

The History of Engineering at Cambridge

Jim Mynors

Dame Anne's Foreword

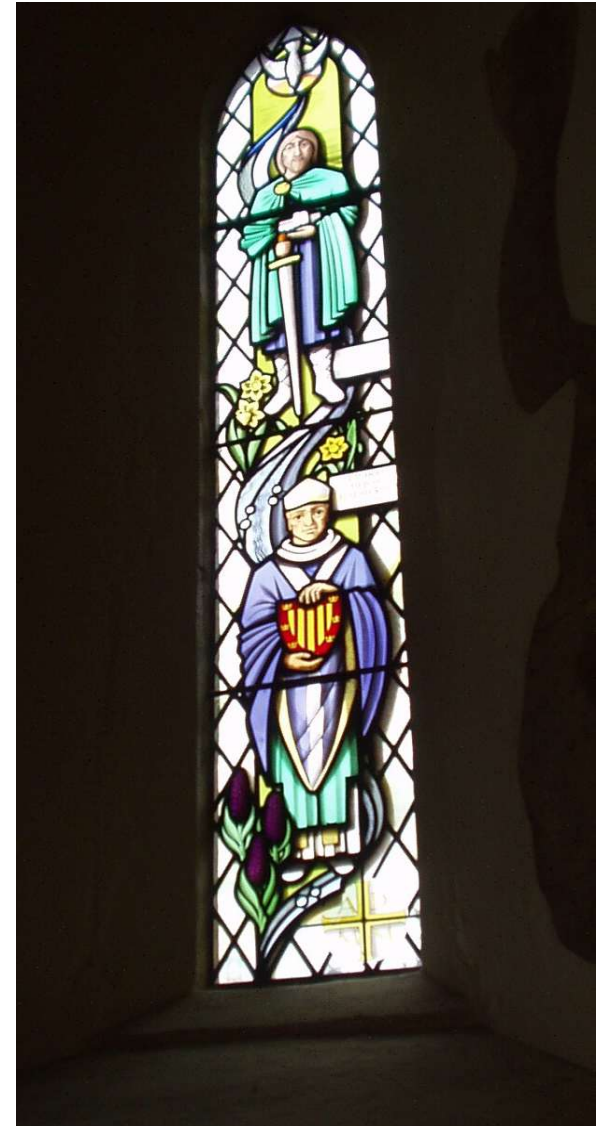


- 150 years ago there was academic opposition to this new discipline. Now Engineering is Cambridge University's largest department. In 1898 it had a 15x6 m hut. Now it has recently added 100,000 sq metres of new facilities
- Professor Dame Ann Dowling's research aims to enable society to have power and mobility without environmental damage or excessive noise. There are two main themes, one associated with efficient, low-emission combustion, and the second with understanding, modelling and reducing the noise from cars, helicopters, fixed-wing aircraft and domestic appliances such as vacuum cleaners and fans.

Founding of University 1209 & Peterhouse 1284

- Thriplow millennium window with Bishop of Ely & Peterhouse crest
- The bishop used Thriplow's glebe income of this small village (£20 pa) to pay for the first -and smallest - college - one that became no1 choice for engineering 600 years later.

I proposed the window design as a Peterhouse engineering alumnus who became vicar of Thriplow!



Andrew Perne

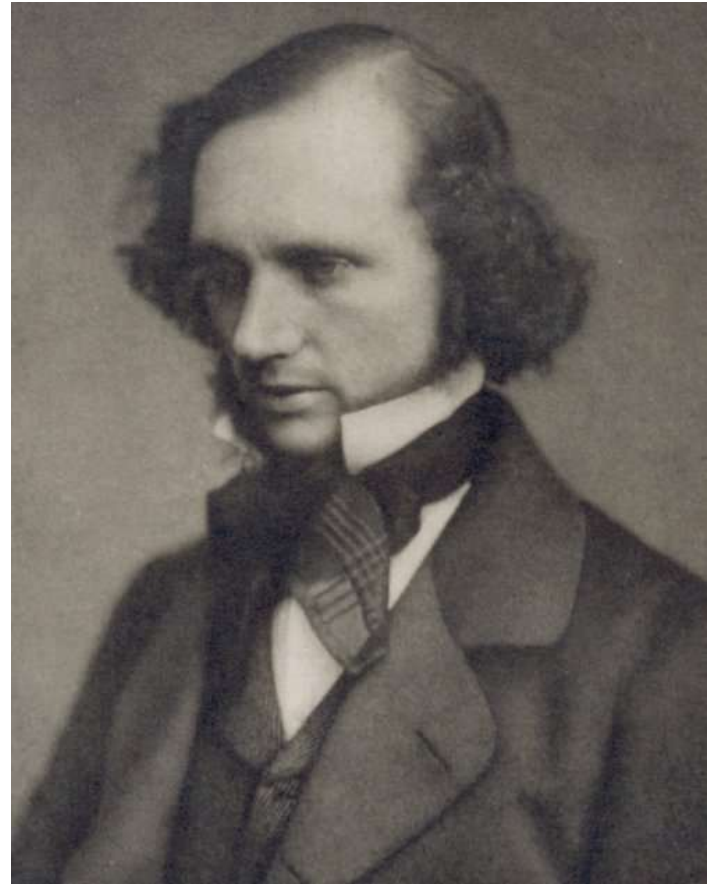
- Perne was five times vice-chancellor of the university in the turbulent mid 16th Century. He bequeathed the greater part of his library to Peterhouse, where he had been Master, together with the funds to house it in what is now the Perne Library . No sign of engineering but his legacy inspired the college's Perne Club which cross-fertilised 20th century academic disciplines and senior and junior college members.



