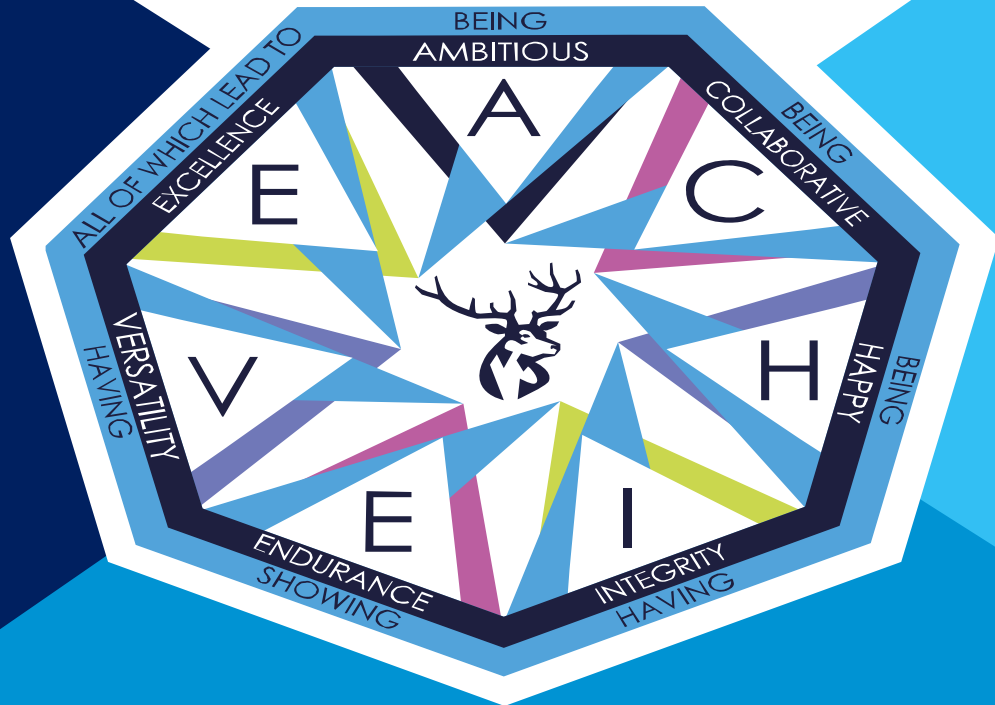


**FURZE
PLATT**
SENIOR SCHOOL



A-LEVEL PHYSICS

Open evening 2023

- Mr Curnow, Head of Physics

Have you ever wondered...

Is
teleport-
ation
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?



What is physics?

