April 2021

CAREERS SERVICE

Careers Occupational Information Unit

Department for the Economy
www.economy-ni.gov.uk

SKILLS TO SUCCEED

Spotlight on PHYSICS

Inside this issue:

CAREERS SERVICE

Spotlight on PHYSICS

Introduction

The Northern Ireland Skills Barometer indicates that STEM subjects, including Physics, have some of the largest forecast annual under supplies. Physics is a key driver of research and innovation and can open up a broad variety of careers opportunities across a range of different sectors.

In the first of a new series of subject-based career guides produced by the DfE Careers Occupational Information Unit, local Physics course options and the careers opportunities Physics can open up are explored.

This publication has been produced in collaboration with Queen's University Belfast (QUB), The Open University (OU) and the Institute of Physics (IOP).

QUEEN'S UNIVERSITY BELFAST

The Open University

What is the Institute of Physics (IOP)?

The Institute of Physics is **the professional body and learned society for physics in the UK and Ireland.** Its purpose is to gather, inspire, guide, represent and celebrate all who share a passion for physics. And, in its role as a charity, it is here to ensure that physics delivers on its exceptional potential to benefit society.

Wherever you are in your journey with physics, the IOP has resources to help you. Whether you're making subject choices at school or college, a physicist considering professional registration as your career progresses or an IOP member looking for CPD support, you can find information and advice on the Institute of Physics website.

IOP Institute of Physics

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Spotlight on PHYSICS

Why study Physics?

If you enjoy studying physics but aren't sure how it could help your job prospects, we have good news. **Employers across a huge range of industries are crying out for people with physics skills right now.**

Studying Physics can lead to careers in some of the most rewarding, exciting and innovative industries. Where Physics could take you: Career path.

Choosing A-level Physics

Physics is a **facilitating subject,** meaning that it's highly regarded whatever degree or career path you choose. It's considered essential for science and engineering courses, so it **keeps a lot of doors open** for you. Physics A level.

Supporting young people with their studies

A young person chooses a subject you don't understand – how can you best help them?

Eve, a Physics A level student and her mum, Sian, share their experience and what advice they have for families in the same boat in Choosing Physics A level: A family perspective.

