THOMAS S. EAVES

School of Science and Engineering, University of Dundee, UK *teaves001@dundee.ac.uk* *www.tseaves.com*

Appointments

- **University of Dundee, School of Science and Engineering** — Dundee, UK
  Lecturer in Environmental Fluid Mechanics and Renewables: Jan. 2020–Present
- **University of Oxford, Department of Physics** — Oxford, UK
  Visiting Researcher: Sept. 2019–Dec. 2019
- **University of British Columbia, Department of Mathematics** — Vancouver, Canada
  Postdoctoral Research Fellow: Sept. 2016–Aug. 2019 — with Prof. Neil Balmforth

Education and Qualifications

- **Institute of Mathematics and its Applications, U.K.**
  - 2024–Present: **Chartered Mathematician (CMath MIMA)**
- **University of Cambridge, U.K.**
  - 2013–2016: **Ph.D. Applied Mathematics & Theoretical Physics**
    Supervisor: Prof. Colm-cille Caulfield
    Thesis title: Generalised nonlinear stability of stratified shear flows: adjoint-based optimisation, Koopman modes, and reduced models.
  - 2012–2013: **M.Math. (Part III) (with Distinction)**
    Thesis title: Instability and perturbation growth in stratified shear flows.
  - 2009–2012: **B.A. Mathematics (First Class)**
- **University of Dundee, U.K.**
  - 2021–2022: **Associate Module, PGCert Academic Practice in Higher Education**
    AFHEA, Jun. 2022

Research Focus

- **Energy efficiency – dynamical systems interpretation of transition and turbulence in fluids**
  - Designing control schemes to guide turbulent flows towards energy-efficient low-drag states.
  - Investigating the effect of density stratification on nonlinear steady vortex solutions.
  - Analysing critical trajectories in state space that transition to turbulence.
- **Climate parameterisation – simulation and categorisation of oceanographic mixing**
  - Developing a nonlinear diagnostic to analyse oceanographic observations of mixing.
  - Developing a linear diagnostic for distinguishing stratified shear flow instabilities.
  - Direct and contour simulation of the nonlinear dynamics of shear flow instabilities.
- **Manufacturing and environmental modelling – compressible and reactive porous media**
  - Determining the compressional dewatering rheology of wood-fibre suspensions.
  - Migration of salt through sea-ice into overlying snow, for sea-ice thickness calibration.
  - Modelling of natural estuarine sediments.

