

ABOUT ME

I'm currently a final year PhD student in the Mathematics Institute at University of Warwick, funded by the EPSRC CDT in Modelling of Heterogeneous systems.

My research interest lies broadly in the area of *fluid dynamics* and *rare events theory*, with a special focus on *fluctuating hydrodynamics* and *atomistic simulations*.

EDUCATION

University of Warwick

Ph.D. in Mathematics

Coventry, UK

2019–Current

- Fully funded as part of EPSRC CDT in Modelling of Heterogeneous Systems
- Project: “Fluctuating hydrodynamics of nano scale thin films”
- Supervisors: Prof. James E. Sprittles, Prof. Duncan A. Lockerby

University of Oxford

M.Sc. Mathematical Modelling and Scientific Computing, Merit

Oxford, UK

2018–2019

- Thesis: “Dynamical system approaches to El Niño southern oscillation”
- Supervisors: Prof. Irene Moroz, Dr. Hannah Christensen

University of Manchester

B.Sc. Mathematics, First class

Manchester, UK

2016–2018

- Final year project: “Thermo-elastic deformation in fibre-reinforced composites”
- Supervisor: Dr. Gareth W. Jones

Shandong University

B.Sc. Mathematics and Applied Mathematics (2+2), 81.71/100

Jinan, PRC

2014–2018

TEACHING

Undergraduate Supervision at University of Warwick

- Co-supervised Tom Stopford on 4th year project: “Numerical simulation of stochastic thin film equation”, 2022–2023.

Teaching Assistant at University of Warwick

- MA4J1 Continuum Mechanics, 2022
- MA4L0 Advanced Topics in Fluids, 2022
- MA261 Differential Equations: Modelling and Numerics, 2022
- MA4J1 Continuum Mechanics, 2021

CONTRIBUTED TALKS

- Warwick Applied Mathematics Seminar, June 2023, Warwick
- British Applied Mathematics Colloquium (BAMC2023), April 2023, Bristol
- 14th European Fluid Mechanics Conference (EFMC14), Sept. 2022, Athens
- Hetsys Summer Conference, July 2022, Warwick
- Workshop on Micro/Nano/Interfacial Flow, May 2022, Warwick
- British Applied Mathematics Colloquium (BAMC2022), April 2022, Loughborough
- Solids, Plasma, Fluids Theme Hetsys Meeting¹, Feb. 2022, Warwick

ONLINE TALKS

Cassini talk: Modelling bounded nanoscale thin films

– doi.org/10.52843/cassini.wb3wg4

SKILLS

- **Computing:** Fortran, Python, LAMMPS, MATLAB, Parallel computing, High performance computing
- **Languages:** Chinese (native), English (fluent).

PUBLICATIONS IN PREPARATION

- [1] **J. Liu**, D. A. Lockerby, J. E. Sprittles, and T. Grafke, “Adaptive multilevel splitting for rare rupture of nanoscale thin films”, in preparation.
- [2] **J. Liu**, J. E. Sprittles, and T. Grafke, “Mean first passage times and eyring-kramers formula for fluctuating hydrodynamics”, in preparation.

PUBLICATIONS

- [3] **J. Liu**, C. Zhao, D. A. Lockerby, and J. E. Sprittles, “Thermal capillary waves on bounded nanoscale thin films”, *Physical Review E*, vol. 107, no. 1, p. 015 105, Jan. 2023, ISSN: 2470-0045, 2470-0053.
- [4] J. E. Sprittles, **J. Liu**, D. A. Lockerby, and T. Grafke, “Rogue nanowaves: A route to film rupture”, *Physical Review Fluids*, vol. 8, no. 9, p. L092001, Sep. 2023, ISSN: 2469-990X.
- [5] C. Zhao, **J. Liu**, D. A. Lockerby, and J. E. Sprittles, “Fluctuation-driven dynamics in nanoscale thin-film flows: Physical insights from numerical investigations”, *Physical Review Fluids*, vol. 7, no. 2, p. 024 203, Feb. 2022, ISSN: 2469-990X.

REFERENCES

Professor James E. Sprittles
Mathematics Institute, The University of Warwick, UK
J.E.Sprittles@warwick.ac.uk

Professor Duncan A. Lockerby
School of Engineering, The University of Warwick, UK
D.Lockerby@warwick.ac.uk

¹Participated in organising.