

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 2021
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	

- 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

University of Bristol

EXPERIENCE

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

A Level Mathematics (online and in-person)

October 2019 –

A Level Further Mathematics (online and in-person)

October 2019 –

A Level Physics(online)

October 2019 –

A Level Computer science (online)

October 2019 –

STEP Mathematics (online)

October 2020 –

MAT (online)

October 2020 –

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

OUTREACH &
ENRICHMENT

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 – 2025

Insight Into Bristol Summer School July 2024 – 2025

Next Step Bristol November 2025

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 Assessment

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 Assessment

Sixth Term Examination Papers (STEP) II 2024 – Present

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.

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REFEREES

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