Teaching and Mentoring

- **Lecturer** — University of Dundee, UK
  2020–Present
  SSEN Learning and Teaching Awards Finalist (Innovation), 2020
  SSEN Learning and Teaching Awards Nominee (Innovation), 2021
  DUSA Student Led Teaching Awards Finalist (Innovation), 2023
  - **EG11003 Science and Engineering Mathematics 1A (BEng Year 1)**: 2021–Present.
    Introductory Mathematics (Algebra; Functions; Trigonometry; Vectors; Calculus).
  - **ME22002 Mechanics of Machines (BEng Year 2)**: 2020–2024.
    Mathematics of Fundamental Mechanics (Rotation; Energy; Momentum; etc.); Applications to Machinery (Dynamic Balancing; Vibration; Mathematical Models of Gear Trains & Belt Drives).
  - **EG22010 Solid Mechanics (BEng Year 2)**: 2020-2024.
    Introductory Solid Mechanics (Restraints; Stress and Strain; Shear Force; Bending Moments; Moments of Area; Bending Stresses; Torsion; Mohr's Circle; FMEA).
  - **ME30001 Engineering Design (BEng Year 3)**:
    Designing a cheaper Lazy Susan. (Foodmek Ltd. 2021)
    Tank design for growing algae on a production scale. (Foodmek Ltd. 2022)
    Insulating an industrial furnace. (Rautomead Ltd. 2023)
    Designing new robotic production line (Rautomead Ltd. 2024)
    Eliminating resonance in an industrial machine (Rautomead Ltd. 2025)
  - **CE40001 Civil Engineering Honours Project (BEng Year 4)**:
    Power grids: identifying weak points likely to cause blackouts (2020/21).
    Coastal transport of pollutants by river discharge (2022/23).
  - **CE40003/EV40001 Water Resources and Treatment (BEng/BSc Year 4)**: 2020–2021.
    Water Treatment (Water Treatment Plants; Softening; Flocculation; Settling; Filtration).
  - **GA40001 Graduate Apprenticeship Civil Engineering Honours Project (BEng Year 4)**:
    A comparison between offshore wind farm and tidal energy arrays (2021/22).
    Design of a table-top coastal defense experiment for outreach (2022/23).
  - **ME40002 Fluid Mechanics (BEng Year 4)**: 2025-Present.
    Advanced Engineering Fluid Mechanics (Piping Systems, Mass Conservation, Navier–Stokes, Exact Solutions, Potential Flows, Boundary Layers, Drag & Lift, Compressible Flows).
  - **ME40005 Mechanical Engineering Honours Project (BEng Year 4)**:
    Review of modern paper pressing technology and its modelling (2020/21).
    Unsteady flow effects on tidal turbine efficiency (2021/22).
    Close approach of a tidal turbine blade to the seafloor (2021/22).
    Aerodynamics of a truck in a cross-wind (2022/23).
    Simulation of heat transfer in agitated cooking vessels (2022/23).
    Supersonic wheel tips (2023/24).
    Wind & tidal turbine comparison (2024/25)
    Moto GP aerodynamics (2024/25)
  - **CE50007 Civil Engineering Research Project (MSc)**:
    Assessment of the settling and deposition of organic wastes from fish farming (2020/21).
  - **CE50033 Coastal Processes and Engineering Applications (MSc)**: 2020.
    Surface-wave Processes (Shoaling; Refraction; Diffraction; Reflection; Coastal Structures).
  - **ME53001 Industrial Placement Engineering Project (MSc)**:
    Modelling the cooking time of steam-jacketed cooking vessels. (Foodmek Ltd. 2020)
    Optimisation of electroplating to reduce thickness non-uniformity. (Interplex PMP Ltd. 2021)

Selection of a Cobot for automotive manufacturing. (Interplex PMP Ltd. 2021)
River Hydrowheel simulation, design and testing. (Hydrowheel Ltd. 2022)
Design and simulation of Ocean Hydrowheel. (Hydroweel Ltd. 2022)
Market research on hydrokinetic, wind and tidal turbines in the UK. (Guha 2023)
Investigation of the power take-off of a novel renewable energy device. (Guha 2023)
Industrial engineering management systems (Logie Timber 2024)

- **PhD Supervisor** — University of Dundee, UK
  2020–Present
  - Yi Yuan (matric. 2022) CSC Studentship
    Primary Supervisor. Fluid-solid flow transitions in mixed (sand-mud) sediments: enhanced modelling of sedimentation in estuarine and coastal waters.
  - Filip Jovanovic (matric. 2021) EPSRC DTP
    Primary Supervisor. Periodic forcing of chaotic dynamical systems: effect on unstable periodic orbits and statistics.
  - Saranraj Gururaj (matric. 2020, grad. 2023) U. Dundee Scholarship
    Secondary Supervisor. Instabilities and mixing in partially stratified estuaries.

- **Advisor of Studies** — University of Dundee, UK
  Academic and Pastoral Advisor
  - BEng Mechanical Engineering (*and* with Renewables): matric. 2022 – 27 students
  - BEng Mechanical Engineering (*and* with Renewables): matric. 2020 – 2 students

- **Lecturer** — University of British Columbia, Canada
  Postdoctoral Lecturer: 2017–2018
  Special commendation from the Dean, Faculty of Science, 2017, 2018
  - **MATH 256 Differential Equations (Engineering Mathematics Year 2)**: 2016/17, 2017/18.
    Differential Equations (First-order ODEs; Second-order ODEs; Systems of first-order ODEs; Laplace transforms; Fourier series; Separation of variables for PDEs).

