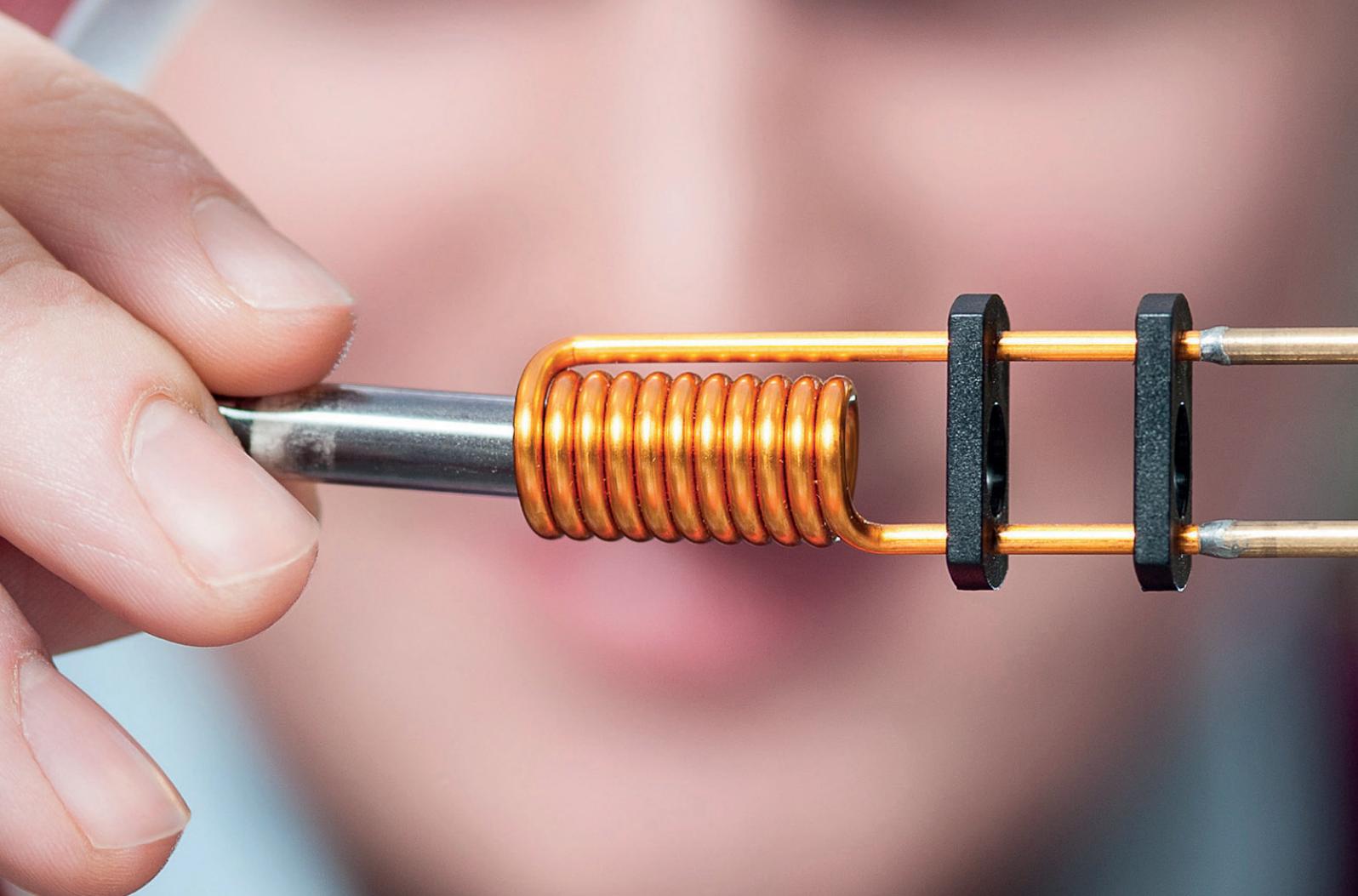


ANNUAL REVIEW

2014-15



UNIVERSITY OF
BATH

Welcome from the Vice-Chancellor

Our University was founded by Royal Charter in October 1966 ‘to advance learning and knowledge by teaching and research, particularly in science and technology, and in close association with industry and commerce.’ As we approach our 50th anniversary, it is an opportune moment to reflect on the diverse ways in which our community of students and staff is fulfilling that mission.



