DR. DEBASISH DAS

Lecturer, Department of Mathematics & Statistics, University of Strathclyde.

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ACADEMIC POSITIONS

Lecturer in Applied Mathematics

Department of Mathematics and Statistics, University of Strathclyde

July 2020 – Present Glasgow, UK

- Mathematical modelling and numerical simulations of biological fluids with applications in soft and active matter, including particles and drops in electric fields, interfacial film dynamics, effects of surfactants, and collective dynamics of chiral particles in magnetic and electric fields.
- Supervising two PhD students.

Post-Doctoral Research Associate

Department of Applied Mathematics and Theoretical Physics (DAMTP), University of Cambridge

November 2016 – July 2020 Cambridge, UK

- Mathematical modeling and numerical simulations of bacteria and cilia hydrodynamics.
- Mentor: Eric Lauga

Graduate Research Assistant

Department of Mechanical and Aerospace Engineering, University of California

January 2014 – September 2016 San Diego, California, USA

Department of Mechanical Science and Engineering,University of Illinois

January 2011 – December 2013 Urbana-Champaign, Illinois, USA

- Mathematical modeling and numerical simulations of electrohydrodynamics of particles and drops in strong electric fields.
- Supervisor: David Saintillan

PUBLICATIONS IN PRESS

Journal Articles

- M. McDougall, S. Wilson, and **D. Das** (2026a). "Nonlinear electrohydrodynamics of a surfactant-laden drop". *Under Review in Journal of Fluid Mechanics*.
- M. McDougall, S. Wilson, and **D. Das** (2026b). "Nonlinear three dimensional electrohydrodynamic interactions of viscous leaky dielectric drops". *Under Review in Physical Review Fluids*.
- L. Schofield, **D. Das**, S. Wilson, and A. Wray (2026). "Evaporation of an elongated drop". *In Preparation*.
- **D. Das**, R. E. Goldstein, and E. Lauga (2026). "Hydrodynamic mechanism for wall-alignment during motor-driven cargo transport along microtubules". *In Preparation*.
- E. Causa, **D. Das**, L. Feriania, J. Kotara, and P. Cicuta (2025). "Cilia dynamics create a dynamic barrier to penetration of the periciliary layer in human airway epithelia". *Proceedings of the National Academy of Sciences* 122.28, e2419032122.

EDUCATION

Ph.D. in Mechanical Engineering

University of California, San Diego, USA

January 2014 – September 2016

Thesis title: Electrohydrodynamics of particles and drops in strong electric fields.

Ph.D. in Mechanical Engineering (Post qualifying exam candidate)

University of Illinois, Urbana Champaign, USA

August 2012 – December 2013

M.S. in Mechanical Engineering

University of Illinois, Urbana Champaign, USA

August 2010 – August 2012

Thesis title: Electrohydrodynamics of particles undergoing Quincke rotation.

