Our Courses

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When you study physics at Birmingham you become a member of a leading research school that gives you choice and flexibility to tailor your degree to your interests. We will make you feel welcome and at home while providing a challenging and stimulating learning environment and preparing you for your future career. You will learn on our beautiful Edgbaston campus, with excellent and modern facilities, situated just ten minutes from the centre of the second biggest city in the UK.

MANY OPTIONAL MODULES TO CHOOSE FROM TO TAILOR YOUR DEGREE TO YOUR INTERESTS

FINAL-YEAR PROJECTS ON REAL RESEARCH PROBLEMS

TAUGHT BY LECTURERS WHO ARE ACTIVE RESEARCHERS IN A WIDE VARIETY OF PHYSICS

EXCELLENT FACILITIES INCLUDING SPECIALISED LABORATORIES AND OUR OWN OBSERVATORY

WEEKLY SMALL GROUP TUTORIALS

HIGH EMPLOYABILITY RATE – TRANSFERABLE SKILLS EMBEDDED IN EACH YEAR

4TH IN THE UK
THE GUARDIAN, 2020

95% OF STUDENTS ARE IN EMPLOYMENT OR FURTHER STUDY SIX MONTHS AFTER GRADUATION (DESTINATION OF LEAVERS FROM HIGHER EDUCATION 2016/2017)

RANGE OF DEGREE PROGRAMMES WITH LOTS OF FLEXIBILITY

FRIENDLY AND SUPPORTIVE ENVIRONMENT
FLEXIBLE COURSES

The range and flexibility of our degree programmes mean you can be confident you will study the course that is right for you. In most cases, it is possible to swap between all our Single Honours courses, during the application year or after the first year of study, subject to academic achievement. The BSc and the MSci version of each course are identical for the first two years, so it is very easy to swap between the two at that point, as long as you have the required marks.

At the start of the second year, you can choose to take your third year abroad. This can be either as a BSc, where you return to take our third year or as an MSci, where you return into the fourth year. Both require language qualifications to study at non-English speaking universities.

All of our courses provide a firm foundation across all fundamental areas of physics and you will be employable in a wide range of careers both inside and outside of science, whichever one you choose.

DANIEL

BSc Physics

'One of the best things about studying physics at Birmingham is the flexibility in the course. For example, it is possible to start on a course focused on astrophysics and then move onto a more general course if your interests change. Or to move between the MSci and BSc courses as I have done. It was very reassuring to know when I applied that if I decided to focus on a different aspect of physics whilst I was doing my degree that it would be possible to do so here at Birmingham.'

FOR MORE COURSE DETAILS VISIT
WWW.BIRMINGHAM.AC.UK/PHYSICS-UG
ZAIYED
MSci Physics

‘The range of options available allows everyone to choose what they want to focus on. In the first year, I chose the Particle Physics module, this was a good opportunity to explore a very large part of modern physics.

‘In the second year, there are a lot more choices and variety. I chose the Electronics and Lagrangian and Hamiltonian Mechanics (LHM) modules. I wanted to pick modules that were relevant in the modern age where everything relies on electronics. I also was advised by my tutor that LHM can be applied in many branches of physics. I am excited to start my third year as there is an even greater variety of options and I am planning to study topics such as Chaos and Dynamical Systems and Radiation and Relativity.’

SPECIALISED COURSES

Physics is the most general course, you can specialise in many different areas or keep your options broad. You will still be able to take modules related to the specialised disciplines covered below.

Physics and Astrophysics is for you if you are fascinated with all things astronomy and astrophysics related. Your core modules will include astrophysics-focused topics and you will take specialised laboratory work focused on telescope observing and astronomical data analysis.

Physics with Particle Physics and Cosmology will let you focus on the study of the fundamental particles of the universe and their interactions. Your core modules will include particle physics and cosmology-focused topics. You will also have the opportunity to visit CERN and have a laboratory tour guided by the Birmingham Physicists who work there.

Choosing the Theoretical Physics course means you will be able to focus on the mathematical side of physics. The lab modules are optional on this course, meaning there is more space for theoretical modules if you wish. You will also take our specialised Current Topics in Theoretical Physics module in the third year, which allows you to delve into cutting-edge research topics being studied by theoretical physicists today.