A university for Bath

Each year on Founders Day we celebrate the far-sighted decision of the then City of Bath Council to support the creation of a university in Bath. We now both directly and indirectly support over 5,500 jobs in and around the City. Our net economic contribution over the period covered by this Annual Review is estimated to be £294 million. For the past three years we have been investing over £1 million per week in improving our University infrastructure and we are committed to continue at that level for the next four years. In the next few months, we will see the opening of new buildings: 10 West (which will be the home of the Department of Psychology, the Institute for Policy Research, and the Research Commons for graduate students) and 4 East South (for the Department of Architecture & Civil Engineering and Computer Services).

With our Sports Training Village and the opening of The Edge we make a significant impact on sporting and cultural life. A re-fronted and refurbished former Bath Police Station will soon provide a state-of-the-art centre for student study in the centre of the city. By volunteering in over 200 projects and events and through raising £88,000 for charity, our students are contributing to the community in which they live and study.

A growing international profile

In this context it is gratifying to know that our excellence in research, teaching and the wider student experience is being increasingly recognised not only nationally but internationally. According to the QS international ranking, we are the highest placed university of our age in Europe and seventh in the world. We have recently announced a ground-breaking partnership with the Government of South Africa to provide doctoral level leadership training to senior South African Higher Education professionals at all 26 of their public universities. Three of our colleagues have been funded as Future Research Leaders in social sciences by the Economic & Social Research Council. Our SETSquared business incubation activities have been ranked number one in the world. These are just a few examples of what made the past 12 months so momentous for our University community.

Looking further

The world of higher education is changing continuously. We must be ready to address the challenges and opportunities ahead with increasing ingenuity and agility. Both the Senate and Council of the University have agreed that this is the right time to take our University forward towards our new strategic goal of being an international leader in graduate education and to provide the resources needed to grow the volume of research we conduct.

We will be recruiting more researchers and investing to create a more vibrant environment for capturing the minds and money that make discovery and impact possible. As you will read later, Bath alumnus Dr Jonathan Milner's confidence in the quality and ambition of our research inspired him to give us £5 million to create a new Centre in evolutionary science. Our Bath Institute for Mathematical Innovation will help us shape thinking around the enormous potential of advanced data analytics to drive innovation and change.

We will be shifting the balance of our student population towards postgraduates whilst at the same time stabilising the number of undergraduates we recruit. In taking the steps needed to provide excellence in all aspects of our doctoral training and masters programmes, we will also be enhancing the quality of the academic and extracurricular experience our undergraduates have here. The continued effectiveness of our partnership with our student community is illustrated by two national accolades won over the course of the year: Our 2014/2015 Students' Union Officer team was awarded the prestigious Officer Team of the Year award at the 2015 NUS Awards and the University was ranked first in the *Times Higher Education* 2015 Student Experience Survey.

The University at 50

Our 50th year will be both a year of celebration and the year in which we lay the foundations of our future success. We are marking this milestone with a comprehensive programme of events and activities which I am sure will be extensively covered in this same publication next year. I do hope you will take the opportunity to join us.



Professor Dame Glynnis Breakwell DBE DL FAcSS
Vice Chancellor

Contents

A world-class University	2
Rankings and reputation	4
Campus investment and developments	6
Learning and Teaching	8
Institute for Policy Research	10
Faculty of Engineering & Design	12
Faculty of Humanities & Social Sciences	14
Faculty of Science	16
School of Management	18
Internationalisation	20
Lifelong connections	22
Community engagement	24
Sport	26
Accounts	28

Front cover - the quantum mechanics of electron spin-flip are measured in an undergraduate physics laboratory.

A world-class University in a world heritage city

Since building work on our Claverton Campus began in 1965, the University has grown to become a world-class research intensive institution of over 15,000 students and over 3,000 staff. Our growing international reputation is built upon both research and teaching excellence and a track record of working in partnership with business, the public services and the voluntary sector supporting the UK's knowledge-based economy. The University plays a significant role in the City of Bath and wider area through our academic offering and contribution to economic growth and social well-being, as well as the City's cultural identity and international profile.

We are recognised as a sector leader in technology transfer attracting the most able staff, researchers and students to Bath who interact with the business community encouraging innovation and enterprise. Our success in securing research projects both in the UK and internationally generates opportunities for investment and employment and supports the area's economic development, notably through the creation and growth of knowledge-based, high value-added companies. Our SETSquared enterprise partnership with other UK universities has helped 1,000 technology start-ups to develop and raised more than £1 billion in investment. It is also ranked as the best university business incubator in the world.

