Cover image: Cosmos Redshift 7 (CR7), the brightest distant galaxy observed so far. Discovered in 2015 by our lecturer Dr. David Sobral using the ESO Very Large Telescope.

The information given in this booklet was accurate at the time of writing. Lancaster University reserves the right to make changes at any time.

Credit to Connor Hayward who took staff profile pictures and captured perfect moments.

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You can also follow us on:
Twitter/LancUniPhysics
Facebook/LancasterPhysics

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Physics

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FLEXIBLE AND ENGAGING DEGREES
RESEARCH-LED TEACHING AND PROJECTS
A HIGHLY SUPPORTIVE ENVIRONMENT
EXCELLENT CAREER PROSPECTS
1ST FOR STUDENT SATISFACTION
We received the highest rating in the National Student Survey three times in the last 6 years

1ST FOR CAREER PROSPECTS
Lancaster is ranked top for career prospects by The Guardian league table 2017

2ND FOR WORLD-LEADING RESEARCH
Our research is ranked second in the UK for world-leading publications in the Research Excellence Framework 2014

DEGREES ACCREDITED BY IOP
All our programmes are accredited by the Institute of Physics

ATHENA SWAN SILVER AWARD
We are recognised for providing a supportive and inclusive environment for students and staff

IOP JUNO CHAMPION
Awarded in 2013 for our efforts to promote equality, diversity and fairness

For more information visit www.lancaster.ac.uk/physics
Welcome to Lancaster Physics

I am proud to be head of one of the top physics departments both for physics education and research in the UK, as recognised in repeated assessments and league tables.

By putting aside preconceptions and analysing the world from a scientific viewpoint, physics furthers our understanding and can bring immense intellectual satisfaction. Based on our broad range of world-leading research, we provide flexible and engaging degrees that allow our students to experience the full fascination of the subject. Through project work, extra-curricular activities and an open-door policy, we offer a unique and inclusive study experience within a degree programme that is constantly evolving along with the frontiers of the discipline.

Whether by contributing to Nobel-prize winning research with colleagues at international facilities such as CERN and the Sudbury Neutrino Observatory, discovering new galaxies or setting low-temperature records, or by providing outreach events for the community, Lancaster University’s Department of Physics strives to play a significant positive role in science and society, and our students have many opportunities to be involved. I hope that this prospectus will be the beginning of your own rewarding journey leading to a deeper understanding of our world.

Professor Roger Jones
Head of Department

The Department of Physics offers a friendly, close community of staff and students and excels in academic support.

We are recognised for providing an outstanding physics education underpinned by a broad portfolio of internationally leading research. This leads to an engaging, varied and flexible degree programme that allows you to acquire a deep understanding of the subject. You will enjoy ample opportunities to apply this knowledge in advanced labs and projects, where you can actively contribute to research and help advance our knowledge of the physical world.

In our supportive learning environment, you also benefit from approachable lecturers and dedicated academic supervisors that guide you through your studies. This is not only a highly rewarding experience, but also provides you with excellent career prospects in research and industry.

Professor Jim Wild
Director of Teaching

In 2015/16 we invested over £13.5M to upgrade our teaching labs and create welcoming spaces for studying and socialising, and have attracted £400K for further teaching lab equipment.
An Engaging and Welcoming Atmosphere

Our department is committed to fostering a diverse, supportive community as a source of academic excellence, cultural enrichment, and social strength. Your study spaces and laboratories are alongside our offices and research areas; therefore, you will also have regular informal contact with our staff and researchers.

A friendly department
A remarkable feature of the department is how everyone is very approachable and happy to help. This positive atmosphere is significantly enhanced by the enthusiasm of our students, who run their own Physics Society LUPhyS and organise numerous social and academic activities which get the whole department involved. Our recent investment into the department was purposefully designed to further encourage the informal interactions of students and lecturers, while our engagement in the JUNO and ATHENA SWAN programmes constitutes a formal commitment to the principles of diversity, inclusiveness and fairness.