If you cannot choose between a mathematics degree and a physics degree then Theoretical Physics and Applied Mathematics is the option for you. You will start by taking half your modules in the School of Mathematics and half in the School of Physics. As you progress through the years, your options will open up and you will be able to specialise either way or keep a balance between the two.
You will begin the course by studying mostly compulsory core modules that cover the fundamentals of Physics. The core includes Mathematics, Quantum Mechanics, Classical Mechanics, Special Relativity, Electromagnetism, Statistical Physics and Optics.

As you move through the years this core will become smaller, making way for you to choose advanced optional modules that match your interests. Optional modules reflect the School’s wide range of research interests and they are kept up to date with the latest scientific advances.

Alongside your lectures in the first and second years, you will have a weekly tutorial with a member of academic staff in a group of no more than four students. These hourly tutorials are an excellent opportunity for you to discuss the content of the previous week’s lectures, practise problems and discuss areas of physics that interest you.

One of the things that will place you in such demand as a Physics graduate is your ability to solve problems. You will learn how to do this through many of your modules but especially in skills development sessions where you will practise how to approach problems that do not fit into a single well-defined subject area. In this module, you will also learn programming, in the Python language, another key skill for physicists and an invaluable skill in the job market.

Laboratory work will be an integral part of your degree and will support your lecture learning and develop your practical, teamwork and report writing skills. You will spend five hours a week in the first year and eight in the second year working in our state-of-the-art laboratories.
RESEARCH

Our internationally leading research expertise means you will always be able to find an expert to answer your questions and you will work alongside those pushing the frontiers of scientific knowledge. The researchers will teach your lectures, lead your labs, act as your personal tutors and supervise your projects.

Our research covers all length scales within the Universe. Starting at the largest scales, as part of the LIGO Consortium we are detecting and analysing gravitational waves from distant black holes and neutron stars. We are also discovering exoplanets orbiting other stars and revealing the hidden secrets of stars by observing their resonant oscillations. Back down to Earth, we are manipulating the structures of materials to build invisibility cloaks. We are researching exotic quantum properties of matter and, as the host of one of the UK Quantum Technology Hubs, we are exploiting atoms cooled to extremely low temperatures to build new sensors and devices with real-world applications. At the smallest scales, we are studying the fundamental nature of matter using particle accelerators at CERN; and, bringing our research full circle, understanding the structure of nuclei and implications for nuclear reactions inside stars.

Discover more at: www.birmingham.ac.uk/physics-research

Teamwork is essential in most areas of modern science and group studies in your third year is a great way to prepare for this. It is a major project which is undertaken in groups of 10–20 students. The task requires the group to work as a team and enables you to tackle a problem larger than what could be attempted by an individual alone.

One of the most exciting parts of the MSci course is your independent research project, where you will become a member of one of the research groups. As well as learning in-depth about the area of physics you have chosen and acquiring new skills, you will also learn vital management and communication skills during this project.

EMILY

MSci Physics
and Astrophysics

‘During my time as a student at Birmingham, I have enjoyed working on various astrophysics-related projects – even getting the chance to exploit the University’s own observatory at Wast Hills, which is definitely a highlight! Importantly, during the third and fourth years, you get the opportunity to be involved with the frontiers of science, looking for answers to questions that are yet to be addressed. This has also given me a unique insight into what actual research looks like, learning under the guidance of working physicists and has lead me to pursue a PhD in the field!’
As soon as you enter the School of Physics and Astronomy you will find a friendly, welcoming and supportive environment that will help you achieve the most from your degree. Our study spaces, student societies and enthusiastic staff create a place our students are proud to call home!

Your lecturers have an open door policy and are happy to chat about their modules or research. Support is always close at hand. Your personal tutor will be your first port of call for any questions in your first two years. They are supported by a wellbeing officer, who can provide practical and emotional support for any issues you are facing.

Equality and diversity are important to the School. A committee comprising members from all levels of the School, including undergraduates, meets monthly to work towards the best environment possible for everyone.

Your views and concerns are quickly fed back into the running of the School by the Student Reps and the Staff–Student Forum. This means you will always know how you can feed into decisions which impact your learning. The Student Reps also run various events in the School such as charity cake sales and themed 'Coffee and Conversation' events with topics such as a research field, mental health or women in science.

