

The Physics Department has a strong international reputation for its research in the fields of Theoretical Physics, Condensed Matter and Materials Physics, Medical Physics and Fusion and Plasma Physics. Our Astronomy & Astrophysics and Elementary Particle Physics groups participate in international collaborations such as LHCb in CERN and the WASP exoplanet search.

We have around 125 research students and 50 post-doctoral research fellows, 61 academic staff and 22 technicians in the Department and related research centres. The size and reputation of our research activity attract many visitors from overseas and the UK. Strong funding from the research councils, regional development agency and industry ensure state-of-the-art equipment and high-end computational facilities, with excellent technical support. A new Materials and Analytical Sciences building is due for completion in 2011.

Our close links with the Centre for Scientific Computing, Molecular Organisation of Cells (MOAC) and Complexity Doctoral Training Centres enable exciting cross-disciplinary research projects. Together with the Universities of Birmingham and Nottingham, the Department is a member of the Midlands Physics Alliance, enabling co-ordinated research projects and supporting a Midlands Physics Alliance Graduate School (MPAGS).

The Department is also involved with the Science City research initiative, an £80 million programme funded by Advantage West Midlands between the universities of Birmingham and Warwick, stimulating research and business engagement in Advanced Materials, Translational Medicine and Energy. This investment has enabled us to expand our suite of experimental equipment, e.g. in high resolution X-ray diffraction, surface science and crystal growth.

## RESEARCH DEGREES

MSc BY RESEARCH (MScR)

DOCTOR OF PHILOSOPHY (PhD)

## CONTACT DETAILS

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# DEPARTMENT OF PHYSICS

[www.warwick.ac.uk/go/physics](http://www.warwick.ac.uk/go/physics)

## RESEARCH GROUPS

**Experimental Condensed Matter Physics** is the largest research area in the Department and covers a wide range of materials and techniques. Groups covered by this area include:

- Microscopy
- Ferroelectrics and Crystallography
- Surface, Interface & Thin Film
- Nano-Silicon
- Analytical Science Projects
- Solid State NMR
- EPR and Diamond
- Ultrasonics
- Superconductivity and Magnetism
- Magnetic X-ray Scattering
- Glass and Glass-ceramics

These groups work jointly on many projects, sharing equipment and expertise. Postgraduate researchers often interact with several groups during their studies, using a variety of facilities to tackle their project.

### Theoretical and Computational Physics

[www.warwick.ac.uk/go/physics/research/theory](http://www.warwick.ac.uk/go/physics/research/theory)

The Group offers projects in a wide variety of areas, including electronic structure theory, disordered quantum systems, soft condensed matter and biophysics. It has close links to Experimental Condensed Matter research groups in physics, as well as Complexity, Systems Biology and MOAC. This is the first port of call for theoretical projects in Physics.

Computationally-based MSc projects are also available in many experimental groups in Physics. See [www.warwick.ac.uk/go/surfsci](http://www.warwick.ac.uk/go/surfsci)

### Fusion, Space and Astrophysics

Please see the Centre for Fusion, Space and Astrophysics (CFSA) entry, page 159. See [www.warwick.ac.uk/go/cfsa](http://www.warwick.ac.uk/go/cfsa)

### Astronomy and Astrophysics

The group works in areas of both galactic and extragalactic astrophysics, conducting research into accreting compact objects (white dwarfs, neutron stars, black-holes) in binary stars and the evolution of these systems, extra-solar planetary systems and gamma-ray bursts and the high-redshift Universe. A common theme is variability and time-resolved observations and research involves instrumentation developments to push the boundaries of high-speed astronomical observations. See [www.warwick.ac.uk/go/astronomy](http://www.warwick.ac.uk/go/astronomy)

### Medical and Biological Physics

Research in medical and biological physics spans several groups within the Physics Department, often involving one of the interdisciplinary centres. Medical Physics Research focuses on modelling the behaviour and imaging of tissues. The Solid State NMR Group also studies biological materials such as membrane proteins. See [www.warwick.ac.uk/go/physics/research/medphys/](http://www.warwick.ac.uk/go/physics/research/medphys/)

Within the Theoretical Physics Research Group, several projects are available on a biological theme: see [www.warwick.ac.uk/go/physics/research/theory](http://www.warwick.ac.uk/go/physics/research/theory)

### Elementary Particle Physics

The group is currently pursuing collaborative experimental research. The LHCb experiment, at the CERN laboratory in Geneva is studying the delicate asymmetry between matter and anti-matter, known as CP violation. By making precision measurements of the phenomenon in different ways and comparing them, it is hoped that hints of new physics might be discovered. Together with our international collaborators, we have recently built the T2K experiment in Japan, which directs a beam of neutrinos (underground) from one side of Japan to the other. We hope to detect for the first time, the very rare spontaneous change of muon neutrinos to electron neutrinos via an effect known neutrino oscillations. We are also involved in other projects looking at generating more intense neutrino beams, in what is called a 'neutrino factory', and for detecting the neutrinos produced at very long distances, after neutrino oscillations have taken place. See [www.warwick.ac.uk/go/epp](http://www.warwick.ac.uk/go/epp)

## RESEARCH DEGREES

### MSc BY RESEARCH (MScR)

**Standard Duration: 1 year full-time**

This degree emphasises training and original research on a specialised project. These are in similar areas to PhD projects, but must be completed in 12 months and so are more focused.

### DOCTOR OF PHILOSOPHY (PhD)

**Standard Duration: 3 – 3.5 years full-time**

This degree emphasises research training and original research. There is also a component of advanced tuition via the Midlands Physics Alliance (MPAGS) as well as transferable skills development throughout.



*A ring of metal-rich gas orbiting around a white dwarf star*

## APPLICATION FACT FILE (RESEARCH DEGREES)

### Entry Requirements

PhD: At least a 2:i degree in Physics or a related subject, or an equivalent qualification, is required.

MRes: At least a 2:ii degree in Physics or a related subject, or an equivalent qualification, is required.

### English Language Requirements

IELTS 6.5, TOEFL (iBT) 92 or equivalent

### Application

All applications are made online at [www.warwick.ac.uk/go/pgapply](http://www.warwick.ac.uk/go/pgapply)

### Tuition Fees

(2011/12 fees. Please note fees for 2012/13 will be published online in spring 2012.)

Home/EU: Full-time £3,900, Part-time £2,340

Overseas: (Band 2 – lab based)

Full-time £15,460, Part-time £9,276

### Funding

Projects are funded by a variety of sources, including research councils, industry or a combination of both. Applicants with scholarships are welcome to apply at any time, clearly stating the scholarship they have been awarded. Funding is also available through the Chancellor's Scholarships or Warwick Collaborative Postgraduate Research Scheme (WCPRS), although applicants are strongly encouraged to contact the Departmental Postgraduate Admissions tutor before applying for funding through either of these routes. Please note that both Chancellor's Scholarships and WCPRS are for PhD applicants only. Some support for Master's projects is available.