. Paris (France) 2006, IMCCE (Observatoire de Paris)
2. Orsay (France) 2005, LPTMS (Université Paris XI)
1. Paris (France) 2005, Laboratoire de Physico-Chimie Théorique (ESPCI)

## Publications–Teaching

- Co-auteur des Annales des concours 2011, ed. HK, Physique, MP, 2011
- Co-auteur des Annales des concours 2006, ed. HK, Physique, MP, 2006
- Co-auteur des Annales des concours 2005, ed. HK, Physique, PC, 2005
- Co-auteur des Annales des concours 2005, ed. HK, Physique, MP, 2005
- Co-auteur des Annales des concours 2005, ed. HK, Mathématiques, PSI, 2005
- Co-auteur des Annales des concours 2004, ed. HK, Physique, PC, 2004