Campus experience and colleges
All these features are replicated across the whole University, which not only offers you a self-contained 360 acre parkland campus with amenities such as a theatre, a cinema, a modern sports centre and sports fields, but also more than 200 student-run societies. This is complemented by a thriving college system, which along with award-winning accommodation provides events and activities that further enrich and support your student experience.

SHAUN MAY
Second Year MPhys Physics, Astrophysics and Cosmology
Lancaster University first caught my attention for being so highly ranked for physics in the University league tables, but it wasn’t until I visited the department on an Open Day that my decision was made. The staff and students were very welcoming and unmistakably passionate, combine that with how the department is dedicated to so many projects, and I was sold!

KATHERINE COGMAN
LUPhyS President
The aim of the Physics Society is to strengthen the community within the physics department and to bring students together through various activities and events that are held throughout the year. Both lecturers and students get involved and it’s a great way to socialise outside of the academic environment. We pride ourselves on inclusivity and aim to hold events for everyone, no matter their interests. We also host a range of academic talks given by speakers from both within and outside of the University, and offer help to anyone who wishes to apply for internships and other academic endeavours. I’m really excited about our plans for the upcoming year!

For more information visit www.lancaster.ac.uk/physics
A Highly Supportive Learning Environment

We offer an open-door policy, small-group tutorials, individually supervised projects, dedicated career advice as well as summer placements and internships.

**Extensive high-quality contact time**

With approximately 375 high-quality contact hours a year, you can always rely on our staff for guidance and assistance. In a typical week you will have 12-15 hours of lectures, take part in 3-4 hours of seminars where the lecturer will explain solutions and help with any difficulties, and spend about 6 hours in the laboratory, working closely with other students and staff. You will participate in demonstrations of the physical phenomena described in lectures, learn to use scientific equipment and develop skills in taking measurements, drawing conclusions and writing reports. You will also carry out extensive research projects, first in groups and then under individual supervision, where you apply your knowledge and actively contribute to the development of the field.

**Comprehensive academic support**

You will be able to rely on extensive academic support with multiple possible contacts for any type of question – amongst others, you can choose to contact your lecturer, your departmental academic advisor, your degree scheme manager, or the teaching support staff. You will also be assigned a college tutor responsible for providing advice and assisting with any other questions you may encounter.

**Continuous feedback**

We continually provide academic feedback and keep you informed of your results. A very large part of your lab, project and course work counts towards your final degree mark – this allows us to make the assessment meaningful, in recognition of the fact that proper scientific work is deep and requires time. As a rough guide, 40-50% of your degree marks will be based on this continuous assessment, with the remainder based on exams.

**OPEN DOOR POLICY**

We operate an open door policy and have an excellent 1:10 staff-to-student ratio.

**QUALITY CONTACT HOURS**

You will benefit from small-group tutorials and projects, individually supervised research projects, and regular meetings with your academic advisors.
An Outstanding Education

All of our degree programmes provide a comprehensive state-of-the-art physics education at the frontiers of the discipline. We constantly update our syllabus in response to recent scientific developments, skills required by employers, and feedback from our students.

Flexible degrees

Our courses combine fundamental concepts with cutting-edge topics and admit a wide range of degree specialisations. A common core covers central topics such as Quantum Mechanics and Electromagnetism and their application to Atomic, Particle and Condensed Matter Physics. This is supplemented with degree-scheme specific labs and projects, as well as a wide range of options that let you explore advanced topics and tailor the degree to your interests.

Getting you involved in world-leading research

The teaching on our courses is directly informed by our world-leading experimental and theoretical research. Our staff includes many leading authorities, and the department has achieved a number of world firsts in key research areas. Our courses are designed to link strongly to our research - we find that this not only provides the correct context of a contemporary physics education, but also engages and inspires our students and contributes to excellent student-staff relations.

As a Lancaster student you will benefit from this not only through the wide choice of optional courses and research projects, but also from the expertise and enthusiasm for these subjects by our staff.