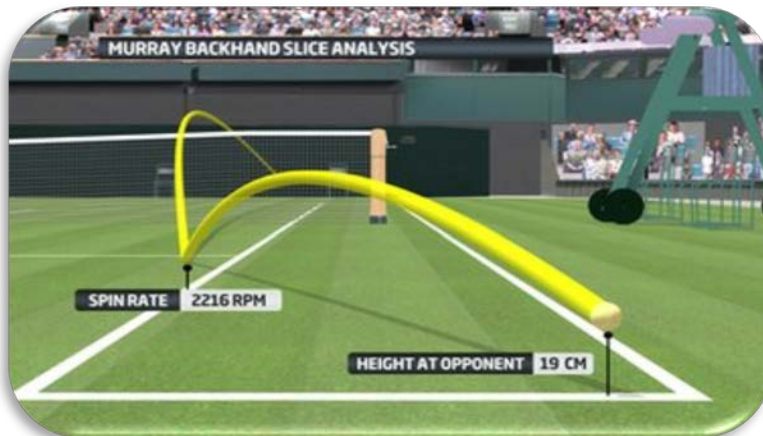
Life-saving



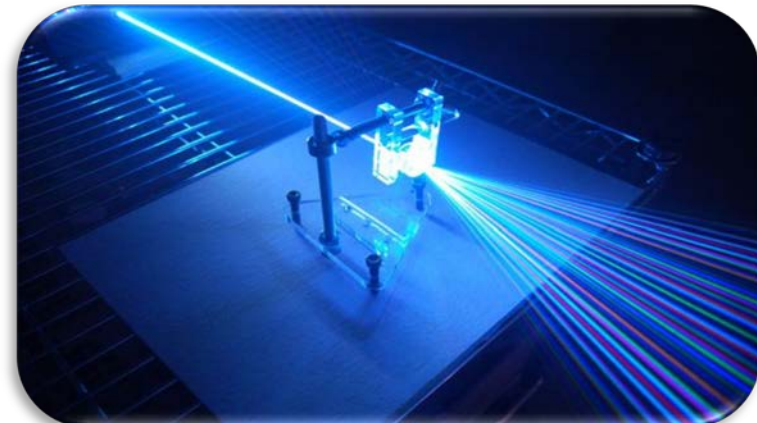
Mind-bending



Integral to all technology

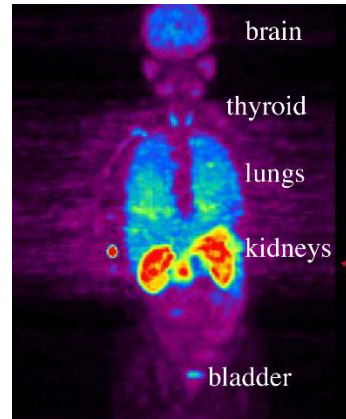


Practical-based

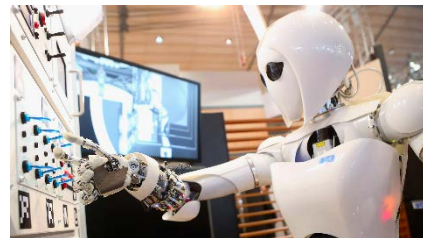
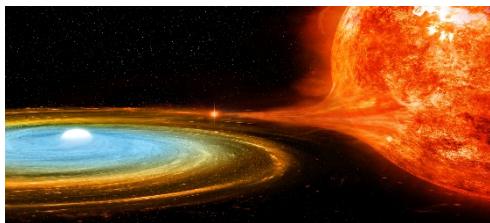


What sorts of jobs is A-level physics useful for?

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



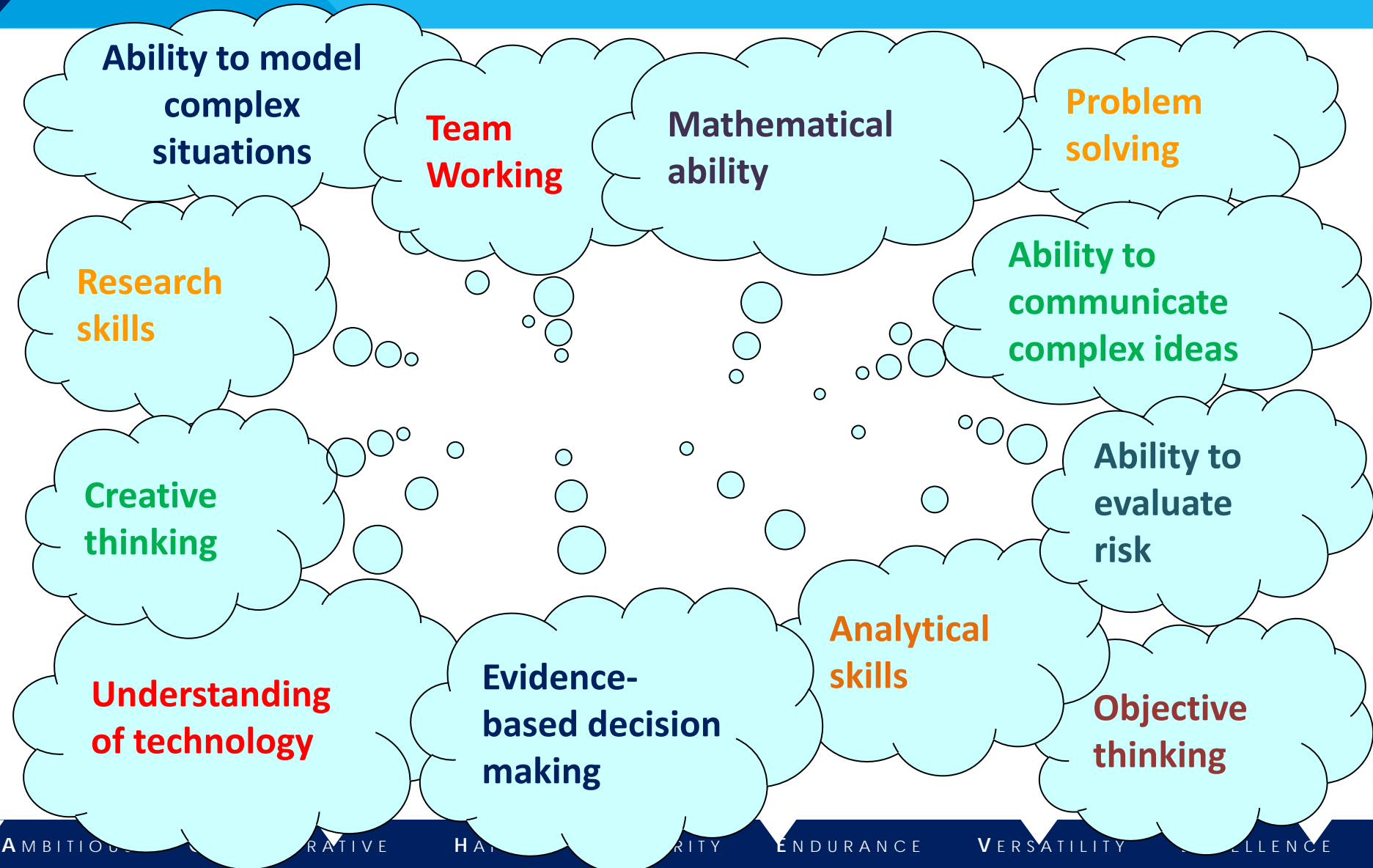
- Finance
- Astrophysics
- Meteorology
- Telecommunications
- Palaeontology
- Forensic scientist



