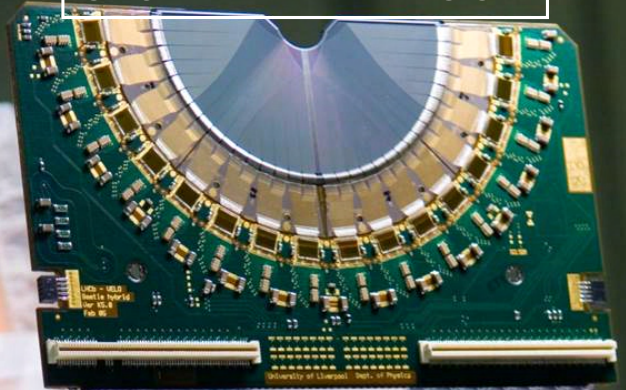
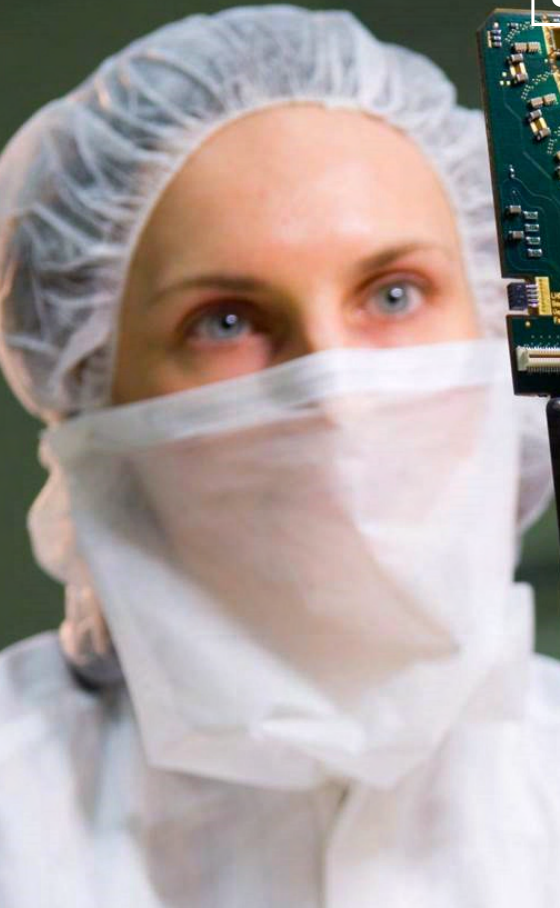




UNIVERSITY OF  
LIVERPOOL

# DEPARTMENT OF PHYSICS

UNDERGRADUATE  
STUDY AT LIVERPOOL

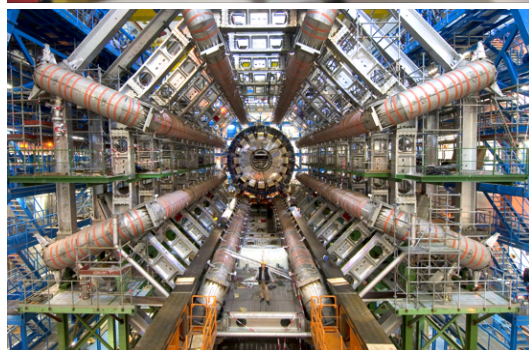
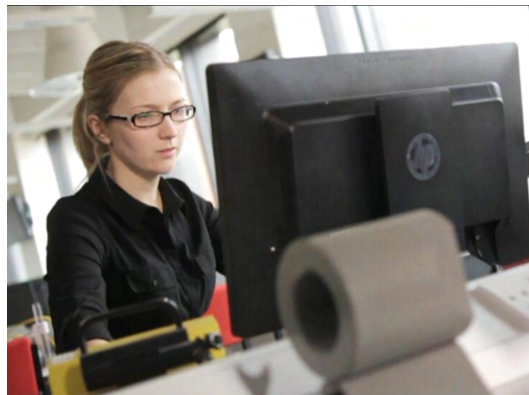
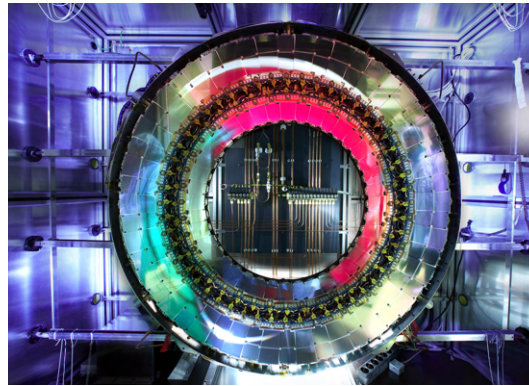