Excellent Facilities and Resources

We are one of the very best resourced departments in the country. You will have access to a wide range of learning resources, be it through the virtual learning environment, the University Library or our own computing suites and physics library in the newly refurbished building. You will also benefit from our unique and world-leading research facilities, which attracted £6M of investment since 2012. This includes the highly specialised equipment and materials from our unique Quantum Technology Centre, IsoLab and Ultra-Low Temperature Lab and our direct involvement in international collaborations such as the Large Hadron Collider at CERN, T2K in Japan, the Hubble Space Telescope, space science experiments inside the Arctic and Antarctic circles, and NASA’s Cassini-Huygens space mission. In particular, these provisions significantly enhance your research projects, via the cutting-edge equipment onsite and the access to real research data from the international facilities.

Andrew Stevens
Third year Physics with Particle Physics & Cosmology

When I was deciding on Physics courses, it was evident that there were many opportunities available. However I didn’t know which pathway to take. This was why Lancaster’s flexible programme was the most attractive. Following a common first year, I found that it was easy to choose the degree specialisation. Ultimately I changed onto the MPhys in Physics with Particle Physics and Cosmology and haven’t looked back since.

Our students are happy

According to the 2014 National Student Survey, 98% of our students were highly satisfied with their course.

For more information visit www.lancaster.ac.uk/physics
A Shared Love for Physics

Our academic staff engage in a very broad portfolio of internationally leading research. We love our research, and we love to share this with our students.

A LONGSTANDING RECORD OF EXCELLENCE

Before being ranked second for world-leading research outputs in the most recent Research Excellence Framework (2014), we ranked first overall in the previous two Research Assessment Exercises (2001 and 2008).

Staff and students from the Neutrino group who won a share of the 2016 Breakthrough Prize, with Helen O’Keeffe in the front row far right.

For more information visit www.lancaster.ac.uk/physics
Amazing Opportunities

In 2016, Dr David Sobral provided some of our 2nd year students an extra curricular opportunity to observe at the Gran Telescopio Canarias and the Isaac Newton Telescope on La Palma.

ROBBIE KAISER
“...The whole experience was incredible. The aspect that we were able to contribute to science was brilliant and gave me an idea of what I want to do in the future. Even just visiting the observatory was amazing, standing between the MAGIC 1 and 2 telescopes, their sheer size was so much larger than expected. Although the hours were unsociable and it was freezing cold, I would do it again!"

JOE CAIRNS
“We worked alongside researchers making real observations that could potentially change our understanding of the universe. When we could no longer observe our target we turned the telescope to things like Saturn or the Orion Nebula, obtaining some amazing images.”

SHAUN DEMPSEY
“This really helped me gain an insight into everything what happens, from opening to closing the dome and operating the telescope from the computers. Seeing procedures which I had learnt about really tied in the teaching and made me want to go into Observational Astrophysics even more.”

DR DAVID SOBRAL
Lecturer for Observational Astrophysics who observed CR7 (see front cover), a discovery so significant that it is listed among ESO’s all-time top 10 astronomical discoveries.

By unveiling the nature of CR7 piece by piece, we understood that not only had we found by far the most luminous distant galaxy but also started to realise that it had every single characteristic expected of Population III stars — the first generation of stars that were born out of the primordial material from the Big Bang. It doesn’t really get any more exciting than this! This is the frontier of research, and Lancaster University is the perfect place to really push it forward.

For more information visit www.lancaster.ac.uk/physics
Throughout your course, you build up the necessary skills by a succession of projects, commencing with a computer project in year two and progressing to open-ended research projects of increasing complexity in the following years. This includes a group project on a current research topic in year three, and an extensive, individually supervised research project in the final year of the MPhys/MSci programmes. The topics are closely connected to our broad portfolio of world-leading research, and afford you with an opportunity to make an active contribution to actual research. You will also develop a range of transferrable skills such as team working, time and project management and communication skills, all of which are highly valued by employers.

Research in the Physics Department is structured into four divisions: Astrophysics, Particle and Accelerator Physics, Experimental Condensed Matter Physics and Theory. Each division has a team of research-active staff at the forefront of research in their respective fields. We place great importance on bringing this research into our undergraduate teaching, and into our schools and public engagement programme.