Research excellence

The quality and impact of the University's research was recognised in the 2014 UK-wide Research Excellence Framework with 87% of our research being assessed as world-leading or internationally excellent. Our work on straw built homes is helping the construction sector to reduce energy consumption. The new safer scrummaging techniques we developed were adopted in time for the 2015 Rugby World Cup. We are helping Network Rail optimise systems and so improve services for their customers.



Our long-term collaboration with partners including Ford and Jaguar Landrover in delivering world-class automotive research led to the launch in 2015 of our Centre for Low Emission Vehicle Research (CLEVeR). This facility features a state-of-the-art dynamometer, allowing the UK automotive industry to carry out research and development locally, and was the result of a £1.8 million equipment funding award from the Engineering & Physical Sciences Research Council (EPSRC), and £600,000 investment from the University of Bath.

The work of our Tobacco Control Research Group in exposing the use of misinformation by tobacco companies supported the UK Government's decision to introduce standardised cigarette packaging. Our new Bath Institute for Mathematical Innovation, and Centre for War & Technology have been established to meet specific industry and governmental research needs. Thanks to the generosity of alumnus Dr Jonathan Milner, the University



will establish the Milner Centre for Evolution, the first of its kind in the UK positioning Bath at the forefront of evolutionary science.

The University has also expanded its research links overseas through the development of international strategic partnerships and networks with leading research intensive universities and organisations. Over the past three years the University has invested close to £1 million supporting international partnerships and raising its international profile. As a direct result, new partnerships have emerged already generating nearly £3 million in follow-on external research funding. Year-on-year the number of internationally co-authored publications involving Bath researchers grows. In addition, last year the University developed a ground-breaking partnership with the South African Government to provide doctoral training for next-generation university leaders across the country.

Teaching excellence

The challenging but supportive learning environment created by this combination of intellectual endeavour and high quality facilities is what makes Bath such a highly sought after choice for students. In the last year we received over 28,000 applications for 3,500 undergraduate places. This year, 31% of our students have come from outside the UK, representing over 100 nationalities.

Our students continue to gain valuable real-world experience from highly regarded placement programmes which complements their studies and positions them among the most desirable in the graduate employment market. Intellectual curiosity, practical experience and challenge goes alongside the very active contribution of the student body in helping to shape their own educational experience. We aim to ensure our graduates are classic all-rounders - of the highest intellectual calibre, and accomplished in other spheres of life - competitive sports, the arts and any other field of endeavour they choose to pursue.

Rankings and reputation

Best university under 50 in Europe

Our international reputation has continued to grow. Bath was identified as the number one university in Europe and 7th globally in the QS 'Top 50 under 50' rankings of the world's best universities under 50 years of age.

We were ranked number one out of 113 UK institutions in the *Times Higher Education* Student Experience Survey 2015 and in the 2015 Leiden Ranking, which measures the scientific performance of 750 major universities worldwide, Bath is now placed at 179th - up from 241st last year. In the QS World University Rankings 2015/2016, Bath jumped

20 places to a position of 159th out of nearly 900 national and international institutions.

In the 2015 National Student Survey, the overall satisfaction of our students was 90% - four points above the national average of 86% for UK Higher Education Institutions.

On a subject level, Bath excelled in a number of areas. Chemical Engineering received the maximum possible score of 100% satisfaction for the second year in a row. A further four academic departments achieved 95% or above - Psychology (97%), Biology & Biochemistry and Mechanical Engineering (both 96%), and Chemistry (95%).



Guide	Year	Ranking	Institutions ranked	Location
The Times & The Sunday Times Good University Guide	2016	12	127	National
The Guardian University Guide	2016	5	119	National
Whatuni Student Choice Awards	2015	8	113	National
The Complete University Guide	2016	11	126	National
QS Top 50 under 50*	2015	7	50	International
Times Higher Education '100 under 50'	2015	42	100	International
Times Higher Education '100 Most International'***	2015	79	100	International
QS World University Rankings	2015	159	800	International
Leiden Ranking	2015	179	750	International
Times Higher Education World University Rankings	2015-2016	251-300	400	International

* Based on QS World University Rankings

** Based on *Times Higher Education* World University Rankings.



“For a long time those most closely involved in the University have known that we offer something very special. Across these latest rankings, across the sector, nationally and internationally, we see that more and more people are learning about our unique offer both in terms of research and teaching excellence. This gives us a solid base as we look ahead to future developments for the University.”

