

Dr. François BOULOGNE
Laboratoire de Physique des Solides
Université Paris-Saclay
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Research

- 2017–present **CNRS Researcher**
Laboratoire de Physique des Solides, Paris Sud University, France.
- 2014–2017 **Marie Curie International Outgoing Fellowship**
Individual European Grant (Mark: 91.5%, 268 k€).
Complex Fluid Group, Department of Mechanical and Aerospace Engineering (2 years). Advisor: H.A. STONE.
Laboratoire Matière et Système Complexe (1 year). Advisor: L. LIMAT.
Princeton University, New Jersey, USA
Paris Diderot University, Paris, France.
- 2013–2014 **Postdoctoral Researcher**
Complex Fluid Group, Department of Mechanical and Aerospace Engineering.
Advisor: H.A. STONE.
Princeton University, New Jersey, USA.
- 2010–2013 **Ph.D., Physics (Soft matter)**
“Attenuation of morphological aspects induced by the physical chemistry of complex fluids” Supervisors: L. PAUCHARD and F. GIORGIUTTI-DAUPHINÉ.
Laboratoire FAST, Paris Sud University, France.
- 2010 **Work experience, 4 months**
My Master Thesis was devoted to the study of the instability of complex fluids flowing down a vertical fiber. Supervisors: L. PAUCHARD and F. GIORGIUTTI-DAUPHINÉ
Laboratoire FAST, Paris Sud University, France.
- 2009 **Work experience, 3 months**
I studied with S.J. COX the flow of 2D foams around obstacles. The aim was to use Surface Evolver to understand independently the role of bubble pressure and film tension on drag and lift forces.
Institute of Mathematics and Physics, Aberystwyth University, United Kingdom.
- 2008 **Work experience, 2 months**
I worked on polyelectrolyte and surfactant film drainage to understand interfacial properties of soap films. I contributed to set up the experiment, data analysis and to carry out measurements in Frankel and Landau-Levich configurations. Supervisors: E. RIO, J. DELACOTTE and F. RESTAGNO
Laboratoire de Physique des Solides, Paris Sud University, France.

Education-Qualification

- 2010–2013 **Ph.D., Physics (Soft matter)**
“Physique des liquides et matière molle”, with the highest honour.
Université Pierre et Marie Curie, Paris, France.
- 2007–2010 **Physics student with Soft Matter speciality** “Magistère de physique fondamentale” and “Physique des liquides et matière molle”, both with the highest honour.
Université Paris 11, Orsay, France and Université Pierre et Marie Curie, Paris, France.
- 2005–2007 **CPGE: PCSI PC* (Physics and Chemistry)** Undergraduate courses to prepare for entry exams to top universities or engineering schools.
Lycée Faidherbe, Lille, France.

