

Physics and Astronomy PhD (Nuclear Physics specialism)



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

Our research is aimed at understanding the properties of atomic nuclei in terms of the behaviour of their constituents. These properties are investigated from low energy, where the nuclear constituents interact as individual particles, to very high energies, where nucleons can 'melt' into their component quarks and gluons.

We are also interested in the use of nuclear physics in medical and

industrial applications.

[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 Peter Jones

[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 4677.

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

Details

Our research is aimed at understanding the properties of atomic nuclei in terms of the behaviour of their constituents. These properties are investigated from low energy, where the nuclear constituents interact as individual particles, to very high energies, where nucleons can 'melt' into their component quarks and gluons. We are also interested in the use of nuclear physics in medical and industrial applications.

The Charissa collaboration is using large detector arrays to investigate the properties of nuclei far from stability, near the neutron and proton drip lines. This work is undertaken at laboratories around the world, including the Grand Accélérateur National d'Ions Lourds (GANIL) in France, which is a leading facility for the study of exotic nuclei far from stability.

Information about sizes and shapes of unstable nuclei is obtained by the application of high-resolution laser spectroscopy at Jyväskylä in Finland at the CERN-ISOLDE facility. The group is also involved in preparatory work for experiments at the forthcoming Facility for Antiproton and Ion Research (FAIR) at GSI in Germany.

At very high-energy, collisions of heavy nuclei produce energy densities that would have occurred at times only several microseconds after the Big Bang. We are responsible for the trigger system in the ALICE experiment at the CERN Large Hadron Collider and are pursuing physics topics ranging from soft particle production and resonances through to jets and heavy flavour.

There is also the possibility of research projects related to the nuclear power industry, usually following-on from our MSc course on the Physics and Technology of Nuclear Reactors. These projects are normally run in conjunction with the UK and French industry.

Related links

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

Nuclear Physics Group: www.np.ph.bham.ac.uk (<http://www.np.ph.bham.ac.uk/>)

Fees and funding

[Standard fees \(/postgraduate/dr-fees/tuition.aspx\)](/postgraduate/dr-fees/tuition.aspx) apply.

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

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 \(https://pga.bham.ac.uk/lpages/EPS005.htm\)](https://pga.bham.ac.uk/lpages/EPS005.htm)

[Apply now \(https://pga.bham.ac.uk/lpages/EPS005.htm\)](https://pga.bham.ac.uk/lpages/EPS005.htm)

Related links

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

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 [Nuclear Physics Research Group \(http://www.np.ph.bham.ac.uk\)](http://www.np.ph.bham.ac.uk) research group for further information.

Related research

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

Related staff

[Professor Peter Jones \(/staff/profiles/physics/jones-peter.aspx\)](/staff/profiles/physics/jones-peter.aspx)

[Professor Martin Freer \(/staff/profiles/physics/freer-martin.aspx\)](/staff/profiles/physics/freer-martin.aspx)

Employability

University Careers Network

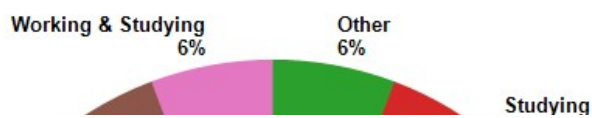
Preparation for your career should be one of the first things you think about as you start university. Whether you have a clear idea of where your future aspirations lie or want to consider the broad range of opportunities available once you have a Birmingham degree, our Careers Network can help you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

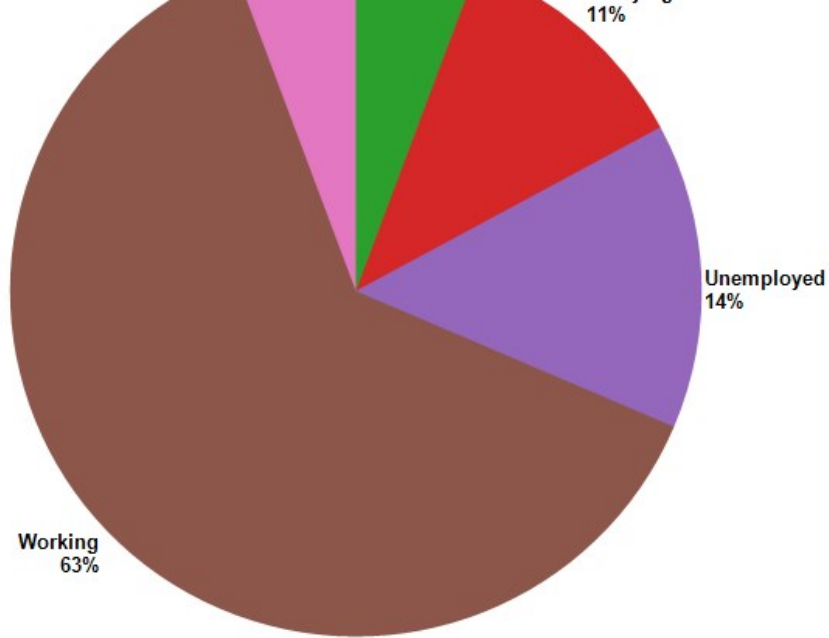
Destinations of Leavers from Higher Education (DLHE) 2011/12 (postgraduate taught graduates)

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.