Technician and Apprenticeship entry routes

Becoming a Technician

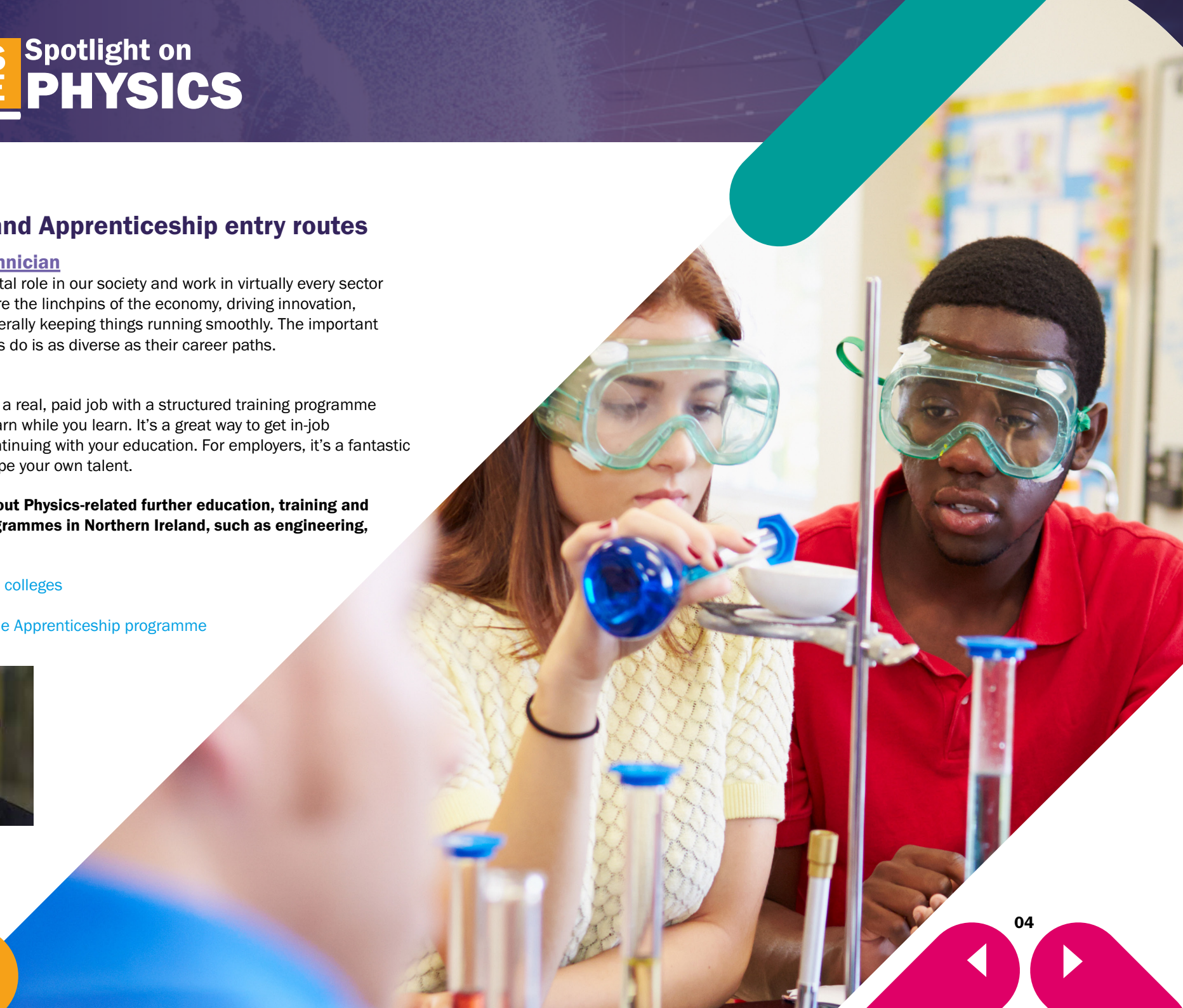
Technicians play a vital role in our society and work in virtually every sector and industry. They are the linchpins of the economy, driving innovation, productivity and generally keeping things running smoothly. The important work that technicians do is as diverse as their career paths.

Apprenticeships

An apprenticeship is a real, paid job with a structured training programme attached – so you earn while you learn. It's a great way to get in-job experience while continuing with your education. For employers, it's a fantastic way to grow and shape your own talent.

To find out more about Physics-related further education, training and apprenticeship programmes in Northern Ireland, such as engineering, please refer to:

NI Further Education colleges
Training
Getting started on the Apprenticeship programme



Physics at University

If you study physics at university, you can either graduate in three or four years with a Bachelor of Science (BSc) or continue studying for an additional one or two years to graduate with a Master of Physics (MPhys) or a Master of Science (MSci). Choosing physics: University.

There are a wide range of courses available and the duration will depend on the course structure and may vary from university to university.

You can explore course options in the United Kingdom and ROI by using **MyPhysicsCourse.**

Detailed information on Physics higher education options in Northern Ireland can be found overleaf.

Watch **QUB Astronomy PhD student,** Stephanie Merritt discuss the importance of diversity in academia, and outline her return into education as an adult.

Physics careers

Where could Physics take you...?

VFX/ Gaming?

Robotics/AI?

Medical Physics/ Healthcare?

Climate Science/ Technology?

Finance/ Law?

To name just a few options!

Physics at QUB

What are the advantages of studying Physics?

Most students undertake a Physics degree as they have an inherent interest in understanding the world and Universe around them and are stimulated by new concepts and the problem solving challenges involved.

They also are excited by the opportunity to undertake final year projects within leading research groups on topics of national and international importance such as fusion energy, quantum computing, enhanced radiotherapy, exoplanet discovery, categorisation of comets, asteroids and supernovae, and developing next-generation data storage.

On a practical level, students recognise that the mathematical, computing, research and problem-solving skills developed in their Physics course are highly valued by employers around the world, as evidenced by the variety of destinations of graduates.

