

Physics and Astronomy PhD (Particle Physics specialism)

Postgraduate doctoral research degree in Physics and Astronomy PhD (Particle Physics specialism):

The Particle Physics Group is involved in diverse present and future experiments at particle accelerators operating at the highest available energies, in order to determine the ultimate structure of matter and to study the fundamental forces of nature.

We contribute to these experiments both through data analysis and through design and construction of detector and trigger components.

[Study here and find out why the University of Birmingham was awarded The Times and The Sunday Times University of the Year 2013-14 \(http://www.birmingham.ac.uk/news/latest/2013/09/20-sep-Birmingham-announced-as-University-of-the-Year.aspx\)](http://www.birmingham.ac.uk/news/latest/2013/09/20-sep-Birmingham-announced-as-University-of-the-Year.aspx)

Course fact file

Type of Course: Doctoral research

Study Options: Full time

Duration: PhD: 3.5 years full-time; MSc by research: 1 year full-time

Start date: Contact the School directly for further information

Related courses

[Postgraduate research - School of Physics and Astronomy \(/schools/physics/postgraduate/postgraduate-research.aspx\)](/schools/physics/postgraduate/postgraduate-research.aspx)

Contact

Admissions Tutor: Dr Cristina Lazzeroni

[Contact us online \(http://bham.hobsons.co.uk/ask.aspx?cid=1223&did=24\)](http://bham.hobsons.co.uk/ask.aspx?cid=1223&did=24) or at +44 (0)121 414 4614.

[School of Physics and Astronomy \(/schools/physics/index.aspx\)](/schools/physics/index.aspx)

Details

The Particle Physics Group is involved in diverse present and future experiments at particle accelerators operating at the highest available energies, in order to determine the ultimate structure of matter and to study the fundamental forces of nature. We contribute to these experiments both through data analysis and through design and construction of detector and trigger components.

Our largest current activities centre on the Large Hadron Collider (LHC), and Birmingham is the only UK group participating in three current LHC experiments.

We are heavily involved in data analysis at the ATLAS experiment, and members of the group have played major roles in the discovery of the new particle consistent with the Higgs boson. Besides, our ATLAS group works on heavy quarks physics (beauty and top) and search for supersymmetry and other new physics phenomena.

Our LHCb group studies rare decays of particles containing the beauty quark, and the search for new physics beyond the Standard Model. At LHCb we also study Charge-Parity violation and matter-antimatter asymmetry, which relates to the matter-antimatter imbalance in our Universe.

Our Birmingham nuclear physicist colleagues are the only UK group which is involved in the LHC programme of heavy ion collisions, studied with the ALICE experiment. ALICE is expected to observe and study the quark-gluon plasma, a state of matter that is thought to have existed in the very early universe in which particles such as protons and neutrons 'dissolve' into their constituent quarks and gluons.

Beside LHC experiments, we are also searching for new physics in very rare strange particle decays and for processes that violate Lepton Flavour Universality through our work on the fixed target NA62 (formerly NA48) experiment using the CERN SPS accelerator. Rare processes are sensitive to contributions of virtual new particles (in a mass range of up to 100 TeV) entering the respective Feynman diagrams, and thus provide stringent tests of new theories and an important testing ground for the Standard Model.

Looking at a more distant future, we are heavily involved in LHC upgrades and looking at future possibilities for electron-proton collisions using the LHC proton beam (LHeC project).

Fees and funding

[Standard fees \(http://www.birmingham.ac.uk/students/pg/courses/fees/standard\)](http://www.birmingham.ac.uk/students/pg/courses/fees/standard) apply

Learn more about **[fees and funding \(/postgraduate/dr-fees/tuition.aspx\)](/postgraduate/dr-fees/tuition.aspx)**.

Scholarships and studentships

We have a number of studentships supported by the UK research councils EPSRC and STFC available each year, including some CASE awards. These studentships cover the costs of tuition fees and provide a subsistence allowance for 3.5 years. They are available to UK nationals with at least an upper second-class Honours degree from a UK university, or equivalent. Preference is usually given to those holding four-year MPhys or MSci degrees.

We offer about half a dozen postgraduate teaching assistantships each year as top-ups to EPSRC and STFC studentships. There are also substantial opportunities for postgraduate demonstrators. EU nationals may be eligible for fees-only awards, which are occasionally supplemented by the School. Scholarships may be available, for more information contact the School directly or email **[sfo@contacts.bham.ac.uk \(mailto:sfo@contacts.bham.ac.uk\)](mailto:sfo@contacts.bham.ac.uk)**

International students can often gain funding through overseas research scholarships, Commonwealth scholarships or their home government.

Entry requirements

Learn more about [entry requirements \(http://www.birmingham.ac.uk/students/dr/requirements\)](http://www.birmingham.ac.uk/students/dr/requirements).

International students

We accept a range of qualifications from different countries – learn more about [international entry requirements \(http://www.birmingham.ac.uk/students/dr/requirements/international\)](http://www.birmingham.ac.uk/students/dr/requirements/international).

[Standard English language requirements \(/postgraduate/requirements-pgt/international/index.aspx\)](#) apply.

