Faculty of Science

50th Anniversary Prize Fellowships

University of Bath Prize Fellowships are an opportunity for outstanding post-doctoral researchers to develop their academic career in a supportive and well-resourced research environment.

As a Prize Fellow, you will be expected to pursue an independent programme of research, including publishing in top quality journals and securing external research grants. The initial appointment will be to a fixed-term Research Fellowship in one of a number of selected areas, embedded in a scheme intended to fast-track Fellows to a permanent appointment at Bath.

In the Faculty of Science we will appoint six Fellows to further strengthen and develop areas of existing research excellence. One appointment will be made within the Milner Centre for Evolution (evolutionary biology) and the remaining five within the other research areas.

Biology & Biochemistry

- Animal models of human disease
- Microbial interactions & antimicrobial resistance
- Synthetic biology
- Evolutionary biology (Milner Centre for Evolution)

Chemistry

- Computational chemistry
- Functional energy materials
- Sustainable soft matter

Computer Science

- Computer graphics
- Computer vision
- Human-computer interaction

Mathematical Sciences

- Fundamental mathematics: geometry & differential equations
- Mathematical biology
- Statistical applied mathematics

Pharmacy & Pharmacology

- Macromolecular medicines design & delivery
- Mechanisms of inflammation & autoimmune disease
- Medicines optimisation

Physics

- High-energy extragalactic astrophysics
- Photonics
- Theoretical soft matter physics

Details of these areas and information about the appointment process can be found at **www.bath.ac.uk/science/prize-fellows**

Closing date for applications: **Thursday 31 December 2015**

Faculty of Science

We are the largest Faculty in the University, and currently have over 3,800 undergraduate students, over 650 postgraduate students and nearly 400 academic and research staff.

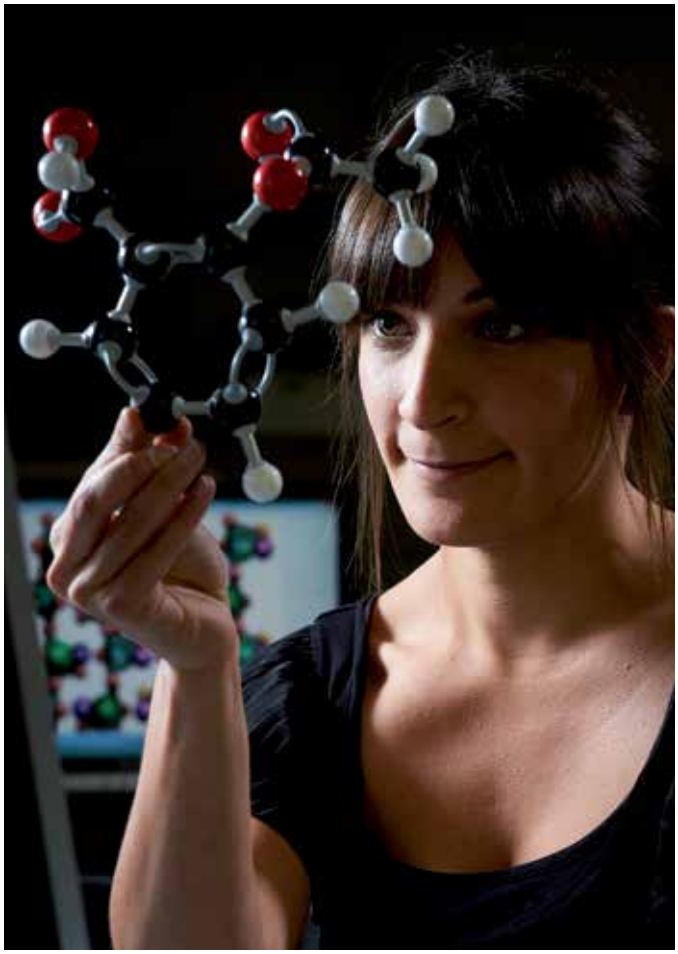
The Faculty comprises six departments and a cross-faculty degree:

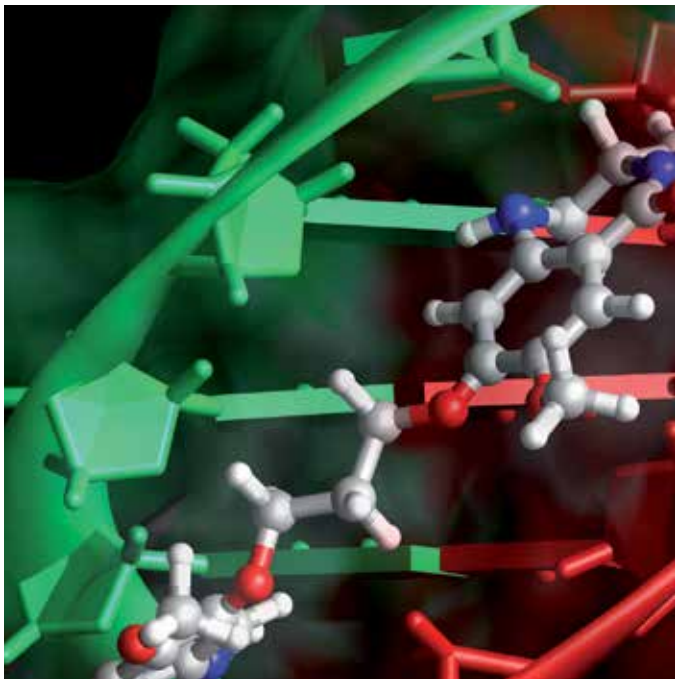
- Biology & Biochemistry
- Chemistry
- Computer Science
- Mathematical Sciences
- Natural Sciences (cross-faculty degree)
- Pharmacy & Pharmacology
- Physics

The Faculty of Science prides itself on its excellence in research, which provides the foundation from which our unique style of teaching has developed. Research by academics in the Faculty has been recognised as of the highest quality and of international importance, according to the most recent Research Excellence Framework (REF 2014).