THE ORIGINAL

REDBRICK

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# Why choose Physics at Liverpool?

We are one of the UK's leading physics departments, with a history of discovery that goes back over 130 years, producing three Nobel Laureates. The school is internationally renowned for its work in particle physics, nuclear physics, condensed matter physics and accelerator physics. As a student, you'll be immersed in a research environment from the start.

## Create a degree to suit you

Explore and apply fundamental principles that underpin modern physics, from electrodynamics and semiconductors to the startling conclusions of relativity and quantum mechanics. Our flexible programmes allow students to transfer up to the end of Year Two between any of the physics programmes.

## Be part of a supportive community working together to do great science

Our open-door approach enables us to offer you a friendly and supportive learning environment.

## Prepare for your professional career

Most of our BSc and MPhys programmes are accredited, or pending accreditation by the Institute of Physics, and our specialist programmes such as Physics with Nuclear Science and Physics with Medical Applications provide skill sets necessary for these growing sectors.

## Be at the forefront of modern physics

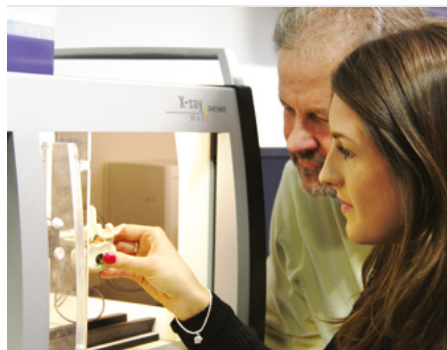
There are opportunities to work alongside our internationally renowned academics on projects at the LHC at CERN and in many international and national research centres in the USA, Canada, Japan, Korea and many European countries.

## Learn in our award-winning facilities

Teaching takes place in our Central Teaching Laboratories, which have transformed the way in which physical sciences are taught at the University.







## How you learn

Our research-led teaching ensures you are taught the latest advances in cutting-edge physics research. Lectures introduce and provide the details of the various areas of physics and related subjects. You will be working in tutorials and workshops, which are another crucial element in the learning process, where you put your knowledge into practice. All of our lecturers also perform world class research and use this to enhance their teaching.

Practical work is an integral part of the programmes, and ranges from training in basic laboratory skills in the first two years to a research project in the third or fourth year. You will undertake an extended project on a research topic with a member of staff who will mentor you. By the end of the degree you will be well prepared to tackle problems in any area and present yourself and your work both in writing and in person.

## Global Opportunities

Studying abroad has huge personal and academic benefits, as well as giving you a head start in the graduate job market. Students can choose to study a year abroad between years 2 & 3 or years 3 & 4, at one of our partner institutions around the world.

Students on a four year programme can do a semester exchange in their 3rd year of study. For more information visit

[liverpool.ac.uk/goabroad](http://liverpool.ac.uk/goabroad)

## Year in China

The Year in China is the University of Liverpool's exciting flagship programme allowing students the opportunity to spend an additional year at our sister university Xian Jiaotong-Liverpool University (XJTLU), after their final year of studies. For more information visit

[liverpool.ac.uk/yearinchina](http://liverpool.ac.uk/yearinchina)



## Did you know?

**Our existing Physics degree programmes are accredited by the Institute of Physics, including the joint honours courses with Physics.**

