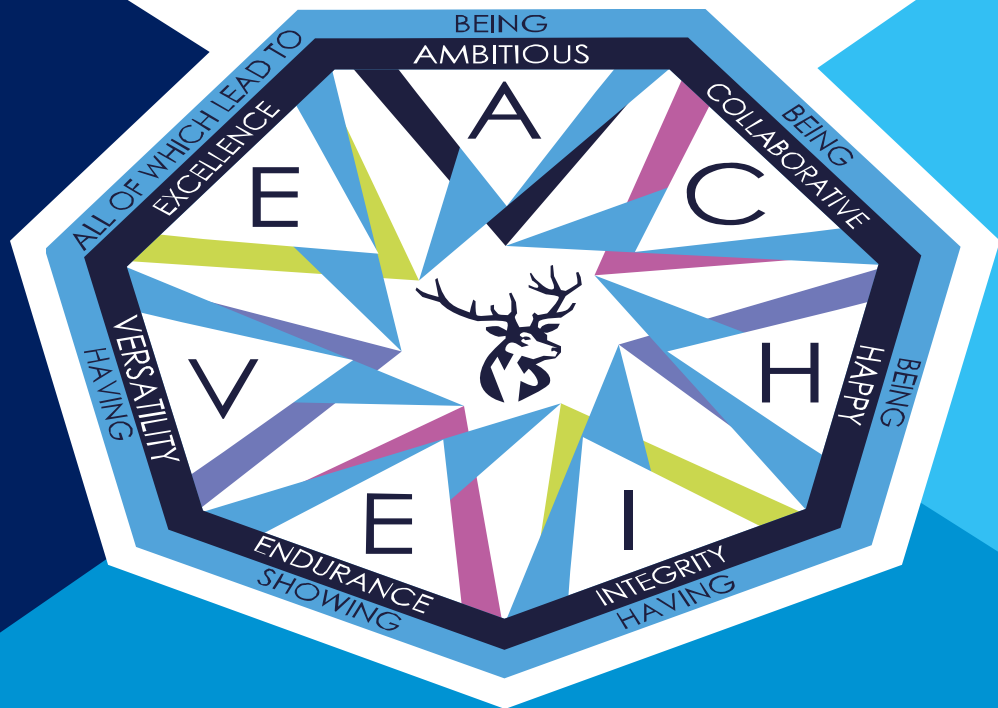


**FURZE
PLATT**
SENIOR SCHOOL



A-LEVEL PHYSICS

Open evening 2025

- Mr Curnow, Head of Physics

Have you ever wondered...

Is teleportation possible?

What's inside a black hole?

What does $E = mc^2$ mean?

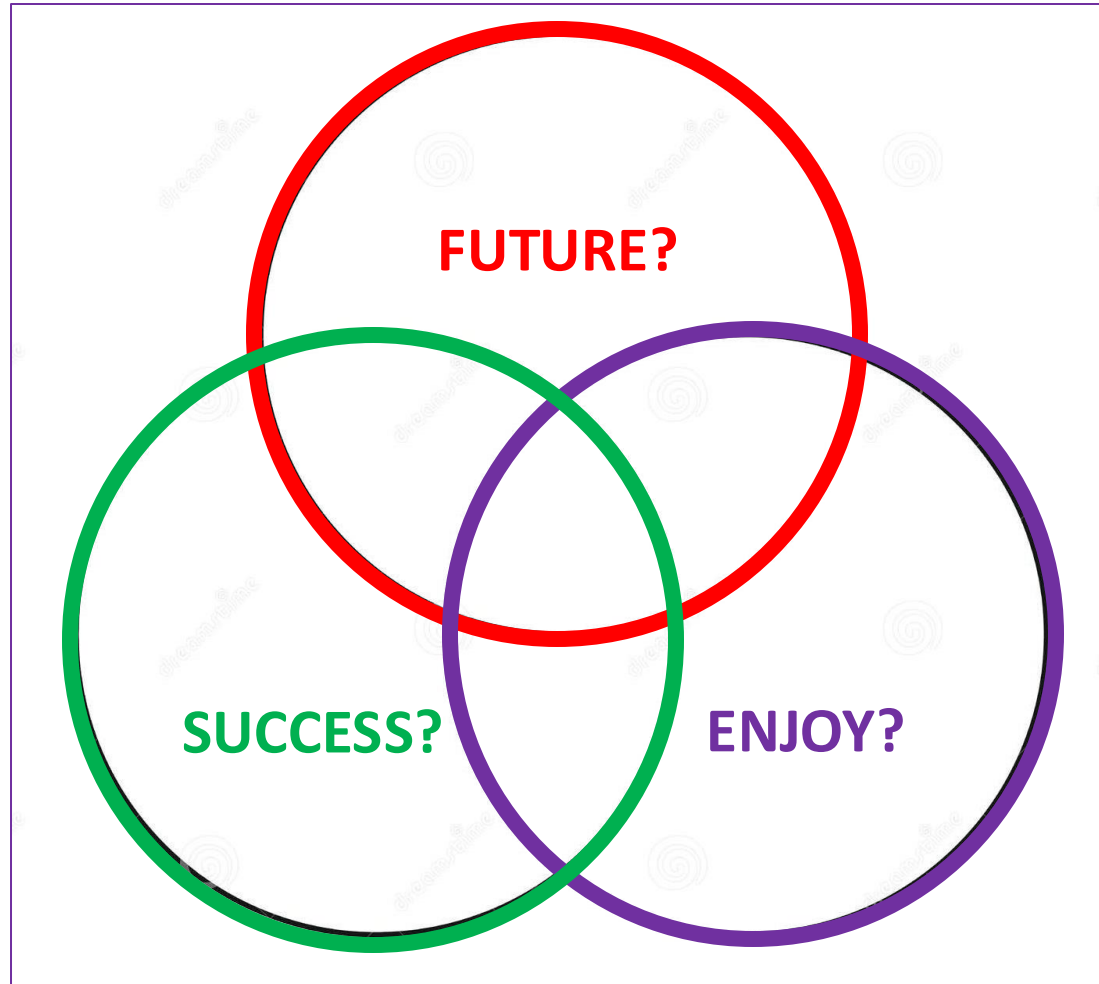
What *is* quantum physics?

