What is physics?

Physics is a key part of science and technology; it deals with how and why things behave as they do. Physics is used to solve problems: environmental, social, health, technological and many more. It's about practical things but also involves ideas such as the origin of the universe and the tiniest building blocks of all materials.

- Physics lies at the heart of science, engineering, technology, our planet and the universe itself
- Physics involves living and non-living things
- Physics is intriguing and challenging
- Physics is fundamental

A knowledge and understanding of physics is necessary to....

predict the weather
understand climate change
prospect for minerals
insulate our homes
test and improve our hearing and eyesight
investigate how animals communicate
build quiet, efficient and safe vehicles
launch a rocket
create new materials
analyse pollution of air, land and water
take scans of the human body
harness energy of all kinds
solve crimes
date archaeological remains

Physics will help you appreciate so many things which affect our lives with answers to fascinating questions such as

How can we save premature babies from dying?
Can we get cheap energy from sea waves?
How can radioactive substances be used in medicine?
What makes a nano-material SMART?
Why does food feel hot but plates stay cold in a microwave oven?
How can we measure the smoothness of skin?
How do contact lenses work?
Can Radar be used to track plumes of volcanic ash?
How does a nano-engineered swim suit work?
Why are the skies blue and sunsets red?
How does CERN's research with proton beams provide new treatments for cancer?
What makes glass transparent?
How can we improve the hearing of a nearly deaf person?
How does a laser allow you to download an itune?
Where can we find water in dry countries?
What is the best way of spraying crops and protecting harvests?
How do bats use echolocation for navigation?
How can we analyse the age of paint on a Renaissance painting?
Why do different materials have such different strengths?
What are the best designs for football boots?
Which technology will predict earthquakes and tsunamis best?
How can a laser correct shortsightedness?
What nanotechnology application will make a sunscreen more effective?
How would an understanding of ballistics help a forensic scientist?

and many, many more.

In the words of some physics graduates

'It's a very satisfying feeling to see the rocket on a launch pad, knowing your kit is about to be blasted into space'
Patrick Brown, Rocket Scientist

'There is a lot of local wildlife in Botswana that enjoys chewing on the wires nosing around the instruments!'
Jessica Spratt, Geophysicist

'but instead of warding off evil trolls, I get to create the game.'
John White, Computational Physicist

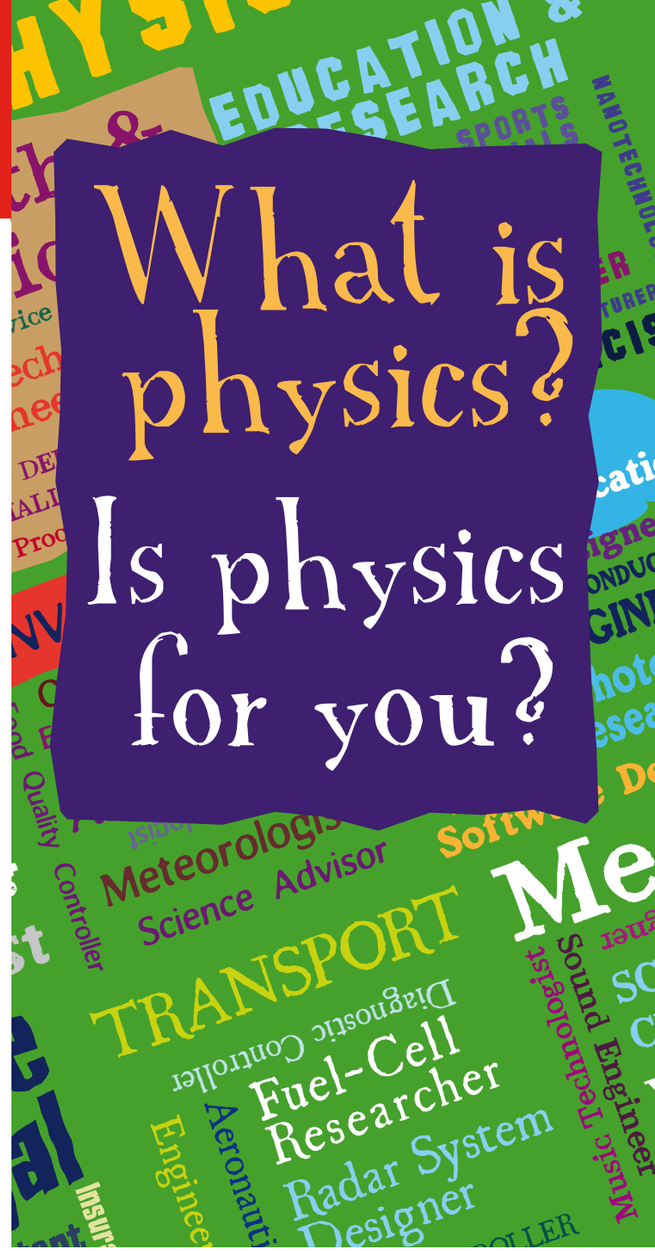
'..and if any severe weather is expected, I will issue warnings.'
Sarah O'Reilly, Meteorologist

'My work is in gamma-ray bursts, tremendous explosions, which we can detect even to the edge of the universe.'
Lorraine Hanlon, Astronomer

'If correct, this could be a Nobel prize winning discovery!'
Ronan McNulty, on his work at CERN. Particle Physicist

'Case settles for fraction of its value. Physics wins!'
Pat Culleton, Forensic Physicist

think physics!