In Refereed Journals

- [1] F. **Boulogne**. Cheap and versatile humidity regulator for environmentally controlled experiments. *The European Physical Journal E*, 42(4):51, 2019.
- [2] L. Champougny, J. Miguet, R. Henaff, F. Restagno, F. **Boulogne**, and E. Rio. Influence of evaporation on soap film rupture. *Langmuir*, 34(10):3221–3227, 2018.
- [3] F. **Boulogne** and B. Dollet. Convective evaporation of vertical films. *Soft Matter*, 14:1665–1671, 2018.
- [4] S. Khodaparast, F. **Boulogne**, C. Poulard, , and H. A. Stone. Water-based peeling of thin hydrophobic films. *Physical Review Letters*, 119:154502, Oct 2017.
- [5] F. **Boulogne**, S. Shin, J. Dervaux, L. Limat, and H. A. Stone. Diffusiophoretic manipulation of particles in a drop deposited on a hydrogel. *Soft Matter*, 13:5122–5129, 2017.
- [6] F. **Boulogne**, S. Khodaparast, C. Poulard, , and H. A. Stone. Protocol to perform pressurized blister tests on thin elastic films. *The European Physical Journal E*, 40(6):64, 2017.
- [7] B. Dollet and F. **Boulogne**. Natural convection above circular disks of evaporating liquids. *Phys. Rev. Fluids*, 2:053501, 2017.
- [8] E. Rio and F. **Boulogne**. Withdrawing a solid of a bath: how much liquid is coated? *Advances in Colloid and Interface Science*, 247:100–114, 2017.
- [9] F. **Boulogne**, F. Ingremeau, and H. A. Stone. Coffee-stain growth dynamics on dry and wet surfaces. *Journal of Physics: Condensed Matter*, 29(7):074001, 2017.
- [10] A. Sauret, F. **Boulogne**, K. Somszor, E. Dressaire, and H. A. Stone. Drop morphologies on flexible fibers: influence of elastocapillary effects. *Soft Matter*, 13:134–140, 2017.
- [11] F. **Boulogne**, Y. L. Kong, J. K. Nunes, and H. A. Stone. Effect of the polydispersity of a colloidal drop on the drying induced stress as measured by the buckling of a floating sheet. *Physical Review Letters*, 116:238001, 2016.
- [12] F. **Boulogne**, F. Ingremeau, L. Limat, and H. A. Stone. Tuning the receding contact angle on hydrogels by addition of particles. *Langmuir*, 32(22):5573–5579, 2016.
- [13] H. Kim, F. **Boulogne**, E. Um, I. Jacobi, E. Button, and H. A. Stone. Controlled uniform coating from the interplay of Marangoni flows and surface-adsorbed macromolecules. *Physical Review Letters*, 116:124501, 2016.
- [14] B. Andreotti, O. Baumchen, F. **Boulogne**, K. E. Daniels, E. R. Dufresne, H. Perrin, T. Salez, J. H. Snoeijer, and R. W. Style. Solid capillarity: When and how does surface tension deform soft solids? *Soft Matter*, 12:2993–2996, 2016.
- [15] E. Dressaire, A. Sauret, F. **Boulogne**, and H. A. Stone. Drop impact on a flexible fiber. *Soft Matter*, 12:200–208, 2016.
- [16] F. **Boulogne**, F. Ingremeau, J. Dervaux, L. Limat, and H. A. Stone. Homogeneous deposition of particles by absorption on hydrogels. *EPL*, 112(4):48004, 2015.
- [17] A. Bick, F. **Boulogne**, A. Sauret, and H. A. Stone. Tunable transport of drop on a vibrating fiber. *Applied Physics Letters*, 107(18), 2015.
- [18] Y. L. Kong, F. **Boulogne**, H. Kim, J. Nunes, J. Feng, and H. A. Stone. Deposition of quantum dots in a capillary tube. *Langmuir*, 31(45):12560–12566, 2015.
- [19] A. Sauret, F. **Boulogne**, B. Soh, E. Dressaire, and H. A. Stone. Wetting morphologies on randomly oriented fibers. *The European Physical Journal E*, 38(6):62, 2015.
- [20] A. Sauret, F. **Boulogne**, D. Cébron, E. Dressaire, and H. A. Stone. Wetting morphologies on an array of fibers of different radii. *Soft Matter*, 11:4034–4040, 2015.