Can we ever go back in time?

How can a particle be in two places at once?

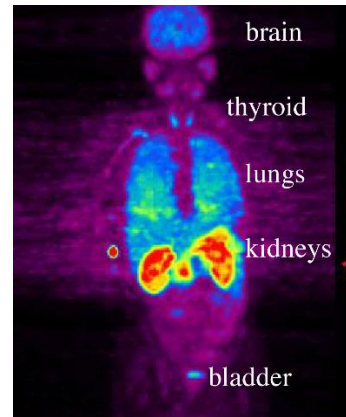


How to choose an A-level?

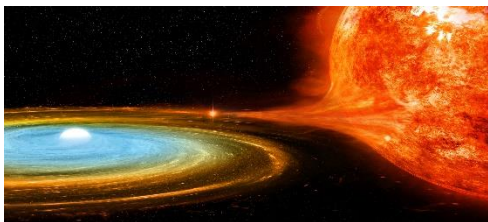


What sorts of jobs is A-level physics useful for?

- Engineering
- Computing / A.I.
- Medical physics
- Architecture
- Geoscientist
- Software designer



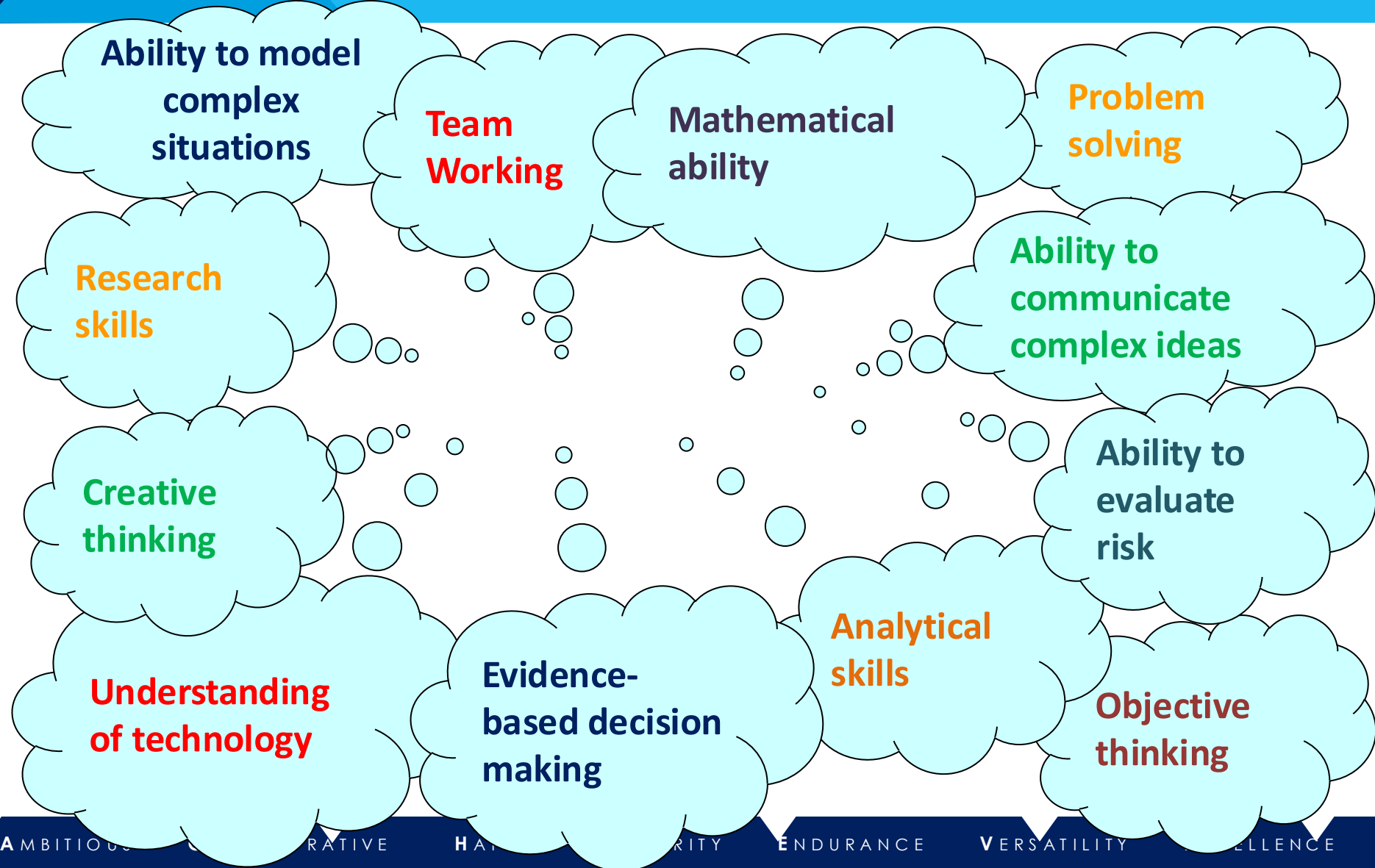
- Finance
- Astrophysics
- Meteorology
- Telecommunications
- Palaeontology
- Forensic scientist



...and loads more! See displays in the Physics department or “UCAS careers” for more details.