**IOP** Institute of Physics

# 83 Example Timetable

## Physics Year 1 Semester One

	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
9:00 – 10:00	Mathematics for Physicists I	Introduction to Computational Physics	Introduction to Computational Physics	Practical Physics I		
10:00 – 11:00	Physics Icebreaker Project/Academic Advisor sessions	Thermal Physics and Properties of Matter	Dynamics and Relativity			
11:00 – 12:00	Thermal Physics And Properties of Matter		Thermal Physics and Properties of Matter [Workshop]			
12:00 – 13:00	Introduction to Computational Physics	Mathematics for Physicists I			Work on assignment and preparation for workshops at the library	
13:00 – 14:00		Peer assisted learning		Practical Physics I		
14:00 – 15:00						
15:00 – 16:00	Mathematics for Physicists I [Workshop]					Reading for following week's lecture
16:00 – 17:00		University sport event	Dynamics and Relativity [Workshop]			
17:00 – 18:00						
18:00 – 19:00		Attend the Astro Society social event				
19:00 – 20:00	Guild quiz night					

# Invest in your future

Physicists are trained to solve a wide range of problems. That's why graduates have gone on to explore careers in diverse areas such as cryogenics; astronomy; geophysics; medical physics; telecommunications; microelectronics; nuclear power and instrumentation; materials science; computing; teaching; business; finance and management.

## Work experience opportunities

All Physics students have the opportunity to pursue a Physics internship module, working for 4 weeks in one of the following: an international research lab such as CERN, a UK institution such as Clatterbridge Cancer Centre, local industries or in a School. This module takes place during the summer break between years 2 and year 3. The results obtained during your summer project will be brought back to Liverpool for a project report and may form the basis for a more detailed project in your final year.

## Year in Industry

All of our programmes include the option for students to undertake a Year in Industry. The placement year typically takes place between Year 2 and Year 3 of the programme for 8-12 months. Students who complete a Year in Industry placement develop valuable personal and professional skills in a workplace environment. During this Year you will be supported by an academic who will perform site visits and pastoral care.



## Postgraduate opportunities

The knowledge, skills and experience that our graduates develop during their degree are in high demand by employers and researchers. This means our graduates benefit from superb postgraduate study opportunities particularly in the fields of condensed matter physics, nuclear physics, particle physics, nanoscience and energy.

The Department has significant achievements in research and attracts considerable research income. This provides excellent opportunities for our undergraduates to study this research and have exceptional facilities at their disposal.

## Preparing you for future success

Our goal is to support you to build your intellectual, social, and cultural capital so that you graduate as a socially-conscious global citizen. We achieve this by:

- Embedding employability within your curriculum and providing opportunities to gain real-world experience.
- Providing opportunities to develop connections with people and organisations, including student and graduate employers as well as our global alumni.
- Providing you with the latest tools and skills to thrive in a competitive world.
- Supporting you through our peer led Careers Studio, where our career coaches provide you with tailored advice and support.

# Degrees

## Programmes at a glance

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### Degrees offered with other departments

<b>Geophysics (Geology) BSc (Hons) F640 3 years</b>	<b>10</b>
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<b>Physics and Mathematics BSc (Joint Hons) FG31 3 years</b>	<b>10</b>
<b>Theoretical Physics MPhys F344 4 years</b>	<b>10</b>

See [liverpool.ac.uk/study/undergraduate/courses](http://liverpool.ac.uk/study/undergraduate/courses) for current entry requirements.

Programme details listed are illustrative only and subject to change.



*"You get to find out answers to how the world works that most people would probably never know. What's surprised me most about my programme is how wide-ranging it is, we've covered all sorts of areas of physics from relativity on the very large scale, to quantum mechanics on the very small."*

**Amelia Ross**  
**Physics BSc (Hons)**

# Programmes

## Physics BSc (Hons)

**UCAS Code: F300**

**Duration: 3 years**

Physics is the most fundamental of the sciences. New concepts, such as quantum mechanics and relativity, are introduced at degree level in order to understand nature at the deepest level. These theories have profound philosophical implications because they challenge our view of the everyday world. At the same time they have a huge impact on society since they underpin the technological revolution.