Our research spans the spectrum from fundamental studies of the mathematical, physical and biological worlds through to cutting-edge applications. We have excellent facilities for research and are continually investing in research infrastructure. Our research is supported by a wide variety of funding agencies, including the UK Research Councils, the European Union, industry and charities. Our total research portfolio is currently in excess of £60 million, with an additional £15 million supporting Centres for Doctoral Training.

Undergraduate and postgraduate teaching in the Faculty provides our students with a breadth of knowledge, and quality and flexibility of learning. There are opportunities for placements, research projects and study year abroad options, and our graduates are highly successful in the employment market. We also have strong links with business and are keen to build on this and encourage an enterprise culture amongst our staff and students.





The Department of Biology & Biochemistry

The Department of Biology and Biochemistry is ranked 11th in the UK for undergraduate education in biosciences (2016 Complete University Guide) with 96% student satisfaction according to the 2015 National Student Survey. With 47 academic staff, our research is diverse and 83% of our Department's outputs were rated as world-leading or internationally excellent in the most recent Research Excellence Framework (REF 2014).

We publish approximately 125 papers each year in peer reviewed journals and our current research grant portfolio stands at £12 million. We currently have around 750 undergraduates, 45 postgraduate masters, and 96 PhD students.

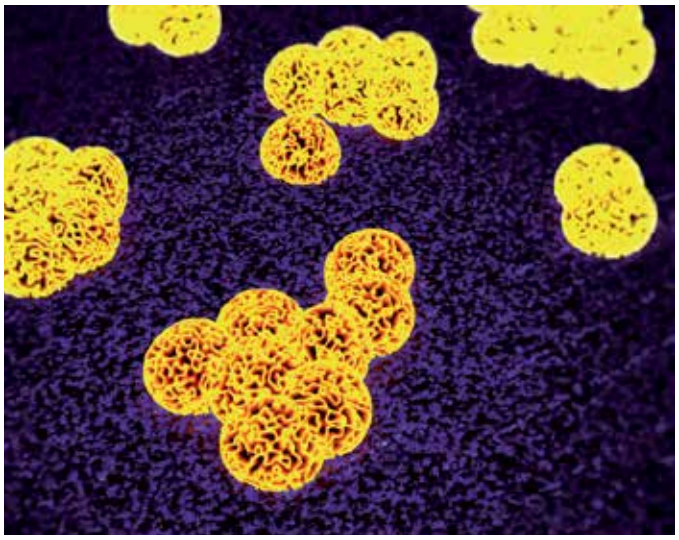
Research

Areas of departmental strength include: Developmental biology & regenerative medicine, cell biology & molecular neuroscience, infection & immunity, molecular structure & function, industrial biotechnology, evolutionary genomics & biodiversity. Four interdisciplinary research centres link activities to labs in other departments. These are the Milner Centre for Evolution (**www.bath.ac.uk/projects/the-milner-centre-for-evolution**), the Centre for Regenerative Medicine (**www.bath.ac.uk/crm**) and the Centre for Mathematical Biology (**www.bath.ac.uk/cmb**).

Facilities

We are currently housed in two adjacent buildings well equipped for modern life science research – buildings 4 South and 3 South. They house growth facilities including Xenopus and zebrafish aquaria, six insectaries, three plant growth rooms, a cooled GM glasshouse and a small scale bioreactor suite. A biosciences services unit was opened in 2008 and a new tissue engineering laboratory has recently been commissioned. Other departmental facilities include protein purification, a crystallisation robot, histology lab, fluorescent microscopes, optical tomography, a virus preparation laboratory and molecular biology services including a microarray reader, and phosphorimaging.

Staff have access to a full range of microscopy facilities within the University's Microscopy and Analysis Suite (**www.bath.ac.uk/mas**) including an electron microscope suite (soon to be upgraded as part of a University initiative), and the bio-imaging suite. The latter contains state-of-the-art



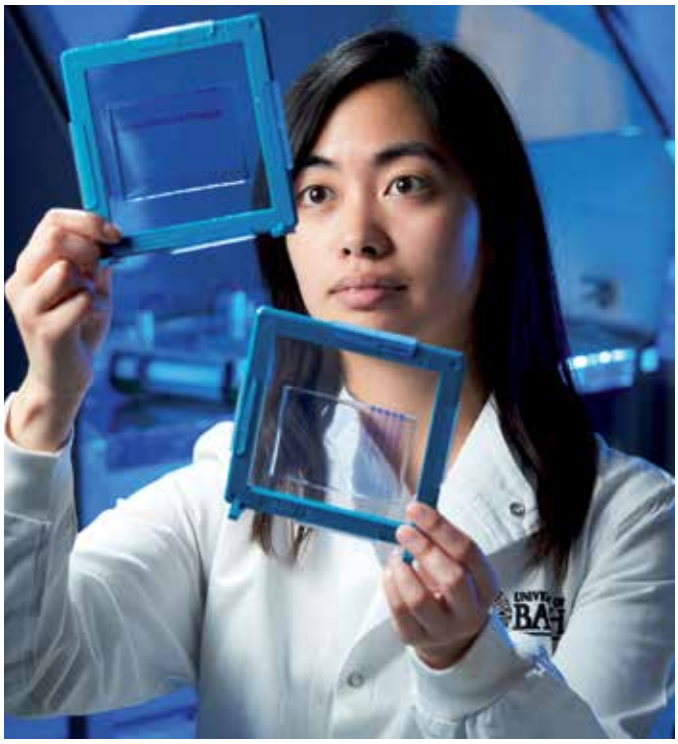
confocal microscopes, a high content microscope, a fluorescence activated cell sorter, a calcium imaging system, a mesoscale multianalyte instrument and the UK's first advanced hypoxic imaging facility. Staff also have access to the Chemical Characterisation and Analysis Facility (www.bath.ac.uk/facilities/ccaf) that contains a full range of NMR, mass spectrometry and X-ray diffraction equipment.