- **Research Student Mentoring** — University of British Columbia, Canada
  Postdoctoral mentoring of graduate and undergraduate research
  - Daniel Paterson, PhD Candidate, Department of Chemical Engineering (now at AFT-Global)
  - Romain Mary, Undergraduate Research Visitor from ENSTA Paris (now at AVNIR Engineering)

- **College Teaching Assistant (Tutorials)** — St. John's College, University of Cambridge, UK
  2014–2016
  - **Methods (Mathematics Year 2)**:
    Further Differential Equations (Fourier series; Sturm–Liouville theory; Wave, heat and Laplace equations; Separable solutions of PDEs; Green's functions for ODEs and PDEs; Fourier transforms; Method of images).

- **Undergraduate Supervisor (Small-group teaching)** — St John's College, Churchill College, Fitzwilliam College, Emmanuel College, Murray Edwards College, University of Cambridge, UK
  2013–2016
  - **Methods (Mathematics Year 2)**
  - **Dynamical Systems (Mathematics Year 3)**:
    Essentials of Dynamical Systems (Phase portraits; Stability of fixed points and periodic orbits; Near-Hamiltonian flows; Stationary bifurcations; Hopf bifurcations; Bifurcations of maps; Definitions of chaos; Horseshoes).

  - **Asymptotic Methods (Mathematics Year 3)**:
    Introduction to Asymptotic Methods (Asymptotic sequences; Laplace's method; Stationary phase; Steepest descent; WKB and Liouville–Green).
  - **Mathematical Biology (Mathematics Year 3)**:
    Topics in Mathematical Biology (Discrete or continuous dynamical systems; Fixed points and stability; Master equations; Fokker–Planck equations; Similarity solutions; Travelling wave solutions; Turing instability).

Additional Research Experience

- **Woods Hole Oceanographic Institution** — Woods Hole, Massachusetts, USA
  Geophysical Fluid Dynamics Program Fellow: Jun.–Aug. 2015
  - Collaborator: Prof. Neil Balmforth
- **University of Cambridge, DAMTP** — Cambridge, UK
  Research Assistant: Jun.–Aug. 2012
  - Supervisor: Prof. John Lister
- **University of Cambridge, DAMTP** — Cambridge, UK
  Research Assistant: Jun.–Sep. 2011
  - Supervisors: Prof. Nathalie Vriend, Prof. Jim McElwaine, Prof. Stuart Dalziel

Research Funding

- **EPSRC New Investigator Award** — PI, £244k awarded, £305k FEC, Feb. 2023 – Aug. 2025
  Saving energy via drag reduction: a mathematical description of oscillatory flows (EP/W021009/1)
  - Dynamical systems interpretation of oscillating-boundary drag reduction and its optimisation.
- **British Society of Rheology Undergraduate Bursary** — PI, £3.4k awarded, Jun. – Sep. 2024
  Thixotropic Modelling of Concrete Pumping
  - Leading an undergraduate research project into an improved model of the non-Newtonian flow of concrete.
- **ETP Knowledge Exchange Network** — Co-I, £10k awarded, £28k FEC, Mar. – Jun. 2022
  Hydrowheel – predicting and harvesting freely available electricity (ETP KEN PR052-EDI)
  - Advising on the simulation, design, and testing of "Hydrowheel", an inexpensive and portable floating waterwheel, and interpreting and explaining power extraction data.

Publications

- **In Press**
  1. Eaves, T. S. 2025: Nonlinear stability measures of synchronised states in a power-grid model *J. Nonlinear Sci.* in press (2025).
- **Published Manuscripts**
  1. Paterson, D., Eaves, T. S., Hewitt, D. R., Balmforth, N. J. and Martinez, D. M. 2022: One-dimensional compression of a saturated elasto-visco-plastic medium. *Phys. Rev. Fluids* 7, 054303 (2022).
  2. Pershin, A., Beaume, C., Eaves, T. S., and Tobias, S. M. 2022: Optimizing the control of transition to turbulence using a Bayesian method. *J. Fluid Mech.* 941, A25 (2022).

