

physics at A-level the logical choice

why is physics important?



Unlike the other sciences, physics has no limits – everything in your life, on this planet, other planets, to the far reaches of universe and beyond is in physics' job description.

We'd be a bit lost without physics. All the gadgets that we take for granted like laptops and mobile phones wouldn't be here. Nor would the electricity supply that charges them and powers so many other things we use every day. Did you know that a physicist invented the World Wide Web? It's hard to imagine a world without the Internet, but when you were born almost no one had heard of it. Physicists are constantly finding new things. They have recently shown that teleportation is possible – who knows what that will lead to in a few years time?

Physics also deals with the big questions:
How do we search for aliens? Are there
parallel universes? Will we ever travel back
in time? Why do we always find the smallest
bits of cereal at the bottom of the packet?

"Physics is about how everything around you works."

Stuart, TV producer

what's physics like at A-level?



You will already have come across some of the concepts of physics at GCSE: forces, energy, waves, radioactivity, electricity and magnetism. At A-level you will start to see how these ideas work together, and begin to grasp the universal principles that apply to everything from the smallest atoms to the largest galaxies. You will also be able to impress your mates by knowing how things like MP3 players and plasma screen TVs work.



"It's a bit of a jump from GCSE to A-level physics. You study things in much more depth. But towards the end of my A-level physics I started understanding the links between different areas and it really changed my outlook on the world."

David, Renewable Energy Manager

why should I study physics?



Well, do you want to investigate the limits of space, the beginning of time and everything in between?

How about understanding how the technology around you works? Want to save the planet or maybe just help people get better when they are ill? Or maybe you don't care about any of this and just want to earn lots of money?

Well it doesn't really matter. Whatever you do the knowledge and skills you gain by studying physics will be useful. Physics is more than a subject – it trains your brain to think beyond boundaries.

"There are millions of students in the world, but to get a job you have to stand out from the crowd. Physics will help to give you that edge; people are always impressed by a qualification in physics."

Steff, Weather Forecaste

which subjects should I choose?



There's no doubt that A-level physics can be a bit mathematical at times, and so it is best to take maths as well (at least to AS-level).

"For me maths is the language through which you do physics. It helps if you do maths A-level.
Others in my class didn't do maths and they did

okay, they just had to work a bit harder."

vid

Many students choose to combine physics with one of the other sciences such as chemistry or biology, while others who are thinking of becoming an engineer or architect combine physics with design-technology or art.

"I knew I wanted to be an engineer, but I wasn't sure which type. That's why I chose physics at A-level; you pretty much need physics to do any engineering degree."

laomi

But there is no need to follow the crowd. Physics and maths can be combined with just about anything.

"I chose physics and maths at A-level because I thought they would make a nice balance to my English and photography A-levels."

To find out more about these people and all the jobs an A-level in physics could lead to, visit:

physics.org/careers



IOP Institute of Physics

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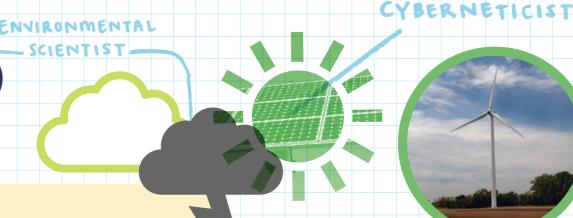
It all starts with physics A-level...



METEOROLOGIST

Catherine, Astrophysicist Catherine was always fascinated by space when she was at school and so she studied astrophysics at university. She now investigates galaxies for a living and also gets to travel the world. "I've been to places like Australia and the Canary Islands. The skies there are much clearer and darker and so I get a much better view," she explains. Catherine has even used the Hubble Space Telescope, which is way above the Earth's atmosphere, in her search for dark matter. "Dark matter is a bit

increasingly important.