Research areas:
- Observational Astrophysics
- Theoretical Particle Cosmology
- Space and Planetary Science
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Exciting Research Projects

A major goal of our undergraduate degree programmes is to develop your skills and understanding to the level where you can address the exciting open problems that abound in contemporary physics.

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Recent projects include:

- Physics for healthcare
- Optoelectronics characterisation
- Novel nanoscale detectors
- Modelling of stellar winds
- Studies of the Earth’s aurora
- Studies of Saturn’s ring current and aurora
- Particle physics with the ATLAS experiment
- Neutrino interactions in the T2K near detector
- Development of future neutrino experiments
- Studies of exotic atoms using quantum Monte Carlo simulations
- Galaxies and dark matter
- Superfluid wind tunnel

Recent group projects include:

- **Particle physics**: studies of cosmic rays, construction of low cost radiation detectors and investigating the role of quantum mechanics in nuclear decays.
- **Industrial projects**: student teams worked with external organisations to investigate: re-condensing gas-based anaesthetics to reduce waste, testing high-tech plastic films to improve the shelf-life of food and characterising technical non-woven fabrics for magnetic shielding.
- **Cosmology Group Project**: using cosmological constants and dark energy to solve the Age of the Universe problem.
- **Space Science Group Project**: designing part of a space mission, and investigating the relationship between the solar wind and Earth’s magnetosphere.
- **Theory and Theoretical Physics with Mathematics Group Project**: modelling the properties of electrons in crystal lattices (e.g. graphene), dynamics of vortices in superfluids and studies of particles obeying fractional statistics.

**Examples of Recent Projects**

Working alongside students in the lab is really rewarding. It’s great to see how quickly people can learn new skills and make a contribution to the ongoing research. Many students at Lancaster go on to do postgraduate degrees and I think this has a lot to do with the experience that they gain during final-year projects.

DR JONATHAN PRANCE
Physics Lecturer

For more information visit www.lancaster.ac.uk/physics
A Rewarding Journey Onwards

Preparing you for your next step and helping you achieve good employment prospects is paramount for the Physics department. As a result our graduates enjoy the very best career prospects in the whole sector.

Enhancing Your Prospects

Our degree schemes develop transferrable skills such as critical thinking, problem solving, numeracy, computational skills, communication skills, and team working, which are all highly valued by both employers and academia. You benefit from our direct links with industry and outside agencies, which contribute to the range of our third and fourth year projects and fund departmental research. We also offer dedicated careers advice, organise an employers exhibition, and arrange placements and internships on and off campus. You also have ample opportunities for extracurricular activities to further enhance your CV, e.g. via outreach activities with our Teacher Fellow, by being a student ambassador, or by joining student societies and participating in the University’s Lancaster Award.

Rewards and recognition

We reward academic excellence with prizes and certificates for academic achievement in each year of study. We also offer the Dame Kathleen Ollerenshaw Prize for the best performance in an astronomy project and the Azzeddine Hammiche Prize for exceptional project work. Over the past ten years, physics graduates have been sustained recipients of The Chancellor’s Medal, which is awarded by the University to its six best graduating students.

Exciting careers and excellent employability

All these efforts culminate in an excellent range of career options for our graduates – you can carry on with a research degree or enter employment that relies on your specialist and transferrable skills. Amongst these varied careers, our graduates find employment in high-technology industries such as materials research, medical and telecommunication businesses, in computer programming, in public health and teaching programmes, as well as in consulting, finance and accountancy.

Laura Nutall

Graduated MPhys Physics, Astrophysics and Cosmology and now works on the LIGO collaboration, allowing her to participate in the groundbreaking discovery of gravitational waves.

LAURA NUTALL
Graduated MPhys Physics, Astrophysics and Cosmology and now works on the LIGO collaboration, allowing her to participate in the groundbreaking discovery of gravitational waves.

My time at Lancaster has been the best years of my life. The Physics Department has a fantastic course that I have found to be challenging and rewarding. My course allowed me to pursue many topics that I have found interesting, such as my favourite module about quantum information processing. The lecturers and staff throughout my degree have all been friendly, and it is very easy to get help with any problems. The drive, friendliness and outstanding research found at Lancaster has convinced me to continue my studies here as a PhD research student, and I am very much looking forward to what the coming years will bring.