3. Paterson, D., Eaves, T. S., Hewitt, D. R., Balmforth, N. J. and Martinez, D. M. 2021: On two-phase modelling of dewatering of pulp suspensions. *AIChE J.* 67, e17277 (2021).
4. Eaves, T. S., Paterson, D., Hewitt, D. R., Balmforth, N. J. and Martinez, D. M. 2020: Dewatering saturated, networked suspensions with a screw press. *J. Eng. Math.* 120, 1-28 (2020).
5. Langham, J., Eaves, T. S. and Kerswell, R. R. 2020: Stably stratified exact coherent structures in shear flow: the effect of Prandtl number. *J. Fluid Mech.* 882, A10 (2020).
6. Paterson, D., Eaves, T. S., Hewitt, D. R., Balmforth, N. J. and Martinez, D. M. 2019: Flow-induced compaction of a fibrous porous medium. *Phys. Rev. Fluids* 4, 074306 (2019).
7. Eaves, T. S. and Balmforth, N. J. 2019: Instability of sheared density interfaces. *J. Fluid Mech.* 860, 145-171 (2019).
8. Ponetti, G., Balmforth, N. J. and Eaves, T. S. 2018: Instabilities in a staircase stratified shear flow. *Geophys. Astrophys. Fluid Dyn.* 112, 1-19 (2018).
9. Eaves, T. S. and Caulfield, C. P. 2017: Multiple instability of layered stratified plane Couette flow. *J. Fluid Mech.* 813, 250-278 (2017).
10. Eaves, T. S. and Balmforth, N. J. 2016: Noisy homoclinic pulse dynamics. *Chaos* 26, 043104 (2016).
11. Eaves, T. S. and Caulfield, C. P. 2015: Disruption of SSP/VWI states by a stable stratification. *J. Fluid Mech.* 784, 548-564 (2015).
12. Brun, P.-T., Audoly, B., Ribe, N. M., Eaves, T. S. and Lister, J. R. 2015: Liquid ropes: A geometrical model for thin viscous jet instabilities. *Phys. Rev. Lett.* 114, 174501 (2015).

Presentations

- **Conference Presentations**

1. Eaves, T. S. 2024: Transition to turbulence in the stokes boundary layer. Part 1: Minimal seeds. Bifurcations and Instabilities in Fluid Dynamics, *24-28 Jun 2024*.
2. Sandoval, J. and Eaves, T. S. 2024: Transition to turbulence in the stokes boundary layer. Part 2: edge states. Bifurcations and Instabilities in Fluid Dynamics, *24-28 Jun 2024*.
3. Jovanovic, F. A. and Eaves, T. S. 2024: Optimisation of average quantities in a forced Lorenz system: influence of periodic orbits. Bifurcations and Instabilities in Fluid Dynamics, *24-28 Jun 2024*.
4. Eaves, T. S. 2023: Compressional rheology of a fibrous porous medium. BSR Mid-Winter Meeting, *19-21 Nov 2023*.
5. Eaves, T. S. 2023: Minimal seeds for transition to turbulence in the Stokes boundary layer. APS DFD, *18-20 Dec 2023*.
6. Jovanovic, F. A. and Eaves, T. S. 2023: Structures and dynamics in a periodically forced Lorenz system. APS DFD, *19-21 Nov 2023*.
7. Jovanovic, F. A. and Eaves, T. S. 2023: Periodic forcing of chaotic fluid systems. Scottish Fluid Mechanics Meeting, *24 May 2023*.
8. Eaves, T. S. 2023: Minimal disturbances to cause blackouts in model power grids. British Applied Mathematics Colloquium, *3-5 Apr. 2023*.
9. Jovanovic, F. A. and Eaves, T. S. 2023: Periodic forcing of chaotic fluid systems. British Applied Mathematics Colloquium, *3-5 Apr. 2023*.
10. Eaves, T. S., Gururaj, S. and Guha, A. 2022: Identification of stratified shear flow instabilities: an estuarine example, International Symposium on Stratified Flows, *29-01 Aug.-Sept. 2022*.

