

Course Summary: March 27, 2026

## Theoretical Physics BSc Honours

- UCAS code: **F345**
- Full time
- 3 years

Use mathematical models and abstract reasoning to study the universe's deepest mysteries and the fundamental laws of nature.

You are currently viewing course information for entry year: **2026**

Next start date:

- September 2026

### Tuition fees (Year 1)

- Home: **£9,790**
- International: **£31,500**

### Entry requirements and offers

- A-Level: **AAB**

- IB: **34 points**

**UCAS Institution name and code:**

- NEWC / N21

## Undergraduate Open Day

Start your university journey. Find where you belong. Friday, June 26 (9:00-16:00)

Saturday, June 27 (9:00-16:00)

[Book your place now](#)

## Course overview

Unravel the universe's deepest mysteries with a degree in theoretical physics.

During this course, you'll gain a strong foundation across core physics disciplines. You'll explore theoretical and experimental physics, studying modules from our Physics BSc courses. You'll then specialise in theoretical physics and study:

- advanced electromagnetism
- advanced fluid dynamics

These modules are unique to our Theoretical Physics degrees.

You'll gain hands-on experience in our high-spec facilities, gaining practical skills for your career. You'll work on projects, applying theoretical knowledge to practical challenges. These could include particle sensing, chemical detection, and other real-world applications.

You'll graduate with an accredited degree and an interdisciplinary skillset in-demand with employers. This course is also ideal for someone interested in research or further study in physics or mathematics.

## Flexible degree structure

Our flexible degree structure allows you to tailor your studies. All students follow the same curriculum in Stage 1, with specialisations beginning in Stage 2. You can transfer between Physics disciplines until the end of Stage 1. You can also switch between the BSc and MPhys of your chosen discipline until the end of Stage 2:

## [Physics BSc](#)

Theoretical Physics BSc

## [Physics with Astrophysics BSc](#)

## **BSc or MPhys?**

Theoretical Physics is offered at two levels:

- three-year Bachelor of Science (BSc)
- [four-year Master of Physics \(MPhys\)](#)

Our MPhys degree has an extra year of advanced study at Master's level. You'll study more advanced topics and work on an extended project. You'll learn about research methodology and work with experts in their field.

## **Your course and study experience - disclaimers and terms and conditions**

Please rest assured we make all reasonable efforts to provide you with the programmes, services and facilities described. However, it may be necessary to make changes due to significant disruption, for example in response to Covid-19.

View our [Academic experience page](#), which gives information about your Newcastle University study experience for the academic year 2025-26.

See our [terms and conditions and student complaints information](#), which gives details of circumstances that may lead to changes to programmes, modules or University services.

# Quality and ranking

## Professional accreditation and recognition

All professional accreditations are reviewed regularly by their professional body.

# Modules and learning

## Modules

**The information below is intended to provide an example of what you will study.**

Most degrees are divided into stages. Each stage lasts for one academic year, and you'll complete modules totalling 120 credits by the end of each stage.

Our teaching is informed by research. Course content may change periodically to reflect developments in the discipline, the requirements of external bodies and partners, and student feedback.

### **Optional module availability**

Student demand for optional modules may affect availability.

Full details of the modules on offer will be published through the [Programme Regulations and Specifications](#) ahead of each academic year. This usually happens in May.

To find out more please [see our terms and conditions](#)

During your first year, you'll study introductory modules in physics and mathematics. You'll also spend time in the lab working on experiments.

## Modules

<b>Compulsory Modules</b>	<b>Credits</b>
Introductory Algebra	10
Introductory Calculus and Differential Equations	20
Multivariable Calculus	10
Dynamics	10
Introductory Astrophysics	10
Introductory Electromagnetism	10
Introductory Quantum Mechanics	10
Laboratory Physics 1	20
States of Matter, Waves & AC Theory	20

You'll continue learning about the core concepts of physics, including quantum mechanics and electromagnetism. You'll also study modules in fluid dynamics, and computational methods and professional skills for theoretical physics.