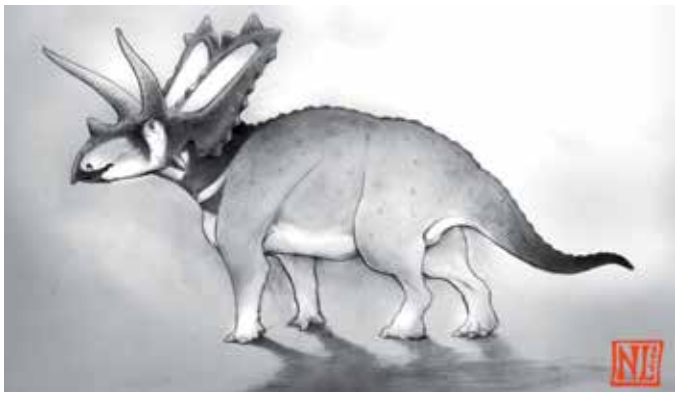
The Milner Centre for Evolution, funded by a multi-million pound donation to the University, will occupy a new building adjacent to 4 South, due for completion in late 2017. This will house state-of-the-art laboratories, provide bioinformatics support, sequencing and computing facilities, and will build upon our excellent reputation for post-genomic analysis, evolution research and outreach.

Teaching

We offer undergraduate degrees in Biology, Biochemistry, Biomedical Sciences, and Molecular & Cellular Biology. There is a total annual intake of around 240 undergraduate students, of which approximately two thirds undertake a professional placement, where they spend one year of their degree in employment. Many of these posts are in research laboratories around the world.

We also run MRes and MSc degrees in a range of bioscience subjects, with a total annual intake of around 50 students.





Biology & Biochemistry Prize Fellowships in:

- Animal models of human disease
- Microbial interactions & antimicrobial resistance
- Synthetic biology
- Evolutionary biology (Milner Centre for Evolution)

The Department of Chemistry

The Department of Chemistry has nurtured a vibrant research culture over recent years. In the most recent Research Excellence Framework (REF 2014), 98% of our outputs were rated as world-leading or internationally excellent.

Our research combines excellence in core fundamental chemistry with a strategic approach to leadership and participation in large interdisciplinary research initiatives, targeted at solving global grand challenges. This is reflected in our research themes which cut across traditional chemistry sub-disciplines and offer an integrated approach to tackling key research areas: Catalysis & chemical transformations, energy materials, sensing & healthcare, structural & materials chemistry, and sustainable chemical technologies.

We currently have around 35 postdoctoral research assistants and 140 postgraduate students. We also benefit from an EPSRC funded Centre for Doctoral Training (CDT) in Sustainable Chemical Technologies as well as participation in a variety of other CDTs.

Staff

The Department is currently headed by Professor Chris Frost and has 45 members of academic and related staff, including 18 professors, four Royal Society University Research Fellowships and a Prize Fellow. An endowment of £1 million has also allowed us to create four five-year 'Whorrod' Research Fellows in Sustainable Chemical Technologies.

Research

We are a research intensive department with a current EPSRC grant portfolio of around £30 million. The five research themes are led by Professor Jonathan Williams (catalysis & chemical transformations), Professor Mark Weller (energy materials) Professor Tony James (sensing & healthcare), Professor Paul Raithby (structural & materials chemistry) and Dr Barbara Kasprzyk-Hordern (sustainable chemistry). The vast majority of researchers are associated with more than one theme, reflecting our strongly interdisciplinary and collaborative approach. Particular strengths exist in catalysis, computational chemistry, dynamic structural science, synthesis, electrochemistry, sensing, analytical chemistry and in using central synchrotron, neutron and laser facilities.

The Centre for Sustainable Chemical Technologies, which spans Chemistry and Chemical Engineering and houses the CDT, is led by Professor Matthew Davidson and there are strong research links with the Departments of Physics,

Chemical Engineering and Biology & Biochemistry. The boundaries between groups and departments are very flexible and expertise in structural chemistry, materials chemistry, electrochemistry and catalysis in particular span right across the traditional group structure with formal and informal collaborations.

