TR071 Science – Physics / Physics and Astrophysics

- Proton-Proton Collision – Particle Physics (10^{-14} m) 1
- Diffraction Pattern – Surface Physics (10^{-10} m) 2
- Nanocantilever – Bio & Molecular Physics (10-8m) 3
- Earth – Planetary Physics (10^{-7} m) 4
- Sunspot – Solar Physics (10^{-7} m) 5
- Galaxy – Astrophysics (10^{-21} m) 6
ABOUT THE COURSE

Physics is the core degree in the School of Physics. The Trinity Physics degree courses are recognised by the Institute of Physics, which is the professional body for physicists in Ireland and the UK, as qualifications for the professional title ‘Chartered Physicist’ (CPhys). The course code in Trinity is TR071.

WHAT IS PHYSICS

Physics explores our universe in all its diversity – from particles to planets, from crystals to chaos, from quanta to quasars and from superconductors to supernova. Its applications are to be found in modern communications, lasers, computing, and many other technologies of vital importance. A Physics degree covers a broad syllabus which includes hands-on practical work while allowing you develop flexible skills in theory, instrumentation and data analysis. The course covers core subjects, including mechanics, electromagnetism, quantum mechanics, modern optics and condensed matter physics. Specialised topics such as nanoscience, high energy physics, astrophysics and superconductivity are also part of the curriculum. In the final year students gain real-life experience in a research laboratory while completing a three-month research project in Trinity or abroad.

IS IT FOR ME?

Yes, if you like experiments and working in the lab! Yes, if you enjoy physics, technology and maths and working things out for yourself and solving problems!
WHAT IS ASTROPHYSICS?

Since the dawn of human civilisation humans have gazed in wonder at the night sky. Astrophysics – the exploration of our solar system and the universe beyond - is still a major part of human endeavour in science. Physics and Astrophysics at Trinity College will give you an introduction to this fascinating subject.

The Physics or Physics and Astrophysics course includes a strong background in core Physics subjects as well as specialised courses in topics such as astronomical instrumentation, spectroscopy, the solar system, stellar evolution, supernovae, galaxies, black holes and cosmology. Final year students get the opportunity to complete a research project in Trinity or abroad.

IS IT FOR ME?

Yes, if you are interested in how the universe began and evolved. Yes, if you enjoy asking questions and working out the answer!

In the third year laboratory there are experiments using optical and radio telescopes.
**COURSE STRUCTURE**

**Junior Freshman & Senior Freshman**

(1st & 2nd year)

Students follow the TR071 Science course in their Junior Freshman and Senior Freshman years and must take the prescribed modules in Physics and Mathematics in both years. The Physics course in the Freshmen years includes introductory astrophysics, thermodynamics, electricity, sound and optics, nuclear physics and quantum physics.

**Junior Sophister & Senior Sophister**

(3rd & 4th year)

In the Junior Sophister year, Physics and Astrophysics students study a wide variety of specialised modules tailored to their chosen moderatorship as well as receiving training in communication and presentation skills. All Junior Sophister students have the opportunity to meet with past graduates of the School of Physics through the Wild Geese program where they receive guidance on building a career in physics.

The Senior Sophister course consists of lectures, tutorials and practical physics. During the Senior Sophister year, students carry out a 3 month research project in either an academic or industrial research laboratory. Many students carry out their final year project abroad, mainly across Europe, Canada and America. This unique opportunity allows our students to develop their practical skills in a research environment while learning about different countries and cultures.
CAREER OPPORTUNITIES

This degree will provide graduates with a flexible qualification for employment in cutting-edge high technology industries. Our graduates will be strongly sought-after in the knowledge economy where their interdisciplinary training in Physics will give them a clear edge in solving real-life problems in high-tech industry. Graduates of the Physics or Physics and Astrophysics courses are now working in a range of fields, including multinationals such as Intel, indigenous start-ups, publishing and in further academic research. Many of our graduates pursue postgraduate research both in Trinity College and other world class research institutes around the world.

