

NEWSLETTER

“What is possible in the Cavendish Laboratory may not be too difficult in the sun.”

Arthur Stanley Eddington

Week 4 2022-23

PHYSICS AT WORK – CAVENDISH LABORATORY



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Physics at Work aims to introduce students to diverse career opportunities that stem from studying physics and the practical challenges that Physics can address. The event was organized by the Head of Science, Neelam Debata. On April 21st, 32 of our passionate Physics students had the privilege of visiting the renowned Cavendish Laboratory. Here's what our A2 student, Rachel, had to say about the event:

“It was a sunny yet windy Friday morning when we went to attend an event in University of Cambridge’s Cavendish laboratory, “Physics at Work”. Departing from our school at 8:30 a.m., we embarked on a memorable expedition, returning by 12:30 p.m. We were around 30 people at the time so we had to be divided into 3 groups with me being in group 3 that was led by our head of science, Neelam.

First off, we went to a lecture called “MathWorks” that focused on helicopter-like rovers that was recently sent to Mars. The discussion primarily revolved around their innovative programming software and its diverse applications in today's world; what shocks me was they were also used in financial sector such as comparing changing rate between currencies. Throughout the session, we participated in hands-on activities, such as the challenge of balancing a cardboard tube blindfolded and with open eyes, as well as a practical test run of a rover replica.

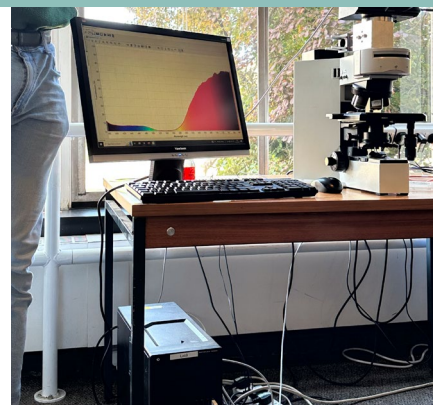
We then continued with “Isaac Physics” which was a revision of an AS Physics chapter in; Newton’s law and dynamics. An experiment that was memorable was when the professor stepped on a board full of needles and felt no pain. Moreover, we continued to another lecture about “How Materials Break” which I find interesting as I can conclude that failure in constructing can mean a lot of things such as structure, foundation and materials. In this particular talk, I volunteered myself to do an activity of tearing apart tapes and not only it was an experience but also I learnt some new knowledge such as the term ‘fatigue’.

After that, we had a 15-minute break and was served drinks and snacks for everyone who were attending the event. Once the breaktime was over, we carry on with another interesting talk about “Nanophotonics”. By the name, we may have guessed it is about small particles and photons. We did lots of experiments in this particular part of the day, such as microwaving grapes, freezing chocolate, spectroscopy and investigation of nano particles using darkfield microscope.

Our fifth event introduced us to Domino, a printing company (not the food and game), showcasing two printing machines: a laser printer and continuous printing. We even had the chance to use the continuous printer to inscribe our names on pens, providing a cherished souvenir from the day. And last but not least, the British Antarctic Survey. It was honestly the most interesting part of the day with the lecturer talking about her experience in Antarctic and the importance of sunscreen during certain timeS of the year. I would like to try it one day despite the hygiene issues like showering, toilets, etc.

That’s basically my whole experience and I definitely will come back to see other things that I missed on that day. “

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FITZWILLIAM COLLEGE – VET OPEN DAY 2023

Fitzwilliam College hosted the 2023 Vet School Open Day, which took place on Thursday, September 7th. This annual event is a valuable resource for students making decisions about their choice of veterinary school. It also provides an opportunity for those interested in Veterinary Medicine and curious about college life at Cambridge to gather information before they submit their UCAS applications. Our three A-level students attended the program.

The program encompasses a range of activities and offerings, including:

- Engaging talks at Fitzwilliam that shed light on undergraduate life and the initial phases of the veterinary course.
- A sample teaching session to provide participants with a taste of the educational experience.
- Guided tours of the Vet School, allowing attendees to explore its facilities.
- Opportunities to connect with current clinical students and gain insights into their experiences.
- Informative sessions cover the course's later stages and the application process's intricacies.
- Optional tours of Fitzwilliam College

This Vet School Open Day offers a comprehensive and informative experience for students considering a career in Veterinary Medicine and seeking to learn more about the offerings at Cambridge and Fitzwilliam College.

"We started the day with a wonderful tour of the college, followed by an enjoyable break at the college's café where we had the opportunity to talk to current Cambridge veterinary students. Our day continued with a course presentation and a taster session in rodent physiology. We then had the honour of experiencing a meal as a Cambridge student would and proceeded with a visit to the veterinary department. During this visit, we had the chance to listen to a cow's lungs, stomach, heart, and participate in other workshops. The day concluded with a lecture on the syllabus content. Fitzwilliam's open day for veterinary medicine provided an excellent opportunity and expanded my options. I truly enjoyed it, and it was well worth enduring the high temperatures!"