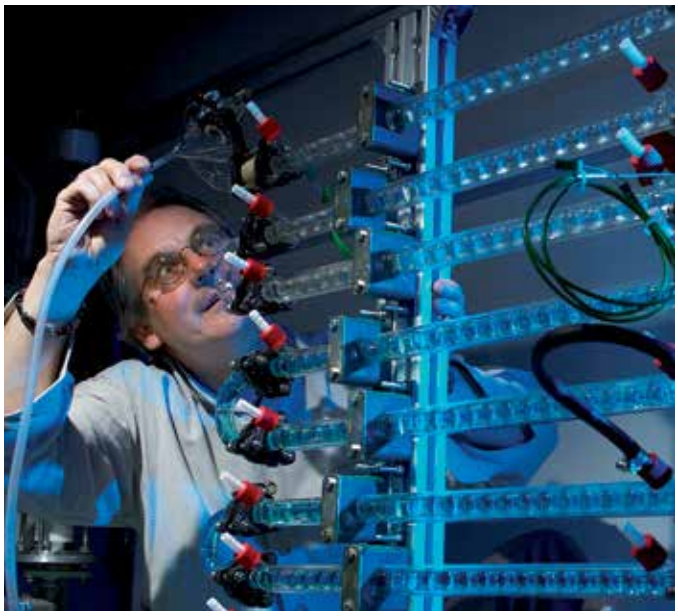
Teaching

We offer MChem and BSc degrees in Chemistry, Chemistry with Management and Chemistry for Drug Discovery. These are all accredited or recognised (as appropriate) by the Royal Society of Chemistry. We are also a major contributor to the multidisciplinary Natural Sciences courses.

Current intake is around 145 high quality students into year one chemistry, with an additional 40 or so natural sciences students also studying chemistry. A large majority of students choose to undertake a placement year in industry or abroad during their third year, and all MChem students undertake a sizable research project in their final year.

Teaching methods include small group tutorials as well as lectures, problem classes and laboratory practicals. The development of e-learning is an important component of curriculum development, and the University provides support for new e-learning projects. We are known for providing a high standard of pastoral care to students, and all members of academic staff act as personal tutors.

The Centre for Doctoral Training in Sustainable Chemical Technologies has developed innovative approaches to postgraduate training within the Department, including the introduction of MRes, MSc and Integrated PhD courses.



Chemistry Prize Fellowships in:

- Computational chemistry
- Functional energy materials
- Sustainable soft matter

The Department of Computer Science

The Department of Computer Science is housed in a new space that includes dedicated research laboratories. Staff from the Department collaborate both nationally and internationally with contacts that span the globe, and we currently hold grants in excess of £30 million. Our industrial links are very strong too; we work with industry leaders in aeronautics, films, games, and broadcast, and our staff act as consultants to government and other agencies, whilst being regularly interviewed on TV and in other news media.

Staff

The Department has 7 professors and 18 other academic staff, including a Prize Fellow. There are also 19 post-doctoral researchers and 42 research students.

Our staff have worked internationally with Princeton, Berkeley, Waterloo, Tsinghua, Amsterdam, Vienna, Paris, Nancy, amongst others, and UK connections are not limited to UCL, Cambridge, Oxford, Edinburgh and Cardiff. They are prominent in the UK's subject base, with Professor Willis being Director of the Centre for Digital Entertainment, and Professor Davenport being on the Council and the Engineering and Science Board of the British Computer Society. Staff edit journals, organise international conferences and sit on national steering bodies.

Research

Our research activity is not confined within rigidly defined boundaries, but core expertise can be characterised by four main research themes:

Human-computer interaction, which includes complex and autonomous systems (with substantial government and industrial collaboration including BAE), mobile and pervasive computing (with substantial industrial collaboration including Vodafone), and systems for collaboration, communication and creativity (with significant government collaboration).

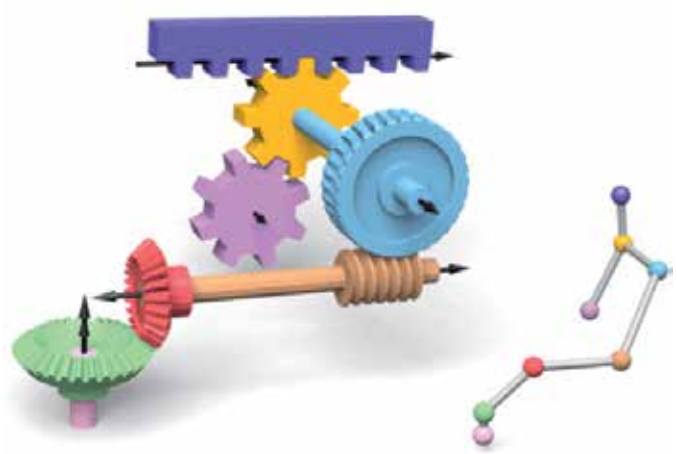
Mathematical foundations, with themes in algorithms (computer algebra, where is the UK's biggest group, cryptography and complexity) and semantics (notably game semantics) and logic. This group also hosts the Department's interest in High-Performance Computing.

Visual computing, through which the Department is host to the joint Bath-Bournemouth Centre for Digital Entertainment, funded to £20 million, and the Centre for the Analysis of Motion, Entertainment Research and Applications with

£5 million directly and a further £5 million in industrial contributions. The group has very strong links to the burgeoning creative sector in the UK.

Artificial intelligence, with main areas in agent technology, artificial models of natural intelligence and knowledge representation and reasoning. The agents area has had substantial European funding over many years, often in collaboration with other Bath subject areas.

The diversity of our research is evident through our collaborations with colleagues across the University. Current collaborations span across mathematics, psychology, biological sciences, education, architecture, politics, languages and international studies, management and mechanical engineering.



Teaching

We offer MComp and BSc courses in Computer Science, Computer Science and Mathematics, and a BSc Computer Science with Business and Computer Information Systems. In total we have an intake of around 100 undergraduate students each year.