**Professor Dame Glynis Breakwell DBE DL FAcSS
Vice-Chancellor**



Campus investment and developments



The Edge, our new arts and management building was formally opened in May 2015 by our Chancellor, HRH The Prince Edward, The Earl of Wessex, at a special showcase evening of music, dance and debate.

The Earl of Wessex was joined by 200 guests at the ceremony.

This featured an 'in conversation' panel debate with eminent speakers covering the relationship between arts, leadership and management; the unveiling of three specially commissioned new paintings of the west coast of Ireland by Alan Cotton, one of Britain's most distinguished landscape painters; and a piano recital by Joanna MacGregor OBE, one of the world's most innovative musicians and an honorary graduate of the University.

The building is the base for the University's creative arts programme engaging students, staff and local communities in the visual and performing arts. It is also home to our new Executive Education Suite from which the School of Management offers business partners an innovative programme of courses, events and seminars.

The Edge includes a theatre, gallery, performance and rehearsal studios, and teaching facilities.

Elsewhere on campus, our **1 West** building has benefited from campus investment resulting in expansion and full refurbishment. 1 West houses a number of departments and academic centres including the Department for Health; the Centre for the Analysis of Motion, Entertainment Research & Applications in the Department of Computer Science; and two Department of Physics laboratories - Ultrafast Science & Terahertz Photonics and the Centre for Space, Atmospheric & Oceanic Sciences.

We also have two brand new academic building developments underway situated at opposite ends of the campus.

The **4 East South** building continues to make good progress and is due to open by summer 2016. This new building will create a research and teaching space for the Faculty of Engineering & Design and also house a cutting edge computing data centre to support the University's digital infrastructure.

At the other end of the campus, our new **10 West** development is on course to open in 2016 and a 'topping-out' ceremony was held in October 2015 (pictured below) to celebrate the construction of the highest point of the new building. This building will provide space for the expansion of the Department of Psychology and a new home for the University's Institute for Policy Research.



The University's acquisition of the former police station at **18 Manvers Street**, in which we plan to invest £4.5 million, will see the building transformed into a student-focussed city centre hub, enhancing the University's presence in the centre of Bath.

The proposals offer a learning zone with study space, training rooms and a coffee bar alongside services including access to the Careers Service, Student Services and others for advice and guidance.

All of the latest information about the University's campus investments and developments can be found at go.bath.ac.uk/campus-investments

Learning and Teaching

At Bath we understand the importance of delivering learning and teaching which is informed by our world-leading research. Combined with using the latest learning technologies, we provide our students with unparalleled opportunities to develop at all levels, from undergraduate to doctorate, in a challenging and engaging environment that helps them to succeed.

HEFCE 2014/15 Postgraduate Support Scheme success

Bath was one of just 20 projects selected by a competitive process to be part of the Higher Education Funding Council for England (HEFCE) 2014/15 Postgraduate Support Scheme.

HEFCE developed the scheme in order to pilot new initiatives to support and encourage more students, particularly from under-represented groups, to undertake postgraduate taught study. As part of this scheme, the University developed a brand new programme - MSc Modern Building Design.

Co-designed and delivered with industry, the 15-month programme includes taught modules, a professional placement and a research dissertation based on work undertaken as part of the placement; it was only open to UK/EU students in its first year of operation.

The programme commenced with its first cohort in September 2014 in which 18 UK/EU students enrolled, all of whom received fee waivers whilst 11 UK students received an additional bursary having met widening participation criteria. 80% of students who successfully completed the programme have now received job offers from their placement company as a result of studying on the programme.

“Supporting a dissertation student on the MSc Modern Building Design degree gave us an opportunity to fully explore an initiative that had been in development for a long time, but where we’d never had time to conduct the research in-house. We’re very grateful to the Modern Building Design programme for engaging with our aims. This led to a strong collaboration with project outcomes that are beneficial to our day-to-day activities. The work of the research student has proved instrumental in getting our initiative off the ground.”

**Dr Peter Gates, Structural Engineer,
BuroHappold Engineering**



MSc Modern Building Design student Robin Miedzybrodzki pictured here (above left), whilst on placement at Buro Happold with structural engineer, Dr Peter Gates (above right).

Extending our MOOCs

This year we launched our third MOOC, ‘From State Control to Remote Control: Warfare in the 21st Century’, showcasing our research strengths in international relations and security studies.