B.Tech. in Mechanical Engineering

National Institute of Technology, Rourkela, India

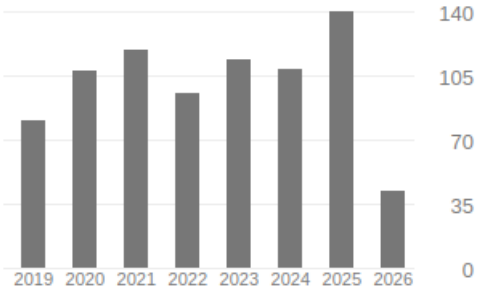
July 2005– April 2009

GOOGLE SCHOLAR

As of 31th Mar, 2026

Cited by VIEW ALL

	All	Since 2021
Citations	949	620
h-index	12	11
i10-index	12	11



- E. Fitzgerald, C. Clavaud, **D. Das**, I. C. D. Lenton, and S. R. Waitukaitis (2025). "Rolling at right angles: Magnetic anisotropy enables dual-anisotropic active matter". *Physical Review E* 112.6, p. 065418.
- P. H. Htet, **D. Das**, and E. Lauga (2024). "Hydrodynamic hovering of swimming bacteria above surfaces". *Physical Review Research* ***(selected for inclusion in the APS outreach to the press)*** 6.3, p. L032070.
- H. Nganguia, **D. Das**, O. S. Pak, and Y.-N. Young (2023). "Influence of surface viscosities on the electrodeformation of a prolate viscous drop". *Soft Matter* 19.4, pp. 776–789.
- **D. Das** (2023). "Flow field disturbance due to point viscosity variations in a heterogeneous fluid". *Physical Review Fluids Letters* 8.5, p. L051301.
- **D. Das** and D. Saintillan (2023). "On the absence of collective motion in a bulk suspension of spontaneously rotating dielectric particles". *Soft Matter* 19.35, pp. 6825–6837.
- **D. Das** and D. Saintillan (2021). "A three-dimensional small-deformation theory for electrohydrodynamics of dielectric drops". *Journal of Fluid Mechanics* (***Early career researcher invited article for special JFM volume in celebration of G. K. Batchelor's life and work***) 914.A22.
- N. Pellicciotta, **D. Das**, J. Kotar, M. Faucourt, N. Spassky, E. Lauga, and P. Cicuta (2020). "Cilia density and flow velocity affect alignment of motile cilia from brain cells". *Journal of Experimental Biology* 223.24.
- **D. Das** and E. Lauga (2019a). "Active particles powered by Quincke rotation in a bulk fluid". *Physical Review Letters* 122, p. 194503.
- **D. Das** and E. Lauga (2019b). "Transition of bacteria from swimming to becoming surface bound". *Physical Review E* ***(Editor's Suggestion)*** 100, p. 043117.
- H. Xu, J. Dauparas, **D. Das**, E. Lauga, and Y. Wu (2019). "Self-organization of swimmers drives long-range fluid transport in bacterial colonies". *Nature Communications* 10, p. 1792.
- J. Dauparas, **D. Das**, and E. Lauga (2018). "Helical micropumps near surfaces". *Biomicrofluidics* 12, p. 014108.
- E. E. Riley*, **D. Das***, and E. Lauga (2018). "Swimming of peritrichous bacteria is enabled by an elastohydrodynamic instability". *Scientific Reports* 8, p. 10728.
- **D. Das** and E. Lauga (2018). "Computing the motor torque of *Escherichia coli*". *Soft Matter* ***(Front Cover)*** 14, pp. 5955–5967.
- **D. Das** and D. Saintillan (2017a). "A nonlinear small-deformation theory for transient droplet electrohydrodynamics". *Journal of Fluid Mechanics* 810, pp. 225–253.
- **D. Das** and D. Saintillan (2017b). "Electrohydrodynamics of viscous drops in strong electric fields: numerical simulations". *Journal of Fluid Mechanics* 829, pp. 127–152.
- A. Bricard, J.-B. Caussin, **D. Das**, C. Savoie, V. Chikkadi, K. Shitara, O. Chepizhko, F. Peruani, D. Saintillan, and D. Bartolo (2015). "Emergent vortices in populations of colloidal rollers". *Nature Communications* 6, p. 7470.
- **D. Das** and D. Saintillan (2013). "Electrohydrodynamic interaction of spherical particles under Quincke rotation". *Physical Review E* 87, p. 043014.

SUPERVISION/TEACHING

PhD Supervisor

University of Strathclyde

October 2021 – present Glasgow, Scotland

- PhD supervisor for Michael McDougall on project titled "Electrohydrodynamics interactions of a droplet pair".

RESEARCH AWARDS

- **Leverhulme Research Project Grant (RPG)**: Awarded a research grant of £403,532 over 36 months for "Active Self-Propelled Helices" starting from September 2026 that will fund an international PhD student and a Post-Doctoral Research Associate.
- **Research Excellence Award (REA) - PhD studentship**: Awarded three years of student funding for project "Electrohydrodynamics interactions of a droplet pair" from 2021-2024.
- **EPSRC Doctoral Training Partnerships Strathclyde - PhD studentship**: Awarded four years of student funding for project "Evaporation of interacting droplets on inclined surfaces" from 2022-2026.