UCAS 2019

What skills does studying physics develop?



How can A-level physics help your future career?

MATHS AND PHYSICS SKILLS BOOST YOUR EARNINGS

STEM graduates can earn **£250,000** more than average across their careers

That's the equivalent of five porsches....



or ten year-long round the world trips...

or an average house price in the UK, with no mortgage!

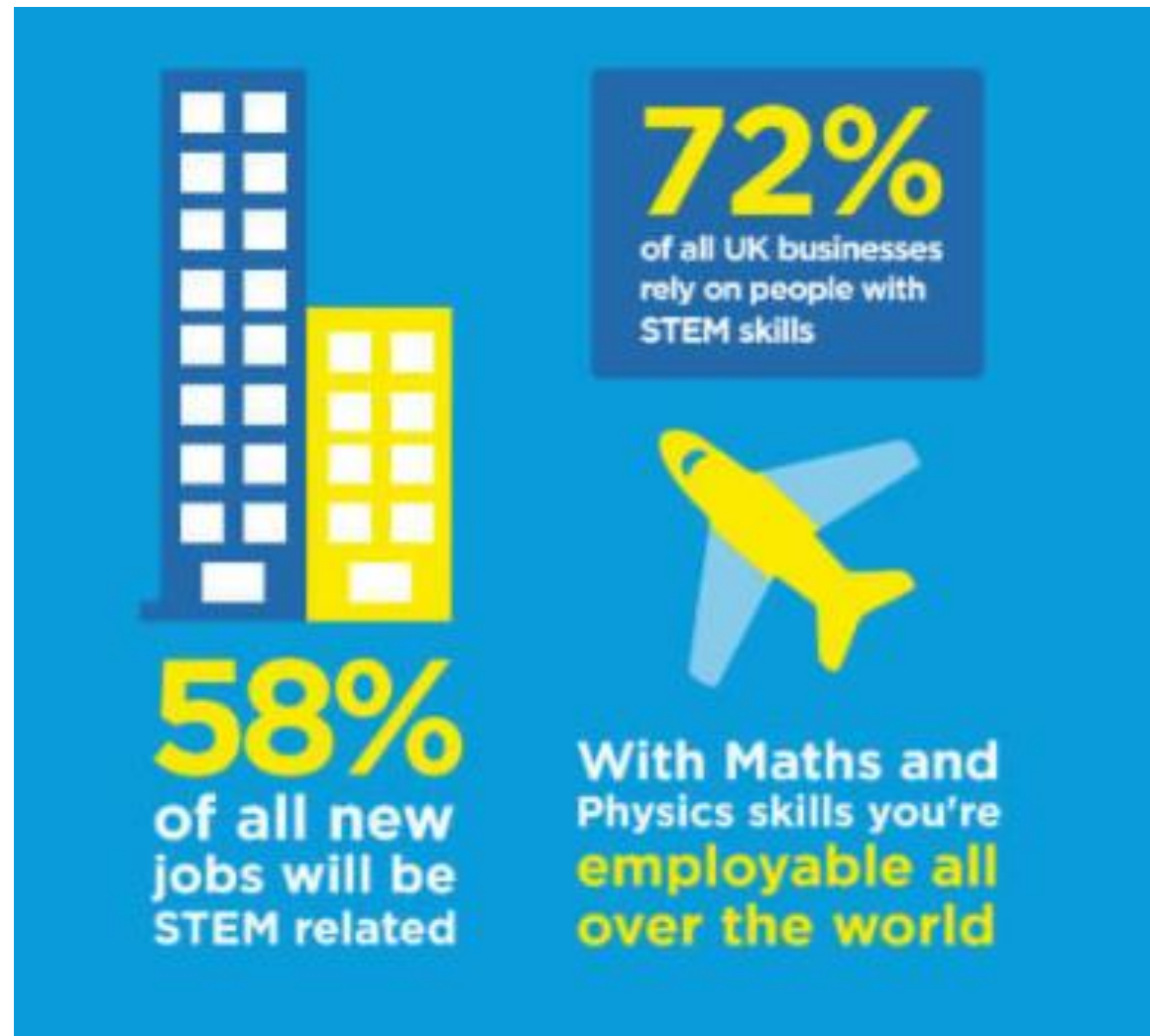


Female STEM graduates can earn up to **33%** more than their peers

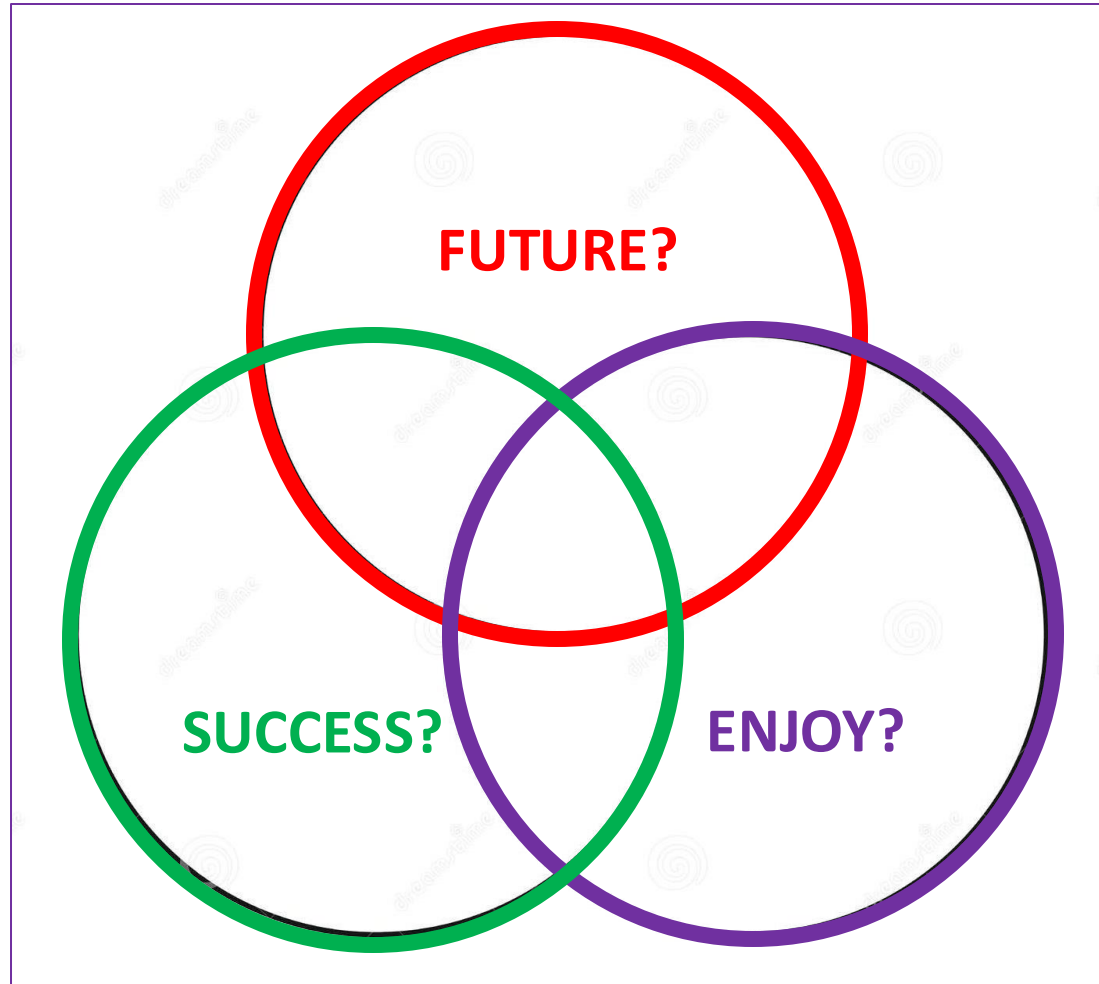
Having just **ONE** STEM A Level boosts your earnings by **15%**



How can A-level physics help your future career?



How to choose an A-level?



CERN 2023 - Geneva, Switzerland



The Large Hadron Collider (LHC) is the world's largest and most powerful particle accelerator. It first started up on 10 September 2008, and remains the latest addition to CERN's accelerator complex. The LHC consists of a 27-kilometre ring of superconducting magnets with a number of accelerating structures to boost the energy of the particles along the way.



CERN TRIP 2023



"The Saturday of our trip was the main reason we went to Geneva, and as A-level physics students, we were eager and ready to ask lots of questions. We were very lucky to walk around CERN's remarkable science facility. The Large Hadron Collider (which is to thank for today's extraordinary development in particle physics) meant having a well-qualified tour guide who knew the machinery and the intricate civil science behind it. During the tour, we learnt fascinating facts that linked our passion for physics, and gained helpful knowledge about the Large Hadron Collider which linked back to our A-level physics course. The day was an exciting insight into what our subjects can lead to: it was an honour to be amongst physicists who have played a part in discovering what we learn at school."

NOT ONLY IS THE UNIVERSE STRANGER THAN WE THINK, IT IS STRANGER THAN WE CAN THINK.

Werner Heisenberg

"Spending the weekend in Geneva was a touching new experience that showed me the Swiss culture, architecture and way of life. Over the weekend, we got to see the United Nations, the Red Cross Museum and even spent our Saturday evening in a bowling alley! The day we arrived was mostly raining so we first visited the UN, where we found out considerable information on current political events and tensions as well as seeing well-known meeting rooms that have previously been where ground-breaking decisions about the United Nations have been made. I found that as we took a tour around some of the building, not only did I get to learn a lot about politics (which I don't usually have an interest in), but it also opened our eyes to opportunities if we wanted to go in the direction of fighting for human rights in the future using our scientific knowledge. Following the visit to CERN, we headed down to a spectacular night playing bowling and having fun with the Red Cross Museum, which was filled with poignant and inspired art exhibitions - showing us an extensive selection of photos of impacted countries, as an extensive selection of photos of impacted countries, ranging from the First World War to recent years of conflict."

