Li Shen

cv

Fields of Research. Interfacial fluid dynamics, Contaminated surfaces, Marangoni effect, bubbles and thin film systems with applications to foaming problems in industrial lubricants and beverages. Pattern formation and capillary waves on thin liquid films.

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Nationality. Chinese[1]

Languages. English (near native), Mandarin Chinese (native)

Academic Positions.

2019-now: Research Associate (EPSRC Impact Acceleration Account) at the Department of Mechanical Engineering, Imperial College London

Responsible for the development of a novel quantitative foam measuring rig for commercialisation alongside an algorithm for surface bubble analysis with machine learning and computer vision methods.

Education.

2014-18: PhD in Mechanical Engineering, Imperial College London

Thesis "Symmetry-breaking pattern formation in thin films with application to foaming in viscous fluids" Supervisor Prof. D. Dini

2011-2014: BA in Mathematics (2.1), University of Cambridge (Pembroke College)

Prizes & Grants.

2019: EPSRC Impact Acceleration Account - £63k for the project "Machine-Learning Pattern Recognition Prototype for Liquid Foams (MaLPReP-Foams)"

2019: Margaret Fishendan Centenary Memorial Prize for best PhD Thesis in a 5 year period, Imperial College London

2018: Engineering & Physical Sciences Research Council (EPSRC) photo competition - *Eureka prize*

2016: American Physical Society Gallery of Fluid motion - *Gallery prize*

Journal Publications.

1. *Transient structures in rupturing thin liquid films: Marangoni-induced symmetry-breaking pattern formation in viscous fluids*[2], Sci. Adv. **6**, eabb0597, 2020
2. *Capillary waves with surface viscosity*[2], J. Fluid Mech., **847**, 644-663, 2018
3. *Before the bubble ruptures*[2], Phys. Rev. Fluids, **2**, 090505, 2017
4. *Marangoni effect on small-amplitude capillary waves in viscous fluids*[2], Phys. Rev. E, **96**, 053110, 2017
5. Capillary waves with compositional Marangoni gradients[3], 2020, In preparation
6. Axisymmetric capillary waves with surfactants[4], 2020, In preparation

[1] with permanent UK residence
[2] L. Shen, F. Denner, N. Morgan, B. van Wachem, D. Dini
[3] L. Shen, D. Dini
[4] L. Shen, M. Corato, F. Denner, D. Dini

Teaching.

2015-16: Graduate teaching assistant (2nd year Engineering maths course), Department of Mechanical Engineering, Imperial College London

2014 Summer: STEP Mathematics Summer school tutor, University of Cambridge

Supervision.

2016-17: Co-supervisor[5] on 3rd year Imperial Mechanical Engineering Design, Make, Test project "Bubble trouble" in partnership with Shell on development of a foaming rig.

2017-19: Co-supervisor[5] on 4th year Imperial Mechanical Engineering final project "Stochastic collapse of foam" in partnership with AB InBev (Budweiser)

Work.

Summer 2014: STEP distance learning project assistant, University of Cambridge

Working under Dr. S.T.C. Siklos with funding from the Department of Education

Skills. Fluent in FENiCs (Finite element package), Matlab, LaTeXand Photoshop; working knowledge of Python.

Hobbies. *Photography* (featured on the BBC, Guardian, Telegraph, Metro, Nikon Asia and ScienceNews magazine, worked as the official photographer of the TriboUK 2017 and 2020 conferences)

Go (British Go Association 6 Dan, ranked 38th in Europe, 1st in UK in 2014), Violin (Grade 7)

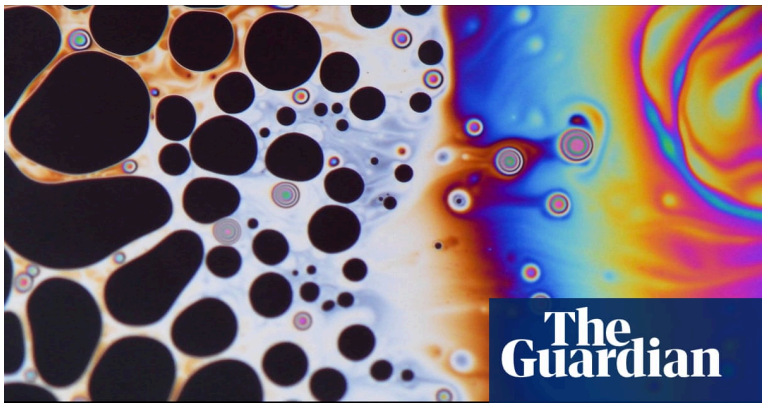

Figure 1: Patterns observed experimentally on the surface of a soap bubble one minute before its rupture as it appears in The Guardian. This picture was awarded the 2018 EPSRC photography Prize in the Eureka and Discovery section and was also featured in the January 2017 issue of the Science News Magazine and on the BBC. The associated video was awarded the Gallery Prize at the 34th Annual Gallery of Fluid Motion, held at the 69th Annual Meeting of the APS Division of Fluid Dynamics.

Link to article[6]

[5]with Dr. Tom Reddyhoff, Lecturer in Tribology, Department of Mechanical Engineering, Imperial College London

[6]E. Hilaire (2018). Single atoms, soap bubbles and soil: scientists capture their research, in pictures, Guardian. [online] Available at: theguardian.com/science/gallery/2018/feb/12/single-atoms- soap-bubbles-and-soil-scientists-capture-their-research-epsrc-in-pictures [Accessed 27.6.19]