Durham University
Department of Physics

WELCOME

Why Physics?

Durham
University
Department of Physics

WHY STUDY PHYSICS

Durham University
Department of Physics

- Physics is at the core of understanding of nature.
- Physics is a rigorous discipline based on logic and reason.
- Physics is a quantitative discipline based on mathematics.
- Physics is based on measurements.

KEY SKILLS

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- Employers look for key skills:
  - Communication
  - Modelling/simulating complex systems
  - Information Technology
  - Working with others
  - Improving own learning & performance
  - Problem solving

DURHAM PHYSICS

Durham University
Department of Physics

- A large department of world-renowned experts.
- A research-led teaching programme: explore the frontiers of human knowledge.
- An innovative teaching programme giving you a broad range of transferable skills.

WHY PHYSICS AT DURHAM?

Durham University
Department of Physics

- SILVER Teaching Excellence Framework Award.
- Degree Accredited by *Institute of Physics.*
- 3rd place in Guardian 2025 UK Universities ranking.
- 3rd in Complete University Guide 2026.

physics

GRADUATE EMPLOYMENT

Durham University
Department of Physics

- **~94%** of our students are in graduate level employment or studying for a higher degree within 15 months of graduation.

- Areas include science, teaching, business and finance.
- Employers include JP Morgan; Cancer Research UK; BAE systems, Cisco; Centrica; KPMG and the Foreign Office.
- Jobs include: trainee clinical scientist; graduate electro-optics engineer; graduate engineer; medical physicist; graduate trainee auditor; accountant and research scientist…and one astronaut…

Rosemary Coogan
Astronaut at European Space Agency
https://www.bbc.co.uk/news/articles/czxyv3z710do

The Durham Course

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Department of Physics

CURRENT UNDERGRADUATE COURSES

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BSc 3-year programme

MPhys 4-year programme

Physics	*BSc, MPhys*
Physics and Astronomy	*MPhys*
Theoretical Physics	*MPhys*
Physics (part of Natural Sciences)	*BSc, MSci*

YEAR 1	**COMMON TO ALL PROGRAMMES**
YEAR 2	**CORE INCLUDING LABORATORIES**
YEAR 3	**CORE COURSE COMMON TO BSc AND MPhys**
	BSc PROJECT (COMPUTING OR DISSERTATION) WITH LABORATORY OR TEAM PROJECT)
	OPTIONAL LECTURE COURSES, PROJECTS AND MATHEMATICS
YEAR 4	**MPhys RESEARCH-BASED PROJECT, LECTURE COURSE OPTIONS**

HOW WE TEACH

Durham University
Department of Physics

Lectures	About 12 per week
Tutorials	Weekly in Year 1
Problems workshops	Years 2 - 4
Practical work	Varies from 1 to 2 to 4 afternoons
Computing	IT Skills, programming
Team Projects	“Real life” problem solving
Presentations	Talks in all years; poster in Year 3
Homework Problems	Weekly in all years

YEAR 1

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- Most students take the following five modules:
  - Foundations of Physics (double module)
  - Discovery Skills in Physics (single module)
  - Mathematics A (single module)
  - Mathematics B (single module)
- *Plus, an "Elective" module*
  - Single module from another department (single module)
  - Introduction to Astronomy (single module)
  - Maths Toolkit for Scientists (single module)

FOUNDATIONS OF PHYSICS 1

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Einstein - Relativity

Heisenberg – Quantum Mechanics

Conceptual Tutorials

BRIDGE PROJECTS

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YEAR 2

Durham University
Department of Physics

- **All students take the following:**
  - Foundations of Physics 2

    (Two modules)
  - Mathematical Methods
  - Physics Laboratory
- **Plus two further modules from:**
  - Stars and Galaxies
  - Theoretical Physics 2
  - Physics and Society

Workshops associated with each Lecture module

LATEST DECISION TIME FOR DEGREE TYPE (BSc or MPhys) start of Year 3

LATEST DECISION TIME FOR MPhys DEGREE SUBJECT start of Year 3

What you applied for can be changed!

Average Physics Contact Time
in first and second year

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- **Lectures:**
  - Around 12 per week.
- **Tutorials/Workshops:**
  - 3 to 4 per week.
- **Laboratories:**
  - 1 x 3-hour session per week
  - 1 x computing workshop per week

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YEAR 3

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- **All students take the following:**
  - Foundations of Physics 3

(Two modules)

- **Choose four modules from:**
  - Advanced Laboratory
    - Nuclear
    - Condensed Matter
    - Optics
    - AstroLab
  - Team Project
  - Computing Project
  - BSc Project
  - Mathematics Workshop
  - Theoretical Physics 3
  - Planets and Cosmology
  - Condensed Matter Physics
  - Physics into Schools
  - Modern Atomic and Optical Physics
  - Module from another department

Some flavours and degree types require certain modules to be taken!

