

Ian Williams

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Google Scholar: <https://scholar.google.com/citations?user=m1E8LQUAAAAJ&hl=en>

EMPLOYMENT & EDUCATION

POSTDOCTORAL RESEARCHER INSTITUTE FOR BIOENGINEERING OF CATALONIA (IBEC)
Oct 2019 – Present, PI: Giuseppe Battaglia

POSTDOCTORAL RESEARCH ASSOCIATE
DEPARTMENT OF CHEMISTRY, UNIVERSITY COLLEGE LONDON
Oct 2018 – Oct 2019, PI: Giuseppe Battaglia

POSTDOCTORAL SCHOLAR DEPARTMENT OF CHEMICAL ENGINEERING, UNIVERSITY OF CALIFORNIA, SANTA BARBARA
Jan 2015 – Aug 2018, PI: Todd M. Squires

VISITING RESEARCHER UNIVERSITY OF MINNESOTA
Oct 2017

POSTDOCTORAL RESEARCH ASSISTANT H. H. WILLS PHYSICS LABORATORY, UNIVERSITY OF BRISTOL
Jul 2013 – Dec 2014, PI: C. Patrick Royall

PHD (CHEMISTRY) UNIVERSITY OF BRISTOL
Sept 2009 – Jul 2013 (Awarded March 2014)
Thesis: *Colloids in optically defined confinement*
Supervisors: C. Patrick Royall & Paul Bartlett

MPHYS (PHYSICS) UNIVERSITY OF EDINBURGH
Sept 2005 – Jun 2009, First Class Honours

PROFESSIONAL EXPERIENCE

TEACHING

- Mar 2019 **Soft Matter Chemistry** – University College London, Chemistry. Six tutorial classes for 3rd year undergraduate students.
- Feb 2019 **Instrumental & Computational Techniques in Chemistry** – University College London, Chemistry. Organisation of and demonstration in undergraduate chemistry laboratory.
- Jan 2019 **Optics for Microscopy: From Fundamentals to Superresolution** – University College London. Two workshops for interdisciplinary cohort of students and postdoctoral researchers.
- Mar 2014 **Masterclass in Soft Matter Chemistry** – University of Bristol, Chemistry. Exam preparation problem solving class for senior undergraduates.
- Mar 2014 **Optical Techniques in Nanophysics** – University of Bristol, Physics. Lecture describing optical microscopy and manipulation techniques for senior undergraduates.
- Jan 2014 **Optical Micromanipulation** – University of Bristol, Bristol Centre for Functional Nanomaterials. Graduate level course on the theory and practise of optical trapping for Masters students.
- Jan 2014 **Nanophysics** – University of Bristol, Physics. Teaching assistant leading tutorial classes for senior undergraduates.

LEADERSHIP, MENTORING & PROFESSIONAL DEVELOPMENT

Supervising Masters Students: Skills for Effective Supervision, 1 day interactive training workshop hosted by Barcelona Institute of Science and Technology and Broad Associates.

Organization of *6th International Soft Matter Workshop*, Helford, Cornwall, May 2014.

Mentoring of graduate students resulting in publications in *PNAS* and *Langmuir*

Supervision of 5 undergraduate research projects resulting in publication in *The Journal of Physics: Condensed Matter*.

Elementary school outreach food science demonstrations, Isla Vista Elementary School, 2017.

Edinburgh University Physics Society President, academic year 2007 – 2008.

PEER REVIEW

Physical Review Letters • The Journal of Rheology • The Journal of Chemical Physics • Soft Matter

AWARDS & ACCOLADES

- 2017 **Art of Science Honourable Mention**, University of California Santa Barbara
- 2009–12 **Centenary Postgraduate Research Scholarship**, University of Bristol
- 2008–09 **Integrated Masters Physics Class Medal**, University of Edinburgh
- 2007–08 **Senior Honours Physics Class Medal**, University of Edinburgh
- 2007–08 **Brodie Memorial Prize**, University of Edinburgh
- 2006–07 **Junior Honours Physics Class Medal**, University of Edinburgh
- 2006–07 **Donald Fraser Bursary**, University of Edinburgh