Lord Kelvin

Was perhaps the most important physicist of the 19th century. He played key roles in everything from thermodynamics and electric lighting to transatlantic telecommunication and the age of the Sun.

In 1841 he went to Peterhouse, Cambridge. He was active in sports, athletics and sculling. He took a lively interest in the classics, music, and literature; but his real love was the pursuit of science. The study of mathematics, physics, and of electricity, had captivated his imagination.



James Stuart



- Professor of Mechanism and Applied Mechanics, 1875-1890
- The first true professor of Engineering at Cambridge, appointed in 1875 was a great reformer. James Stuart, a graduate in mathematics at Trinity, played a leading role in establishing inter-collegiate lectures at Cambridge and was also a great proponent of higher education for women and for the working classes.

Prof Sir John Baker

Fairy godmother and World War 2 life-saver

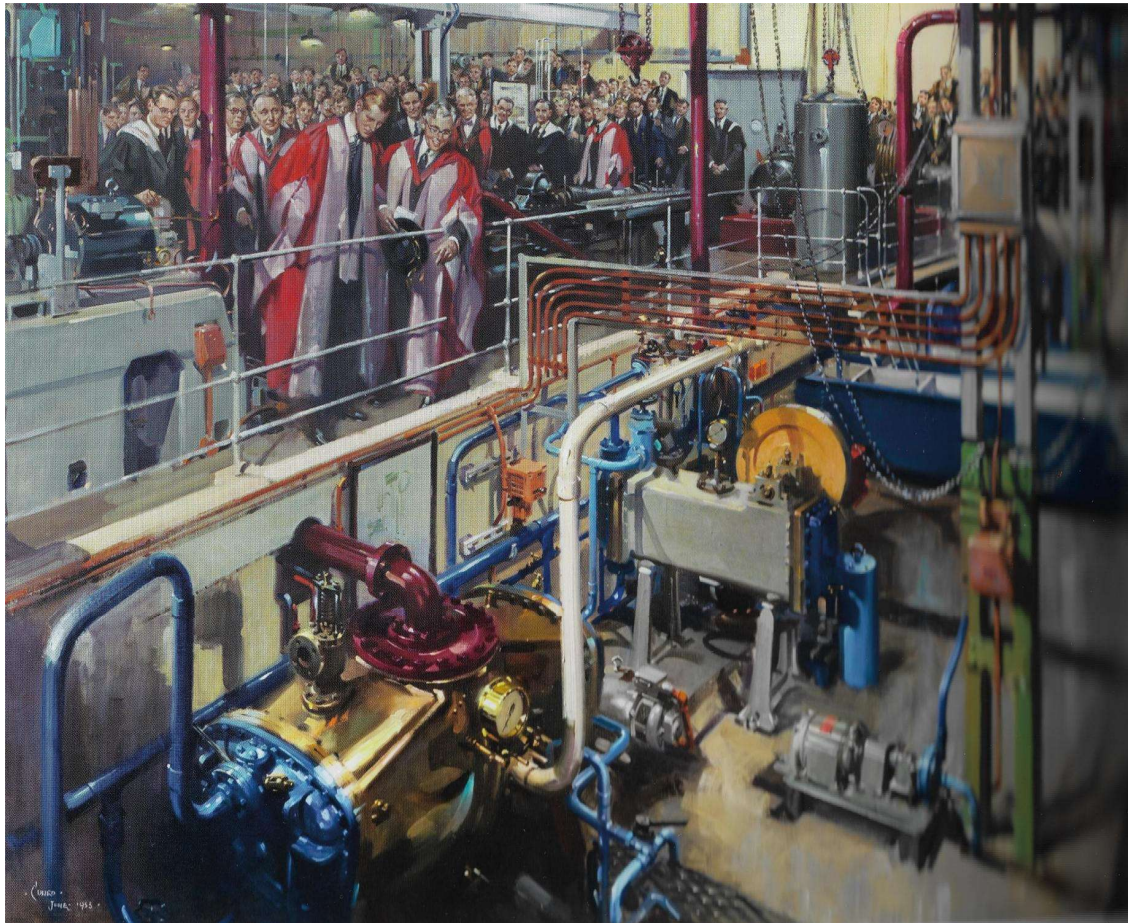


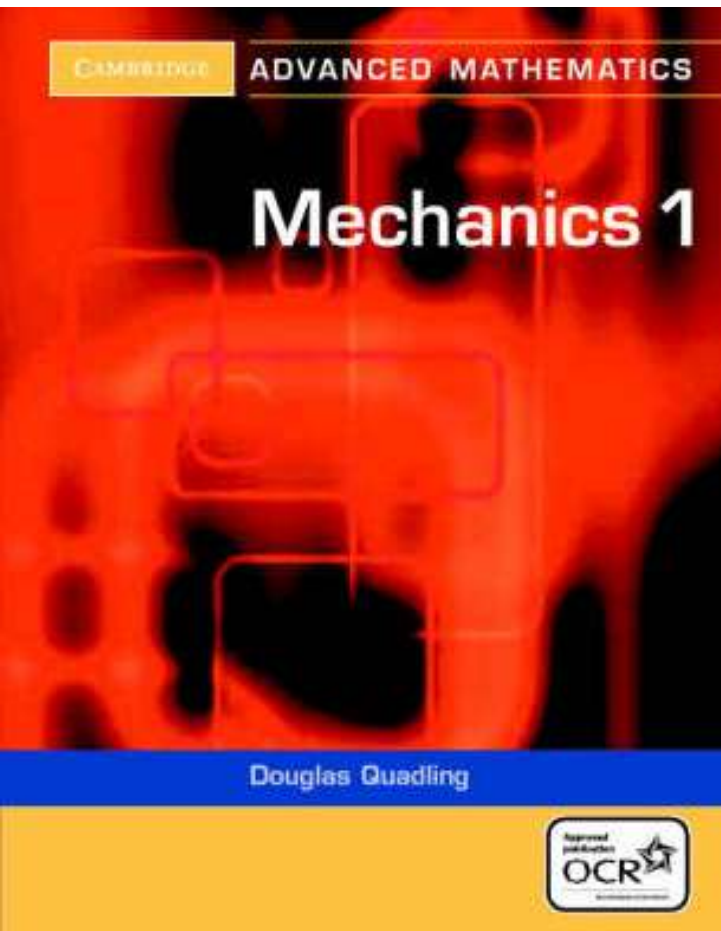
Baker's achievement



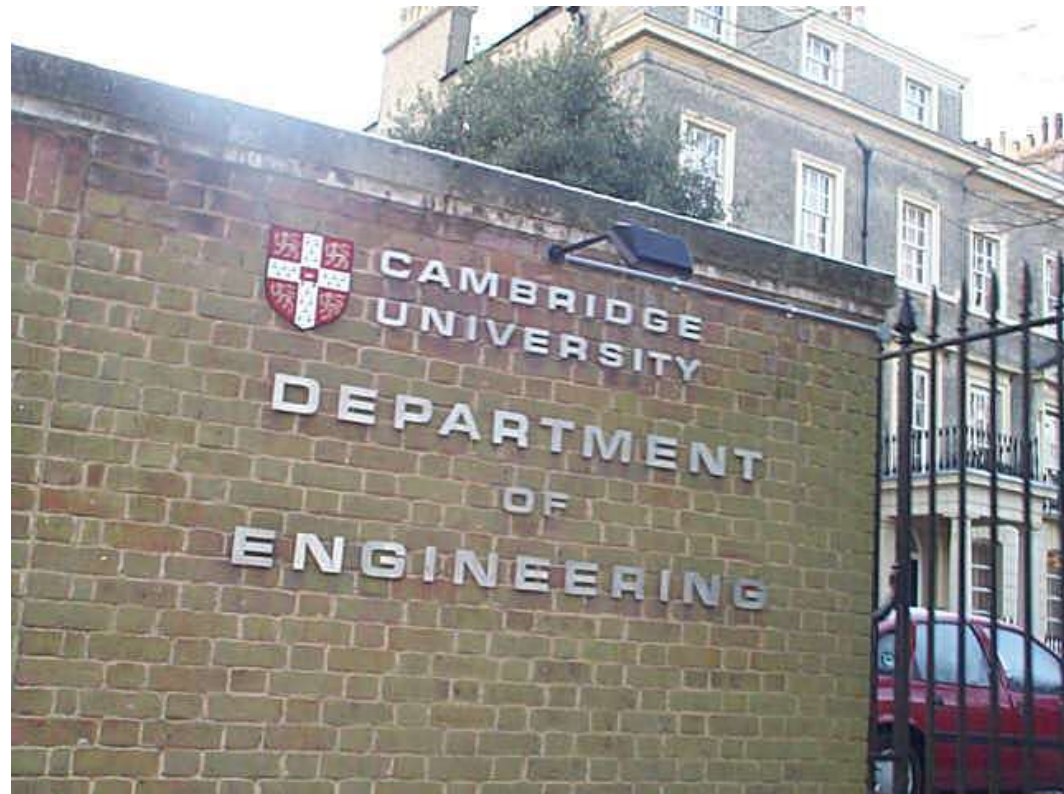
From 1943 to 1968, he was Professor of [Mechanical Sciences](#) and Head of Department at [Cambridge University Engineering Department](#). During this time the department more than tripled in size, from 24 lecturers to 111. He used the structure of the Forth rail bridge as the basis of explanations of structural design theory to his students. (Network Rail arranged for my son to visit in 2014). During Baker's time at Cambridge, plasticity theory was used to design the new Baker Building of the department, making it the first building in the world designed by this method.