## Modules

<b>Compulsory Modules</b>	<b>Credits</b>
Principles of Quantum Mechanics	10
Vector Calculus	10
Differential Equations, Transforms and Waves	10
Fluid Dynamics I	10
Principles of Electromagnetism	10

Principles of Materials and Solid-State Physics	10
Computational Methods and Professional Skills for Theoretical Physics	10
Thermodynamics & Statistical Mechanics	20
Scientific Computation with Python	10
Astronomy with Data	20

During your final year, you'll study more advanced modules and work on two different projects with a focus on theoretical physics.

You'll choose three optional modules.

## Modules

<b>Compulsory Modules</b>	<b>Credits</b>
Advanced Quantum Mechanics	10
Fluid Dynamics II	10
Relativity and Fundamental Particles	10
Advanced Materials and Solid-State Physics	10
Atoms, Molecules, and Nuclei	10
Team Project	10
Individual Project	20
Classical Fields	10
<b>Optional Modules</b>	<b>Credits</b>
Geohazards and Deformation of the Earth	10
Mathematical Biology	10
Quantum Information	10

Methods for Differential Equations	10
Hydrodynamic and Climate Instabilities	10
Variational Methods and Lagrangian Dynamics	10
Advanced Astronomy	10
Stellar Structure and Evolution	10
Cosmology	10
High Energy Astrophysics and Black Holes	10

## Teaching and assessment

### Teaching methods

You will be taught via a range of approaches, including:

- lectures and seminars
- small group tutorials
- problem classes
- laboratory sessions
- practical computing sessions

In Stage 1, you'll work on experiments and projects in our labs. These practical sessions will be about 45 hours in total.

### Assessment methods

You'll be assessed through a combination of:

- Assessments
- Examinations – practical or online
- Group work
- Projects
- Reports

## Skills and experience

### Practical skills

This degree will give you practical skills that can be applied across a wide range of industries. You'll also develop highly valued attributes, such as:

- problem-solving
- time management
- resilience
- the ability to meet deadlines

Using our high-spec facilities, and working alongside our expert staff, you'll:

- gain experimental experience in our state-of-the-art laboratories
- work on lab and project-based modules, based on real-world challenges
- develop analytical and computational skills, using industry-relevant software
- enhance your written and oral communication skills
- learn from experts in the field at a leading Russell Group university

### Business skills

Physics graduates are highly valued for their transferable skills. You'll graduate with strong abilities, including:

- problem-solving
- a logical, analytical mindset
- big data analysis
- communication
- teamwork

You'll benefit from regular talks and visits from professionals and academics in cutting-edge fields like quantum computing and biomedical applications.

### Research skills

We have an interdisciplinary approach to research. Our academic staff are experts in their field, with a diverse range of research strengths.

We have research expertise in:

- novel electronic materials
- semiconductor devices
- computational physics
- quantum fluids
- astrophysics
- relativity
- nanoscale properties of materials

Each module is shaped by the latest research and expertise from our academic staff.

Through the group and individual projects, you'll develop your own research skills by:

- exploring your ideas
- experimenting with theories
- finding innovative solutions

You'll critically analyse experimental data, identify the best approaches, and apply the right techniques for the task. You'll your communication skills, presenting your findings with clarity and evidence.

You will graduate with the skills required for a research career in academia or industry.

[Research areas in the School of Mathematics, Statistics and Physics](#)

## **Student stories**

Adam, a 2022 graduate, shares his highlights of studying Physics at Newcastle.

[Read about Adam's experience studying Physics BSc](#)

# Opportunities

## Study abroad year

Experience life in another country by choosing to study abroad as part of your degree. You'll be encouraged to embrace fun and challenging experiences, make connections with new communities and graduate as a globally aware professional, ready for your future.