Around 80% of undergraduates choose to do a year-long paid industrial placement between the second and third years of study – a distinctive feature of Bath. We offer a diverse range of placement opportunities, from IT companies and banks to large industries and the highly specialised, such as the European Synchrotron Facility in Grenoble.

We offer postgraduate MSc courses in Software Systems, Human Computer Interaction and Digital Entertainment. These courses last for one year but can be extended to two with the inclusion of a one-year placement. These courses also take EngD students who go on to study for a doctorate within the Centre for Digital Entertainment (CDE).

Computer Science Prize Fellowships in:

- Computer graphics
- Computer vision
- Human-computer interaction

The Department of Mathematical Sciences

The Department of Mathematical Sciences is committed to high-quality research, teaching and learning, and is consistently ranked among the top mathematics departments in the UK. We are one of the largest of the 17 departments and schools making up the University of Bath, and have been housed in a new building at the heart of campus since 2010.

Research

The Department is based on teams focusing on particular research areas but with a strong culture of collaboration and mutual support. There are four strands of activity, covering pure mathematics, applied mathematics, probability and statistics. In particular, there is a strong tradition of interaction between pure and applied mathematicians and a lively, well attended, "Landscapes" Colloquium.

Research in pure mathematics focuses on algebraic and differential geometry, group theory, representation theory, geometric analysis, functional analysis and theoretical nonlinear PDEs.

Research areas in applied mathematics are applied and multiscale analysis, continuum mechanics of fluids and solids, dynamical systems and complexity, industrial mathematics, mathematical biology, mathematical control theory, and numerical analysis.

The Statistics and Probability Group covers a range of work on probability and statistics with a focus on applications as well as core methodology.

We have around 60 academic members of staff with a strong community of postdoctoral fellows and academic visitors. Our research enjoys a strong international reputation, with 88% rated as world leading or internationally excellent in the most recent Research Excellence Framework (REF 2014). We also ranked seventh out of all UK mathematics departments in the 2016 Complete University Guide.

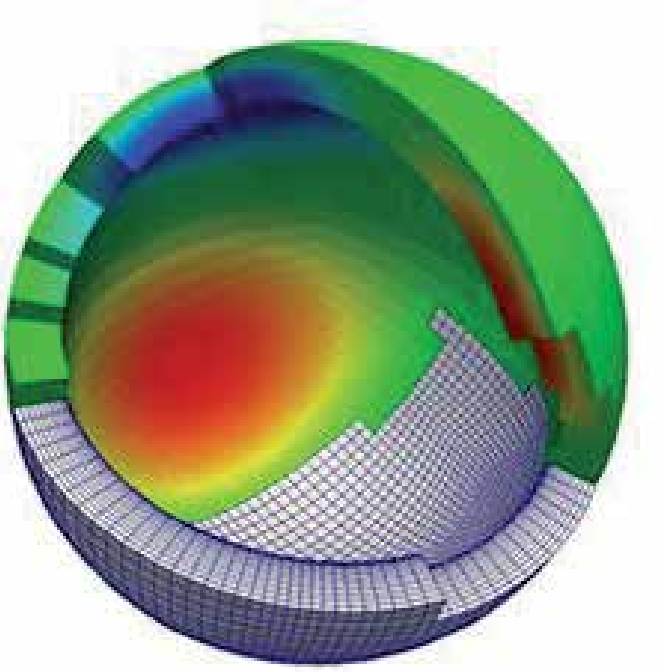
October 2015 has seen the launch of the Bath Institute for Mathematical Innovation (Bath IMI), which will deliver mathematical solutions to problems of an intersectoral and interdisciplinary nature. We also run the Centre for Mathematical Biology, the Centre for Networks and Collective Behaviour, the Centre for Nonlinear Mechanics and the Probability Laboratory at Bath (Prob-L@b).

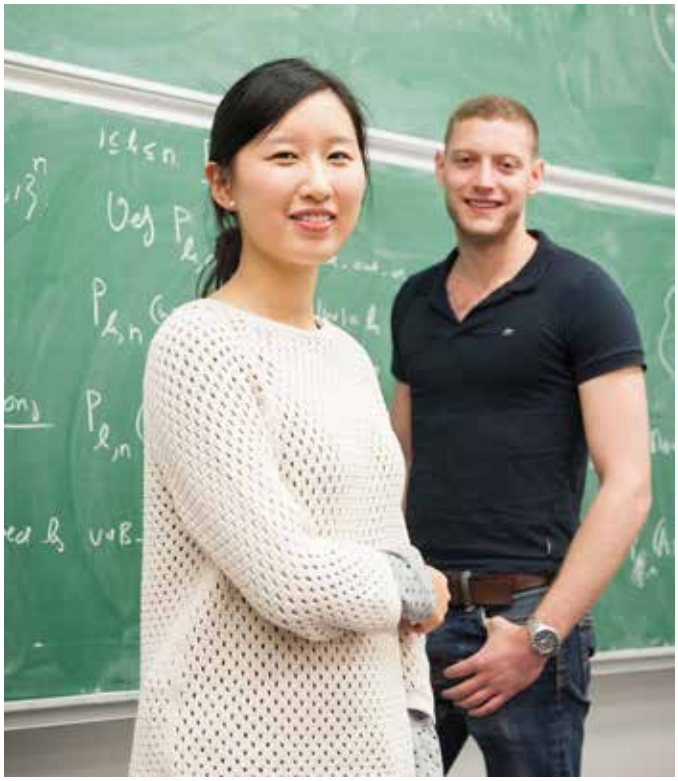
Postgraduate research is vibrant in the Department, with an expanding PhD population currently standing at around 70. In particular, Bath is home to the EPSRC funded Centre for Doctoral Training in Statistical Applied Mathematics at Bath (SAMBa), which will train over 50 PhD students by 2021 in a broad range of mathematics and statistics research areas.