1952 Cinderella and the Prince





Marlborough to
Oxford or Cambridge? Churchill or Peterhouse?



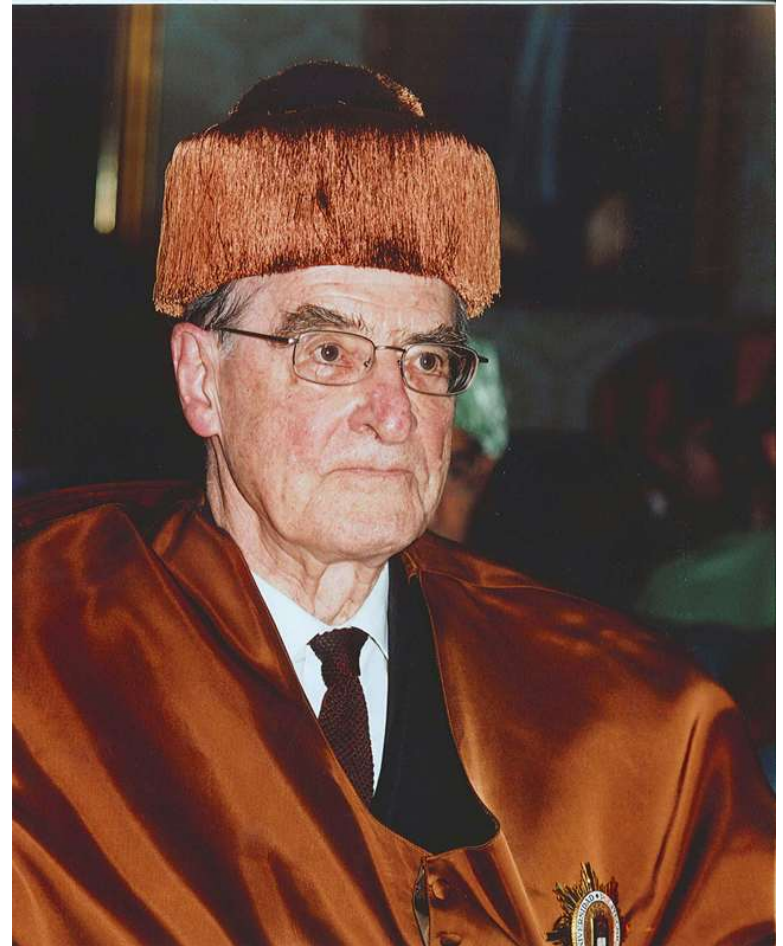
My Cambridge (Peterhouse) supervisors 1967-9

Prof Jacques Heyman

Head of Cambridge Engineering

1983-1992

From Gothic cathedrals to steel skyscrapers, Professor Heyman's research has not only guided the design and repair of countless historic constructions around the world but paved the way for new low-carbon vaulted structures, inspiring generations of structural engineers who seek to build modern structures with more efficient use of resources.