- [21] F. Boulogne, A. Sauret, B. Soh, E. Dressaire, and H. A. Stone. Mechanical tuning of the evaporation rate of liquid on crossed fibers. *Langmuir*, 31(10):3094–3100, 2015.
- [22] A. Sauret, F. Boulogne, J. Cappello, E. Dressaire, and H. A. Stone. Damping of liquid sloshing by foams. *Physics of Fluids*, 27(2), 2015.
- [23] J. Cappello, A. Sauret, F. Boulogne, E. Dressaire, and H. A. Stone. Damping of liquid sloshing by foams: from everyday observations to liquid transport. *Journal of Visualization*, 18(2):269–271, 2015.
- [24] F. Boulogne and H. A. Stone. Self-crumpling elastomers: bending induced by the drying stimulus of a nanoparticle suspension. *EPL*, 108:19001, 2014.
- [25] S. van der Walt, J. L. Schönberger, J. Nunez-Iglesias, F. Boulogne, J. D. Warner, N. Yager, E. Gouillart, and T. Yu. scikit-image: Image processing in python. *PeerJ*, 2:e453, 6 2014.
- [26] F. Boulogne, F. Giorgiutti-Dauphiné, and L. Pauchard. Surface patterns in drying films of silica colloidal dispersions. *Soft Matter*, 11:102–108, 2015.
- [27] F. Boulogne, L. Pauchard, F. Giorgiutti-Dauphiné, R. Botet, R. Schweins, M. Sztucki, J. Li, B. Cabane, and L. Goehring. Structural anisotropy of directionally dried colloids. *EPL*, 105:38005, 2014.
- [28] F. Boulogne, M.-A. Fardin, S. Lerouge, F. Giorgiutti-Dauphiné, and L. Pauchard. Suppression of the Rayleigh-Plateau instability on a vertical fibre coated with wormlike micelle solutions. *Soft Matter*, 9:7787–7796, 2013.
- [29] F. Boulogne, L. Pauchard, and F. Giorgiutti-Dauphiné. Annular cracks of thin films of colloidal silica particles coating a fiber. *EPL*, 102(3):39002, 2013.
- [30] F. Boulogne, F. Giorgiutti-Dauphiné, and L. Pauchard. The buckling and invagination process during consolidation of colloidal droplets. *Soft Matter*, 9:750–757, 2013.
- [31] F. Boulogne, L. Pauchard, and F. Giorgiutti-Dauphiné. Effect of a non-volatile cosolvent on crack patterns induced by desiccation of a colloidal gel. *Soft Matter*, 8(32):8505–8510, 2012.
- [32] F. Boulogne, L. Pauchard, and F. Giorgiutti-Dauphiné. Instability and morphology of polymer solutions coating a fibre. *Journal of Fluid Mechanics*, 704:232–250, 7 2012.
- [33] F. Boulogne and S. J. Cox. Elastoplastic flow of a foam around an obstacle. *Phys. Rev. E*, 83:041404, Apr 2011.

In Refereed Proceedings

- [1] A. Sauret, F. Boulogne, J. Cappello, E. Dressaire, and H. A. Stone. Influence d’une mousse liquide sur le ballotement d’un fluide. In *18eme Rencontre du Non Lineaire, Paris, France*, 2015.
- [2] F. Boulogne, F. Giorgiutti-Dauphiné, and L. Pauchard. How to reduce the crack density in drying colloidal material? In *Oil Gas Sci. Technol. - Rev. IFP Energies nouvelles*, volume 69, pages 397–404, 2013.

Seminars, conferences, workshops, juries

Invited conferences

1. “Some dynamics of vanishing droplets”
GDR Liquids at Interfaces, Grenoble, 2017
2. “Quand café, thé, whisky inspirent le physicien”
Café de l’Europe, Paris Diderot, 2017.
3. “Goutte et flaque s’évaporent-elles à la même vitesse”
25th Allain Bouyssy Symposium, 2017

Conferences

1. RNL: Estimate the drying stress with the buckling of a membrane
Paris, France, 2017
Oral presentation.
2. Droplet 2015: Homogeneous deposition of particles on hydrogels by absorption
Twente, The Netherlands, 2015
Oral presentation.
3. 29th ECIS conference: Homogeneous deposition of particles on hydrogels by absorption
Bordeaux, France, 2015
Enzo Ferroni Award for the best oral presentation.
4. Congrès Français de Mécanique: Pelage de feuilles d’élastomère: stimulus induit par le séchage de nanoparticules
Lyon, France, 2015
Oral presentation.
5. Fluid and Elasticity: Homogeneous deposition of particles by absorption on hydrogels
Biarritz, France, 2015
Oral presentation.
6. APS-DFD: Self-crumpling elastomers: bending motion induced by a drying stimulus
San Francisco, USA, 2014
Oral presentation and Gallery of Fluid Motion.
7. Society of Rheology
Philadelphia, USA, 2014
Poster: Damping of sloshing liquids by a foam layer.
8. Conference micro & nanofluidics: Capture of droplets on fibers: role of the fiber flexibility
Twente, The Netherlands, 2014
Oral presentation.
9. APS-DFD: Suppression of the Rayleigh-Plateau instability on a vertical fiber
Pittsburgh, USA, 2013
Oral presentation.
10. International Conference on Colloids and Complex Fluids: Challenges and Opportunities
Rueil-Malmaison, France, 2012
Oral presentation.
11. Journée de physique statistique. Paris, France, 2012
Oral presentation.
12. Journée dynamique des fluides du Plateau d’Orsay. Orsay, France, 2011
Oral presentation.
13. 25th ECIS conference. Berlin, Germany, 2011
Poster: Deformation of colloidal drops in a confined geometry.