Theo Noble

Graduated MPhys Physics

92.5% of our graduates find graduate-level employment or study within six months after graduation (HESA)

For more information visit www.lancaster.ac.uk/physics
Choosing Your Degree

All our degrees provide you with a comprehensive education, and cover all the general and specialist skills valued for further study and employers in the private and public sectors. We offer a choice of physics degrees at the 4-year master’s (MPhys) and 3-year bachelor’s (BSc) level.

The different degree specialisations share a common first year, which makes it easy to settle on your preference. In the subsequent years, the degrees share a common physics core, which covers all key areas of the discipline. The degree-scheme specific labs and projects, equip you with specialist skills, while the wide range of options lets you explore advanced topics and tailor the degree to your interests.

The additional year in the MPhys degrees contains an extended research project, which is ideal if you are planning to enter into higher research degrees (MSc or PhD).

We also offer a BSc/MSci degree in Theoretical Physics with Mathematics, jointly with the Mathematics Department, as well as one of the best developed Study Abroad exchange programmes, which allows MPhys and MSci students to spend their third year studying at a partner institution overseas.

We welcome applicants with alternative qualifications and offer a unique Open Plus programme for those not meeting traditional requirements. Further details can be found on our website.

Scholarships
The Department of Physics is rewarding excellence by providing an academic scholarship of £1,000 for applicants who choose a Lancaster University Physics course as their firm choice and achieve A** in A-level mathematics and physics, or equivalent grades for those with alternative qualifications. Lancaster University offers a range of additional scholarships and bursaries, see www.lancaster.ac.uk scholarships.

For more information visit www.lancaster.ac.uk/physics

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<th>CODE</th>
<th>DEGREE</th>
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<tr>
<td>F303F300</td>
<td>MPhys/BSc (Hons)</td>
<td>Physics</td>
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<tr>
<td>F305F301</td>
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<td>F306</td>
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Typical offers for all course are AAA-A*AA. For International Baccalaureate it is 36-38 points with 17 from 3 HL subjects. We welcome alternative and international qualifications and consider each case on an individual basis.

Current optional courses in Year 3&4 include courses from other degree schemes and additional advanced topics, e.g. Astronomy, Cosmology & Space Physics, Groups & Symmetries, Flavour Physics, Gauge Theories, Experimental Particle Physics, Quantum Information, Quantum Transport, Advanced Relativity & Gravitation, Advanced Electromagnetism, Advanced Magnetism, Matter at Low Temperatures, Fluids, Lasers, Semiconductors, Energy, Computer Modelling, Physics of Living Systems.
Physics
UCAS code: F303 (MPhys), F300 (BSc)

By continuously shifting the boundaries of our knowledge and paving the way to new technologies, physics plays a significant role to advance our society, culture, and well-being.

Our Physics degree equips you with the broad conceptual and practical working knowledge of modern-day physics that underpins present-day research. The specialist teaching is informed by our research activities in areas such as low-temperature physics and quantum technologies. This is combined with key transferrable skills enabling you to embark on a wide variety of career paths.

The core curriculum includes subjects such as Quantum Physics and Electromagnetism in your first year, Quantum Mechanics and Relativity in your second year, and Particle Physics, Atomic Physics and Condensed Matter Physics in your third year. This is complemented by laboratories where you will perform state-of-the-art experiments with sophisticated equipment and associated software. In year three, you can choose between a research group project and an extended industrially oriented group project in collaboration with a company or other external organisation. You also explore advanced topics via a wide range of advanced options, which include subjects such as Quantum Computation, Matter at Low Temperatures, and Physics of Living Systems.

In the final year of the MPhys degree you take further advanced options and carry out an extended investigative project. This embeds you into one of our leading research groups and gives you access to world-leading facilities, such as our unique Quantum Technology and Low-Temperature centres. Examples of recent project topics include superconducting qubits, vortices in superfluids, single photon photodiodes, nanoscale probe microscopy of graphene, quantum dots and novel quantum nanostructures.