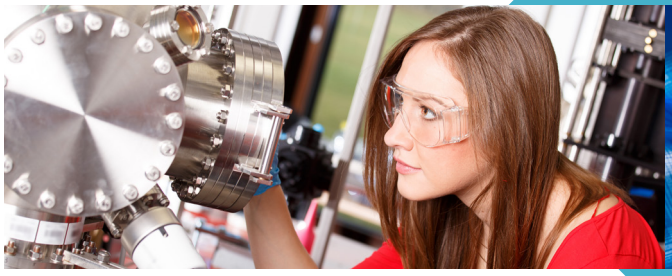
QUEEN'S UNIVERSITY BELFAST

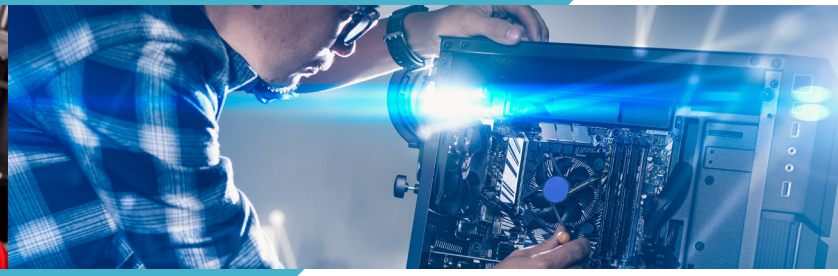
Did you know...?

Physics based industries directly or indirectly support about 60,000 jobs in Northern Ireland in a range of industries[1].

The high value of Physics graduates in NI and GB has been identified in a recent report by the Institute of Fiscal Studies[2]. This shows that **5 years after graduation, compared to all other degree subjects, Physics graduates earn 15% more than the average. Male Physics graduates have the 5th best earning power of any subject and this is even higher for female Physics graduates (4th).**

QUB Physics is working hard to eliminate gender barriers in science and attracts a higher proportion of undergraduate female students than the national average (26% vs 24%).





1 The role of physics in supporting economic growth and national productivity in Northern Ireland, Institute of Physics (2017) - www.iop.org/sites/default/files/2018-10/role-of-physics-in-supporting-economic-growth-northern-ireland.pdf

2 *The Relative Labour Market Returns To Different Degrees,* Chris Belfield et al., (2018), Institute of Fiscal Studies - www.ifs.org.uk/publications/13036

Undergraduate, Integrated Masters and Postgraduate Physics course options

QUB offers undergraduate bachelors (BSc, 3 years) and integrated masters (MSci, 4 years) in a variety of Physics degree programmes. All these are based on a core Physics curriculum, but there are numerous options to specialise as follows:

Physics
Theoretical Physics
Physics with Astrophysics
Physics with Medical Applications
Physics with French or Spanish (Physics major, language minor)
Applied Mathematics and Physics (joint degree)

QUB Physics also offers a postgraduate **MSc course in Material Science, along with research degrees leading to MPhil or PhD degrees.**

Course structure – Undergraduate and Integrated Masters courses

The first two years of these courses are very similar with students developing key competencies in Mathematics, computer programming, experimental skills, analysis and communication, as well as the core Physics. This provides a basis in the third and/or fourth year for students to study specialised topics and research projects in areas such as Astrophysics, Medical Physics, Nanotechnology, Lasers and Plasmas, Quantum Computing, and materials simulation.

These programmes are recognised and accredited by the professional body – Institute of Physics (IOP). QUB Physics' commitment to diversity and gender equality has been recognised with the award of the IOP's Juno Champion status and an Athena SWAN silver award.