Celia Wynn, Year 12

CERN 2025 - Geneva, Switzerland

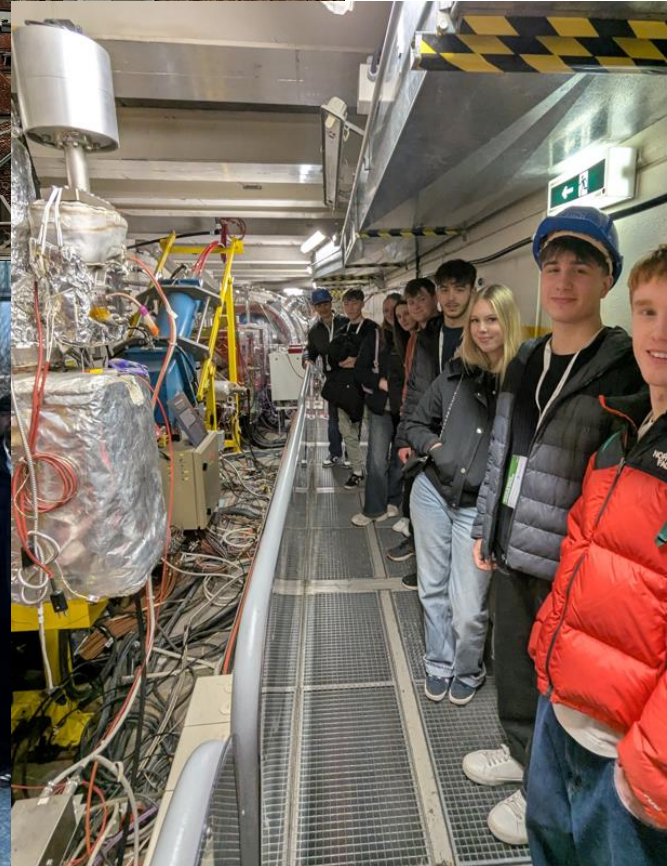
STRANGER THAN WE THINK, IT IS STRANGER THAN WE CAN THINK.
— WERNER HEISENBERG

LENA HOLMES, YEAR 11
I was one of the lucky students apart of the Geneva trip for Physics in February 2025. My favourite part of the trip was the CERN physics exhibits, with many interactive projects not just focused on particle physics, but also space and engineering. Behind the scenes however, the trip wasn't limited to science, there was plenty of time to explore the beautiful city of Geneva, such as the stunning lake and regular architecture. The science museum overlooking the mountains and lake had a variety of intriguing exhibits, such as big skeletons and telescopes too! The trip was a great opportunity for both Year 11 and 12 to make new friends and branch out their science knowledge.

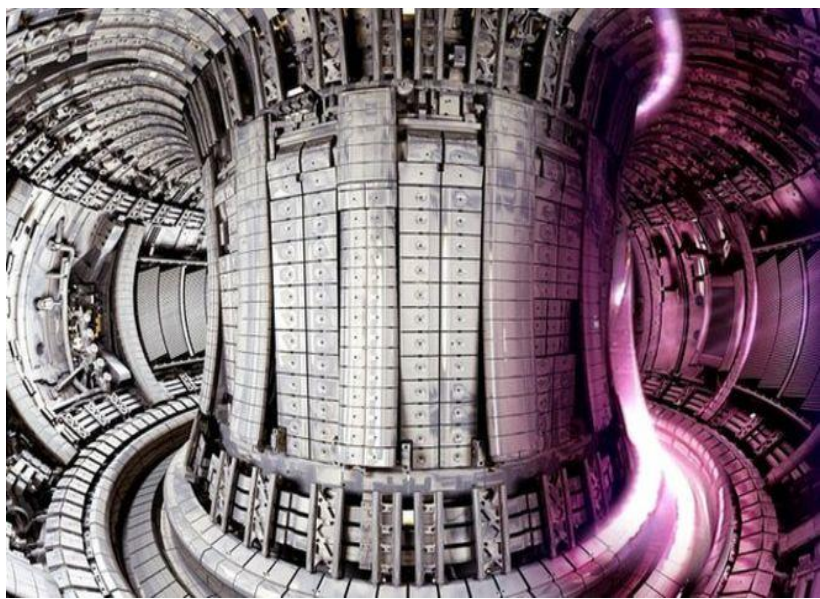
CERN TRIP 2025

WILL COULING, YEAR 12
The physics trip to Geneva was super fun! It was a great way to learn about particle physics in more depth and being in the main place of research for this in the world was very cool. It was also nice to experience a new country and culture. We had time to do some sightseeing and the view from the top of the cathedral was breath taking. Learning about the history of the Red Cross at the Red Cross museum was very interesting and seeing the United Nations building was very cool. It was a great time to enjoy with friends and also a good way to make new friends. Overall it was an awesome trip and I would highly recommend going!

"IN THE QUANTUM WORLD, THE OBSERVER CREATES THE REALITY."
— JOHN WHEELER



Other trips?



JET Fusion reactor (hottest place in the Solar System!)