JOSHUA CHAWNER
Final Year MPhys Physics

Studying Physics at Lancaster University is an extremely rewarding experience. The course is challenging, but the staff and lecturers are incredibly friendly and will offer help on pretty much anything. The course also promotes discussions between yourself and your fellow physicists, giving you plenty of opportunity to meet new people who like physics as much as you do! I chose to do Straight Physics, which has allowed me to study theoretical modules as well as taking part in practical lab and project work, all of which have had a positive impact on my skills as a physicist.

This degree develops your understanding of the relationship between the physical laws of the universe and the astrophysical and cosmological domains. The specialist teaching is informed by our research activities in observational astrophysics, space and planetary science, and particle cosmology.

You will obtain a thorough grounding in core physics areas such as Quantum Physics and Electromagnetism in your first year, Quantum Mechanics and Relativity in your second year, and Particle and Atomic Physics in your third year. Furthermore, this scheme also includes lectures on Astronomy, Astrophysics and Cosmology in your second year and Stellar Astrophysics and Big Bang Cosmology in your third year, as well as specialised laboratory work in astrophysics and cosmology.

In your third year, you also carry out an investigative group project where you tackle a problem of current research. In the final year of the MPhys degree, you will complete an extended research project on topics such as binary variable stars, cosmic radio noise, gravitational waves and cosmic inflation, and study subjects such as Cosmology and Advanced Relativity and Gravity.

For your project work, you can use our on-site astronomical observatory, which contains a 356mm Schmidt-Cassegrain reflecting telescope, as well as data from a large range of space and ground based observatories including the Hubble Space Telescope, NASA’s Cassini-Huygens mission, and the ESO Very Large Telescope.

SOFIA DURWARD
Second Year Student Phys Physics, Astrophysics and Cosmology

I would recommend the Physics, Astrophysics and Cosmology course to anyone who has an interest in physics at the largest scales. The course is well structured and balances astrophysics and cosmology modules well, and there is a great of choice optional modules available so people can tailor their study to their interests. The lecturers are very friendly and helpful and are experts in their field, which makes me confident that I’ll get a good start to the research career that I’m aiming for.
Physicists with Particle Physics and Cosmology
UCAS code: F373 (MPhys), F372 (BSc)

The universe is a mysterious place. How did it form? How does it work? What is the nature of visible and dark matter?

Lancaster’s particle physicists work with state-of-the-art particle accelerators to investigate and identify the nature of space and time. Our resident cosmologists employ all of their creative and mathematical abilities to explain the early history of the universe in a way that complements and supports observational and experimental data. All this expertise is translated into an exciting, modern physics course based on the foundation of our core physics programme. Throughout your degree you will take a range of subjects including Quantum Physics and Electromagnetism in the first year, as well as Astronomy, Detection of Particles and Introductory Cosmology in the second year. In your third year, your modules include Big Bang Cosmology, Flavour Physics, a choice of advanced options, and a group project where you research an open question in particle physics or cosmology.

In the final year of the MPhys degree, you will study subjects such as Current Cosmology and Gauge Theory and carry out your individual investigative project, where you can use experimental data from the Large Hadron Collider at CERN or the T2K neutrino experiment in Japan, or develop cosmological models of our Universe. Recent project topics include W bosons, CP violation using B mesons, the Higgs particle, neutrino oscillations and cosmic inflation.

Each module is taught by a lecturer actively researching the subject and their passion makes it so much more interesting and engaging. The lecturers are very friendly, approachable, and always happy to answer questions, whether it’s about the course, worksheets or beyond the scope of the module. With the variety of different courses available, and a range of optional modules in later years, you can really tailor the course to suit your interests.

Our renowned theoretical physicists devote themselves to uncovering the most appropriate mathematical laws for deducing the essence of physical phenomena on all scales, from the quantum world of microscopic matter and nanomaterials to the geometry of curved space-time and the large scale structure of the cosmos.