L3 ASTROLAB OPTION

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- Observational projects using real data:
- Four computerized telescopes on the building rooftop

- Telescopes tours available during the Experience!

http://www.dur.ac.uk/physics.astrolab/

Projects Include

- Characterizing the orbits of the moons of major planets (Jupiter, Uranus)
- Determining the orbits of Solar System bodies (NEOs, comets, main-belt asteroids, Jupiter Trojans, etc)
- Measuring the rotation of asteroids via their light curves
- Measuring the distance to the Hyades cluster via the convergent-point method
- Characterizing variable stars (eclipsing, pulsating, ...) via their light curves
- Studying exo-planets via transits

YEAR 3: TEAM PROJECTS

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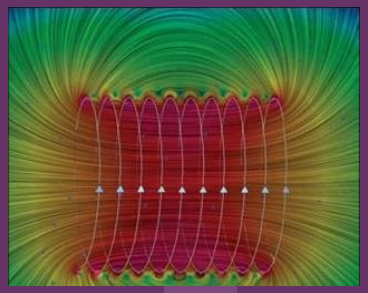
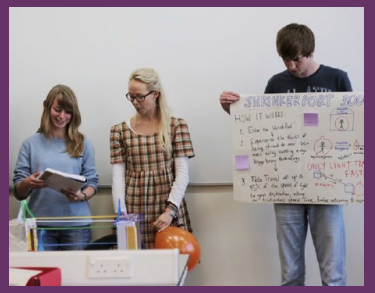
- Students work in teams of 4-6 on industrial projects.
- Students work with big industries:
  - Airbus, EDF, General Electric, Procter & Gamble, Rolls Royce etc.
- …and with smaller ones:
  - Coltraco (ultrasound), HawkEye (tennis, football…), Tracerco (pipelines), Mantis (vacuum systems) etc.
- Many students get a job at the company with whom they did a project.
- Durham led an IoP Project to help other Physics Depts set up similar projects.

Pipeline inspection

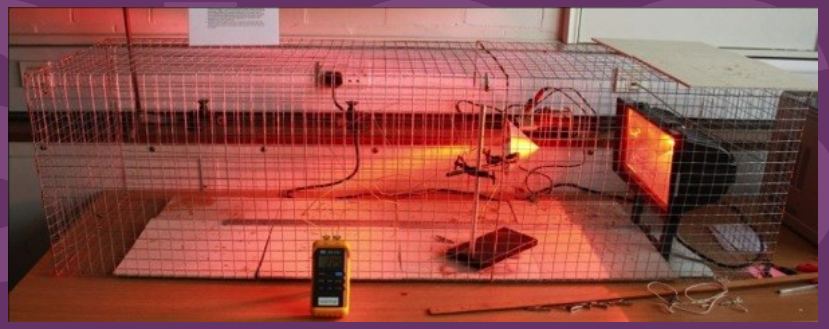
Creating Martian dust



Solenoid simulation for GE



A team game…



Simulating the Sun for Astrium

YEAR 4

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- **Take three lecture modules:**
  - Degree flavour **will** require certain modules to be taken.
- **A Project, worth three modules:**
  - Theoretical, experimental or computational.
  - Work in a research group, interacting with staff, solving a novel problem.
  - Results have been published in the literature!

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STUDY ABROAD YEAR IN INDUSTRY

Durham University
Department of Physics

- Full-year Study Abroad exchange partners across the globe.

- **Additional year of Study Abroad or Industry Placement.**

  Pass/Fail year – grade does not affect the final degree classification!.

- **Replacement year of Study Abroad.**

  In year 3, with grades counting towards final Durham degree

- Talks available today in Central University or go to the Information Hub!

For more details: https://www.durham.ac.uk/global-durham/global-opportunities/go-study-abroad/hub/

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SUPPORT STRUCTURES

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- Academic Advisor, throughout 3 or 4 years
- Academic Tutor in L1
- Workshop Tutors in L2+L3 [+L4]
- Project Supervisors in L3 and L4
- Student Voice Committee
- College Support Teams
- Department Student Support officer

DURHAM COLLEGES

Durham University
Department of Physics

- Member of one during your time at Durham
- Most students live in College during their first year
- All Colleges have students studying for all degrees
- Colleges have sports teams, music and drama, committees etc.