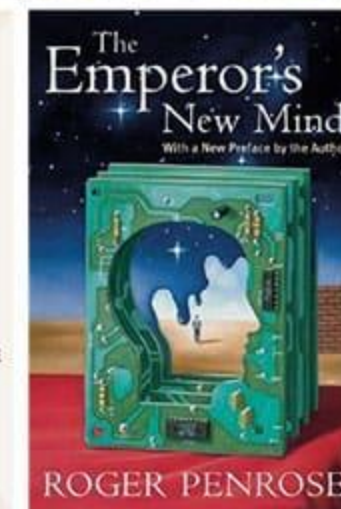
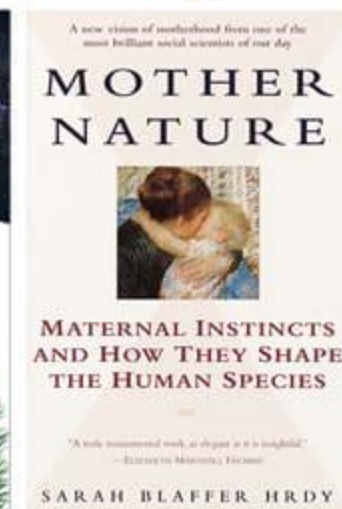
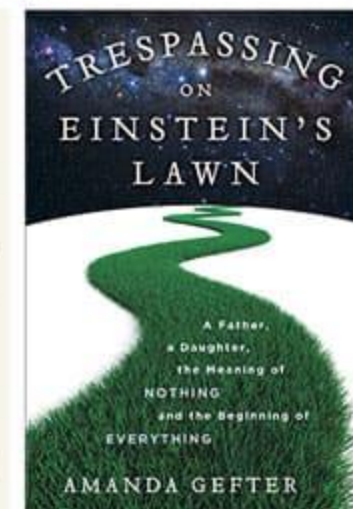
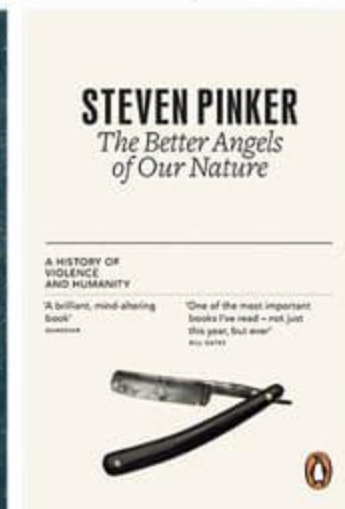
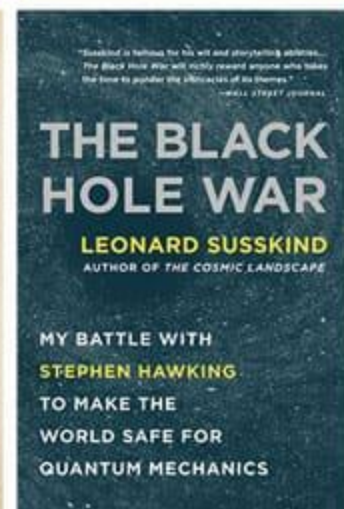
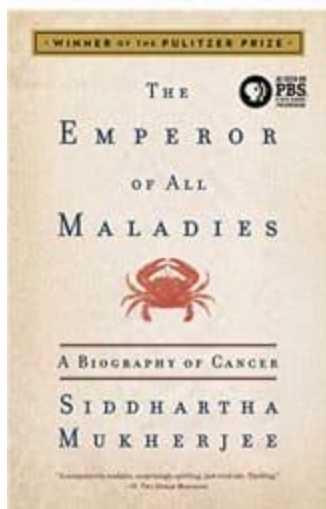
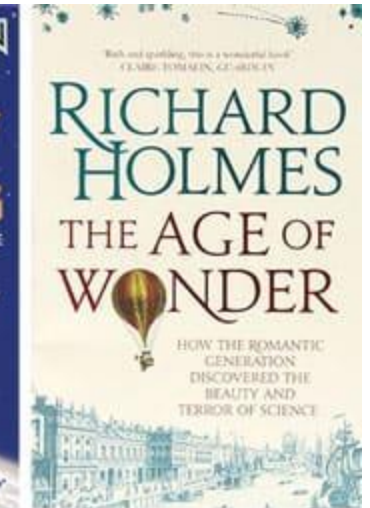
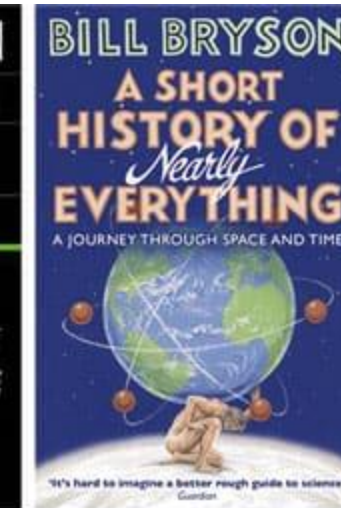
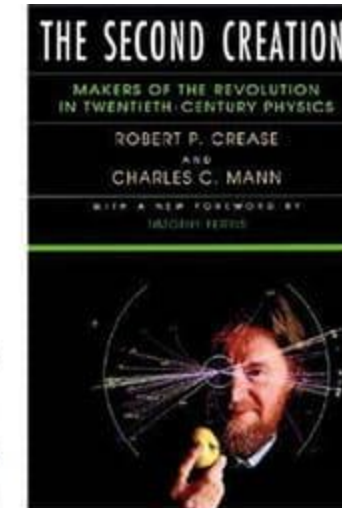
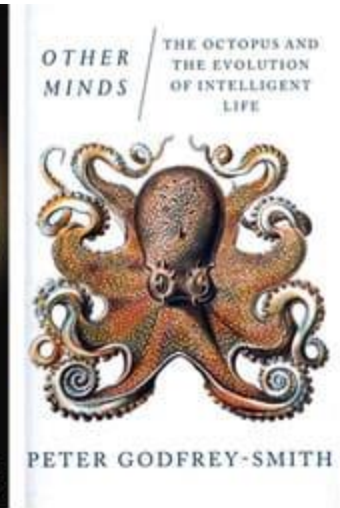
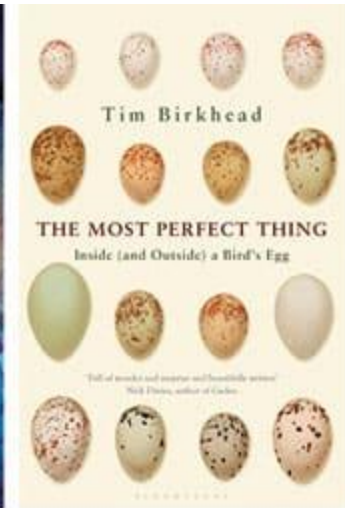
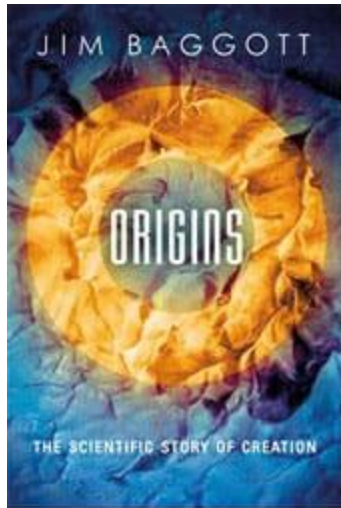
Diamond Light Source Synchrotron
(Particle accelerator)