...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!

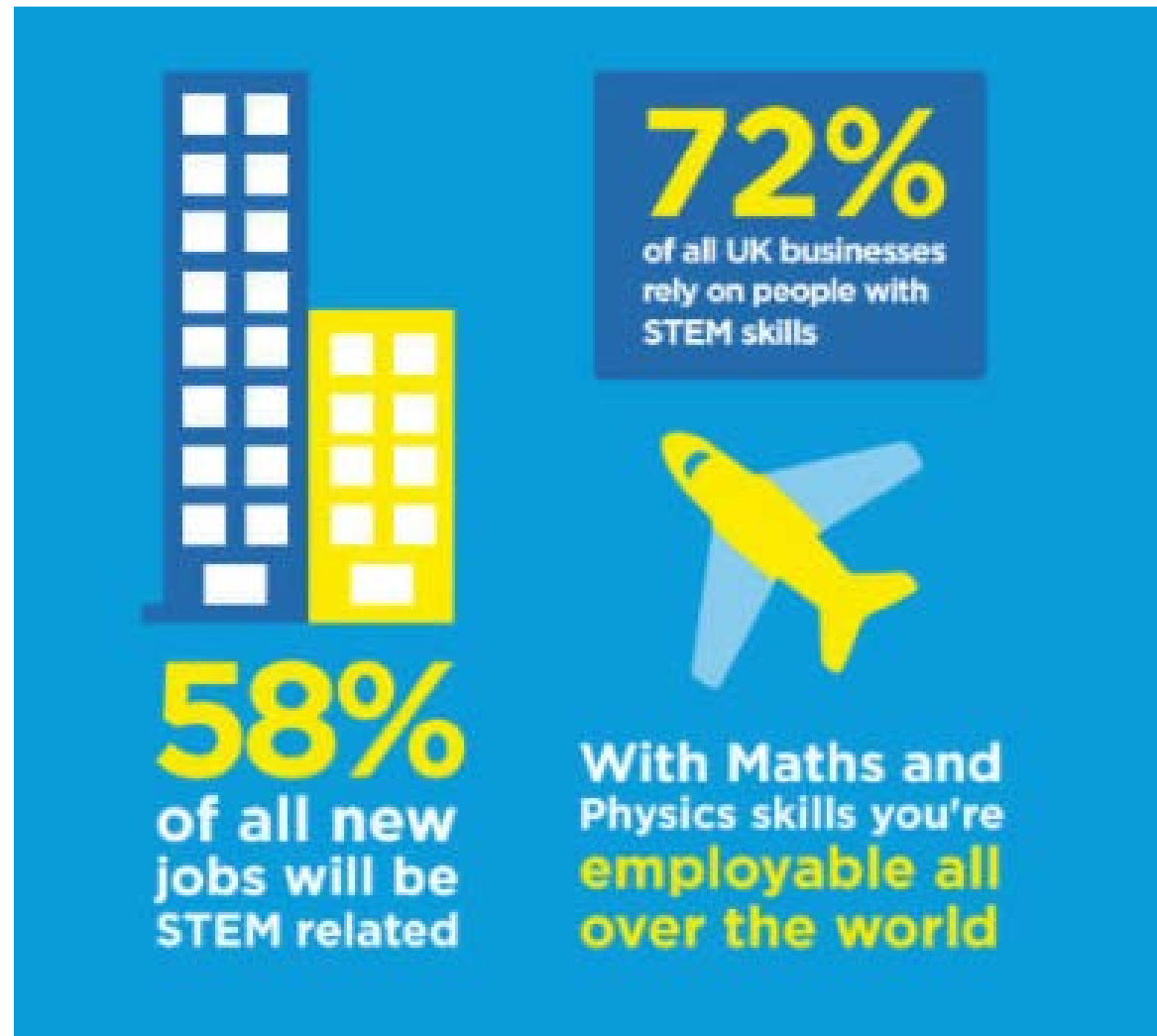


Female STEM
graduates can