Teaching

Our first year undergraduate cohort of around 300 students is highly qualified, and the ambitious standard of undergraduate courses promises a supply of candidates suitably qualified for graduate studies. We also offer popular year-long placements in industry and study year abroad options. Departmental postgraduate taught provision includes the long-running Masters courses in Mathematical Sciences and Modern Applications of Mathematics.

We are part of the EPSRC-supported Taught Course Centre involving the universities of Bristol, Imperial College, Oxford and Warwick. These five universities share video-linked graduate mathematics courses using an Access Grid node at each university.



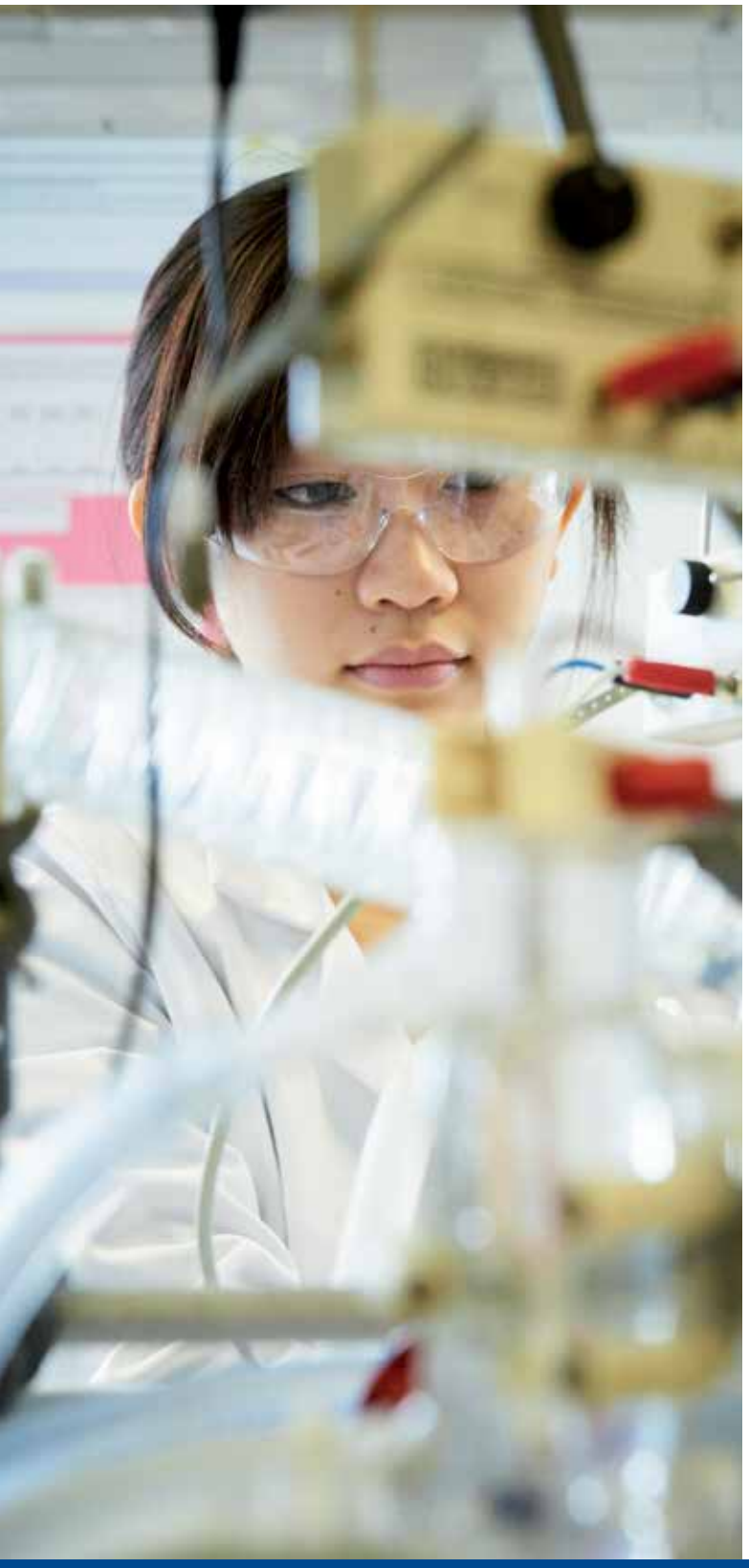


Mathematical Sciences Prize Fellowships in:

- Fundamental mathematics: geometry & differential equations
- Mathematical biology
- Statistical applied mathematics

In addition, a Fellow will be appointed to work within the Bath Institute for Mathematical Innovation which is led by the Department of Mathematical Sciences.

The Department of Pharmacy & Pharmacology



The Department of Pharmacy & Pharmacology is an internationally renowned department, with over 90% of research ranked as world leading or internationally excellent in the most recent Research Excellence Framework (REF 2014). Overall, Bath ranked as a top three university with a school of pharmacy.