University lectures & demonstrations



Wider reading



What else do I need to know?

You get an equation sheet for EVERYTHING

| Class | Name | Symbol | Rest energy/MeV |
|---------|-------------|-----------|-----------------|
| photon | photon | γ | 0 |
| lepton | neutrino | ν_e | 0 |
| | | ν_μ | 0 |
| | electron | e^\pm | 0.510999 |
| | muon | μ^\pm | 105.659 |
| mesons | π meson | π^\pm | 139.576 |
| | | π^0 | 134.972 |
| | K meson | K^\pm | 493.821 |
| | | K^0 | 497.762 |
| baryons | proton | p | 938.257 |
| | neutron | n | 939.551 |

Properties of quarks
antiquarks have opposite signs

| Type | Charge | Baryon number | Strangeness |
|----------|-----------------|----------------|-------------|
| u | $+\frac{2}{3}e$ | $+\frac{1}{3}$ | 0 |

Particle Physics

Waves

wave speed $c = f\lambda$ period $f = \frac{1}{T}$

first harmonic $f = \frac{1}{2l} \sqrt{\frac{T}{\mu}}$

fringe spacing $w = \frac{\lambda D}{s}$ diffraction grating $d \sin \theta = n\lambda$

refractive index of a substance s, $n = \frac{c}{c_s}$

for two different substances of refractive indices n_1 and n_2 ,
law of refraction $n_1 \sin \theta_1 = n_2 \sin \theta_2$

critical angle $\sin \theta_c = \frac{n_2}{n_1}$ for $n_1 > n_2$

Mechanics

moments moment = Fd

velocity and acceleration $v = \frac{\Delta s}{\Delta t}$ $a = \frac{\Delta v}{\Delta t}$

