Andrew William Baggaley

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Employment

2022–present	Senior Lecturer of mathematics, Newcastle University, UK
2015–2022	Lecturer of mathematics, Newcastle University, UK
2012–2015	Lecturer of mathematics, University of Glasgow, UK
2010–2012	Post-doctoral research associate, Newcastle University, UK Mathematical modelling of the Neolithic of Europe PDRA Supervisor: Dr. Graeme R. Sarson

Education

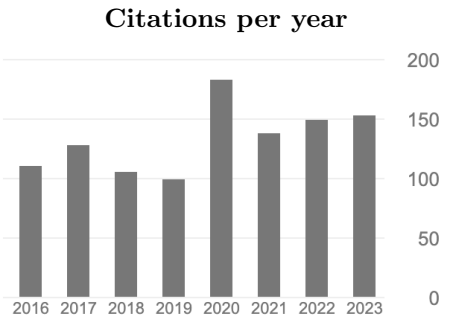
2006–2009	Ph.D. Applied Mathematics Supervisors: Prof. Anvar Shukurov and Prof. Carlo F. Barenghi Newcastle University, UK
2002–2006	MMath. First class with Hons. The chaotic behaviour of a dripping tap Supervisors: Prof. Anvar Shukurov and Dr. Graeme R. Sarson Newcastle University, UK

Grants and Awards

2022	STFC "Superfluid dynamics in neutron stars" (Co-I)	£280K
2022	NERC "Discipline Hopping for Environmental Solutions" (Co-I)	£45K
2021	Leverhulme Trust "Turbulence in Quantum Ferrofluid" (PI)	£160K
2020	EPSRC "Modelling and inference of UK tree pandemics" (PI)	£200K
2014	ESF exploratory workshop "Reconnection events in classical, quantum and magnetized fluids"	£12K

Research Impact

60 refereed journal articles (incl. 3 PRL, 2 PNAS)
$N \approx 1500$ citations, $h = 23$, $i_{10} = 35$ (Google)
Research Group Leader, Mathematics Of Life and Environmental Sciences @Newcastle
(Co-)organiser or member of LOC of 5 major conferences
Member of the organising committee of the UK Quantum Fluids Network & Webinar Series:
https://uk-quantum-fluids-network.github.io/webinars/
Member of Editorial Board, PLOS One
Peer-reviewer for: PRL, PRB, PRE, Phys. Fluids, MNRAS, JLTP, J. R. Soc. Interface, Exp. Fluids.



Teaching and Supervision

Lecture courses, student questionnaire scores are available upon request.

Undergraduate Hydrodynamic Instabilities ($\sim$ 30 students), Newcastle	2023–
Undergraduate Group project, module leader ($\sim$ 120 students), Newcastle	2022–
Undergraduate PDE course (22 lectures, $\sim$ 100 students), Newcastle	2021–23
Undergraduate ODE & PDE course (22 lectures, $\sim$ 120 students), Newcastle	2017–21
Undergraduate Group project, module leader ($\sim$ 160 students), Newcastle	2016–2020
Undergraduate Problem solving course ($\sim$ 160 students), Newcastle	2016–
Undergraduate PDE course (22 lectures, $\sim$ 100 students), Newcastle	2015
Undergraduate ODE & PDE course (30 lectures, $\sim$ 100 students), Glasgow	2012–2014
Undergraduate Calculus course (22 lectures, $\sim$ 100 students), Glasgow	2013

Undergraduate project supervision - Supervised 50+ undergraduate (group and individual) projects on a range of applied maths problems including dynamo theory, coherent animal motion, archaeology and fluid dynamics.

External roles, External examiner, Aston University Mathematics BSc, 2023–

Post Doctoral Research Associates

Gary Liu	*Superfluid dynamics in Neutron stars*	2023-
Srivatsa Badariprasad	*Turbulence in dipolar condensates*	2021-
Ryan Doran	*Vortices in two-component BECs*	2021-2023
Laura Wadkin	*Modelling and inference of UK tree pandemics*	2021-2022
Hannah Kreczak	*Biofouling of microplastics*	2020-2022
Sirio Orozco-Fuentes	*Forecasting of plant epidemics*	2016-2018

Postgraduate students

Laaperi, Axa-Maria	*TBC*	Newcastle PhD 2023-
Julie Thomas	*Superfluid dynamics in Neutron stars*	Newcastle PhD 2022-
Peter Stasiak	*Finite temperature quantum turbulence*	Newcastle PhD 2022-
Matt Dopson	*Network modelling of food webs*	Newcastle PhD 2022-
Jamie McKeown	*Resilient Treescapes: a mathematical approach*	Newcastle PhD 2022-
Richard Tattersall	*Vortex Dynamics in Quantum Fluids*	Newcastle PhD 2022-
George Grimes	*Quantised vortex dynamics*	Newcastle MPhil 2019-2022
John Holden	*Global models of forest epiphytotics*	Leeds/Newcastle PhD 2017-2022
Sultan Aylobi	*Network models of forest epiphytotics*	Newcastle PhD 2017-2021
Jack Walton	*Bayesian inference of cooperative motion*	Newcastle PhD 2016-2021
Hayley Moore	*Constraining models of collective animal motion*	Newcastle PhD 2016-2021
Em Rickinson	*Quantum turbulence*	Newcastle PhD 2015-2020
Scott Richardson	*Modelling of Active Suspensions*	Glasgow PhD 2012-2017
Lucy Sherwin-Robson	*Quantum turbulence*	Newcastle PhD 2011-16
Elena Ardito	*2D Turbulence in Bose-Einstein condensates*	Glasgow MSc 2013