PUBLICATIONS

PEER REVIEWED

[11] INTERFACIAL RHEOLOGY AND DIRECT IMAGING REVEAL DOMAIN-TEMPLATED NETWORK FORMATION IN PHOSPHOLIPID MONOLAYERS PENETRATED BY FIBRINOGEN

I. Williams, J. A. Zasadzinski, & T. M. Squires. *Soft Matter*, DOI:10.1039/C9SM01519A (2019)

[10] THE EFFECT OF ETHYLCELLULOSE ON THE RHEOLOGY AND MECHANICAL HETEROGENEITY OF ASPHALTENE FILMS AT THE OIL-WATER INTERFACE

C.-C. Chang, I. Williams, A. Nowbahar, V. Mansard, J. Mecca, K. Whitaker, A. Schmitt, C. Tucker, T. Kalantar, T.-C. Kuo, & T. Squires. *Langmuir*, **35**, 9374–9381 (2019)

[9] INTERFACIAL RHEOLOGY AND HETEROGENEITY OF AGING ASPHALTENE LAYERS AT THE WATER-OIL INTERFACE

C.-C. Chang, A. Nowbahar, V. Mansard, I. Williams, J. Mecca, A. Schmitt, T. Kalantar, T.-C. Kuo & T. M. Squires. *Langmuir*, **34**, 5409–5415 (2018)

[8] EVOLUTION AND MECHANICS OF MIXED PHOSPHOLIPID FIBRINOGEN MONOLAYERS

I. Williams & T. M. Squires. *J. R. Soc. Interface*, **15**, 20170895 (2018)

[7] EXPERIMENTAL DETERMINATION OF CONFIGURATIONAL ENTROPY IN A TWO-DIMENSIONAL LIQUID UNDER RANDOM PINNING

I. Williams, F. Turci, J. E. Hallett, P. Crowther, C. Cammarota, G. Biroli & C. P. Royall. *J. Phys.: Condens. Matter*, **30**, 094003 (2018)