14. French Physical Society conference. Bordeaux, France, 2011
Poster: Instability and drying of complex fluids on a fiber.
15. 19th Allain Bouyssy Symposium Université Paris-Sud 11, Orsay, France, 2011
Poster: Morphological changes induced by Non-Newtonian fluids
French Physical Society award for the best poster.

Workshops and summer schools

1. Summer School "PHASME" (two weeks).
Cargèse, France, 2016
2. Workshop: Capillarity of Soft Interfaces
Lorentz Center, Leiden, The Netherlands, 2015.
3. Summer School "Soft Fire" (two weeks).
Cargèse, France, 2014
4. Workshop: The Northeast Complex Fluids and Soft Matter Workshop (NCS2)
City College of New York, USA, 2014.
Oral presentation: Structural anisotropy of directionally dried colloids
5. GDR (Research Group on colloids) Approches Multiphysiques pour les Colloides Concentrés
Rueil-Malmaison, France, 2012
Oral presentation.
6. Workshop: Euroscopy. Bruxelles, Belgium, 2012
Poster: Set up a workflow for scientific figures using a python buildtool: waf
Grant from NumFOCUS Foundation
7. Summer School "Soft interfaces" (one month).
Les Houches, France, 2012
8. GDR (Research Group on colloids) Approches Multiphysiques pour les Colloides Concentrés
Toulouse, France, 2011
Oral presentation.
9. Workshop: PyPhys (Euroscopy) Python for teaching and research in Physics.
Paris, France, 2011

Invited seminars

1. Recent developments on evaporation
Laboratoire Ondes et Matière d'Aquitaine, Bordeaux, 2019
2. Some dynamics of vanishing droplets
Saint-Gobain Recherche, Aubervilliers, France, 2017
3. Manipulation of colloids on hydrogels
Institut Jean le Rond d'Alembert, Paris, France, 2016
4. Manipulation of colloids on hydrogels
Laboratoire Matière et Système Complexe, Paris, France, 2016
5. Particle deposition by absorption and evaporation
Gulliver, Paris, France, 2015
6. Investigation of absorption and evaporation phenomena on particle deposition
Laboratory of the Future, Bordeaux, France, 2015
7. Investigation of absorption and evaporation phenomena on particle deposition
Institut Lumière Matière, Lyon, France, 2015
8. Control of interfacial properties of soft materials with colloidal suspensions
Laboratoire Navier, Marne-la-Vallée, France, 2015
9. Interface crumpling or flattening
Laboratoire Physique de la matière condensée, Nice, France, 2014
10. Interface crumpling or flattening
Laboratoire de Physique des Solides, Orsay, France, 2014
11. Interface crumpling or flattening
Laboratoire Matière et Système Complexe, Paris, France, 2014
12. De la suppression de l'instabilité de Rayleigh-Plateau à l'anisotropie structurale de nanoparticules sous séchage directionnel
Laboratoire Interdisciplinaire de Physique, Grenoble, France, 2014
13. De la suppression de l'instabilité de Rayleigh-Plateau à l'anisotropie structurale de nanoparticules sous séchage directionnel
Institut de Physique de Rennes, Rennes, France, 2014
14. Flow of complex fluids on a vertical fiber
Max Planck Institute for Dynamics and Self-Organization, Göttingen, Germany, 2013
15. Drying of colloidal suspensions: creases, cracks and structural anisotropy
Saint-Gobain Recherche, Aubervilliers, France, 2013
16. Suppression of the Rayleigh-Plateau instability on a vertical fibre coated with wormlike micelle solutions
Laboratoire de Physique Statistique, Paris, France, 2012
17. Suppression of the Rayleigh-Plateau instability with giant micelles
Laboratoire de Physique des Solides, Orsay, France, 2012

Jury member in PhD defense

1. Jean-Baptiste Charpentier
Université le Havre Normandie, 2017

Member of PhD committees

1. Mathieu Oléron
Université Paris-Diderot, 2019-2021

Other juries

1. International Physicists' Tournament
Paris, 2019

Teaching and student advising

In 2017, 2 days lecture on image processing in Python with scikit-image for scientists (Lectures dedicated to PhD students).