While studying one of the most intellectually satisfying disciplines, you will acquire transferable skills including numeracy, problem solving and an ability to reason clearly and communicate well.

Physics degrees are highly prized in the flexible labour market of today and our graduates have excellent career opportunities in academic research, industrial research and development, teaching, computing, business and finance.

Your first year starts with a one-week project, designed to familiarise you with staff and other students. There will be two mathematics modules which will provide the mathematical skills required by physics students.

For a summary of modules see page 11.

## Physics MPhys

**UCAS Code: F303**

**Duration: 4 years**

This programme is intended for those considering a career as a professional physicist in fundamental research or industrial research and development. It covers a wider range of topics than the Physics BSc and provides more research experience.

The Department has an excellent track record of securing PhD studentships and, as a consequence, our graduates have a good opportunity to study higher degrees spanning the whole of physics. The research-led teaching will provide a core of experience that will make you an excellent researcher and also prepare you to excel in many other professions.

In addition to core physics modules, you will also take mathematics, computing and experimental physics modules.

There is an advanced computer modelling project in the third year. There may be opportunities to carry out a major project at an international laboratory such as TRIUMF in Vancouver, CERN in Geneva or the Diamond Light Source in Oxfordshire during the summer vacation between the third and fourth years for three months. These projects can form the basis of a more substantial final-year project at the cutting-edge of research.

The first year follows the same programme as F300.

For a summary of modules see page 11.

**For full module details visit [liverpool.ac.uk/study/subjects/physics](http://liverpool.ac.uk/study/subjects/physics) or scan the QR code**



Programme details and modules listed are illustrative only and subject to change.



## Physics with Astronomy BSc (Hons)

**UCAS Code: F3F5**

**Duration: 3 years**

The Physics with Astronomy BSc is delivered collaboratively by acclaimed experts from the University of Liverpool and Liverpool John Moores University.

From the formation, evolution and deaths of stars (involving planetary systems, nucleosynthesis and supernovae) through structure of galaxies to the evolution of the Universe itself, the degree structure introduces the physics involved in the cosmos.

During summer, between Year Two and Year Three, there is a week-long field trip to the Teide Observatory in Tenerife, where students conduct astronomical observations using a professional telescope.

Students have unique access to superb data to undertake their final year research projects. On the empirical side, those include the world's top observational facilities, such as the European Southern Observatory, the Atacama Large Millimeter Telescope, the James Webb and Hubble Space Telescopes, as well as the largest robotic telescope in the world, the 2-meter aperture Liverpool Telescope, located in the Canary Islands. On the theoretical side, students can access data from some of the most sophisticated computer simulations of the evolution of the universe and the formation of galaxies and stars.

Your first year starts with a one-week project, designed to familiarise you with staff and other students. There will be two maths modules which provide skills required by physics students.

For a summary of modules see page 11.

**For full module details visit [liverpool.ac.uk/study/subjects/physics](http://liverpool.ac.uk/study/subjects/physics) or scan the QR code**

## Astrophysics MPhys

**UCAS Code: F521**

**Duration: 4 years**

The MPhys Astrophysics is delivered collaboratively by acclaimed experts from the University of Liverpool and Liverpool John Moores University. An Astrophysics degree has the unique potential to provide students with an understanding of the most up-to-date discoveries in the Universe.

During the programme, students will be introduced to all aspects of physics and astronomy from quantum mechanics to cosmology. In the summer between Year Three and Year Four, there is a week-long field trip to the Teide Observatory in Tenerife, where students conduct astronomical observations using a professional telescope.

Students have unique access to superb data to undertake their final year research projects. On the empirical side, those include the world's top observational facilities, such as the European Southern Observatory, the Atacama Large Millimeter Telescope, the James Webb and Hubble Space Telescopes, as well as the largest robotic telescope in the world, the 2-meter aperture Liverpool Telescope, located in the Canary Islands. On the theoretical side, students can access data from some of the most sophisticated computer simulations of the evolution of the universe and the formation of galaxies and stars.