Research

Our core research activities centre on the biomedical and pharmaceutical sciences, spanning pharmacology, medicinal chemistry, drug formulation and delivery as well as drug use and pharmacoepidemiology.

Research is grouped into six themes: **Inflammation, neuroscience, biological chemistry, medicines design, population health** and **health services research**. Each theme runs research meetings and talks that are overarched by our regular departmental seminar programmes. In addition, we have three Grand Challenge areas in dementia, arthritis and cancer that are the focus for interdisciplinary research and collaboration across the department. As part of our research programme we are expanding our considerable expertise in cell signalling, drug design and macromolecular drug delivery into the development of immune targeted therapies and addressing emerging frontiers such as lncRNA biology.

Recent appointments have expanded our translational research programme with strong clinical links with the local Royal National Hospital for Rheumatic Disease, particularly in areas of pharmacoepidemiology and biomarker analysis. This translational programme has focused on the area of autoimmune and chronic inflammatory disease with numerous synergies in fundamental areas of drug development including immune-targeted therapies, drug delivery and medicines optimisation.

We have strong research links with the Departments of Biology & Biochemistry, Health, Engineering and Mathematical Sciences plus our tissue engineering research contributes to the Centre of Regenerative Medicine (**www.bath.ac.uk/crm**). We have extensive collaborations with the pharmaceutical industrial and several academics in the Department have spun companies out of the University.

Facilities

We are based in a cluster of purpose built accommodation comprising the original Pharmacy & Pharmacology building, 5 West and its more recently constructed annexe, 7 West. A state-of-the-art biosciences services unit was opened in 2008 and a £1 million investment refurbished laboratories for medicines design.

Cell analysis and imaging facilities are available in the Microscopy and Analysis Suite (**www.bath.ac.uk/facilities/mas**) including confocal microscopes, Renishaw inVia Raman Microscope, GE IN Cell Analyzer, flow cytometers with cell sorting capacity, electron microscopes plus an MSD sector imager for multi-cytokine analysis. In 2014 we were awarded an ALERT14 BBSRC grant to establish a ground breaking facility for advanced imaging and analysis under hypoxic conditions. This facility includes a hypoxic plate reader, hypoxic workstation for cell culture housing an advanced Leica Dmi8 imaging microscope and electron spin resonance under hypoxic conditions.

The Chemical Characterisation and Analysis Facility (**www.bath.ac.uk/facilities/ccaf**) provides state-of-the-art analytical equipment including NMR, mass spectroscopy and X-ray diffraction.

Teaching

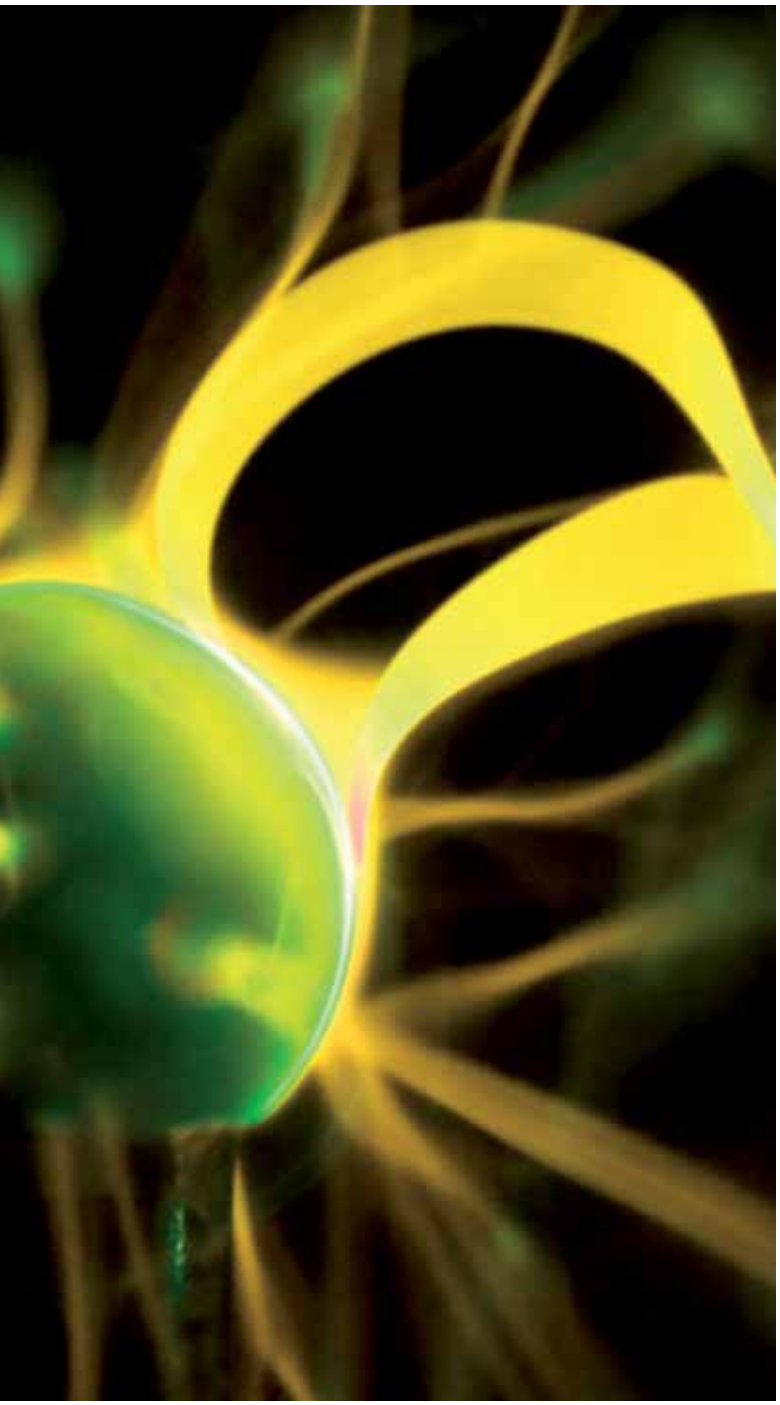
We offer a Masters of Pharmacy degree accredited by the General Pharmaceutical Society. In addition, we deliver both Masters and BSc courses in Pharmacology which includes a year-long industrial placement between the second and third years of the degree. A large range of UK and international pharmaceutical companies provide our placements including GSK, Janssen, UCB, Medimmune and Heptares.