My Cambridge (Peterhouse) supervisors 1967-9

Bill Nixon

Director of Research 1960-5

working with Pof Oatley

Scanning Electron

Microscope experts

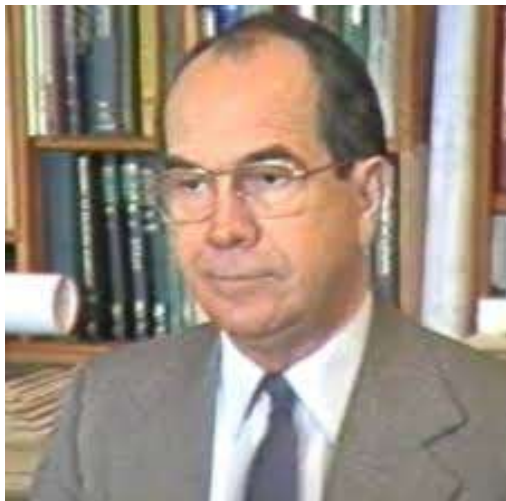
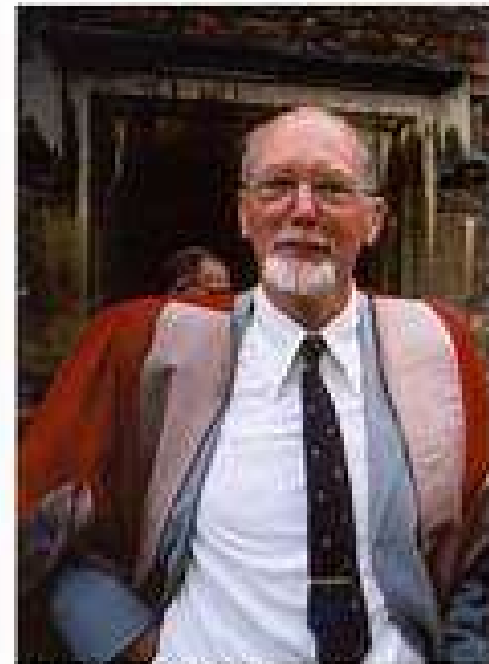
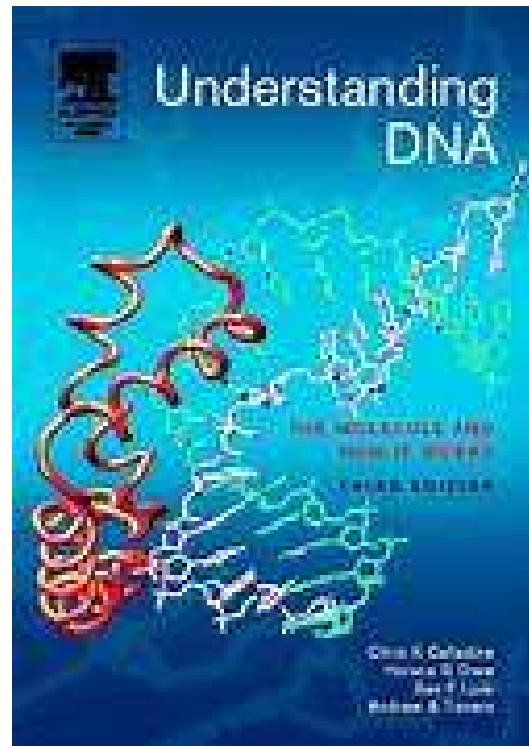


Plate 7.2

My Cambridge (Peterhouse) supervisors 1967-9



Prof Chris Calladine
FRS Structures
expert - from train
buffers to DNA



Chris Calladine, FRS. (Credit: Philip F. F.)

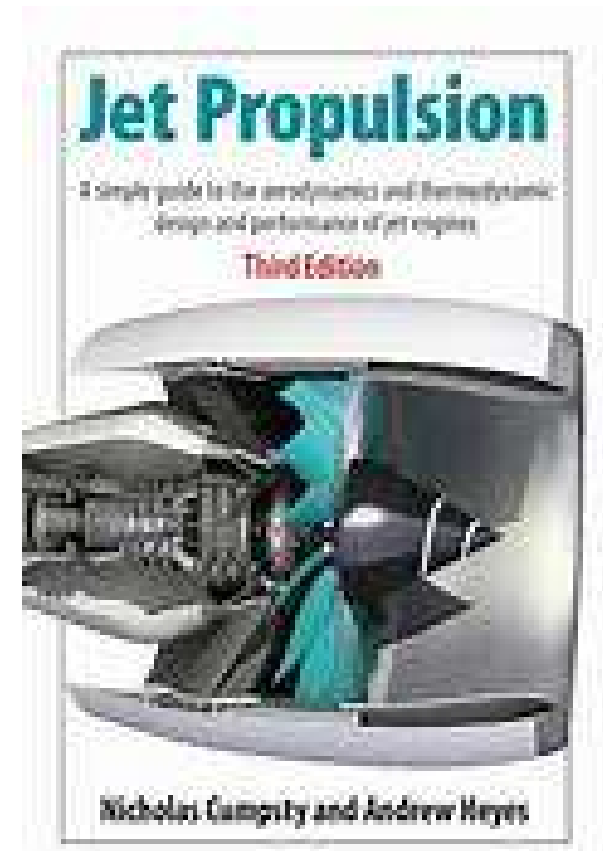
Klug DNA Nobel Laureate & fellow of Peterhouse working with Calladine



My Cambridge (Peterhouse) supervisors 1967-9



Prof Nick Cumpsty
Chief technologist
for Rolls-Royce
Head of Mechanical
Engineering Imperial
College London



Misuses of technology

- Reading on the impacts of engineering on society was part of the Cambridge course in 1969 - with unsettling conclusions.
- We learnt that every advance in technology since earliest times has been accompanied by unfortunate developments
- The Cuban Missile Crisis had recently happened. Brobdingag rulers were puzzled by Gulliver's similar tales.



