

Physics and Astronomy PhD (Astrophysics and Space Research specialism)

Postgraduate doctoral research degree in Physics and Astronomy PhD (Astrophysics and Space Research specialism):

The research carried out by the Astrophysics and Space Research Group covers a wide range of areas, with programmes of international importance in gravitational physics, extragalactic and stellar astrophysics, extrasolar planets, and the study of the sun and heliosphere.

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>)

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>)

Contact

Admissions Tutor: Dr Ilya Mandel

Contact us online (<http://bham.hobsons.co.uk/ask.aspx?cid=1223&did=24>) or at +44 (0)121 414 6474.

School of Physics and Astronomy (</schools/physics/index.aspx>)

Details

The research carried out by the Astrophysics and Space Research Group covers a wide range of areas, with programmes of international importance in gravitational physics, extragalactic and stellar astrophysics, extrasolar planets, and the study of the sun and heliosphere. In addition, the group's Centre for Space and Gravity Research develops instrumentation for space astronomy and physics, as well as for ultra-sensitive ground-based measurements.

In the gravitational area, we are at the forefront of the emerging field of the use of gravitational waves as a new window on the universe. We are centrally involved in the development and application of complex data analysis techniques, using our own 200-CPU Beowulf cluster, as part of the science consortium for the current front-ranking, ground-based detectors GEO600 and LIGO.

We are also engaged in constructing the second-generation ground-based gravitational wave detector, Advanced LIGO, which will supersede these, as well as space-based GW observatories like LISA, which offer the promise of still higher sensitivity in the next decade. In addition, we are developing a novel microwave detection system for high-frequency gravitational waves, and have a vigorous programme of research into the measurement of extremely weak forces, using interferometric and other sophisticated experimental techniques.

Our extragalactic research group has established a strong reputation in the study of galaxies, groups and clusters of galaxies, and the large-scale structure of the universe. This comprehensive and highly integrated programme gives our work a distinctive environmental flavour. We have a strong record of winning time on major international observational facilities, at X-ray, optical and radio wavelengths. We combine these observations with innovative data analysis and modelling techniques and hydrodynamical simulations of large-scale hot gas flows in our research.

A feature of our work is the study of gravitational lensing, which can magnify very distant galaxies, and directly probe the cosmic distribution of dark matter. New developments within the group include collaborations with colleagues in the School of Computer Science, with the aim of introducing advanced algorithms into astronomy, and integrating them into the rapidly developing Virtual Observatory, in which the UK plays a strong role.

Closer to home, the group has a strong interest in X-ray binary systems, involving neutron stars and black holes, which are studied using data from a variety of space-borne observatories. Finally, we are involved in the rapidly growing field of extrasolar planets. We have developed instrumentation for a wide variety of satellites studying the sun and heliosphere, and as a result, have access to information on activity in the sun and its surrounding environment, extending to the outer solar system. Recently launched solar instruments are also being employed to search for the subtle variations in stellar brightness, which signal the presence of transiting extrasolar planets.

Related links

School of Physics and Astronomy (</schools/physics/index.aspx>)

Fees and funding

Standard fees (</postgraduate/dr-fees/tuition.aspx>) apply.

Learn more about **fees and funding** (</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 \(/schools/physics/postgraduate/index.aspx\)](#)

Related news and events

[An orchestra of stars \(/research/impact/our/news/items/stars-orchestra.aspx\)](#)

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 [Astrophysics research group \(http://www.sr.bham.ac.uk\)](http://www.sr.bham.ac.uk) for further information.

Related research

- [School of Physics and Astronomy research \(/research/activity/physics/index.aspx\)](#)
- [Astronomy research - School of Physics and Astronomy \(/research/activity/physics/astronomy/index.aspx\)](#)

Related staff

[Dr Ilya Mandel \(/staff/profiles/physics/mandel-ilya.aspx\)](#)

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.

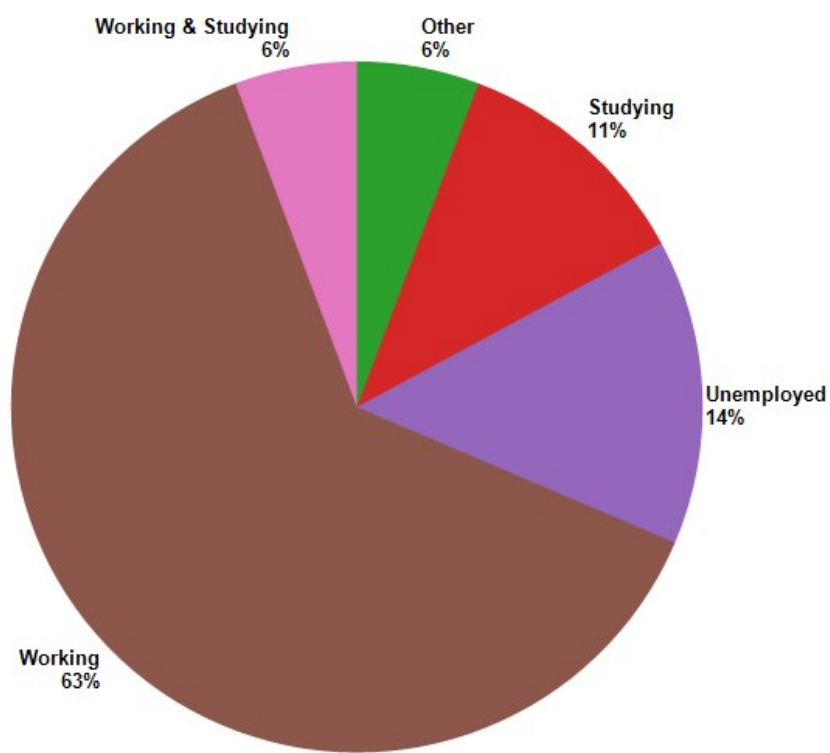
Our unique careers guidance service is tailored to your academic subject area, offering a specialised team (in each of the five academic colleges) who can give you expert advice. Our team source exclusive work experience opportunities to help you stand out amongst the competition, with mentoring, global 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.