11. Eaves, T. S., Paterson, D., Hewitt, D. R., Balmforth, N. J. and Martinez, D. M. 2021: A poro-elasto-visco-plastic model of the dewatering of a two-phase suspension, Interpore, *31-4 Jun. 2021*.
12. Eaves, T. S. 2020: Towards a categorisation of ocean mixing data sets, MASTS Marine Climate Change Forum, *1-10 Dec. 2020*. **Plenary.**
13. Eaves, T. S., Paterson, D., Hewitt, D. R., Balmforth, N. J. and Martinez, D. M. 2020: A poro-elasto-visco-plastic model of the dewatering of a two-phase suspension, APS DFD, *22-24 Nov. 2020*. **Invited.**
14. Eaves, T. S 2020: Dewatering of fibrous porous media, Scottish Fluid Mechanics Meeting, *28 May 2020*.
15. Eaves, T. S. and Salehipour, H. 2019: Flavours of stratified shear flows: algorithmic detection, APS DFD, *23-26 Nov. 2019*.
16. Eaves, T. S., Paterson, D., Hewitt, D. R., Balmforth, N. J. and Martinez, D. M. 2019: Dewatering saturated, networked suspensions with a screw press, APS DFD, *23-26 Nov. 2019*.
17. Eaves, T. S., Paterson, D., Hewitt, D. R., Balmforth, N. J. and Martinez, D. M. 2019: Compaction of fibrous porous media. Oxford Fluids Network Workshop: Large-Deformation Mechanics of Fluids with Complex Rheology, *22-23 Oct. 2019*.
18. Eaves, T. S. and Balmforth, N. J. 2019: Instability of sheared density interfaces. Bifurcations and Instabilities in Fluid Dynamics, *16-19 Jul. 2019*.
19. Eaves, T. S., Caulfield, C. P. and Mezić, I. 2019: Koopman operator theory for turbulence transition in plane Couette flow. SIAM Dynamical Systems, *19-23 May 2019*. **Invited.**
20. Paterson, D., Hewitt, D. R., Eaves, T. S., Balmforth, N. J. and Martinez, D. M. 2018: Flow-induced compaction of a fibrous porous medium I: from the coffee press to industrial machinery. APS DFD, *18-20 Nov. 2018*.
21. Eaves, T. S., Paterson, D., Hewitt, D. R., Balmforth, N. J. and Martinez, D. M. 2018: Flow-induced compaction of a fibrous porous medium II: gelling and Freeness. APS DFD, *18-20 Nov. 2018*.
22. Langham, J., Eaves, T. S. and Kerswell, R. R. 2018: Density homogenization of a stratified exact coherent structure at high Prandtl number. APS DFD, *18-20 Nov. 2018*.
23. Eaves, T. S. and Balmforth, N. J. 2017: Effect of Prandtl number and bulk Richardson number on the secondary nonlinear dynamics of the Taylor–Caulfield instability. APS DFD, *19-21 Nov. 2017*.
24. Eaves, T. S. and Balmforth, N. J. 2017: Secondary nonlinear dynamics of the Taylor–Caulfield instability. SIAM Pacific NW Conference, *27-29 Oct. 2017*. **Invited.**
25. Eaves, T. S., Caulfield, C. P. and Mezić, I. 2016: Transition to turbulence: highway through the edge of chaos is charted by Koopman modes. APS DFD, *20-22 Nov. 2016*.
26. Eaves, T. S. and Caulfield, C. P. 2016: Disruption of the vortex-wave interaction self-sustaining process in stratified plane Couette flow. Fields Institute Workshop on Extreme Events and Criticality in Fluid Mechanics, *25-29 Jan. 2016*.
27. Eaves, T. S. and Caulfield, C. P. 2015: Disruption of the vortex-wave interaction self-sustaining process in stratified plane Couette flow. APS DFD, *22-24 Nov. 2015*.
28. Eaves, T. S. and Caulfield, C. P. 2015: Minimal seeds for turbulence in stratified plane Couette flow. EUROMECH Colloquium 567: Turbulent mixing in stratified flows, U. Cambridge, Cambridge, UK, *22-25 Mar. 22-25*.
29. Eaves, T. S. and Caulfield, C. P. 2014: Nonlinear optimal perturbations of stratified plane Couette flow. APS DFD, *23-25 Nov. 2014*.