All students in their third year undertake a Professional Skills group project in which they investigate a problem set by local technology companies and present their findings to these industry leaders. **Students can also take an additional, optional placement year as part of their course.** These students are given training to support their placement applications and to prepare them for entering the workplace and they have an academic mentor during their placement year. **Students can also take a year abroad as part of their studies with some students financially supported through exchange programmes such as Erasmus.**

Career options

QUB Physics graduates end up in a diverse range of careers. This includes industries not normally associated with Physics as the range of skills and adaptability possessed by graduates is highly valued. The following are examples of sectors and companies which are destinations for QUB Physics graduates:

- **Accountancy**
- **Advanced Engineering** (Seagate, General Electric, Camlin Group)
- **Aerospace** (Spirit Aerosystems, Thales)
- **Biotechnology** (Almac, Randox)
- **Consultancy** (Deloitte, PWC)
- **Education**
- **Finance technology** (FinTru, AquaQ, All State, Citi, First Derivatives)
- **NHS**
- **Software Development** (Kainos)
- **Telecommunications** (BT)

Given that studying Physics opens up lots of different career options, the paths that graduates take depends a lot on what topics they find most interesting during their studies, the strengths they feel they have and where their personal interests lie. In this sense a Physics degree at QUB provides an excellent platform for entry into a wide range of career pathways with a well-developed analytical skillset that is ideally suited to adapt to changes and challenges in an ever-evolving employment landscape.

The Physics graduate's skillset

The analytical and problem solving skills of Physics graduates means they are in high demand among employers in IT, Business and Finance and some branches of Engineering, and the destinations of graduates reflect that. Within Northern Ireland, a high proportion of Physics graduates go into the growth industries here of Finance and **Financial Technology.** Not all graduates follow those paths and it's possible to find graduates with job titles as diverse as Trainee Medical Physicist, Patent Attorney and Transport Planner.

Employers in Northern Ireland

"At Randox we continuously pursue disruptive technologies to push the cutting edge of healthcare diagnostics. QUB Physics graduates are an excellent fit in this framework as at the core of their studies is a questioning of methodology and quantitative analysis."

Dr. Paul Vance, Project Manager, Randox Laboratories.

CAREERS SERVICE

Spotlight on PHYSICS

"The technical and problem-solving skillsets of QUB physics graduates are a perfect match for the needs of AquaQ. Candidates with this background who join our graduate programmes regularly excel and provide the novel thinking required to drive our activities to new levels."

Calum McBurney, Talent Acquisition Specialist, AquaQ Analytics.

Did you know...?

QUB Physics is particularly crucial in supporting medical physics in Northern Ireland:

"The Regional Medical Physics Service benefits hugely from the high quality graduates produced by the School of Maths and Physics at Queen's University Belfast. Since the turn of the century, two thirds of all our Clinical Scientists obtained a Physics degree at Queen's prior to joining the Service. The vast majority of these degrees were at integrated masters level or higher."

Prof. Alan Hounsell, Head of the Regional Medical Physics Service, Belfast Health and Social Care Trust

Postgraduate study

A large proportion of our students (around 30%) go on to acquire higher qualifications at QUB and beyond, doing MSc courses in areas such as Software Development, Data Analytics, Material Science, Medical Physics, etc., or undertaking a PhD in Physics which often has an interdisciplinary flavour. This can lead them into work in **scientific research, academia or research and development** roles within industry. Another popular option for postgraduate study among Physics graduates is the **PGCE**, which enables them to share their love of their subject through **teaching.**

For more information on studying Physics at QUB.

School of Mathematics and Physics website

E-mail: mp@qub.ac.uk or telephone: **+44 (0)28 9097 1386/5293**

A UNIVERSE OF OPPORTUNITIES

Physics study options at The Open University

When you imagine where a physics graduate might work, you might think of research, teaching, or perhaps designing space rockets. All these are possibilities, but you might be surprised by the range of careers physics graduates go into.

Open to people, places, methods and ideas

At The Open University (OU), we offer a range of physical sciences qualifications. **Our open entry policy** means you are welcome to study with us, no previous qualifications necessary, whatever your ambitions, abilities or disabilities, culture, location or background. **Studying physics will develop your numeracy and data analysis skills as well as the time management, self-motivation and remote collaboration skills that all OU students gain from distance learning, which are particularly valued by employers.**

You'll access your study materials online and in books sent to your home. A tutor will be assigned to you for each module, and you'll meet other students in your tutor group, both online and sometimes in face-to-face tutorials. And you'll get to grips with hands-on experimental work using innovative, award-winning online tools such as the OpenSTEM Labs that replicate the experience of conducting experiments in person.