equations of motion $v = u + at$ $s = \left(\frac{u+v}{2}\right)t$

$v^2 = u^2 + 2as$ $s = ut + \frac{at^2}{2}$

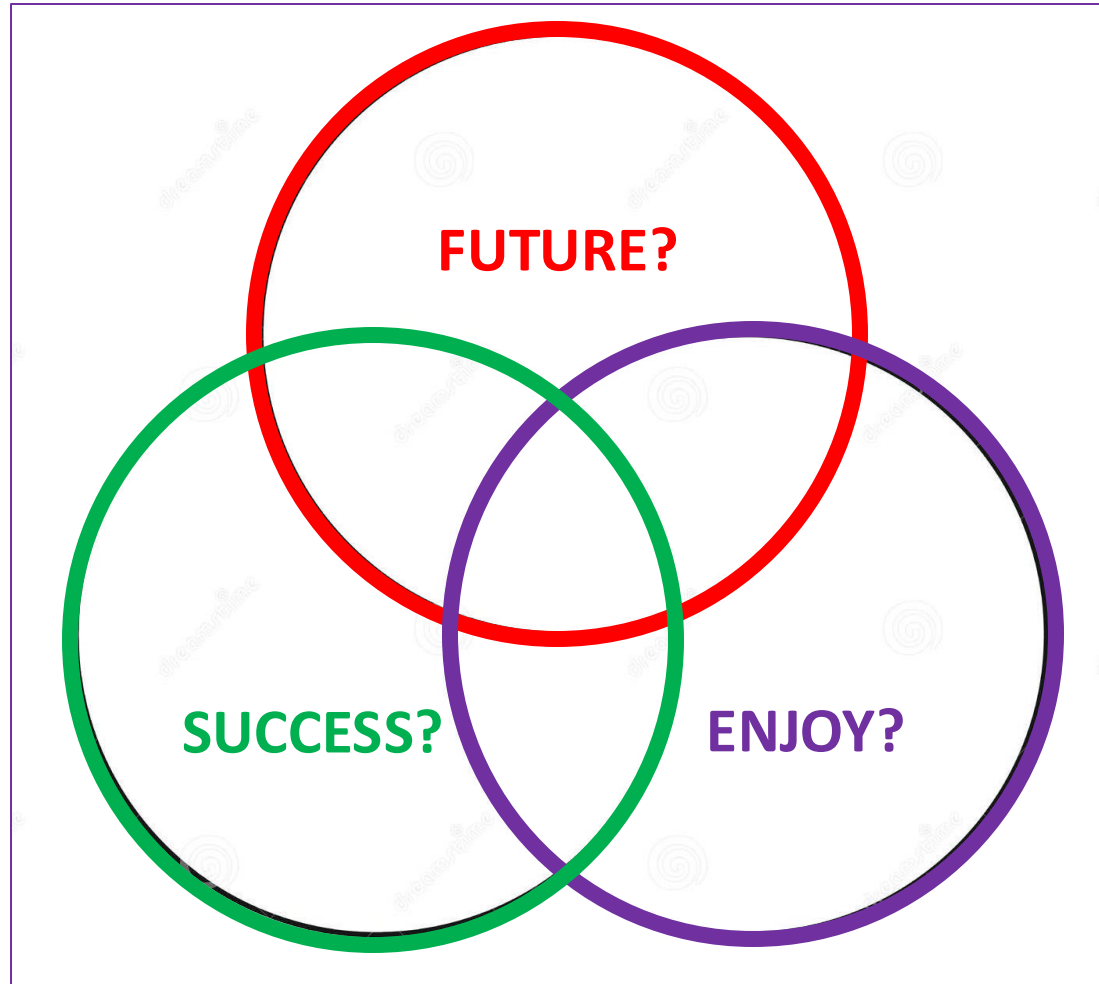
force $F = ma$



Student opinion?



How to choose an A-level?



How will I be assessed?

Three exams in Summer 2027:

- Paper 1 (34%) – Regular & multiple choice questions about **Year 1 content**
- Paper 2 (34%) – Regular & multiple choice questions about **Year 2 content**
- Paper 3 (32%) – Mixture of questions on **practical experiments / analysis + optional topic**

How will I be assessed?

Assessments

| Paper 1 | + | Paper 2 | + | Paper 3 |
|--|---|--|---|--|
| <p>What's assessed</p> <p>Sections 1–5 and 6.1 (Periodic motion)</p> | | <p>What's assessed</p> <p>Sections 6.2 (Thermal Physics), 7 and 8</p> <p>Assumed knowledge from sections 1 to 6.1</p> | | <p>What's assessed</p> <p>Section A: Compulsory section: Practical skills and data analysis</p> <p>Section B: Students enter for one of sections 9, 10, 11, 12 or 13</p> |
| <p>Assessed</p> <ul style="list-style-type: none"> • written exam: 2 hours • 85 marks • 34% of A-level | | <p>Assessed</p> <ul style="list-style-type: none"> • written exam: 2 hours • 85 marks • 34% of A-level | | <p>Assessed</p> <ul style="list-style-type: none"> • written exam: 2 hours • 80 marks • 32% of A-level |
| <p>Questions</p> <p>60 marks of short and long answer questions and 25 multiple choice questions on content.</p> | | <p>Questions</p> <p>60 marks of short and long answer questions and 25 multiple choice questions on content.</p> | | <p>Questions</p> <p>45 marks of short and long answer questions on practical experiments and data analysis.</p> <p>35 marks of short and long answer questions on optional topic.</p> |

What will I be studying?

AQA Physics A-Level (7408)



YEAR 1

1. Measurement and their errors
2. Particles and radiation
3. Waves
4. Mechanics
5. Materials
6. Electricity

YEAR 2

1. Further mechanics
2. Thermal Physics
3. Fields
4. Nuclear Physics
5. *Optional topic*
(*Medical, engineering, astrophysics, turning points, electronics*)

Practical endorsement

We will be carrying out a minimum of 12 assessed practical investigations throughout the year, where you will need to demonstrate key skills:

- ✓ Following instructions
- ✓ Using initiative
- ✓ Recording and analysing results
- ✓ Behaving safely
- ✓ Research and referencing

These are either a pass or fail criteria, and students need to complete the practical activities well to obtain a pass for this part of the course

What do we expect from you?

- We expect pupils to:
 - Attend all classes
 - Pre-read the topics before each lesson
 - Complete home learning tasks on time
 - Attend weekly Physics Clinic for extra support
 - Undertake wider reading

Rule of thumb, for every hour in class → You work 2 hours outside of class

What do you need to do now?

1. Achieve at least a **'6' grade** in your Physics GCSE, or **'6/6' grades** in Combined Science
2. Achieve at least a **'6' grade** in GCSE Maths

We also recommend students take A-Level Maths alongside Physics, so that you can have the best potential chance of succeeding

Further Information?

- Contact:
 - Mr Curnow (Head of Physics)
 - Mr Wright
 - Miss Rex
- Further Reading:
 - www.advancingphysics.iop.org
 - www.aqa.org.uk
 - <https://www.ucas.com/job-subjects/physics>

PHYSICS



See the world differently.