30. Caulfield, C. P. and Eaves, T. S. 2014: Multiple instabilities in layered stratified plane Couette flow. APS DFD, *23-25 Nov. 2014*.

- **Conference Posters**
  1. Jovanovic, F. A. and Eaves, T. S. 2022: Periodic forcing of chaotic fluid systems. Scottish Fluid Mechanics Meeting, *26 May 2022*.
  2. Eaves, T. S. and Caulfield, C. P. 2014: Nonlinear optimal perturbations of stratified plane Couette flow. IPAM Workshop, Mathematics of Turbulence IV: Turbulence in Engineering Applications, *17-21 Nov. 2014*.

- **Seminars**
  1. University of Durham, Applied Mathematics Seminar Series, *20 Jun. 2023*.
  2. Woods Hole Oceanographic Institution, Geophysical Fluid Dynamics Program, *27 Jul. 2022*.
  3. University of Bristol, Fluids and Materials Seminar Series, *17 Jun. 2021*.
  4. Marine Alliance for Science and Technology for Scotland (MASTS) **Public Webinar Series**, *3 Mar. 2021*. YouTube
  5. University of Strathclyde, Continuum Mechanics and Industrial Mathematics Seminar Series, *20 Oct. 2020*.
  6. Imperial College London, Aerodynamics and Control Seminar Series, *14 Oct. 2020*. Vimeo
  7. University of St Andrews, Applied Mathematics Seminar Series, *25 Sept. 2020*.
  8. University of Oxford, Mathematical Geoscience Seminar Series, *25 Oct. 2019*.
  9. Woods Hole Oceanographic Institution, Geophysical Fluid Dynamics Program, *24 Jul. 2019*.
  10. Philipps-Universität Marburg, Complex Systems Seminar Series, *30 Apr. 2019*.
  11. Woods Hole Oceanographic Institution, Geophysical Fluid Dynamics Program, *3 Aug. 2018*.
  12. University of British Columbia, Scientific Computing, Applied and Industrial Mathematics Seminar Series, *31 Oct. 2017*.
  13. University of British Columbia, Fluid Dynamics Seminar Series, *9 Mar. 2017*.
  14. University of Cambridge, G.K. Batchelor Laboratory Seminar Series, *30 May 2014*.

Service

- **Department Roles**
  - Civil Engineering Recruitment Lead (2024–Present)
    Organising and running open days in Civil Engineering
    Updating Civil Engineering webpage and marketing materials.
    Tracking and reporting on in-year recruitment progress.

- **Committee Membership**
  - Civil Engineering Industrial Advisory Committee Working Group on the Climate Emergency (2023–2024)
    Developed a vision for the discipline around tackling the Climate Emergency.
    Embedded industry project-based response to the Climate Emergency into our academic portfolio.
  - School Sustainability Working Group (2023–present)
    Identifying and addressing sustainability issues within SSEN.
    Disseminating policies and opportunities around sustainability issues to colleagues.

- Short Life Working Group on Scientific Computing (2023)
  Information gathering on scientific computing needs with Civil Engineering.
  Developed job descriptions for new scientific computing officer and manager positions.
- Pedagogy Champion, Mechanical Engineering (2022–24)
  Discussing pedagogical approaches with the School Education Committee.
  Disseminating pedagogy recommendations to Mechanical Engineering colleagues.
- School Internationalisation Committee (2020–21)
  School planning committee for international student recruitment and conversion.
  Feedback of committee actions to Civil and Mechanical Engineering staff.
- Short Life Working Group on Usage of Space (2021)
  Information gathering on office space requirements with the School.
  Designed a survey to gather staff opinions on office space and working post-Covid.
  Developed the survey using feedback from the group – survey used by the Dean.