- College allocations after get academic offer.
- Go and experience a variety of Colleges during the day!

Research at Durham

Department of Physics

RESEARCH INSTITUTES

Durham University
Department of Physics

- The department is made up of high-profile research centres leading discovery across the most important areas of modern physics:
  - Institute for Particle Physics Phenomenology
  - Institute for Computational Cosmology
  - Centre for Extragalactic Astronomy
  - Centre for Advanced Instrumentation
  - Centre for Materials Physics
  - Joint Quantum Centre
  - Biophysical Sciences Institute
  - Durham Energy Institute
  - Space Research Centre

The Institute for Computational Cosmology: THE COSMOLOGY MACHINES

Durham University
Department of Physics

The COSMA-8 supercomputer provides:

528 Dell C6525 nodes with a total of 67,584 compute cores, 528TB RAM (1TB per node) and a 200GBit/s network.

…and 16PB data storage.

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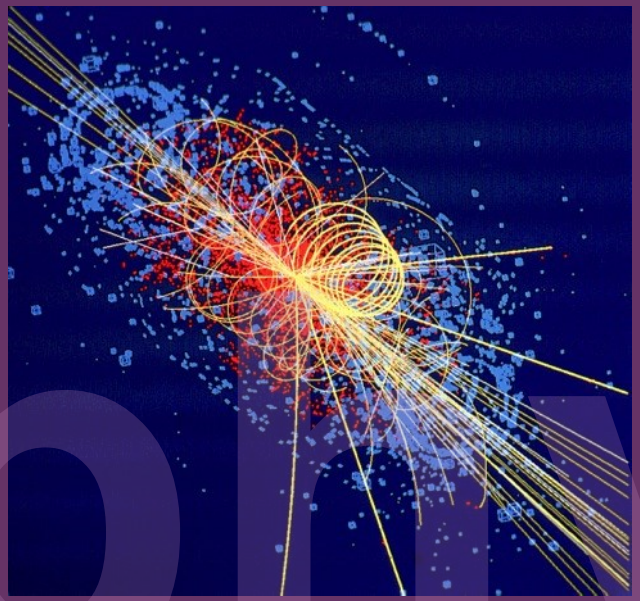
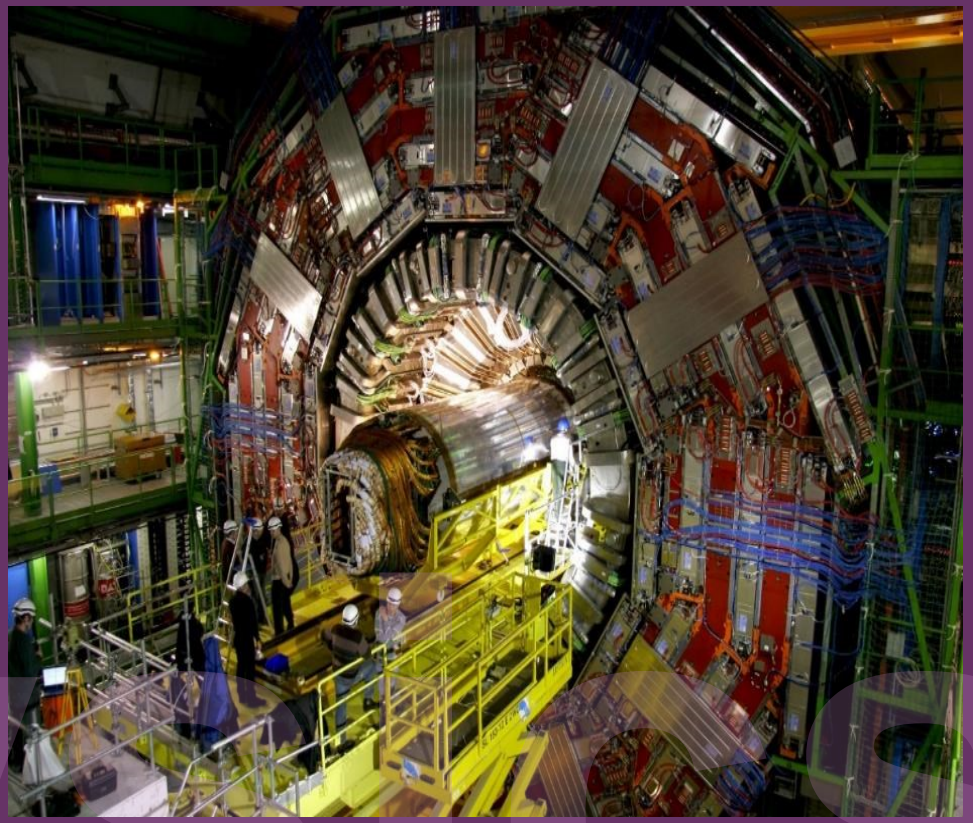
CHARACTERISING THE HIGGS BOSON