Graduates from all of our courses perform well. MPharm graduates consistently outperform all others in the national registration assessment, and over half of our pharmacology graduates go on to read for a higher degree by research.

Pharmacy & Pharmacology Prize Fellowships in:

- Macromolecular medicines design & delivery
- Mechanisms of inflammation & autoimmune disease
- Medicines optimisation

The Department of Physics



The Department of Physics provides a fertile environment for world class research. This is reflected in our strong ranking in the most recent Research Excellence Framework (REF 2014), with 91% of our research rated as world-leading or internationally excellent. Over 120 journal papers from the Department are published each year and we have excellent funding levels, with a current grant portfolio of £8 million.

In the past five years the Department has grown from 25 to 36 academics and we have recently founded a new group in astrophysics. We are an open and welcoming community, keen to collaborate and share expertise and ideas; our emphasis on "physics that makes a difference" has resulted in strong links with industry.

Research

Our research is grouped into four themes: astrophysics, condensed matter theory, nanoscience, and photonics. Within these themes, individual research teams operate autonomously but under the umbrella offered by the larger grouping, with regular meetings, seminars and lecture series.

The Astrophysics Group addresses fundamental questions concerning the most violent processes in the Universe, in particular the physics of black hole driven phenomena and their environments. International collaborations exploit advanced ground and space-based technologies, applying new techniques to gain fresh insight into cosmic processes.

Research interests in condensed matter theory range from electronic structure, strongly correlated electron systems, glasses, electronic transport in photovoltaics through soft condensed matter to social animal networks. Several members of the group are also members of the Nanoscience Group, which facilitates dialogue between theory and experiment.

The Nanoscience Group has dedicated laboratories including state-of-the-art STMs and a modern Nanofabrication Facility. Group members have interests in areas as diverse as terahertz processes, graphene, molecular solids, semiconductors, chiral nanostructures, superconductors, nano-technology, quantum electronic transport, and liquids and glasses.

Research in photonics takes place in the Centre for Photonics and Photonic Materials (CPPM), and focuses on linear and nonlinear optical propagation in waveguides and engineered materials, both for classical and quantum optics. The CPPM runs a state-of-the-art fibre fabrication cleanroom producing world-leading fibre, contains a range of laser sources and analytical equipment, and has strong links globally with both academia and industry.

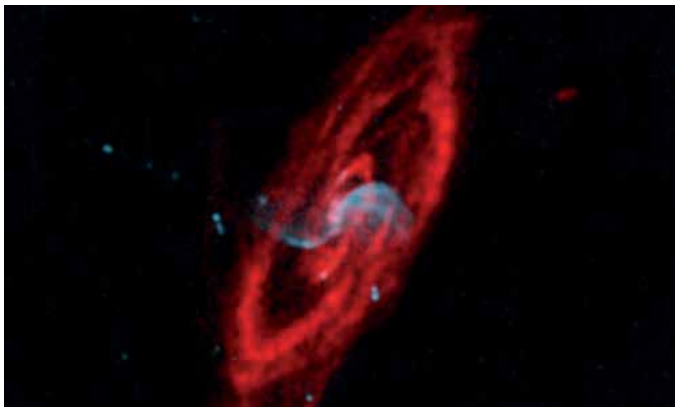
Teaching

We award Institute of Physics-accredited Masters and Bachelors degrees in Physics, Physics with Astrophysics and Mathematics & Physics through three to five year courses.

Around 150 top-class undergraduate students start our degrees annually, which are focused on developing outstanding individuals who have both a deep knowledge of physics, and the ability to communicate effectively and confidently with others in a numerate and analytical environment. Many of our undergraduates progress to PhD study, whilst others move on to a wide range of professions. We currently accept around 20 new PhD students each year and are partners in two Centres for Doctoral Training in Condensed Matter Physics and Sustainable Photovoltaics.

Distinctive features of our courses are the strong emphasis on project work and transferable skills development, the personal nature of our relationships with our students (partly as a result of our tutorial system) and our professional placements programme, which offers opportunities for both research and commercial placements. Embedding transferable skills development through project work and placements is valuable because it transforms our students into communicative and highly employable graduates, who are as valuable in the workplace as they can be, leading to our excellent graduate employment statistics.

Our teaching is enhanced by a small number of dedicated Teaching Fellows, helping to promote a culture of excellence in teaching and learning which is strongly supported within the University. Full-time undergraduate research projects (for our MPhys students) are run in a dedicated laboratory environment, and are closely linked to the research interests of our staff.



Physics Prize Fellowships in:

- High-energy extragalactic astrophysics
- Photonics
- Theoretical soft matter physics