RADIOGRAPHER

Steff. **Weather Forecaster**

After completing her A-levels Steff decided to

continue with physics, rather than take maths

at university. "Obviously there's a lot of maths

in physics, but I far preferred physics, there is much more of a link to the real world." Steff now works as a TV weather forecaster on the news network Al Jazeera. She's also clocked up appearances on the BBC, Sky and Channel five. "I even appeared on Richard and Judy once," she adds. "I certainly wouldn't be where I am today without physics, I use physics every day. It's the backbone of meteorology [the science of predicting the weather]." Steff is keen to point out that forecasting isn't just about working out whether or not it's going to rain tomorrow. "Forecasters also use computer models to predict what will happen to the Earth's climate in the long term. As the effects of global warming become worse in the coming years, the role of a meteorologist will become

David, Renewable **Energy Manager**

Of the many physics inventions, David thinks that wind-turbines or solar panels are probably his favourite. "In principle they're so simple; they take something that is just there [wind and sun] and turn it into something really useful [electricity]." David studied physics at university after his A-levels and feels that this really has helped him do his job. "I manage a number of projects to introduce renewable energies across the UK; my physics knowledge makes it so much easier to understand the technology. The skills you learn whilst studying physics also help you to approach projects in a much more logical way. That's an important part of most jobs and so studying physics really does keep your options open; you can pretty much go into whatever area you want."

to become a surgeon. However, as he often operates on patients with throat problems, neither Declan's music knowledge or what he learned during his physics A-Level goes to waste. "I found A-level physics quite hard, but with hindsight I'm glad I did it. During my music degree, my knowledge of acoustics particularly how sound is produced - helped me understand how the human voice works. If you haven't got a background in physics it can be difficult to understand things like frequency, pitch and harmonics." Physics also comes in useful now that he is a surgeon. "I use lasers most weeks, and having knowledge of how they work helps," he says. "Lasers are a very powerful tool and have made a huge



CAPITALIST

OPTOMETRIST

Emma.

MEDICAL

Clinical Scientist

Surgeons are not the only medical professionals

physicists, and clinical scientists like Emma use

their physics knowledge every day when looking

oblems," says Emma, who uses computers to

after patients. "I am constantly applying the

f there is a problem I alert the surgeon, so

ney can prevent paralysis of the patient."

who use physics. Radiographers, medical

ELECTRICAL ENGINEER

AIR TRAFFIC

CONTROLLER

Declan, Surgeon

Declan started a music degree before deciding difference to how we treat cancers."



AERONAUTICAL ENGINEER

COMPUTER PROGRAMMER



'I could never understand why people don't

SCIENCE

JOURNALIST

OMPUTER

find physics interesting; physics is about how everything around you works," says Stuart, who makes TV documentaries. Stuart studied electronics at university before moving into TV production. "At university I became editor of the student newspaper and just got into storytelling. It was quite a big moment for me to give up science, but I do use my science knowledge in my job a lot, so I feel okay with it. TV production is a very technical thing. Having a physics background means I can do a better job as I have a much better understanding of how cameras and lighting work.'

Tony, Sound Engineer

'There's a lot of physics in sound engineering from the acoustics to radio waves." savs Tonv. who works as a sound system engineer for music artists like Kylie, Il Divo and Bob Dylan. Tony got into sound engineering whilst at university. "A few friends formed a band. The drummer was doing ohysics with me, the singer was doing medicine, and the keyboard player was doing law. I started mixing the sound for them." Tony soon began working for bigger name bands, and now tours all over the world. His physics background helps nim prepare for concerts. Before a gig starts "I get up on the front of the stage and use laser neasuring tools to get the measurements of the room. I then use software to do a 3D model of the room, and put the speakers in that model I'll adjust the angles and height and direction of the speaker system to try and get the most even [sound] coverage for all of the audience area,"



ner GCSEs. "I did some work experience at British Aerospace. That's when I realised what t was all about; it's very hard to understand what an engineer does without seeing it for yourself. It's very hands on; you're always producing something or making something." After completing a degree in engineering Naomi now investigates how people are injured in accidents and terrorist attacks. "The best bit of my job is when I get to crash cars and blow up fake people - its great fun. But it is also good to know that you're preventing people from being injured or killed in the real world."

bi Law student

Abi studied English at University. But now that she is training to become a lawyer she's glad she took physics at A-level "Law and physics are quite similar. Both equire you to identify the key principle hat apply from a wide range of specific problem," she explains.



CIVIL ENGINEE









Harjinder, Solicitor

With law covering so many areas includin new inventions and technology, some lawyers benefit even more directly from a training in physics. "There are many people with a physics background in law,' says Harjinder who studied physics at university. He now works as a solicitor for the Internet search engine Google. "The way of thinking that physics develops is very useful, as is the ability to understand echnology when discussing the legal spects of it."

mysterious: we still haven't discovered what

it is yet. We do know it's important though, it

surrounds and holds our galaxy together."

MARINE ENGINEE