In your first year, you will develop mathematical skills required by physics students.

For a summary of modules see page 11.

Programme details and modules listed are illustrative only and subject to change.



## Physics with Geophysics BSc (Hons)

**New programme**

**UCAS Code: F365**

**Duration: 3 years**

There has never been a better time to study physics and geophysics as we seek to provide sustainable resources for the world's population.

On our Physics with Geophysics BSc you will learn fundamental Physics principles that govern the behaviour of matter and energy, which are essential for understanding a wide range of natural phenomena, and then apply these principles within Geophysics to study the Earth's physical properties and processes. This integration helps in comprehensively understanding the Earth's structure and behaviour.

As a geophysicist, you'll study the physical aspects of the earth using a range of methods, including gravity, magnetic, electrical and seismic. By collecting data on seismic waves, which move through and around the earth, you'll create a picture of what lies below the earth's surface. This information is vitally important to many industries and governments.

In year one, you will gain fundamental skills in maths, geology and geoscience along with a range of transferable skills.

For a summary of modules see page 11.

## Physics with Medical Applications BSc (Hons)

**UCAS Code: F350**

**Duration: 3 years**

Physics research is helping us to live longer, healthier lives. It is helping us to develop new cures for disease and new ways to quickly diagnose health problems. For example, particle beams and detectors used in physics research have led to the development of proton cancer therapies and new diagnostic imaging technologies.

Combining the study of physics and selected topics in medical applications, this programme provides skills such as numeracy, problem solving, reasoning and communication that are attractive to the general employer, and it is an excellent preparation for a career in medical physics.

In addition to core physics modules you will also take mathematics, computing and experimental physics modules in support of these studies. There is a project on a medical physics topic in Year Three with involvement from the local hospitals and medical research centres. Staff from these institutions will also be involved with teaching.

The first year starts with a one-week project to familiarise you with the staff and other students. There will be two Maths modules which are designed to provide the Mathematical skills required by Physics students.

For a summary of modules see page 11.

**For full module details visit [liverpool.ac.uk/study/subjects/physics](http://liverpool.ac.uk/study/subjects/physics)  
or scan the QR code**



Programme details and modules listed are illustrative only and subject to change.

## Physics with Nuclear Science BSc (Hons)

**UCAS Code: F390**

**Duration: 3 years**

Study Physics with Nuclear Science at Liverpool and ensure you're fully equipped with the skills and knowledge necessary for a successful career in nuclear-related industries. In addition to core physics, you'll also study mathematics, computing and experimental physics.

You will explore and apply fundamental principles that underpin modern physics, from electrodynamics and semiconductors to the startling conclusions of relativity and quantum mechanics, alongside the study of selected topics in the field of nuclear science.

Our network of academic advisors and open-door policy ensures a friendly and supportive learning environment.

Throughout your course, you will discover links with many parts of the growing nuclear industry, including those involved with decommissioning and homeland security. Staff from these institutions will be involved in project work undertaken.

In your first year, you will take part in a one-week project with other students. You will also gain Mathematical skills required by Physics students.

For a summary of modules see page 11.

## Physical Sciences entry route leading to BSc (Hons) (4-year route including a Foundation Year at Carmel College)

**UCAS Code: F308**

**Duration: 4(1+3) years**

This programme provides a route into any of the BSc (Hons) degree programmes offered by the Department of Physics. You will undertake a foundation year at Carmel College, St Helens, where the class sizes are small and the standards of academic achievement are high.

At Carmel College, you will take three foundation modules chosen from Physics, Mathematics, Chemistry, Biology or Geography, depending on which degree route you want to follow. In your second year, you will attend the University of Liverpool and take the same modules as other students on your chosen programme.

Please contact Carmen Nuñez for full details:

**E: [degree@carmel.ac.uk](mailto:degree@carmel.ac.uk)**

**T: +44 (0)1744 452 213**



**For full module details visit [liverpool.ac.uk/study/subjects/physics](http://liverpool.ac.uk/study/subjects/physics)  
or scan the QR code**



Programme details and modules listed are illustrative only and subject to change.