Tripes Exam outcomes

- Peterhouse takes in 75 undergrads per year. They can choose from 30 courses but a fifth of my year studied engineering and a third of those obtained first-class degrees.
- By comparison no-one in Peterhouse taught or studied theology. I found the imbalance disturbing.

Lecturing on Engineer's Social Responsibility for Inter-Varsity Fellowship 1971-3



Expansion in 2006

- The Electrical Engineering Division moved to the West Cambridge Site bringing together its
- 20 academics, 52 postdocs, 160 PhD students and 12 support staff .
- The Nanoscale Science Laboratory is nearby along with the Whittle Laboratory and Schofield Geotechnical Centre.
- The Institute for Manufacturing is also close by

At the old Trumpington Street Site Structural Engineering and the Language Unit have new facilities. The fast-growing Engineering Design Centre (EDC) will get new space. Sustainable Development, and Computational Fluid Dynamics will move alongside the EDC . Our other two themes, Engineering for Life Sciences and Cognitive Systems, will also benefit

Whittle

early Hogwarts - type

- Whittle was also at Peterhouse
- The following items are from the 2023-5 departmental journals - not science fiction
- Major themes: Energy, Transport and Urban Infrastructure
Manufacturing, Design and Materials
Bioengineering
Complex, Resilient and Intelligent Systems



Sustainability - thickening sea ice

conducted experiments in Canada recently, before receiving ARIA funding. Early results showed ice growth of about half a metre



Can we cool the Earth? Cambridge scientists to lead research

Scientists are exploring ways to cool the Earth alongside vital emissions reduction.

Through controlled, small-scale outdoor

and it is changing the migration patterns of

assess whether the intervention warrants

Increasing reflectivity of clouds

→ Real-world experiments on marine cloud brightening and fogging have taken place at the Great Barrier Reef – techniques that could temporarily protect it from the worst of the Australian summer heat

Buying time: can science save the Great Barrier Reef?



If we don't stop global temperatures – both on land and at sea – from rising, the Great Barrier Reef could become a coral graveyard. A team of scientists has decided to do something about it.

Cement Recycling



Credit: Materials Processing Institute

Cement recycling method could help solve one of the world's biggest climate challenges

Researchers have developed a method to produce very low-emission concrete at scale – an innovation that could be transformative in the transition to net zero.

Low carbon fertilisers



Credit: Franz W. from Pixabay

Carbon emissions from fertilisers could be reduced by as much as 80% by 2050

Researchers have calculated the carbon footprint for the full life cycle of fertilisers, which are responsible for approximately 5% of global greenhouse gas emissions – the first time this has been accurately quantified – and found that carbon emissions could be reduced to one-fifth of current levels by 2050.

The researchers found that two-thirds of | of the whole lifecycle of these products. It | efficiently, we would need substantially less