During the preparation of my PhD thesis, I taught the following courses:

- Lectures-tutorials-practical work: geometrical optics
- Practical work on soft matter (introduction to rheology, tensiometry, elasticity)
- Lectures and practical work: an introduction to a computer algebra system (Mathematica)
- Tutorials and practical work: numerical methods (integration, derivation, interpolation, molecular dynamics...)

I co-advise the PhD thesis of:

- M. Marchand (2017-2020)

I co-advised these research projects:

- M. Dupuy (L3, Paris-Saclay Univ.) Foam rise in capillaries (2019, 2 months)
- C. Veillon (L3, Paris-Saclay Univ.) Freezing of complex fluid drops (2019, 2 months)
- L. Tian (PhD Student, Northwestern University, China) Interfacial freezing of salt-surfactant mixtures **Funded by a CRC fellowship** (2019, 6 months)
- N. Beserman (L3, Paris-Saclay Univ.) Foam coating with parallel plates (2018, 2 months)
- H. Lama (PhD student, IIT Madras, India) Particle deposition on thin hydrogels. **Funded by a Raman-Charpak fellowship.** (2018, 4 months)
- M. Marchand (M2, Paris-Saclay Univ.) Rheology of foams by withdrawing a plate (2017, 3 months)
- T. V. Do (M2, Paris-Saclay Univ.) Entrainment of liquid foams (2017, 6 months)

During my postdoc:

- Y. L. Kong (PhD student) Deposition of colloidal particles (2014-2015)
- K. Somszor (summer project) Wetting on flexible crossed fibers (2015, 1.5 months)
- A. Bick (final year BSc project) Tunable transport of drops on a vibrating fiber (2014-2015)
- J. Cappello (M1, ENS Cachan) Damping of free-surface oscillations by a liquid foam (2014, 3 months)
- D. Geyer (M1, ENS Lyon) Elastocapillarity: embracing fibers around cylinders (2014, 6 months)
- B. Soh (final year BSc project) Wetting, evaporation & condensation on fibers (2013-2014)

During my PhD thesis:

- M. Swider (M1, Paris 11) Effect of drying conditions on crack patterns (2012, 3 months)
- A. Dumail (M1, Paris 11) Buckling of colloidal droplets (2011, 3 months)
- U. Laujay (M1, Paris 11) Coating of a fiber with colloidal suspensions (2011, 3 months)

Additional skills

English: fluent.

Computer skills:

- **OS:** Experienced GNU/Linux system administrator on desktop and servers (Archlinux and Debian distributions).
- **Computer Literacy:**
 - Proficient knowledge of Python language and scientific libraries (Numpy, Scipy, image processing).
 - Good knowledge of $\text{T}_\text{E}\text{X}$, $\text{L}_\text{A}\text{T}_\text{E}\text{X}$ and $\text{X}_\text{E}\text{L}_\text{A}\text{T}_\text{E}\text{X}$.
 - Experience in C, C++ (Qt), Perl.
 - Experience in software project management.

In particular, I am core developer for scikit-image, a peer-reviewed image processing library in Python.

- **Applications:** ImageJ, Surface Evolver, Gnuplot, Git, Mediawiki.
- **Hardware and automation:** Arduino, Micro-manager.

Responsibilities and professional service

Expert evaluator for European proposals H2020-MSCA-IF in the Physics panel (2016–2018).

Peer review: Physical Review Letter, ACS Nano, Physical Review E, Journal of Fluid Mechanics, Physics of Fluids, Soft Matter, European Physical Journal E.

Seminars: I am the organizer of the Soft Matter seminars at LPS since September 2016.

Webmaster: I am one of the two webmasters of our group website.

First Aider: French diploma Sauveteur-Secouriste du travail.

Other activities

Emergency response volunteer at French Red Cross and Croix Blanche. First and second level diploma (PSE1 & PSE2).

Updated on June 20, 2019.