# Degrees offered with other departments

## Geophysics (Geology) BSc (Hons)

**UCAS Code: F640**

**Duration: 3 years**

This programme provides training in the principles and practice of geophysics with an emphasis on pure and practical physics. Core topics include geology, geophysics and physics, plus a choice of advanced modules in geophysics. Major features include training in practical/applied geophysics, exploration geophysics (particularly seismology), planetary-scale geophysics and geophysical inverse theory.

High-level training is given in geophysics with supporting geology, and includes fundamental university training in physics and mathematics. The programme provides particularly strong opportunities for careers in interpretation and processing of geophysical data and research areas related to geological applications.

In your first year, you will develop fundamental skills in maths, geology and geoscience, supported by an integrated approach to transferable skills conveyed through the tutorial system.

This degree is accredited by the Geological Society of London, satisfying the requirements of Fellowship and Chartered Geologist status.

Vist [liverpool.ac.uk/courses/undergraduate](https://liverpool.ac.uk/courses/undergraduate) to find out more about our Geology and Geophysics courses.

## Mathematical Physics MMath

**UCAS code: FGHI**

**Programme length: 4 years**

## Physics and Mathematics BSc (Joint Hons)

**UCAS code: FG31**

**Programme length: 3 years**

## Theoretical Physics MPhys

**UCAS code: F344**

**Programme length: 4 years**

Physics and Mathematics degrees are highly prized and our graduates have excellent career opportunities in industrial research and development, computing, business, finance and teaching.

We offer one three-year BSc degree and two four-year degrees, MMath or MPhys. Combining the study of Physics and Mathematics in your degree programme will give you a strong mathematical training and mathematical techniques to help you to deal with new ideas that often seem counterintuitive, such as string theory, black holes, superconductors and chaos theory.

Vist [liverpool.ac.uk/courses/undergraduate](https://liverpool.ac.uk/courses/undergraduate) to find out more about our Physics and Mathematics courses.

Programme details and modules listed are illustrative only and subject to change.



# Modules Year 1

## Core and selected optional modules overview

Module title	Physics BSc F300	Physics MPhys F303	Physics with Astronomy F3F5	Astrophysics F52I	Physics with Geophysics F365	Physics with Medical Applications F350	Physics with Nuclear Science F390
Dynamics and Relativity PHYS101	C	C	C	C	C	C	C
Thermal Physics and Properties of matter PHYS102	C	C	C	C	C	C	C
Electricity, Magnetism and Waves PHYS103	C	C	C	C	C	C	C
Foundations of Quantum Physics PHYS104	C	C	C	C	C	C	C
Introduction to Computational Physics PHYS105	C	C	C	C	C	C	C
Practical Physics I PHYS106	C	C	C	C	C	C	C
Mathematics for Physicists I PHYS107	C	C	C	C	C	C	C
Mathematics for Physicists II PHYS108	C	C	C	C	C	C	C
Introduction to Medical Physics PHYS115	O	O				C	
Introduction to Nuclear Science PHYS135	O	O					C
Introduction to Astrophysics PHYS155	O	O	C	C			
Introduction to Geophysics PHYS175	O	O			C		

Key: C: core compulsory module O: optional module

Programme details and modules listed are illustrative only and subject to change.

Visit [liverpool.ac.uk/study/subjects/physics](http://liverpool.ac.uk/study/subjects/physics) or scan the QR code below to find the full module details



# Notes

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# Find out more

Accommodation: [liverpool.ac.uk/accommodation](https://liverpool.ac.uk/accommodation)

Fees and student finance: [liverpool.ac.uk/money](https://liverpool.ac.uk/money)

Undergraduate at Liverpool: [liverpool.ac.uk/undergraduate](https://liverpool.ac.uk/undergraduate)

Student Welfare Advice and Guidance: [liverpool.ac.uk/studentsupport](https://liverpool.ac.uk/studentsupport)

Undergraduate enquiries and applications: T: 44(0)1517945927

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## Department of Physics

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