The Poynting Physical Society (PPS) is the main social group in the School. It is open to all staff and students in Physics and is a part of the excellent community feel which permeates the School. PPS organises a wide range of social events including quizzes, trampolining, bowling and a large formal ball at the end of the year. They also run academic-related events like internship fairs and even hosted the UK Students for the Exploration and Development of Space (UKSEDS) 2020 National Space Conference!

ANWESHA

BSc Physics with Particle Physics and Cosmology

'The warm atmosphere of the School and being surrounded by like-minded passionate individuals makes me feel at home. The friendly nature of staff allows me to easily approach lecturers and build on my understanding of labs and lectures. This boosts my confidence and I love this about our school.

'I am a member of the University’s science magazine, SATNAV and can hone my hobby of writing while building critical analysis skills. I am passionate about science outreach and fuelling curious minds – as outreach officer of our astronomical society, I can help organise astronomy events like talks and observation sessions not only for our university but for the general public as well.'
WHAT CAN YOU DO WITH A PHYSICS DEGREE?

Graduating with a Physics degree means you will be highly employable and your career options will be very wide. You may go on to apply your physics knowledge directly in a scientific or engineering environment or might use your mathematical knowledge in finance, your computing skills in software or your problem-solving skills in business.

Many of our students have their sights set on research and typically over 40% go on to further study, with around two-thirds of those studying for a PhD. The remaining third either take a specialised Masters or a teaching qualification.

There are many options open to physics graduates, so we work hard to ensure that you can find the right one for you and to provide any support you might need in securing the career you want.

The School has an academic careers tutor who oversees the careers support within the School. This includes organising an annual Physics Careers Fair and talks and running career-focused activities in the Physics and Communication Skills module in the first year.

The University Careers Network has a team of specialist careers advisors who will support you throughout your studies and up to two years after you graduate. They provide support, guide workshops and one-to-one sessions in areas such as CV writing, interview preparation, finding an internship and mentoring.
ADMISSIONS

All applications should be made through UCAS and you should obey any deadlines set there. We are happy for you to defer your entry for a year and this will not affect our likelihood of making you an offer. Applicants must be taking three A levels including Physics and Mathematics, or equivalent in other qualification systems. We consider Further Maths as a third A level, however, if you do not have it you will not be disadvantaged during the offer-making process.

We are happy to consider the International Baccalaureate or Cambridge Pre-U courses. BTECs will only be considered alongside Maths and Physics A levels.

If you are taking A levels without Maths or are taking a BTEC or an Access to Higher education course, you might be eligible for our foundation year.

Please do not worry if you do not hear back from us straight away, we sometimes keep applications for a few months before making a decision, so that we can compare all the applications we receive. The admissions tutor is happy to give advice on applying at any time.

To view the entry requirements for each course, including international qualification requirements, please visit www.birmingham.ac.uk/physics-ug for details.

VISIT US

If you can visit us in person, either at a pre-application open day or on offer-holder visit days, you will be able to see the campus and School, meet lecturers and current students and visit the accommodation villages. If you cannot visit on one of these scheduled events, the admissions tutor is happy to try and arrange a visit at another time, with reasonable notice.

If an in-person visit is not possible, please look out for ways to interact with us online. Our staff, students and admissions team want to help you make your university decision and have much more information to share with you about their specialist areas, the courses, the School, the University and the city!

We hope to see you soon!
Cover image:
The front cover image shows a high-energy collision of two protons, within the ATLAS detector at the CERN Large Hadron Collider. A very energetic photon is emitted to the top right, and leaves energy (green), in the calorimeters, with no matching charged particle tracks (orange). An energetic jet of hadrons recoils against the photon, seen as tracks, and calorimeter energy (green and yellow). Birmingham particle physicists work in international collaborations to use events like this to test for new physics at energy and distance scales beyond those studied before.

https://cds.cern.ch/record/2115422
This leaflet was produced in advance of the start of the academic year. It is intended to provide prospective students with a general picture of the programmes and courses offered by the School. Please note that not all programmes or all courses are offered every year. Also, because our research is constantly exploring new areas and directions of study some courses may be discontinued and new ones offered in their place. Before you apply, please visit our website to view essential information for all applicants: www.birmingham.ac.uk/applicantinformation.

Please note the information in this brochure is correct at time of publication but may be subject to change (July 2020).