

CONTACT INFORMATION	School of Engineering Mathematics Queen's building University of Bristol BS15 1RZ UK	kn22417@bristol.ac.uk aa2147@cantab.ac.uk
EMPLOYMENT	University of Cambridge , Cambridge, UK Murray Edwards College Summer School Deputy Director Summer School Director	July 2023 – August 2024 October 2024 – August 2025
	University of Cambridge , Cambridge, UK Department of Applied Mathematics and Theoretical Physics Cambridge Mathematics Open intern	July 2022 – August 2022
	University of Bristol , Bristol, UK Faculty of Engineering Widening participation tutor	July 2023 –
EDUCATION	University of Bristol , Bristol, UK School of Electrical, Electronic and Mechanical Engineering Ph.D., Mathematics <i>Advisors: Dr Andrew Lawrie, Dr Stuart Thomson</i> <i>Thesis title: Hydrogen Ventilation in a Geological Disposal facility</i>	November 2022 –
	University of Cambridge , Cambridge, UK BA (Cantab), MA (Cantab) Mathematics <i>Courses mostly in applied mathematics.</i>	October 2019 – June 22
RESEARCH INTERESTS	<ul style="list-style-type: none"> • Experimental Fluid Dynamics • Numerical methods in Fluid Dynamics • Molecular processes in Fluids Research students Pengzhu Shi (MSc) Interaction of twin buoyant plumes in a confined environment	January 2025 –
PUBLICATIONS	Manuscripts in preparation On the mixing behaviour of plumes in a confined environment Stratification development in a laminar crossflow Stratification development in a circular cross section	
TALKS AND PRESENTATIONS	Research Talks	

- Osborne Reynold’s day 2026
‘On the Mixing Behaviour of Plumes in a Confined Environment’
- British Applied Mathematics Colloquium, UEA, Norwich 2026
‘On the Mixing Behaviour of Plumes in a Confined Environment’ - Poster presentation
- RSO annual conference, Manchester 2026
‘How does hydrogen build up in a closed vault environment?’ - Poster presentation
- EFDC2 – 2nd European Fluid Dynamics Conference, Dublin 2025
‘Mixing behaviour of plumes’
- RSO annual conference, Bristol 2025
‘Hydrogen ventilation in a GDF’ - Poster presentation
- RSO advanced manufacturing webinar (Online) 2024
‘Ventilation of Hydrogen in UILW Vaults ’
- RSO annual conference, Sheffield 2024
‘Mixing Behavior of Laminar Plumes with and without a Ventilating Crossflow’
- RSO annual conference, Leeds 2023
‘Hydrogen Ventilation in a Geological Disposal Facility’
- CMP presentation day, Cambridge 2022
‘The motion of anisotropic carbon nano-particles in shear flow: a hydrodynamic perspective’
- Murray Edwards College Maths Circle, Cambridge 2019
‘Sphere packing’

UNDERGRADUATE **Lead Demonstrator** *Wrote and delivered weekly tutorials*

TEACHING
EXPERIENCE

University of Bristol

Introduction to Pure Mathematics

Sept 2024 – Dec 2024

Probability and Statistics

Jan 2025 – March 2025

Supervisor

Various colleges¹ at University of Cambridge

II Fluid Dynamics

Michaelmas 2024 - Present

Teaching Assistant

University of Bristol

Continuum mechanics

January 2024 – May 2024

Applied Linear Algebra

March 2024 – April 2024

Modelling in Applied mathematics

Sept 2024 – Dec 2024

Engineering Mathematics

Sept 2024 – January 2026

Private Tutor *Online and in-person*

A Level (Further) Mathematics/Physics/Computer science

Oct 2019 –

STEP/MAT/TMUA (online)

Oct 2020 –

OUTREACH &
ENRICHMENT

¹Emmanuel, Queen’s, Sidney Sussex, Murray Edwards, Magdalene, Girton, Lucy Cavendish, Fitzwilliam, Churchill and Jesus.

Summer School Director *Created teaching materials and timetables; made admissions decisions; delivered classes and supervisions; ran evening activities.*

Murray Edwards College, Cambridge

She Talks Science STEP summer school, for Y12 2025–

Summer School Deputy Director *Contributed to teaching materials, delivered classes, and supervisions, ran evening activities*

Murray Edwards College, Cambridge

She Talks Science STEP summer school, for Y12 2023–24

Summer School Staff *Delivered classes, and supervisions, ran evening activities*

Murray Edwards College, Cambridge

Murray Edwards STEP summer school, for Y12 2019 - 2022

University of Cambridge

Sutton Trust Summer School 2021 - 2022

Intro to Maths at Uni July 2021

Outreach talks *Delivered research talks to help with widening participation.*

Sutton Trust Summer School July 2024

Insight Into Bristol Summer School July 2024, July 2025, July 2026

Next Step Bristol November 2025

Virtual Summer School May, 2025, May 2026

Dipont Education, Wuxi

Dipont summer camp - Specialist Maths tutor July 2026

ADMISSIONS,
EXAMINING,
OLYMPIADS

Maths Undergraduate Admissions Interviewer *writing questions, interviewing, assessing applicants.*

Homerton College, Cambridge 2024

Vetter *Assessing content, scope, difficulty, and clarity of wording on draft versions of papers and providing feedback.*

UK Mathematical Olympiad for Girls 2019

Pearson Vue Assessment Associate

TMUA 2024

ESAT 2024

Marking supervisor *leading a group of markers, writing mark scheme, marking, moderating, writing examiner's report.*

Cambridge OCR

Sixth Term Examination Papers (STEP) II 2026

Marker *implementing and feeding back on mark scheme.*

University of Bristol

Applied linear algebra coursework 2024

Engineering mathematics 2024

Introduction to Pure Mathematics 2024

Probability and Statistics 2025

Applied analysis B 2025

Cambridge OCR

Sixth Term Examination Papers (STEP) II	2024 – Present
Sixth Term Examination Papers (STEP) III	2024 – Present
United Kingdom Mathematics Trust	
UK Mathematical Olympiad for Girls	October 2019

SERVICE

Panellist

- Mathematics Open Day, University of Cambridge 2022
- Sutton Trust Experience Cambridge Day 2020-22
- BLUE Education Oxbridge interview seminar Oct 2025

ADDITIONAL
SKILLS

- Proficient in MATLAB, Python, C, and L^AT_EX;
- Reading and conversational proficiency in Urdu;
- Experienced with virtual teaching platforms including Zoom, Microsoft Teams, Voov, Moodle, Whereby, Lessonspace, and Blackboard;
- Skilled in developing numerical simulations using the Finite Element Method;
- High Performance Computing (Blue Crystal and Blue pebble) – experienced in running simulations and managing parallel computations.

Dr Andrew Lawrie
Senior Lecturer
School of Engineering Mathematics
University of Bristol
andrew.lawrie@bristol.ac.uk

Dr Eve Vidalis
Teaching fellow
Pennsylvania State University
evepound@gmail.com

REFEREES

Dr Stuart Thomson
Lecturer
School of Engineering Mathematics
University of Bristol
stuart.thomson@bristol.ac.uk