REFERENCES

Prof. Eric Lauga, FRS
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Prof. Stephen Wilson
@ Professor of Applied Mathematics, University of Bath
sw3197@bath.ac.uk
Phone: +44-1225-386997

Prof. Pietro Cicuta
@ Professor of Biological and Soft Systems, University of Cambridge
pc245@cam.ac.uk
Phone: +44-1223-337462

ACADEMIC SERVICES

- **EPSRC Panel Member**: Mathematical Sciences Prioritisation Panel May 2023, Engineering and Physical Sciences Research Council, UK Research and Innovation.
- **Grant Reviewer**: Full member of Peer Review College, Engineering and Physical Sciences Research Council, UK Research and Innovation.
- **Journal Referee**: Journal of Fluid Mechanics, Soft Matter, Physical Review E and F, Proceedings of the Royal Society of London A, European Physical Letters, Applied Mathematical Modelling, Acta Mechanica, Journal of Fluids and Structures, Journal of Engineering Mathematics, Electrophoresis, Society for Industrial and Applied Mathematics, Langmuir, International Journal of Numerical Methods for Heat & Fluid Flow, The IMA Journal of Applied Mathematics.

- PhD supervisor for Lauren Schofield on project titled “Evaporation of interacting droplets on inclined surfaces”.

Lecturer

University of Strathclyde

October 2020 – present Glasgow, Scotland

- Lecturer for MM554/Scottish Mathematical Sciences Training Centre (SMSTC): Asymptotic and Analytical Methods.
- Lecturer for SMSTC: Continuum Mechanics.
- Lecturer for MM300: Complex Variables and Integral Transforms.
- Lecturer for MM409: Mathematical Introduction To Networks.
- Supervisor for Communicating Mathematics And Statistics (equivalent to Bachelor’s Thesis).

Research Mentor

University of Cambridge

January 2017 – June 2019 Cambridge, UK

- Research mentor for 2 PhD students that resulted in joint publications.
- Independent research supervisor for a mathematics undergraduate student from Trinity College.

Supervisor

University of Cambridge

January 2017 – January 2018 Cambridge, UK

- Supervisor for fluid mechanics part-II lecture.

Course Instructor

University of Illinois

June 2011 – September 2011 Illinois, USA

- Introductory Fluid Mechanics course.
- The class comprised of 45 students including juniors and seniors from Mechanical, Civil, Agricultural & Biological Engineering departments.

Teaching Assistant

University of Illinois

January 2011 – December 2013 Illinois, USA

- Introductory Fluid Mechanics and Fundamentals of Fluid Dynamics courses.
- Responsible for conducting the labs and grading the reports.
- Promoted to head TA for Fundamentals of Fluid Dynamics in Spring 2012.

Undergraduate Tutor

Irwin Academic Center, University of Illinois

January 2011 – December 2013 Illinois, USA

- Courses: Applied Linear Algebra, Introductory Fluid Mechanics, Introductory Dynamics, University Physics-Electricity and Magnetism.

CERTIFICATIONS

- **Fellow of the Higher Education Academy (FHEA)**.
- **PostGraduate Certificate in Learning and Teaching Higher Education**, University of Strathclyde.
- **Graduate Teacher Certificate** and **Teacher Scholar Certificate**, Center for Innovation in Teaching & Learning (CITL), UIUC.

TRAVEL AWARDS

- **London Mathematical Society**: Awarded £1200 to visit Prof. Steven Brunton, University of Washington, Seattle (2026).
- **University of Strathclyde**: Awarded £4800 from the Sir David Anderson Bequest Award to visit Prof. Steven Brunton, University of Washington, Seattle (2026).
- **Institute for Mathematics and its Applications**: Awarded £700 for participating in British Applied Mathematics Colloquium 2024.
- **Institute for Mathematics and its Applications**: Awarded £1500 for participating in XIXth International Congress on Rheology 2023.
- **Institute for Mathematics and its Applications**: Awarded £1500 for participating in APS DFD and AIChE 2019.
- **Mechanical and Aerospace Engineering, UC San Diego**: Awarded $1000 for participating in ICTAM 2016.
- **Graduate Student Association, UC San Diego**: Awarded $500 for participating in ICTAM 2016.
- **Forum on Graduate Students Affairs, APS**: Awarded $500 travel award for participating in APS DFD 2015.