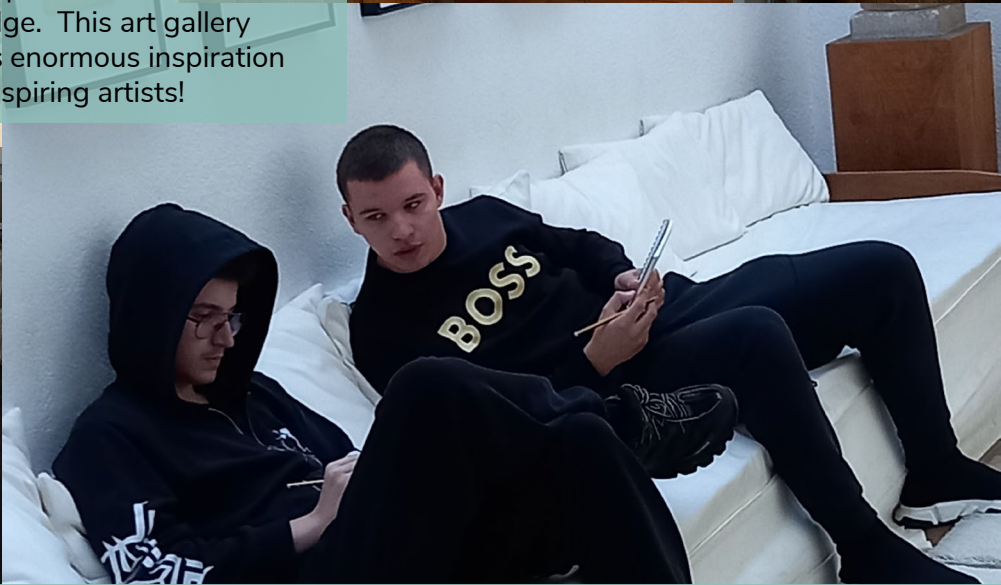
Gabriel – A Level student



ART – KETTLE'S YARD, CAMBRIDGE



CATS Cambridge Art Students took a trip to Kettle's Yard Cambridge. This art gallery provides enormous inspiration for our aspiring artists!



CATS CAMBRIDGE TRIPS – COMING UP

Saturday 7th October

Come and experience the world-famous panoramic views of Cambridge! Climb the 123 steps of the University Church tower and enjoy a 360° view on the newly-refurbished outdoor viewing platform. Followed by a wander around Cambridge Food Market for lunch.



Saturday 14th October

The River Cam runs through the heart of Cambridge enabling you to enjoy fantastic views of the world-famous Cambridge College 'Backs' from the comfort of a traditional Cambridge Punt.

King's College Chapel, The Wren Library at Trinity College and the Bridge of Sighs, are just some of the famous Cambridge landmarks you can expect.



Saturday 14th October

Head down to England's most famous shopping street, Oxford Street. Go into the world known Selfridges, Harrods and many more.



Saturday 4th November

Visit the iconic landmarks of Cambridge and enter the famous King's College Chapel. Enjoy a walking tour with a professional tour guide and see the world behind the institution's closed doors.



Saturday 25th November

The Fitzwilliam Museum is the lead partner of the spectacular collections of the University of Cambridge Museums and Botanic Garden. From antiquity to the present day, the Fitzwilliam houses a world-renowned collection of over half a million beautiful works of art, masterpiece paintings and historical artefacts.



Please speak to George to sign up.



PUTTING PHYSICS TO WORK PEELING BACK THE ONION

**Dominic Tomalin,
Principal**



I have to concede to being a little jealous that I was not able to join the students visiting the University of Cambridge's Cavendish Laboratory last week. I enjoyed studying Physics at school and university, and I put it to great use as a military engineer and later in business. Many of the questions that Physics seeks to answer continue to intrigue me, often until my head hurts!

The Cavendish Laboratory is named after the 18th Century physicist and chemist, Henry Cavendish, famed for discovering hydrogen and describing various properties of electricity. Another scientist, Lord Kelvin, might have been surprised that the Cavendish Laboratory was still going in the third decade of the 21st Century. In 1900, he rather rashly declared the death of Physics with a statement that, "There is nothing new to be discovered in Physics now. All that remains is more and more precise measurement". In the very same year that greater granularity in measurement led to the beginnings of a very different way of seeing the universe; the veil was lifted on quanta, and quantum mechanics was born. The certainties of Kelvin's world view were replaced by probability distributions.

I suspect Lord Kelvin would be grateful that that the Kelvin temperature scale is named after him - Kelvins are certainly mentioned more frequently than his proclamation of there being nothing new to discover. There have been discoveries aplenty since his time. That said, both Kelvin and Cavendish were remarkable men whose insights were even more remarkable given the limitations of the equipment for measuring and detection to which they had access.

The scientific method is one mankind's greatest accomplishments. Measurement and detection are the empirical foundations on which science is built. In science your ideas will only ever gain credibility and longevity when they are supported by the evidence. That evidence will only have weight if it is gained through experimentation that could disprove your hypothesis. In short, the best way to strengthen your understanding is try the hardest to break your paradigm to smithereens, then find its replacement. In developing our own world views, we can see further because we stand on the shoulders of scientific giants like Cavendish and Kelvin.

Just like Kelvin and Cavendish, our ability to collect data is limited to that which we have the technology to detect and measure, directly or indirectly. Ingenuities in detection and measurement have paved the way to many a great discovery. It is the coincidence of mankind's imagination and ingenuity, with the scientific method that breaks paradigms, improving our understanding, taking us a step closer to the ever-nebulous truth.

For all our progress, we need to be wary of complacency. The physicist Frank Close is fond of likening science to peeling an onion, there always seems to be another layer. In life, like science, we should all aim to peel back our own onion, in pursuit of a better understanding, and the new truths and insights that pursuit will deliver. There is always something else to discover.

Dominic Tomalin, Principal