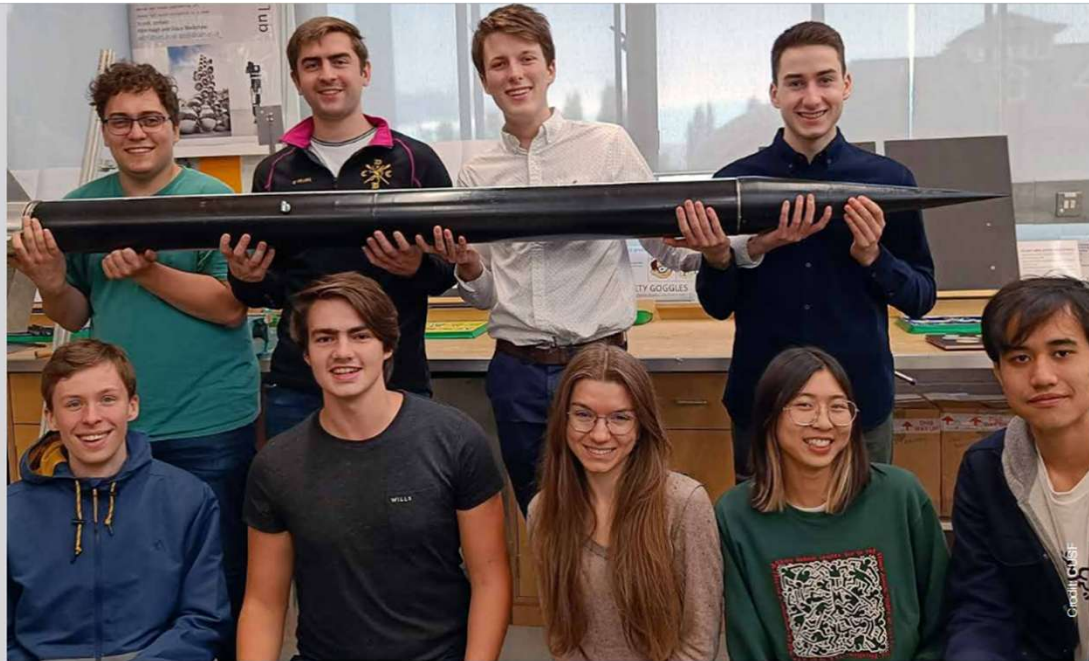
Space exploration

→ [LEFT] Dr Bakht holding a test probe.
[CENTRE] An artist's illustration of JUICE
on its journey towards Jupiter. [RIGHT] The
probes and their stubs after coating
with dense, smooth TiAIN thin films



**Cambridge scientist joins mission to investigate
signs of life on Jupiter's icy moons**

Rocketeers of the future



STUDENT SOCIETIES

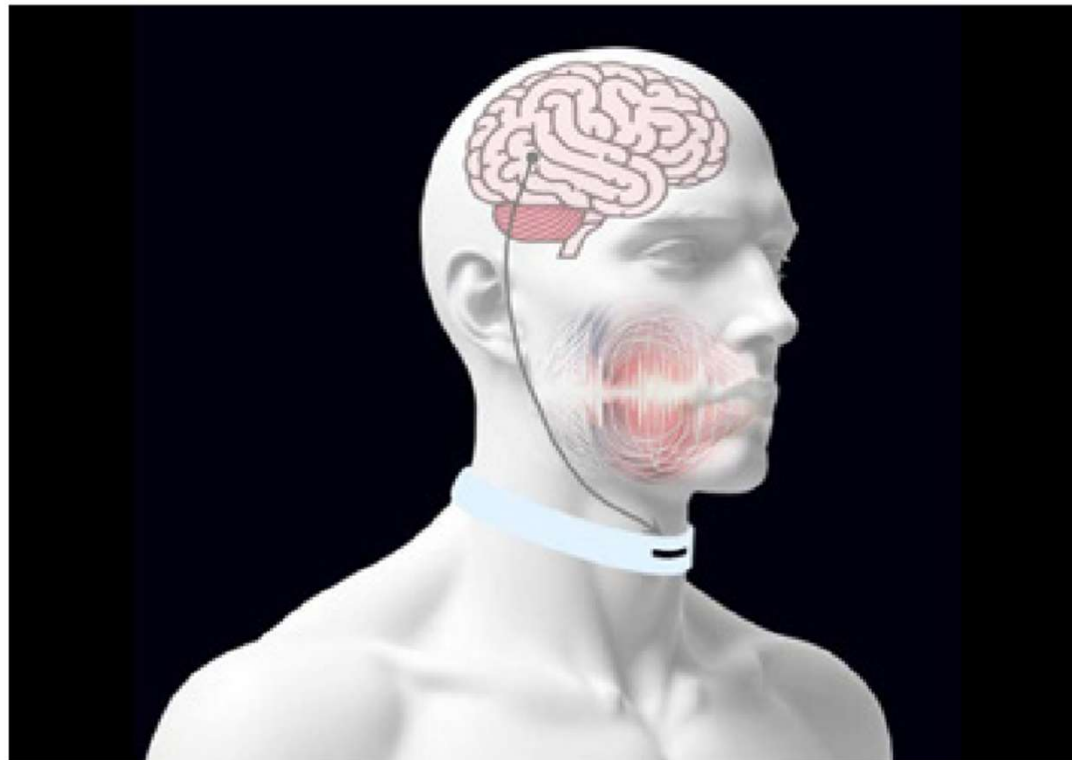
The Cambridge students aiming to send a rocket into space in 2025

↑ Some of the Spaceflight team with the Aquila rocket, a sub-project of the Griffin I launch attempt

Bioengineering

→ Micromovements in the throat are captured by an ultrasensitive strain sensor integrated into a smart choker, comprising a textile substrate with an overlying structured graphene layer

Graphene-based wearable strain sensor can detect and broadcast silently mouthed words