Large Hadron Collider



Simulation of the decay of a Higgs boson into four muons in the CMS detector at LHC



Biophysical Sciences Inst

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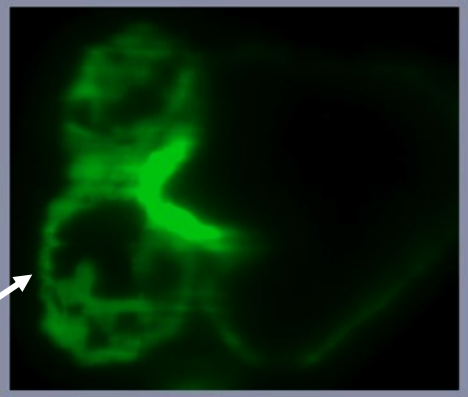
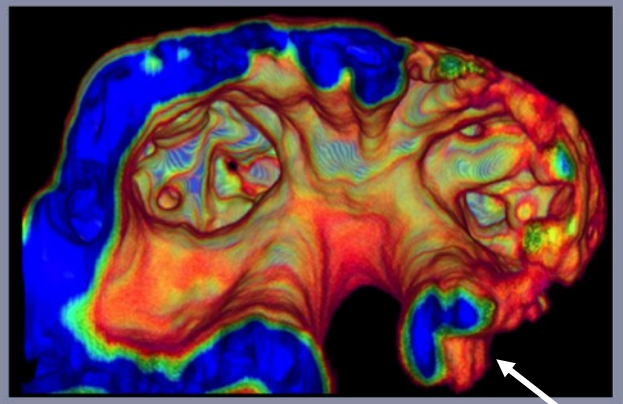
BIOPHYSICAL SCIENCES INSTITUTE





Single “slice” through heart

3-D reconstruction of heart

Zebra fish

BIOPHOTONICS

CfA Durham University Department of Physics

CENTRE FOR ADVANCED INSTRUMENTATION

LASER GUIDE STARS

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AtMol
Atomic & Molecular Physics

Joint Quantum Centre
WWW.JQC.ORG.UK

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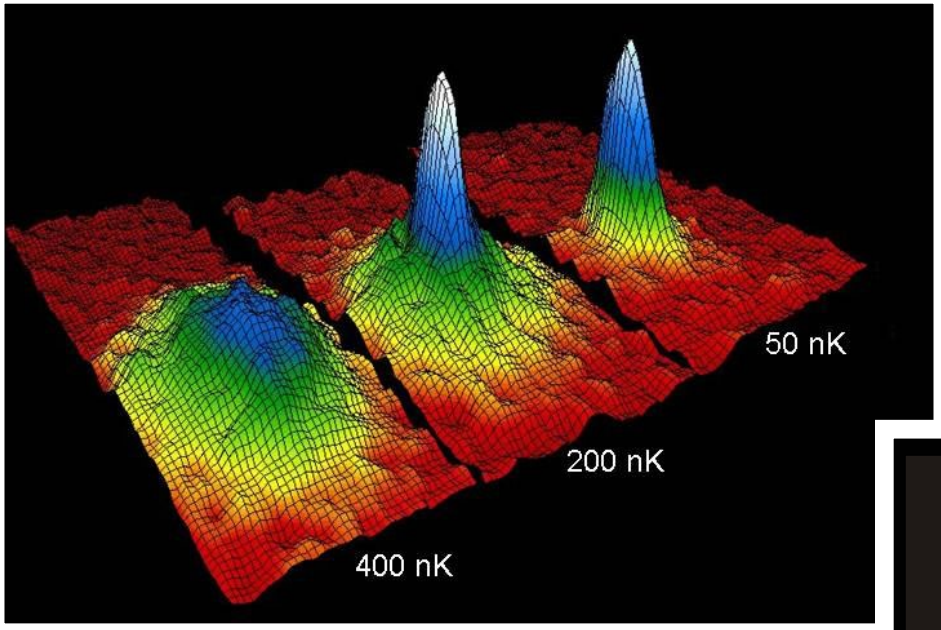
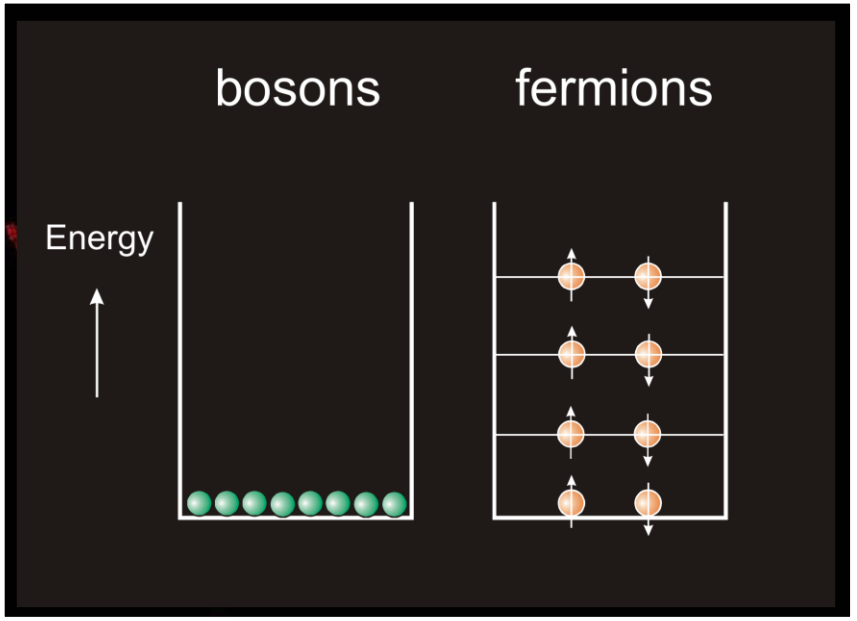
ATOMIC AND MOLECULAR PHYSICS