You can choose to spend up to a year studying at a partner institution overseas. Our overseas partner institutions include:

- Universiteit Leiden, Leiden, Netherlands
- Technische Universität München, Munich, Germany
- Institut National Des Sciences Appliquées De Rennes, Rennes, France
- Lappeenranta University of Technology, Lappeenranta, Finland
- Humboldt-Universität zu Berlin, Berlin, Germany

There are also lots of options in North America, Australia and Asia, including:

- State University of New York (SUNY) Buffalo, Buffalo, USA
- University of New South Wales, Sydney, Australia
- Hong Kong University of Science and Technology, Clear Water Bay, Hong Kong
- National University of Singapore, Singapore
- University of Florida, Florida, USA
- San Jose State University, California, USA
- Korea University, Seoul, South Korea
- National Taiwan Normal University, Taipei, Taiwan

During your time studying abroad, you will select from a range of modules offered by your host university. Alongside taking some subject-relevant modules, you will be given greater flexibility to choose modules from different disciplines (eg Languages, Business)

If you choose to study abroad, it will extend your degree by a year.

[Find out more about study abroad](#)

## **Short-term global opportunities**

During your degree, you can take part in short-term global opportunities in locations such as:

- USA
- Cyprus
- Hong Kong
- Singapore
- Sri Lanka

The activities range from four days to eight+ weeks, and include:

- summer schools
- internships
- volunteering
- experiential learning

Funding is available to support students who want to participate.

## Work placement

Apply your practical skills, increase your confidence and gain real-life work experience to accelerate your career. Take a 9-12-month industrial placement in the UK or abroad. Work placements usually take place in stage 3 of your studies and extend your degree by one year.

[Find out more about work placements.](#)

## Facilities and environment

### Facilities

As a physics student at Newcastle University, you'll be based at our city-centre campus in the [School of Mathematics, Statistics and Physics](#)' Herschel Building.

The school has high-specification laboratory facilities equipped with leading experimental and computational physics capabilities, as well as access to world-class telescopes and space missions, such as:

- cryogenics labs

- semiconductor labs
- High-Performance Computing
- data from the Vera Rubin Telescope
- dark lab
- NASA's Kepler/K2, TESS
- JWST space telescopes ESA's PLATO space mission

The Herschel Building also has dedicated study and social spaces, and a computing area.

[Find out more about our facilities, including a 360 tour](#)

## Support

We take your health and wellbeing seriously and are committed to supporting you throughout your studies so you can fulfil your potential at university. This support includes:

- a personal tutor who is an academic member of staff who can help you with academic and personal issues throughout your degree
- a peer mentor scheme which pairs you with a current student from your course to help you navigate your first year at university
- a staff-student committee, to give you an opportunity to have a say in how your degree works
- Student Wellbeing Advisors who can offer comprehensive listening and support and signpost you to other University support services or external support agencies

## Transition team

A dedicated member of the team will be there to support you as you move from school to university study.

The Transition Officer works with Year 1 undergraduates to provide:

- Year 1 pastoral and academic support
- weekly drop-ins

- training sessions on report writing and professionalism

You'll also benefit from our:

- induction programme, including social events, to help you settle in quickly
- activities and events run by our student-run society, [PhysSoc](#)
- peer supported academic drop-in sessions to help with assignments

## Your future

### Graduating with a degree in physics

Physics graduates report earning average salaries close to £27,000 on graduation.

Our graduates have gone on to work as:

- power systems engineers
- research software engineers
- programmers
- tax associates
- consultants

Employability is embedded throughout your degree, with opportunities to connect with alumni and employers each year. All physics students are invited to attend the annual WRIPA Physics Careers Fair, a major event that brings together employers actively seeking physics graduates.

Our graduates are well-prepared for careers in research and academia, but many also move into fast-growing and diverse sectors in the North East and beyond, including:

- advanced materials and semiconductors
- defence
- energy transition, infrastructure and electrification
- fibre-optics and communications
- space, satellite technology, and earth observation

In addition, physics graduates are highly valued in a range of other fields such as:

- accounting
- banking and financial services
- data analytics
- energy: nuclear and offshore
- engineering: consulting and manufacturing
- IT and software development
- management consultancy
- NHS medical physics
- teaching
- telecommunications
- traffic and transport management
- utilities, including the water sector

Many of our students also go on to further study, including teacher training or PhD programmes in physics and related disciplines.