AI and autonomous driving

→ LEFT: Alumnus Alex Kendall, Wayve Co-founder and CEO. RIGHT: The Wayve team

Wayve – a pioneer in embodied AI for autonomous driving – raises \$1bn in new funding round



Credit: Wayve

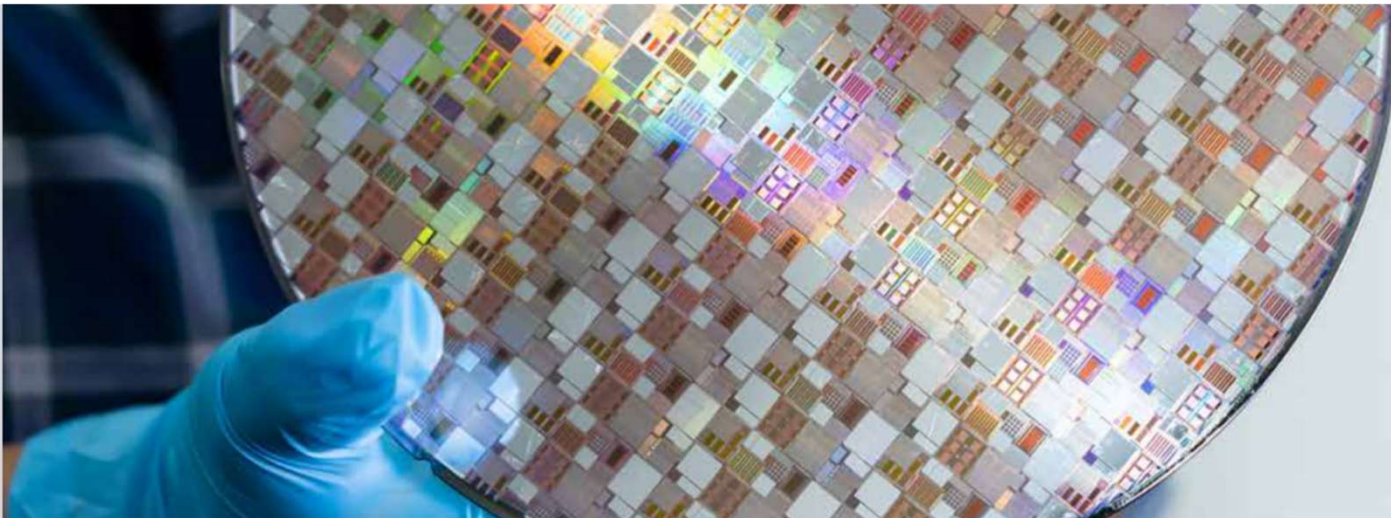
UK AI company Wayve – co-founded by alumnus Alex Kendall in 2017 while studying for his PhD at Cambridge – has secured more than \$1 billion to develop AI for self-driving vehicles.

Backed by SoftBank Group, NVIDIA and Microsoft, this announcement (made in May

capabilities of existing AV technology. Wayve has said that their advancements

a talk at the Department of Engineering as part of the Department's 150th anniversary

Microchips of the future



Credit: amazing studio – stock.adobe.com

£11m semiconductor research centre could be key player in UK's net zero mission

↑ Silicon wafer for manufacturing semiconductor of integrated circuit

The University of Cambridge is a partner in the new £11 million Innovation and Knowledge Centre (IKC) REWIRE, set to deliver pioneering semiconductor technologies and new electronic devices.

Semiconductors, also known as microchips, | low energy-loss power electronic technology. | density, high reliability, and low-cost power

Earthquakes



ALUMNI UPDATE

Engineering for emergency response: Turkey and Syria earthquakes

Alumna Sakthy Selvakumaran is a civil engineer who volunteers for the charity Search and Rescue Assistance in Disasters (SARAIID). She was on the ground as part of the emergency coordination

↑ The SARAIID team in Turkey, with Sakthy Selvakumaran, pictured centre, holding the flag

Credit: SARAIID

King Charles' return visit

The King breaks ground on Cambridge's New Whittle Laboratory



Credit: Lloyd Mann

His Majesty The King visited the University of Cambridge on 9 May 2023 in his first public engagement following the Coronation.

Upcoming STEMM Cell Events

Event Title	Event Date	Event category	Time	Venue
<i>"Geo-surveying with drones"</i> by Geo 4D	Thu 25 Jun 2026	Meeting	14:00	Faringdon United Church
<i>"The Application of Novel Devices in the Treatment of Cancers"</i> by Derek Jerome	Thu 23 Jul 2026	Meeting	14:00	Faringdon United Church
AUGUST BREAK				
TBC	Thu 24 Sep 2026			
TBC	Thu 22 Oct 2026			
TBC	Thu 26 Nov 2026			