IOP Institute of Physics in Ireland

Is physics for You?

If you want to use your imagination, your practical ability and your creative flair, then physics could be for you.

If you are fascinated by the world about you and would like to understand more about it, or if you are thinking about a career in engineering, medicine, computing, the environment, space or technology, then physics is for you.

If you want to use that interest in the world around you to solve many of the Earth's greatest problems then physics is definitely for you. From the search for renewable fuels to the use of solar power in water purification schemes in developing countries, physicists are working with engineers, biologists, chemists, governments, charities and industry to make our planet a safer and more sustainable place.

With a physics qualification you could choose to work in the open air, in a hospital, in a laboratory team, in some kind of engineering, in education or in many other environments.

While many physicists work in research labs particularly in universities, two thirds of Irish physics graduates work in other areas such as medical technology, computing, energy production or food sciences. There is exciting work, too, in meteorology, photonics, w, nanotechnology, scientific journalism, aerospace, chemical, mechanical and civil engineering.

If after studying physics you move away completely from physics-based work, the intriguing uses of physics all around you will always remain of interest. The ideas, techniques and ways of thinking, which you have learnt, will always help you understand the scientific and technological information in the media, which shapes our world, while, the logic and problem solving techniques are of use in any career.

When trying to decide what to study at third level, probably the most important question to ask is 'do you like the subject?'

In a 2010 IOP survey of first year physics undergraduates 72% said they chose their degree because of their interest in the subject, especially the 'big' areas such as astronomy and particle physics fields – which are leading to some of the most impressive technology spin-offs with rapid advances in computing, imaging, medicine and the environment.

In a 2010 IOP survey of the last five years of physics graduates 13% are earning between €40k and €50k.

If you decide to become a physicist then in your training you will learn:

- To design experiments
- To use mathematics and computers in real-life situations
- To observe events and ask sensible questions about them
- To work successfully in teams
- To explain your ideas to people around you
- To have new ideas and think up new theories

So, if you have an enquiring mind, are adaptable, enjoy challenges, have some mathematical ability and good powers of observation and if you can communicate your ideas clearly to other – then physics certainly is for you!

Finding out more

Institute of Physics in Ireland, c/o School of Physics
University College Dublin, Dublin 4 +353 1 7162216

iopireland.org

physics.org

JOBS FOR PHYSICISTS

ENERGY

Bio-fuels researcher
Nuclear Physicist
Oil Rig Engineer
Geothermal Expert
Wind Analyst
WAVE ENERGY EXPERT
Solar Power Advisor

Health & Medicine

Medical Device Designer
Perfusionist
Biomechanical Engineer
Radiation Technologist
Medical Physicist
DRUG DELIVERY SPECIALIST
Image Processing Researcher

EDUCATION & RESEARCH

PARTICLE PHYSICIST
SPORTS MATERIALS SCIENTIST
NANOTECHNOLOGIST
LAB TECHNICIAN
RESEARCH TEAM LEADER/MANAGER
PHYSICS TEACHER/LECTURER
LASER PHYSICIST

Space

aSTRONOMER
radiation effects engineer
Satellite designer
remote Sensing researcher
PLASMA MODELLER
SOLAR PHYSICIST

ENVIRONMENT

Oceanographer
Food Quality Controller
Environmental Analyst
VOLCANOLOGIST
Archaeologist
Seismologist
Meteorologist
Science Advisor
Geophysicist
Soil Physicist
Encryption Expert
Manufacturing Technician
Electrician

IT & Telecommunications

Antenna Designer
Lithographer
SEMICONDUCTOR ENGINEER
Photonics Researcher
Games Developer
Software Designer

Finance & Legal

Entrepreneur
Risk Analyst
Patent Examiner
Sales and Marketing Rep
Insurance Broker
Econophysicist
Intellectual Property Lawyer
Forensic Physicist

TRANSPORT

Diagnostic Controller
Aeronautical Engineer
Fuel-Cell Researcher
Radar System Designer
AIR TRAFFIC CONTROLLER

Media

Web Designer
Exhibit Designer
Sound Engineer
SCIENCE CURATOR
Music Technologist
Video Producer
Science Journalist/ Communicator