earn up to **33%**
more than their
peers

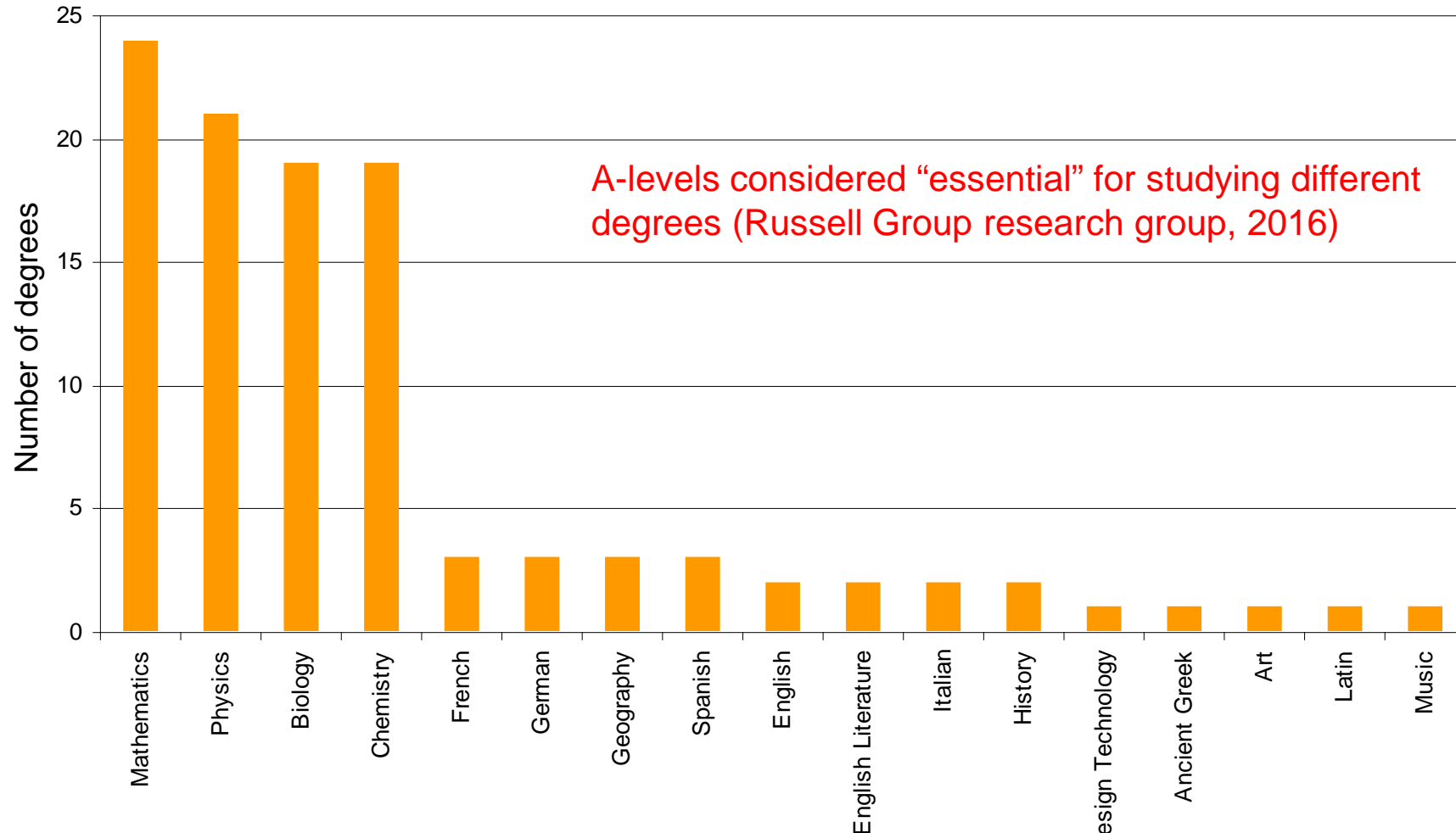
Having just
ONE
STEM A Level
boosts your
earnings by
15%