- **PhD Examiner**
  - Exam Convenor (University of Dundee): Jonathan Wilkin (2024)
    New insights into turbidity currents and their deposits in channel mouth settings
  - Internal Examiner (University of Dundee): Azin Lamei (2023)
    Elastic response of floating offshore wind turbines to waves, current and wind
  - Internal Examiner (University of Dundee): Lorna Dennison-Wilkins (2021)
    A study of human body movement in inland waterways

- **Peer Review**
  - Journal of Fluid Mechanics (23 manuscripts, plus revisions)
  - Physical Review Fluids (2)
  - Proceedings of the Royal Society A (1)
  - SIAM Journal on Applied Mathematics (1)
  - Physics Letters A (1)
  - ASME Offshore Mechanics and Arctic Engineering (1)
  - Applied Mathematical Modelling (1)
  - Journal of Waterway, Port, Coastal, and Ocean Engineering (1)

- **Seminar Organisation**
  - Session Chair, International Symposium on Stratified Flows, *30 Aug. 2022*.
  - Organiser, G. K. Batchelor Laboratory Seminar Series, *2014.*
    Scheduled speakers, organised end-of-year event.

- **Outreach**
  - STEM Ambassador *2022–present*.
    2022–2023: Engineering the Curriculum: Inspiring the Next Generation of Engineers, University of Dundee. Academic team leader, designing and facilitating secondary-school classroom activities around water treatment and purification, to contribute to a Tayside STEM Library.
  - Open Days, University of Dundee, *2022*.
    Planned and ran fluids lab demonstrations for offer-holders' day and general open day.
    Developed a new experiment to demonstrate water filtration.

  - Math Mania Volunteer, University of British Columbia, *2018*.
    Interactive mathematics demonstrations, puzzles, and games, for primary-age children.
  - Fluid Dynamics Laboratory Demonstrator, Cambridge Science Festival, *2014*.
    Demonstration of vortex stretching and other fluids experiments.

- **Extended Research Visits**
  - Invited Programme Visitor, Anti-Diffusive Dynamics, Isaac Newton Institute, *Jan.–Jun. 2024*
  - Staff member, Geophysical Fluid Dynamics Program, Woods Hole Oceanographic Institution, *Summer 2018, 2019, 2022.*
  - Industrial collaboration, VTT Technical Research Centre of Finland, *Apr., Aug. 2019.*
  - Industrial seminars, Valmet Ltd (Montreal Canada, Sundsvall Sweden), *Multiple, 2016–2019*.

Academic Awards

- **Geophysical Fluid Dynamics Fellowship** at the GFD Program, Woods Hole Oceanographic Institution, USA, *Jun.–Aug. 2015*
- **Sims Scholarship for PhD** University of Cambridge, UK, *Oct. 2013 – Sept. 2016*
- **Dirac Prize for High Performance in Part III (Master's Degree)** St John's College, University of Cambridge, UK, *Oct. 2013*
- **Ian Hall Prize for High Performance in Part II (Bachelor's Degree)** St John's College, University of Cambridge, UK, *Oct. 2012*

Additional Information

- Proficient in programming in Fortran and Matlab.
- Professional affiliations: Chartered Member of the Institute of Mathematics and its Applications (CMath MIMA), Associate Fellow of the Higher Education Authority (AFHEA), member of the American Physical Society (APS), member of the Society for Industrial and Applied Mathematics (SIAM), member of the British Society of Rheology (BSR).
- Citizenship: United Kingdom.

References

- **Prof. Jonathan A. Knappett** — U. Dundee (Civil Engineering)

  Mailing address: School of Science & Engineering
  Fulton Building
  Dundee DD1 4HN
  United Kingdom

  Telephone: +44 (0)1382 384345

  Email: J.A.Knappett@dundee.ac.uk

- **Prof. Colm-cille P. Caulfield** — U. Cambridge (Applied Mathematics)

  Mailing address: DAMTP, CMS
  Wilberforce Road
  Cambridge CB3 0WA
  United Kingdom

  Telephone: +44 (0)1223 337744

  Email: C.P.Caulfield@damtp.cam.ac.uk

- **Prof. Neil J. Balmforth** — U. British Columbia (Mathematics)

  Mailing address: Department of Mathematics
  Room 121, 1984 Mathematics Road
  Vancouver, BC V6T 1Z2
  Canada

  Telephone: +1 (604) 827 3034

  Email: njb@math.ubc.ca