“After four great years studying Physics at TCD, I headed to Oxford for a MSc in Applied Mathematics before beginning a PhD in climate science at MIT. I spend most of my time running climate simulations under the supervision of another TCD Physics graduate, Prof Paul O’Gorman! My PhD research involves extensive use of the coding skills I honed in the computer lab in the SNIAM during my degree. Research questions I’m working on include: Why, under global warming, do land temperatures increase more than ocean temperatures? How will the terrestrial water cycle change in the future? What effects do land surface properties have on monsoon circulations?”

Michael Byrne,
Former Physics graduate

For more case studies, go to physics.tcd.ie
Trinity College Dublin is one of the great universities of the world and is consistently ranked in the top 100 in the QS World University Rankings. It is widely recognized for the high quality of its graduates, the international standing of its research and scholarship, and the value it places on contributing to Irish society and the wider world.

Trinity College provides a stimulating environment where independence of thought is highly valued. With a distinguished history, it also has all the facilities associated with a modern university. Located in the heart of Dublin city, it has some 16,600 students and 2,900 staff. Students can experience a well-rounded University life through the range of clubs, societies, volunteer groups and other social activities.

The School of Physics is affiliated and has access to state-of-the-art research facilities within CRANN and the advanced microscopy lab (AML). Researchers from the School of Physics are currently involved in the AMBER (Advanced Materials and BioEngineering Research) project funded by Science Foundation Ireland. This project provides a partnership between leading researchers in material science and industry. The School of Physics is a major participant in the Trinity Centre for High Performance Computing, www.tchpc.tcd.ie. Graduates from both Schools are in strong demand for a wide range of jobs in industry and commerce.
SCHOOL OF PHYSICS

The study and teaching of physics at Trinity College has a distinguished history dating back to the 18th century and has included figures such as Hamilton, Lloyd, Fitzgerald and Walton. Ernest T. S. Walton was the first Irish-born recipient of a Nobel prize in Science (1951). The Sami Nasr Institute for Advanced Materials, completed in 2000, houses the central part of the School today. The school’s buildings provide excellent modern facilities for teaching and research for a very lively community of over 200, including 25 academic staff, more than 50 postdoctoral fellows and over 100 graduate students, representing nationalities from all over the world.

The School of Physics offers scholarships to incoming first year students, information is available on physics.tcd.ie

Follow us on twitter: @TCD_physics or @TCD_astro
ENTRY REQUIREMENTS

The Trinity Science course is a common entry two year Freshman programme, from which students have a choice of specialising in their Sophister (third and fourth) years across a wide variety of scientific topics. Physics or Physics and Astrophysics are two of the moderatorships offered.

Science - Physics or Physics and Astrophysics

» Course Code: TR071
» Duration: 4 years, full time
» Points 2014: 515
» Points 2015: 510
» Degree Awarded: B.A.

Special Entry Requirements

» Leaving Certificate
   — HD3 or OC3 / Mathematics
   — HC3 in two of: Physics, Chemistry, Biology, Mathematics, Physics & Chemistry, Geology, Geography, Applied Mathematics or Agricultural Science

» GCSE: Grade B Mathematics or Advanced GCE (A-Level): Grade C Mathematics

Advanced GCE

» Advanced GCE (A-Level): Grade C in two of Physics, Chemistry, Biology, Mathematics, Applied Mathematics

Combinations not permitted

» Physics & Chemistry with Physics or Chemistry
» Applied Mathematics with Mathematics

HOW DO I APPLY?

Apply for TR071 Science. Upon entry into the TR071 Science degree, choose Physics (20 credits), Maths (20 credits) and one other Science subject on your subject choice form. In your third year, specialise in either Physics or Physics and Astrophysics.

International entry requirements are available at: www.tcd.ie/international/apply/non-eu-undergraduate