The core curriculum includes subjects such as Quantum Physics and Electromagnetism in your first year, Quantum Mechanics and Relativity in your second year, and Particle Physics, Atomic Physics and Condensed Matter Physics in your third year. In addition, in years two and three you take specialised modules on Quantum Theory, Electromagnetism, Condensed Matter Physics, Gravitation and Cosmology, and Elementary Particle Physics. You also have a choice of options such as Quantum Information and Advanced Gravity and Relativity, and carry out a group project on a topic of current research. In the final year of the MPhys degree, you take further advanced and options, and carry out your individual investigative research project on a topic such as quantum computation, quantum physics of graphene, quantum optics, concepts of particle acceleration or gravitational waves.

SAM JENKINS
Third Year MPhys Particle Physics and Cosmology

Theoretical Physics
UCAS code: F321 (MPhys), F340 (BSc)

Quite possibly the most astonishing aspect of the world around us is that so much of it can be understood by using a small number of physical laws.

Our renowned theoretical physicists devote themselves to uncovering the most appropriate mathematical laws for deducing the essence of physical phenomena on all scales, from the quantum world of microscopic matter and nanomaterials to the geometry of curved space-time and the large scale structure of the cosmos.

The core curriculum includes subjects such as Quantum Physics and Electromagnetism in your first year, Quantum Mechanics and Relativity in your second year, and Particle Physics, Atomic Physics and Condensed Matter Physics in your third year. In addition, in years two and three you take specialised modules on Quantum Theory, Electromagnetism, Condensed Matter Physics, Gravitation and Cosmology, and Elementary Particle Physics. You also have a choice of options such as Quantum Information and Advanced Gravity and Relativity, and carry out a group project on a topic of current research. In the final year of the MPhys degree, you take further advanced and options, and carry out your individual investigative research project on a topic such as quantum computation, quantum physics of graphene, quantum optics, concepts of particle acceleration or gravitational waves.

I have found my degree to be both demanding and fulfilling. The specialised theory modules in particular have been a recurring highlight, with interactive styled classes offering many opportunities for collaborative problem solving and developing presentation skills. Also, I have really enjoyed my masters project, and this experience as well as a funded summer research project before my 3rd year to study graphene has led me to pursue further graduate study abroad.

SAM JENKINS
Third Year MPhys Particle Physics and Cosmology

Ben McKeever
Graduated MPhys Theoretical Physics, now postgraduate student at Utrecht University in the Netherlands

For more information visit www.lancaster.ac.uk/physics
Theoretical Physics with Mathematics
UCAS code: F3G1 (MSci), F3GC (BSc)

Physics and mathematics enjoy an astonishing symbiotic partnership.

Taught jointly with Lancaster’s Department of Mathematics and Statistics, this degree combines core physics and specialised theoretical physics subjects with classes in pure mathematics. This equips you with an understanding of the mathematical foundations of physics; for example, you will learn how quantum mechanics is underpinned by the powerful mathematical concept of a Hilbert space.

In your first year you will cover the core of physics in modules such as Quantum Physics and Electromagnetism, and the core of mathematics including geometry and calculus, numbers and relations, and probability.

In years two and three, the core physics modules are complemented by courses from the Theoretical Physics degree and mathematical topics such as group theory and differential equations. In the final year of your course you will take advanced options such as Quantum Information and Advanced Gravity and Relativity, and complete your extended research project on a topic such as gravitational waves, quantum computation, or geometry and electrodynamics.

Lancaster has the greatest experience of any UK institution in organising exchange programmes, with more than 50 co-operating institutions. A year studying in a university abroad provides a unique opportunity to broaden your educational experience within a different academic and cultural context. Many former Lancaster students attest to the value of their year abroad for their personal development and the enhancement of their long-term career prospects.

Physics (Study Abroad), Theoretical Physics with Mathematics (Study Abroad)
UCAS code: F305 (MPhys), F3G5 (MSci)

A physics degree with a year in the USA, Canada, Australia, New Zealand or Europe

Lancaster has the greatest experience of any UK institution in organising exchange programmes, with more than 50 co-operating institutions. A year studying in a university abroad provides a unique opportunity to broaden your educational experience within a different academic and cultural context. Many former Lancaster students attest to the value of their year abroad for their personal development and the enhancement of their long-term career prospects.