How to apply

Learn more about [applying \(/postgraduate/requirements-dr/index.aspx\)](#)

When clicking on the Apply Now button you will be directed to an application specifically designed for the programme you wish to apply for where you will create an account with the University application system and submit your application and supporting documents online. Further information regarding how to apply online can be found on the [How to apply pages \(http://www.birmingham.ac.uk/students/courses/postgraduate/apply-pg/index.aspx\)](#)

[Apply now \(https://pga.bham.ac.uk/lpages/EPSo05.htm\)](https://pga.bham.ac.uk/lpages/EPSo05.htm)

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Related links

[Postgraduate degree courses - School of Physics and Astronomy \(/schools/physics/postgraduate/index.aspx\)](#)

Related news and events

[What has the Higgs Boson ever done for me? \(/news/thebirminghambrief/items/2013/09/higgs-boson.aspx\)](#)

[New Particle at the Large Hadron Collider Discovered by ATLAS Experiment \(/news/latest/2011/12/22-Dec-11-New-Particle-at-the-Large-Hadron-Collider-Discovered-by-ATLAS-Experiment--.aspx\)](#)

[Birmingham Physicists excited by hints of Higgs boson existence \(/research/impact/our/news/items/higgs-hints.aspx\)](#)

Research interests of staff

The School of Physics and Astronomy was placed among the leading research institutions in the latest (2008) Research Assessment Exercise.

Our research portfolio is wide-ranging, and covers three principal themes: Particle and Nuclear Physics; Quantum Matter and Nanoscale Science; and Astronomy. We have over 120 academic and research staff together with 120 graduate students with around 50 technical and clerical support staff. Our annual research income is over £8 million and more than 250 research publications are produced each year.

Visit the website for the [Elementary Particle Physics \(http://www.ep.ph.bham.ac.uk/\)](http://www.ep.ph.bham.ac.uk/) research group for further information.

Related research

- [Particle Physics \(http://www.ep.ph.bham.ac.uk/\)](http://www.ep.ph.bham.ac.uk/)
- [School of Physics and Astronomy research \(/research/activity/physics/index.aspx\)](#)

Employability

University Careers Network

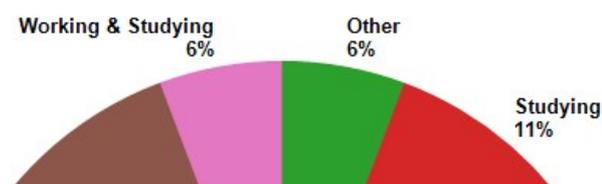
Preparation for your career should be one of the first things you think about as you start university. Whether you have a clear idea of where your future aspirations lie or want to consider the broad range of opportunities available once you have a Birmingham degree, our Careers Network can help you achieve your goal.

Our unique careers guidance service is tailored to your academic subject area, offering a specialised team (in each of the five academic colleges) who can give you expert advice. Our team source exclusive work experience opportunities to help you stand out amongst the competition, with mentoring, global internships and placements available to you. Once you have a career in your sights, one-to-one support with CVs and job applications will help give you the edge.

If you make the most of the [wide range of services \(https://intranet.birmingham.ac.uk/as/employability/careers/college/eps/index.aspx\)](https://intranet.birmingham.ac.uk/as/employability/careers/college/eps/index.aspx) you will be able to develop your career from the moment you arrive.

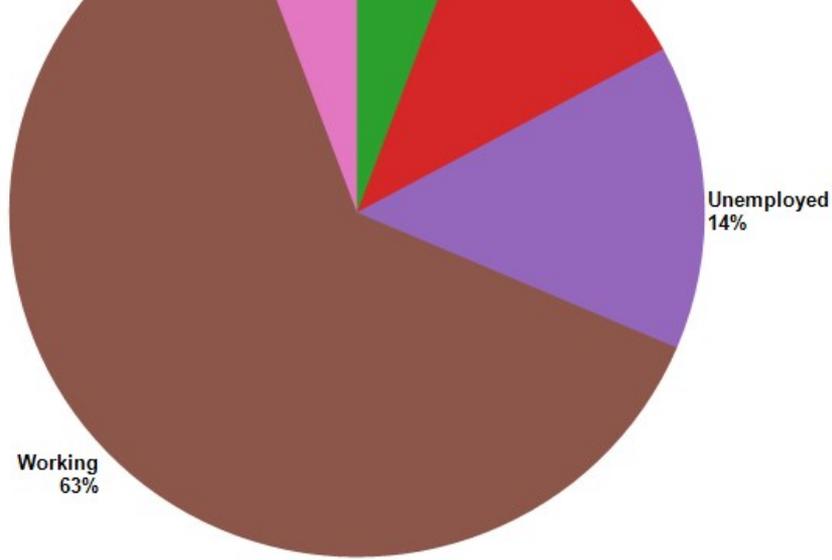
Destinations of Leavers from Higher Education (DLHE) 2011/12 (postgraduate taught graduates)

The DLHE survey is conducted 6 months after graduation.



Examples of employers

- Siemens
- Rolls Royce PLC
- Optical Performance Centre
- KPMG
- Microsoft Ltd



- King Edwards Consortium
- J.Sainsburys PLC
- Mondrago Investigations Limited
- Self employed
- NHS

Examples of occupations

- Software Engineer
- Trainee Clinical Scientist
- Technology Graduate
- Secondary School Teacher - Physics
- Research Analyst
- Nuclear Manufacturing Engineer Intern
- Musician
- Recruitment Consultant
- Internet Application Engineer
- Data Analyst

Further study - examples of courses

- MSc Astrophysics

- MSc Computer Science
- MSc Forensic Ballistics
- MSc Medical Imagery
- MSc Nuclear Physics
- MSc Physics and Technology
- MRes Chemical Engineering
- PhD Electronic Engineering
- PhD Physical Sciences

Visit the **Careers section of the University website** (<https://intranet.birmingham.ac.uk/as/employability/careers/college/eps.aspx>) for further information.