How can A-level physics help your future career?



How does A-level physics keep your options open?



<http://www.russellgroup.ac.uk/media/informed-choices/InformedChoices-latest.pdf>

What else do I need to know?

You get an equation sheet for EVERYTHING

| Particle Physics | | | |
|------------------|-------------|-----------|-----------------|
| 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 |

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

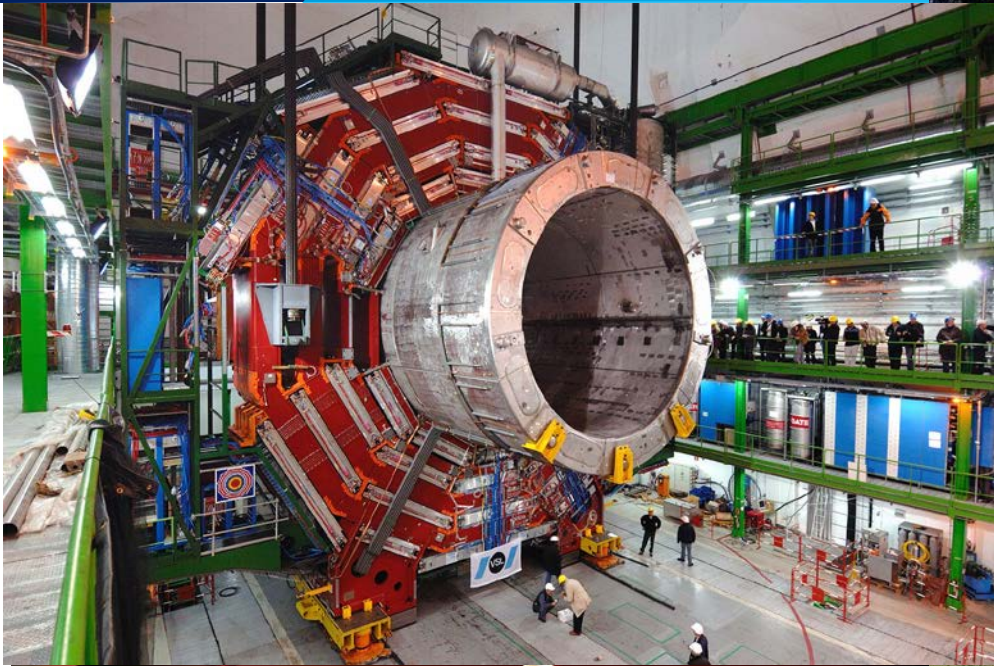
$v^2 = u^2 + 2as$ $s = ut + \frac{at^2}{2}$