Postgraduate examinations

Holly Middelton-Spencer	Newcastle (internal)	PhD 2023
Kieran Peel	Newcastle (internal)	PhD 2022
Nick Keepfer	Newcastle (internal)	PhD 2022
Ryan Doran	Newcastle (internal)	PhD 2021
Laura Wadkin	Newcastle (internal)	PhD 2021
Cetin Evirgen	Newcastle (internal)	PhD 2020
Adam Griffin	Warwick	PhD 2020
Sarah Jowett	Newcastle (internal)	MPhil 2018
Niklas Hietla	Aalto	PhD 2017
Alex Williamsi	Manchester	MPhil 2015
Tianhui Zhui	Manchester	MPhil 2015
Umar Qureshi	Glasgow (internal)	PhD 2014
Edward Ashley Guise	Lancaster	PhD 2014

References

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Andrew William Baggaley
Refereed Journal Articles

[60] Golightly, A., Wadkin, L. E., Whitaker, S., Baggaley, A., Parker, N., & Kypraios, T.. Accelerating Bayesian inference for stochastic epidemic models using incidence data, to appear in statistics and computing, (2023).

[59] Kreczak, H., Baggaley, A. W., & Willmott, A. J., The dynamics of biofouled particles in vortical flows. Marine Pollution Bulletin, **189**, 114729, (2023).

[58] Laurie, J., & Baggaley, A. W., Vorticity locking and pressure dynamics in finite-temperature superfluid turbulence. Physical Review Fluids, **8**, 054604, (2023).

[57] Wadkin, L. E., Golightly, A., Branson, J., Hoppit, A., Parker, N. G., & Baggaley, A. W., Quantifying invasive pest dynamics through inference of a two-node epidemic network model. Diversity, **15**, 496, (2023).

[56] Galantucci, L., Rickinson, E., Baggaley, A.W., Parker, N.G. and Barenghi, C.F., Dissipation anomaly in a turbulent quantum fluid. Physical Review Fluids, **8**, 034605, (2023).

[55] L.E. Wadkin, J Branson, A Hoppit, N.G. Parker, A. Golightly and A.W. Baggaley, Inference for epidemic models with time-varying infection rates: Tracking the dynamics of oak processionary moth in the UK, Ecology and Evolution, **12**, e8871, (2022).

[54] G.S.E. Grimes and A. W. Baggaley, Approach and separation of bundles of quantized vorticity, Phys. Rev. Fluids, **7**, 034701, (2022).

[53] Kreczak, H., Willmott, A.J. & Baggaley, A.W., Subsurface dynamics of buoyant microplastics subject to algal biofouling, to appear in Limnology and Oceanography (2021).

[52] Galantucci, L., Barenghi, C.F. , Parker, N.G. & Baggaley, A.W., Mesoscale helicity distinguishes Vinen from Kolmogorov turbulence in helium-II, *Physical Review B* **103**, 144503 (2021).

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[47] Laurie, J. & Baggaley, A.W., Coarse-grained pressure dynamics in superfluid turbulence, *Physical Review Fluids* **5**, 014603, (2020).

[46] Cooper, R.G., Mesgarnezhad, M., Baggaley, A.W. & Barenghi, C.F., Knot spectrum of turbulence, *Scientific Reports* **9**, 10545, (2019).

[45] Orozco-Fuentes, S., Neganova, I., Wadkin, L.E., Baggaley, A.W., Barrio, R.A., Lako, R.M., Shukuorv, A. & Parker, N.G., Quantification of the morphological characteristics of hESC colonies, *Scientific reports* **9**, 1-11, (2019).

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[42] Carrer, F., Sarson, G., Baggaley, A.W., Shukurov, A., & Angelucci, D. E. (2019). Ethnoarchaeology-Based Modelling to Investigate Economic Transformations and Land-Use Change in the Alpine Uplands. In Integrating Qualitative and Social Science Factors in Archaeological Modelling (pp. 185-216). Springer, Cham.

[41] S. Orozco-Fuentes, G. Griffiths, M. J. Holmes, R. Ettelaie, J. Smith, A. W. Baggaley, & N. G. Parker Early warning signals in plant disease outbreaks, *Ecological Modellins* **393**, 12-9, (2019).

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