ADMIN. DUTIES

- Member of ATHENA SWAN team.
- Continuum mechanics & Industrial Mathematics representative on the departmental Knowledge Exchange (KE) working group.
- Departmental member of staff-student liaison committee.

PROGRAMMING SKILLS

JULIA | FORTRAN | MATLAB | C | C++ | PYTHON | HPC | OPENMP | MPI | CUDA | OPENMP | UNIX | PARAVIEW

INVITED SEMINARS PRESENTATIONS

- Jan 2026: Department of Chemical Engineering, Stanford, USA
- Sep 2025: The International Micro and Nano Flows Conference, University of Edinburgh, UK
- Jun 2024: Department of Mechanical Engineering, Indian Institute of Science (IISc), Bengaluru, India
- Jun 2024: International Centre for Theoretical Sciences (ICTS), Bengaluru, India
- Jun 2024: National Centre for Biological Sciences (NCBS), Bengaluru, India
- Apr 2024: Invited Speaker in the mini-symposium “Mechanics controls the behaviour of biological and active materials” at The British Applied Mathematics Colloquium (BAMC), Newcastle, UK
- Jan 2024: Distinguished speaker under Early Career Researchers category at the workshop on “Interfacial Engineering at Multiple Spatio-temporal Scales”, Indian Institute of Science, India
- Aug 2023: Challenges in the Physics of Active and Biological Matter – Interplay Between Computer Simulations, Theory, and Experiments workshop, Aalto University, Finland
- May 2023: 21st International Workshop on Numerical Methods for Non-Newtonian Flows, Glasgow, UK
- Apr 2023: Physics Department, University of Warsaw, Poland
- Dec 2022: BioLunch Seminar Series, DAMTP, Cambridge, UK
- Dec 2021: Motility in Microbes, Molecules and Matter Meeting, organized jointly by the Institute of Physics (IoP) and the Physics of Life Network (PoLNet3)
- Nov 2021: BioMathematics Seminar, Department of Mathematics, University of California, Davis
- Sep 2021: Durham-Oxford-Strathclyde meeting in Anisotropic Materials, Durham University
- Jul 2021: Complex Fluids Seminar, Carnegie Mellon University, Pittsburgh, USA
- May 2021: 7th International Conference on Micro and Nano Flows, Imperial College London
- Apr 2021: Commemorative “G. K. Batchelor Seminar Series” organised by University of Cambridge to commemorate the life and work of George Batchelor (1920 – 2000)
- Apr 2021: Department of Physics, Warsaw, Poland
- Jan 2021: Department of Mathematics, University of Manchester, UK
- Jan 2020: Department of Chemical Engineering, University of Michigan, Ann Arbor, USA
- Jan 2020: Department of Mechanical Engineering, University of Michigan, Dearborn, USA
- Jan 2020: School of Mathematics and Statistics, University of Glasgow, Scotland
- Jan 2020: School of Mathematics, University of Edinburgh, Scotland
- Oct 2019: Condensed matter physics seminar series, School of Physics & Astronomy, University of Edinburgh, Scotland
- Jan 2018: Department of Mathematics, Imperial College London, UK
- Oct 2017: Mathematical Biology Department, University of Birmingham, UK
- May 2017: Mathematical Biology and Chemistry Department, University of York, UK
- May 2017: Schlumberger Gould Research Center, Cambridge, UK
- Nov 2015: 68th Annual Meeting of the APS DFD, Boston, MA, USA (Invited talk in focus session: Electro-Hydro-Dynamics of Drops,

Vesicles and Membranes)

- Nov 2015: Condensed matter and biophysics group, Physics Department, Brandeis University, MA, USA
- Aug 2015: Eric Shaqfeh research group, Department of Mechanical Engineering, Stanford University, Stanford, CA, USA