## **Our links with industry**

The Department of Physics has extensive research and alumni links with leading companies and external organisations. These connections help inform our

teaching and support student networking and career development opportunities.

Our industry links include:

- BBC
- Cosm (Digistar)
- De Beers
- Engineering and Physical Sciences Research Council (EPSRC)
- European Southern Observatory (ESO)
- European Space Agency (EUCLID Space Observatory)
- FreeAgent
- Intel
- Johnson Matthey
- Jumping Rivers
- James Webb Space Telescope (JWST)
- Met Office
- Mind Foundry
- National Audit Office
- National Space Centre
- NICD
- Northern Gas Networks
- Oliver Wyman
- Phase Photonics
- Science and Technology Facilities Council (STFC)
- Vera C. Rubin Observatory (LSST)

## **Make a difference**

### **Careers support**

Our Careers Service is one of the largest and best in the country, and we have strong links with employers. We provide an extensive range of opportunities to all students through our ncl+ initiative.

[Visit our Careers Service website](#)

## Recognition of professional qualifications outside of the UK

If you're studying an **accredited degree** and thinking about working in Europe after you graduate, the best place to find current information is the [UK Government's guidance on recognition of UK professional qualifications in EU member states](#). This official resource explains whether your profession is regulated in another country, what steps you need to take, and which organisation you should contact.

## Additional information

### Advice on maths and physics requirements

If you don't think you will have the exact mathematics and science qualifications referred to in our entry requirements by the time you need them, you may not be sure what to do.

- If you have A-Level qualifications (or equivalent) but not in Maths and/or Physics, you should apply for [Physics with Foundation Year](#). This course gives access to all of our Physics, Astrophysics and Theoretical Physics programmes.
- If you have A-levels (or equivalent) but don't meet the required grade(s) in Maths and Physics, contact us for advice. We may decide to consider you for Foundation Year entry, or it may be that this course is not the best option for you.
- If you have relevant qualifications but not at A-level (or equivalent) standard, you should apply for either Stage 1 or the Foundation Year. The Admissions Tutor will assess your application and offer you the most suitable course. Your offer may include a requirement to complete pre-entry Maths and/or Physics courses and examinations. It may also involve an admissions interview.

- If it has been some time since you completed your qualifications, you should apply for either Stage 1 or the Foundation Year. The Admissions Tutor will assess your application and offer you the most suitable course. Your offer may include a requirement to complete pre-entry Maths and/or Physics courses and examinations. It may also involve an admissions interview.

If you are still not sure, don't worry. Whatever you apply for, our Admissions Tutors will help you decide which is the best route for you. They may, therefore, make you an offer for a different course from the one you apply for (eg Foundation Year entry instead of Year 1 entry).

## Find out more...

- Go online for information about our full range of degrees:  
**[www.ncl.ac.uk/undergraduate](http://www.ncl.ac.uk/undergraduate)**
- Watch videos about student life in Newcastle by visiting our YouTube channel at **[www.youtube.com/@newcastleuni](http://www.youtube.com/@newcastleuni)**
- Watch a virtual tour of our campus at  
**<https://youtu.be/vJUfHcqB7l8?si=8lUrf7kTxXbgdfr1>**
- Book for an Open Day to come and see us in person  
**[www.ncl.ac.uk/openday](http://www.ncl.ac.uk/openday)**
- Contact us online at **[www.ncl.ac.uk/enquiries](http://www.ncl.ac.uk/enquiries)** or phone +44 (0)191 208 3333

This brochure is created from web content and is up to date at the time of creation (see the first page for creation date). If you are on screen you are able to use the live links that are highlighted in blue. If reading in print, the URLs provided above will help you to navigate back online. Full details of the University's terms and conditions, including reference to all relevant policies, procedures, regulations and information provision, are available at:

**<https://www.ncl.ac.uk/student-welcome/student-contract/>**

© Newcastle University.

The University of Newcastle upon Tyne trading as Newcastle University.