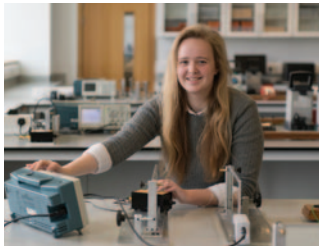


# Physics

CAO code: DN200 Option: Mathematical, Physical & Geological Sciences (MPG)



Eimear Conroy preparing an experiment in the Physics undergraduate laboratories.

- Learn how to investigate the physical world from the outermost reaches of the universe to the innermost parts of the atom
- Develop skills in how to interpret the physical world, carry out experiments and compare results critically with predictions from theory

“ I fell in love with Physics after discovering how much I appreciated being able to see what we learned in the classroom work first-hand in the lab. I visited to the University of Notre Dame to undertake a summer internship studying radioactive materials’ impact on the environment. I am currently in my First Year of a PhD in Particle Physics at the University of Oxford, working with the ATLAS experiment at CERN. There, I research the internal structure of protons and measure a particular decay of the W boson, which carries the force responsible for a kind of nuclear decay.

Eimear Conroy, Graduate

## Sample pathway for a degree in Physics \*

### YEAR 1 ENGAGE WITH THE PRINCIPLES

<p><b>PHYSICS</b> Modules include:</p> <ul style="list-style-type: none"> <li>▶ Foundations of Physics</li> <li>▶ Frontiers of Physics</li> <li>▶ Thermal Physics and Materials</li> <li>▶ Quanta, Particles and Relativity</li> </ul>	<p><b>MATHEMATICS</b> Modules include:</p> <ul style="list-style-type: none"> <li>▶ Calculus in the Mathematical and Physical Sciences</li> <li>▶ Linear Algebra in the Mathematical and Physical Sciences</li> </ul>	<p><b>APPLIED &amp; COMPUTATIONAL MATHEMATICS</b> Modules include:</p> <ul style="list-style-type: none"> <li>▶ Applied Mathematics: Mechanics and Methods</li> </ul>	<ul style="list-style-type: none"> <li>▶ One Elective module</li> <li>▶ One Small-Group Project</li> </ul>
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### YEAR 2 CHOOSE YOUR SUBJECTS

The subject combinations listed below are illustrative of what a student who graduates in Physics could choose in Year 2. Further subject combinations are possible depending on the choices in Year 1. Further information is available on page 19.

<p><b>PHYSICS</b> Modules include:</p> <ul style="list-style-type: none"> <li>▶ Electronics and Devices</li> <li>▶ Introductory Quantum Mechanics</li> <li>▶ Fields, Waves and Light</li> <li>▶ Methods for Physicists</li> <li>▶ Thermodynamics &amp; Statistical Physics</li> </ul>	<p>Physics students also study the following topics in Mathematics:</p> <ul style="list-style-type: none"> <li>▶ Calculus of Several Variables</li> <li>▶ Vector Integral &amp; Differential Calculus</li> <li>▶ Computational Science</li> </ul>	<p><b>PHYSICS WITH ASTRONOMY &amp; SPACE SCIENCE</b> Modules include:</p> <ul style="list-style-type: none"> <li>▶ Astronomy &amp; Space Science</li> <li>▶ Exploring the Solar System</li> </ul>	<ul style="list-style-type: none"> <li>▶ Two Elective modules</li> </ul>
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### YEAR 3 FOCUS ON YOUR CHOSEN SUBJECT

<p><b>PHYSICS – Modules include:</b></p> <ul style="list-style-type: none"> <li>▶ Classical Mechanics &amp; Relativity</li> <li>▶ Optics &amp; Lasers</li> <li>▶ Electromagnetism</li> <li>▶ Advanced Laboratory</li> </ul>	<p><b>PHYSICS WITH ASTRONOMY &amp; SPACE SCIENCE – Modules include:</b></p> <ul style="list-style-type: none"> <li>▶ Nuclear Physics</li> <li>▶ Quantum Mechanics</li> <li>▶ Stellar Astrophysics &amp; Astronomical Techniques</li> <li>▶ Condensed Matter Physics</li> </ul>	<ul style="list-style-type: none"> <li>▶ Two Elective modules</li> </ul>
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### YEAR 4 REFINE YOUR KNOWLEDGE

<p><b>PHYSICS – Modules include:</b></p> <ul style="list-style-type: none"> <li>▶ Advanced Laboratory</li> <li>▶ Applied Quantum Mechanics</li> <li>▶ Applied Optics</li> <li>▶ General Relativity &amp; Cosmology</li> <li>▶ High Energy Particle Physics</li> </ul>	<p><b>PHYSICS WITH ASTRONOMY &amp; SPACE SCIENCE – Modules include:</b></p> <ul style="list-style-type: none"> <li>▶ Computational Biophysics</li> <li>▶ Theoretical Astrophysics</li> <li>▶ Medical Physics</li> </ul>	<p><b>PHYSICS WITH ASTRONOMY &amp; SPACE SCIENCE – Modules include:</b></p> <ul style="list-style-type: none"> <li>▶ Galaxies &amp; Observational Cosmology</li> <li>▶ Quantum Field Theory</li> <li>▶ Advanced Statistical Physics</li> </ul>
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## BSc (Honours) Physics

MSc	PhD	Industry	Conversion Courses
<ul style="list-style-type: none"> <li>▶ MSc NanoBio Science</li> <li>▶ MSc Meteorology</li> <li>▶ MSc Space Science &amp; Technology</li> <li>▶ MSc Research</li> <li>▶ MSc Physics (NL)</li> <li>▶ MSc Nanotechnology</li> <li>▶ MSc Applied Mathematics &amp; Computational Physics</li> <li>▶ MSc Computational Physics</li> </ul>	<p>▶ Students can pursue a PhD in universities in Ireland or abroad in areas as diverse as atomic physics, computational nanobio physics, particle physics, biophysics, nuclear physics, medical physics, theoretical physics and astrophysics</p>	<ul style="list-style-type: none"> <li>▶ Energy Technology Sector</li> <li>▶ Medical Physics &amp; Biotechnology</li> <li>▶ Material Science &amp; Nanotechnology</li> <li>▶ Geoscience &amp; Exploration</li> <li>▶ ICT Industry</li> <li>▶ Financial Sector</li> <li>▶ Meteorology</li> </ul>	<ul style="list-style-type: none"> <li>▶ Professional Master of Education (PME)</li> <li>▶ MA Economics</li> <li>▶ Graduate Medicine</li> <li>▶ Master of Management</li> </ul>

\*See pages 4 and 5 for information on the terminology used above. Potential combinations shown here are examples only and are not guaranteed by UCD. Modules are subject to change each year.