[6] SOLUTO-INERTIAL PHENOMENA: DESIGNING LONG RANGE, LONG-LASTING, SURFACE SPECIFIC INTERACTIONS IN SUSPENSIONS

A. Banerjee, I. Williams, R. Nery Azevedo, M. E. Helgeson, & T. M. Squires. *PNAS*, **113**, 31, 8612–8617 (2016)

[5] TRANSMISSION OF TORQUE AT THE NANOSCALE

I. Williams, E. C. Oguz, T. Speck, P. Bartlett, H. Löwen, & C. P. Royall. *Nature Phys.*, **12**, 98–103 (2016)

[4] FLEXIBLE CONFINEMENT LEADS TO MULTIPLE RELAXATION REGIMES IN GLASSY COLLOIDAL LIQUIDS

I. Williams, E. C. Oguz, P. Bartlett, H. Löwen, & C. P. Royall. *J. Chem. Phys.*, **142**, 024505 (2015)

[3] STRUCTURAL CHARACTERISATION OF POLYCRYSTALLINE COLLOIDAL MONOLAYERS IN THE PRESENCE OF ASPHERICAL IMPURITIES

A. T. Gray, E. Mould, C. P. Royall & I. Williams. *J. Phys.: Condens. Matter* **27**, 194108 (2015)

[2] THE EFFECT OF BOUNDARY ADAPTIVITY ON HEXAGONAL ORDERING AND BISTABILITY IN CIRCULARLY CONFINED QUASI HARD DISCS

I. Williams, E. C. Oguz, R. L. Jack, P. Bartlett, H. Löwen, & C. P. Royall. *J. Chem. Phys.*, **140**, 104907 (2014)

[1] DIRECT MEASUREMENT OF OSMOTIC PRESSURE VIA ADAPTIVE CONFINEMENT OF QUASI HARD DISC COLLOIDS

I. Williams, E. C. Oguz, P. Bartlett, H. Löwen, & C. P. Royall. *Nature Commun.*, **4**, 2555 (2013)

PREPRINT, SUBMITTED & IN PREPARATION

THE RHEOLOGY OF CONFINED HARD DISCS

I. Williams, E. C. Oguz, W. C. K. Poon, H. Löwen, & C. P. Royall. *in preparation*

CONCENTRATION DEPENDENT CROSSOVER FROM DENSITY-DRIVEN TO DIFFUSIO-OSMOTIC CONVECTIVE FLOW IN GLUCOSE GRADIENTS

I. Williams, S. Lee, R. Sear & G. Battaglia. *in preparation*

RESEARCH PRESENTATION

INVITED PRESENTATIONS

- May 2019 **Two-dimensional soft matter: from adaptive confinement to monolayer rheology**, University of Warwick, UK
- Mar 2019 **Anisotropic growth & relaxation of condensed domains in a phospholipid monolayer**, *9th International Soft Matter Workshop*, Fowey, UK
- Oct 2018 **Structural and rheological consequences of phospholipid monolayer penetration by blood protein**, University of Bristol, UK.
- Feb 2017 **Bloody rheology! Measuring interfacial viscoelasticity in mixed monolayers of lung surfactant and serum protein**, *8th International Soft Matter Workshop*, Helford, UK.
- May 2014 **Two relaxation regimes in quasi-hard-discs under adaptive circular confinement**, *6th International Soft Matter Workshop*, Helford, UK.
- Mar 2014 **Hard discs in circular confinement**, ESPCI, Paris, France.
- Feb 2014 **Hard discs in circular confinement**, University of Amsterdam, Amsterdam, The Netherlands.
- Sep 2012 **Non-circular confinement of quasi hard discs**, *5th International Soft Matter Workshop*, Helford, UK.
- Jun 2012 **The colloidal corral**, Heinrich-Heine-Universität, Düsseldorf, Germany.
- May 2011 **The colloidal corral**, *4th International Soft Matter Workshop*, Helford, UK.
- Feb 2010 **Optical trapping: manipulating the energy landscape**, *3rd International Soft Matter Workshop*, The Cotswolds, UK.

CONTRIBUTED PRESENTATIONS

- Mar 2018 **Fibrinogen Adsorption Onto Phospholipid Monolayers: Aging & Stiffening**, *APS March Meeting*, Los Angeles, USA.
- Nov 2017 **Lung Surfactant & Serum Protein: Monolayer Rheology & Morphology**, *Soft Matter Interfaces: From Biology to Engineering Applications*, Ascona, Switzerland.
- Nov 2017 **Fibrinogen adsorption onto phospholipid monolayers: aging & stiffening**, *2017 AIChE Annual Meeting*, Minneapolis, USA.
- Jul 2017 **Rheology and morphology of mixed monolayers of lung surfactant and serum protein**, *91st ACS Colloid and Surface Science Symposium*, New York, USA.
- Jun 2015 **Interfacial colloidal polycrystals and gels under oscillatory shear**, *89th ACS Colloid and Surface Science Symposium*, Pittsburgh, USA.
- Jul 2014 **Structure in circularly confined quasi-hard-discs: the role of boundary adaptivity**, *9th Liquid Matter Conference*, Lisbon, Portugal.
- Apr 2014 **Circularly confined quasi-hard-discs: the role of boundary adaptivity**, *The Physics of Soft and Biological Matter*, Cambridge, UK.
- Mar 2014 **Structural bistability in quasi-hard-discs under adaptive circular confinement**, *APS March Meeting*, Denver, USA.
- May 2013 **Static & rotating adaptive confinement of quasi hard disc colloids**, *Workshop on Crystallisation at Interfaces*, CECAM, Lausanne, Switzerland.
- Jul 2012 **Static & dynamic confinement: colloidal corrals & washing machines**, *M4 Colloids Symposium*, Bristol, UK.

POSTER PRESENTATION

- Sep 2019 **Natural Convection Versus Diffusioosmosis In Glucose Gradients**, *4th Edwards Symposium - Emerging Trends in Soft Matter*, Cambridge, UK.
- Oct 2017 **Fibrinogen adsorption onto phospholipid monolayers: evolution & stiffening**, *Society of Rheology 89th Annual Meeting*, Denver, USA.
- Mar 2012 **2d freezing in confinement: the role of external fields**, *International Conference CODEF III*, Bonn, Germany.
- Jan 2012 **The colloidal corral: confined quasi-hard-discs**, *IoP Liquids and Complex Fluids Group Winter School*, Edinburgh, UK.
- Sep 2011 **The colloidal corral: confined quasi-hard-discs**, *8th Liquid Matter Conference*, Vienna, Austria.
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