force $F = ma$





CERN 2023 - Geneva, Switzerland



AMBITIOUS

COLLABORATIVE

HAPPY

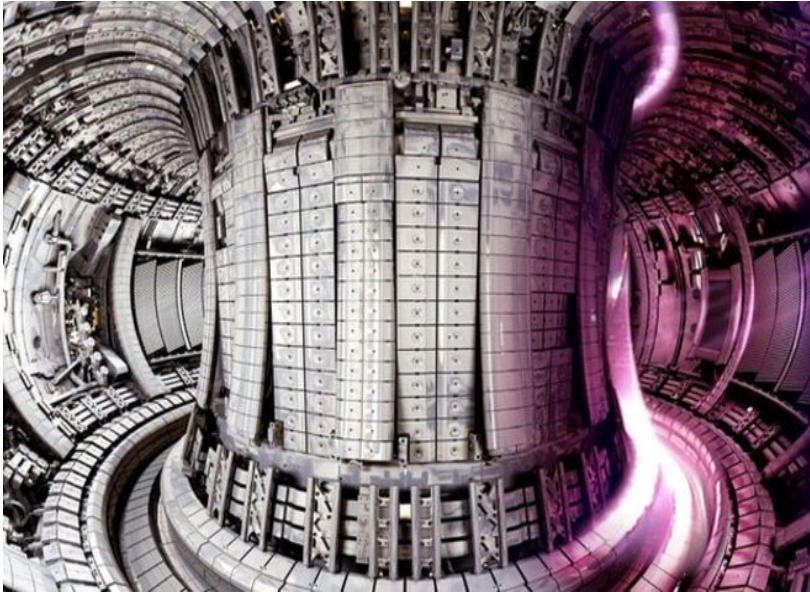
INTEGRITY

ENDURANCE

VERSATILITY

EXCELLENCE

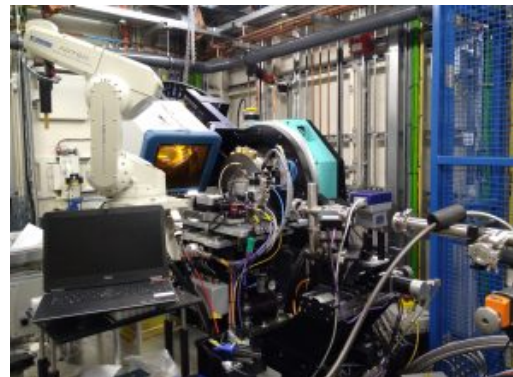
Other trips?



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



Diamond Light Source Synchrotron
(Particle accelerator)



University lectures & demonstrations

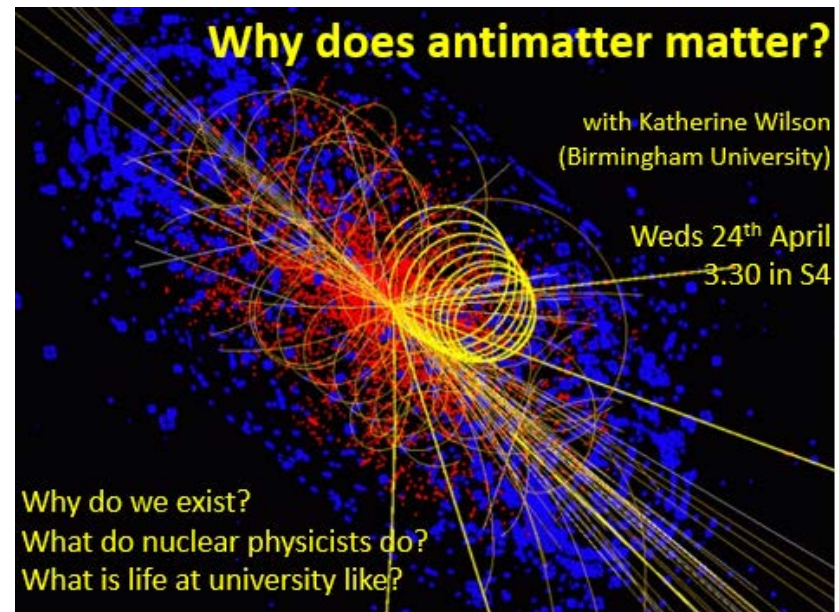


Visiting speakers

Vicky Fawcett's talk about her PhD on
Black Holes (2022)



Former student Katherine Wilson
came in to talk about her degree in
Nuclear Physics (2019)



Recent results

| | %A*-A | %A*-B | %A*-C | %A*-E |
|-------------|-------|-------|-------|-------|
| 2020 | 31.3% | 50.0% | 68.8% | 100% |
| 2021 | 44.0% | 60.0% | 76.0% | 100% |

Although they are Teacher-assessed grades, these are very comparable to the other sciences, and we have a lot evidence to support them

How will I be assessed?

Three exams in Summer 2023, with almost exact equal weighting:

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

How will I be assessed?

Assessments

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

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

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 '5' grade in your Physics GCSE, or two '5' grades in Combined Science
2. Achieve at least a '6' grade in Mathematics

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

Further Information?

- Contact:
 - Mr Curnow
 - Mr Wright
 - Miss Herrick
- Further Reading:
 - www.advancingphysics.iop.org
 - www.aqa.org.uk
 - <https://www.ucas.com/job-subjects/physics>

PHYSICS



See the world differently.