Bose-Einstein condensates



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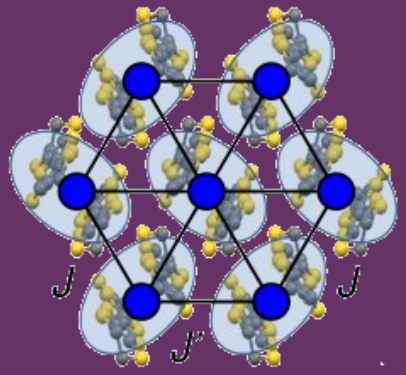
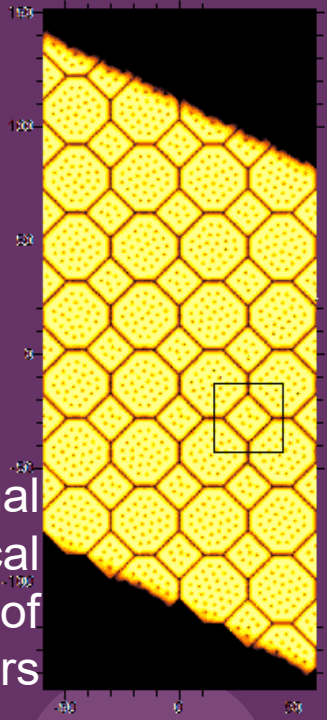
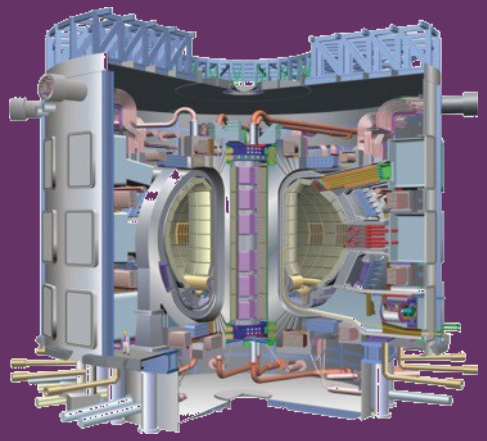
CONDENSED MATTER PHYSICS



Frustrated magnetism in an organic magnet



Empirical, computational and theoretical understanding of superconductors



ITER Fusion Tokamak

QUANTUM MAGNETISM & SUPERCONDUCTIVITY

Admissions

Durham
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Durham University
Department of Physics

Entry requirement

A*A*A

To include Mathematics and Physics.

Applicants taking Science A-levels that include a practical component will be required to take and pass this as a condition of entry. This refers only to English A Levels.

Specific subjects excluded for entry:
General Studies and Critical Thinking.

Admissions

Durham University
Department of Physics

Admissions are centralised

What our selectors consider

- Prior and predicted grades
- Personal Statement
- Teachers/Academic Reference
- Contextual evidence of merit & potential
- Motivation for the degree programme
- Study & other skills

Thank You!

Watch the video on youtube:
Physics@Durham

Further Information
http://www.dur.ac.uk/physics/undergraduate/

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