Flexible study to fit around you

Studying with the OU means you can fit your studies around work, family or caring duties. **Studying at part-time intensity, it usually takes around six years to complete a full degree. However, if you need a study break, the option is there to do so or complete your degree in three years by studying at full-time equivalent intensity.**

The Open University

Physics study options at The Open University *(Continued)*

Choose your qualification

Whether you're interested in a Degree, Certificate or Diploma of Higher Education in physical sciences, we've got a course for you. Our physics degree courses include:

BSc (Honours) Physics (R51) - accredited by the Institute of Physics. Develop the knowledge and skills you need to explore the smallest and largest scales of the Universe.

BSc (Honours) Mathematics and Physics (Q77) - Explore the concepts of modern physics, including Newtonian mechanics, special relativity, electromagnetism and quantum mechanics.

BSc (Honours) Natural Sciences (Astronomy & Planetary Science) (Q64) - If you're drawn to the mysteries of the Universe beyond Earth, explore the Solar System and the history and fate of the Universe.

Career opportunities

Physics qualifications can gain you access to a wide range of placements, postgraduate study, further professional training or entry-level roles in many fields, such as:

Computing - Many physics pathways revolve around using data, and there's a growing industry in data science. With their strong analytical skills, physics graduates are well suited to working in information and technology industries.

Business and Finance - analysis and management roles are a popular choice for physics graduates. An example of this would be actuarial science, providing financial risk management advice based on probability theory and statistics.

Teaching - Primary and Secondary Education roles attract a lot of science graduates, and the sector is always in need of new science teachers, especially in Physics.

Medical science - for example, working in radiotherapy.

Astronomy and Geophysics - studying the Earth and Space, for example conducting research, developing software, building satellite equipment.

Engineering - in areas such as electrical, mechanical, energy, nuclear and software engineering.

Physics study options at The Open University *(Continued)*

You don't necessarily have to wait until you've completed your physics qualification to start using the skills you've gained to take the next step in your career, and some OU students find placements with employers whilst studying. A number of Physics graduates also go on to do further study, for example a Masters or PhD. These students may then go into further research, helping to make new discoveries in science.

Employers in Northern Ireland

The Open University work closely with employers who offer placements and opportunities for physics students. Examples of opportunities in Northern Ireland include:

- **AquaQ Analytics –** financial software development opportunities.
- **Almac –** roles in quality management and project management.
- **BT–** software and technology industrial placements, technology professional graduate programme.
- **EY –** data science graduate programme.
- **Olenick –** graduate software testing programme.
- **Randox –** placements in biochemistry, biotechnology, physics, mathematics and statistics.
- **SpotX –** software engineering placements and graduate programmes.

Stuart Harvey, CEO of Datactics, a Data Management company based in Belfast highlights the relevance of Physics as a degree choice:

"Datactics has five members of staff who studied Physics as a primary degree. In fact, our founder Jens Rasch, has a PhD in Atomic Physics! It's our experience that the expertise in data analysis, mathematics and problem solving gained by a Physics education are ideal skills for working in various technical jobs at the company. The roles most likely to be a strong fit at Datactics are in software development or data science."

CitiGroup, another employer who hire physics students and graduates in Northern Ireland, speak about why they value those coming from that discipline of study:

"At Citi, we value diverse thinking and we encourage Physics students to join our Graduate Programmes each year. The Physics graduates that we have hired have been extremely valuable to our roles within Citi, in particular our Software Engineering opportunities. They excel within their careers with us as they are able to transfer their analytical, numerical and problem solving skills to their day to day roles."

Carla McGlynn, Head of Markets Data, Risk and Controls Technology & Belfast at Citi group

For more information on studying Physics at The Open University

If you'd like to discover more about studying physics with The Open University, go to open.ac.uk/courses/physics .

You can also email northern-ireland@open.ac.uk to get more advice about studying with the OU.

Physics careers....a huge range of options!

Want to discuss your career options?

Contact a Careers Adviser

If you would like to talk through your career options with a careers adviser, please get in touch.