You take the year abroad as the 3rd year of a 4-year MPhys or MSci degree. Whilst in Lancaster, you will study on one of the standard degree schemes outlined on the preceding pages. Prior to the year abroad you will be given every assistance with both the academic and the administrative aspects of the exchange. The courses taken abroad are chosen to be similar to those you would have studied in Lancaster, so that you will smoothly fit back in on your return. All the work that you do at the partner university is assessed and counts towards your final degree.

Physics and mathematics enjoy an astonishing symbiotic partnership.

The course is set up in a way that ensures that I am able to learn as much theoretical physics as those on the Theoretical Physics course, whilst also learning pure mathematics with the Maths department. This course is ideal for people who enjoy both subjects!

JOSHI THOMPSON
Graduated MSci Theoretical Physics with Mathematics

You take the year abroad as the 3rd year of a 4-year MPhys or MSci degree. Whilst in Lancaster, you will study on one of the standard degree schemes outlined on the preceding pages. Prior to the year abroad you will be given every assistance with both the academic and the administrative aspects of the exchange. The courses taken abroad are chosen to be similar to those you would have studied in Lancaster, so that you will smoothly fit back in on your return. All the work that you do at the partner university is assessed and counts towards your final degree.

ALEXANDER BOOTH
Graduated MPhys Physics.

The flexibility in the degree scheme also applies to Study Abroad. This has enabled me to tailor my studies toward the theoretical side of the subject, allowing me to focus on what I enjoy learning about the most. My third year was spent at the University of Illinois, where I was lucky enough to experience a very different way of life and learning. Thanks to my time spent in the USA, I was able to secure a work placement with Fermilab National Accelerator Laboratory near Chicago, where I begin the next chapter in my studies.

For more information visit www.lancaster.ac.uk/physics
Interested? What next?

We share your excitement for the subject and are always happy to answer any questions about our courses and the application process. Once you apply we will look at all aspects of your application in a timely manner and keep you well informed. It would be nice to welcome you here in Lancaster—on an open day or an interview day, and eventually as a student in our department.

Find out more
For more details on the department, our courses, our research, news and more please visit our website www.lancaster.ac.uk/physics.
For more information about Lancaster University see www.lancaster.ac.uk.

Visit us
You are also very welcome to visit us! You can experience the department, meet staff and students, see the teaching and research facilities, and explore the campus and colleges.
For University Open Days and Campus Tours, where we offer guided tours and talks, see www.lancaster.ac.uk/visitus.

How to apply
You can apply through the Universities and Colleges Admissions Service (UCAS). Details are given on their web page www.ucas.com.

Interview days
We interview our applicants to learn more about them and let you find out more about us. This will include a taster lecture, guided tours of the department and campus, and ample opportunity to talk to staff and students. Parents/guardians are welcome and will have the opportunity to attend a dedicated programme.

Get in touch
If you would like to know more about our courses or entry requirements, please contact us:
Admissions team
Department of Physics
Lancaster University
Lancaster LA1 4YB
Tel: 01524 592261
Email: physics-ugadmissions@lancaster.ac.uk
Twitter: @LancUniPhysics
Facebook: facebook.com/LancasterPhysics

Professor Henning Schomerus
Director of Undergraduate Admissions

Helen Mcalley
Department Recruitment, Conversion and Marketing Coordinator

We Are Easy To Find!

By road
From the north or south: leave the M6 motorway at junction 33 and take the A6 north towards Lancaster for about 2 miles. The University is on the right. For Sat Nav use: LA1 4YW.

By rail
There are direct rail links between Lancaster and London (Euston), Birmingham, Leeds, Manchester, Glasgow and Edinburgh. The single journey between London and Lancaster takes between 2.5 and 3 hours. Buses and taxis are available from just outside the station.

By coach and bus
Lancaster city is on the national coach network. National Express coaches call at the University. Local buses (numbers 2, 2A, 3, 4, X4, 42) from Lancaster bus station run to the University every 5 minutes on weekdays. Further details can be found on www.lancaster.ac.uk/travel

We Are Easy To Find!

For more information visit www.lancaster.ac.uk/physics