Over 3,500 people took part in the six-week online course which addressed the practical and philosophical issues related to states increasingly using remote control methods of war, such as drones, private military companies and special operations units, to engage in activities traditionally performed by armed forces. This complements additional popular MOOCs Make an Impact: Sustainability for Professionals; and Inside Cancer: How Genes Influence Cancer Development, both of which we re-ran this year.

Institute for Policy Research



A comprehensive programme of activities and outputs is now firmly established by our Institute for Policy Research (IPR). Over the past year the IPR has developed its projects and expanded its networks, ensuring our researchers and their research has policy impact locally, nationally and internationally.

Addressing global policy challenges

Significantly for the IPR this year, new Global Policy Challenges were launched. These mirror current priorities for our external policy stakeholders and research funders and reflect our own research expertise here at Bath. Their focus is on the development of interdisciplinary research, covering a variety of themes: changing behaviour; developing the public good; innovation, growth and inclusive prosperity; and resourcing the future.

Complementing the new Global Policy Challenges, the IPR is nurturing four active international research networks. Through these, the IPR is supporting expert groups in different world regions and involving researchers, policy makers and practitioners across all continents. Through its four networks, the IPR this year helped to facilitate regular exchange between academics and policy makers about research concerning the opportunities for young people; social policy in the Middle East and Latin America; and the growth and rapid urbanisation of megacities in Latin America, Asia and Africa.

Against an ever-changing backdrop in the region, a high profile two-day event for the IPR's Middle East & North Africa (MENA) network in November 2014 put the issue of social policy in the MENA region in the spotlight. The event was attended by Egyptian Minister of Social Solidarity, H.E. Dr Ghada Waly, pictured below.



Aligning research and policy

Two important developments led by the IPR took place this year which will strengthen ties between research and policy.

Launched in December 2014, a new Policy Fellowship Programme was established to bring together senior policy makers with our research experts. This is a significant venture for the University which aims to enhance the impact of our research by enabling direct connections and building lasting relationships between our researchers and senior policy makers from government, industry and the third sector.

This year policy makers from the Office for Low Emission Vehicles, the Defence, Science & Technology Laboratory and the Ministry of Defence spent five intensive days on campus meeting our researchers building mutually beneficial relationships that will continue into the future.

In addition, we welcomed our first cohort of students taking part in a brand new Professional Doctorate in Policy Research and Practice, developed by the IPR. This course is designed to enable experienced professionals working in a range of different policy settings to develop their policy analysis expertise without having to take a full career break.

The first 2015 cohort includes ten policy makers working in high profile settings locally, nationally and internationally, including the UN Economic Commission for Africa, the UN Capital Development Fund, the Canadian International Development Research Centre, RenewableUK, Oxfam GB as well as the Police.

These major initiatives to improve research and policy links continue to be supported by regular IPR policy engagement events on and off campus, as well as regular, high-impact policy briefings.

Pictured right, the first cohort on our new Professional Doctorate in Policy Research and Practice.



Achieving healthcare impact locally

An innovative IPR project working with our local authorities and clinical commissioning groups, using Big Data to map and redesign health services for patients with Type II Diabetes, was this year shortlisted for a national healthcare award.

The results of the project will now help improve self-care and the management of diabetes within the Bath and North East Somerset population.

Looking ahead

In 2015, the IPR appointed Professor Nick Pearce – former Head of Policy at Number 10 – as its new Director heralding a major milestone in its future development.

Engineering & Design

Our Faculty of Engineering & Design maintains an impressive reputation for excellence in research, established over decades of close engagement with industry. The Faculty's academic staff ensure their expertise and research findings inform their teaching and it is this rounded approach that produces such sought-after graduates and has resulted in the Faculty being consistently ranked highly in all major UK league tables.

Building cleaner, sustainable homes

In February 2015 the UK's first affordable straw eco homes went on sale as a result of research conducted within our Department of Architecture & Civil Engineering.

The three-year research project, led by Professor Pete Walker (pictured below) in collaboration with industry partners Integral Engineering Design and architects White Design, culminated in a new factory-built straw panel design developed here at the University receiving the BM Trada's Q mark certification in recognition of the quality of this construction method. This means developers and house buyers can insure and secure mortgages against homes, schools and offices built using this sustainable construction method.



In the UK, millions of tonnes of straw is annually discarded, but our research found that this 'leftover' agricultural co-product could be used to build over 500,000 new homes a year, helping to reduce the national housing shortage whilst also enabling the construction industry to lower its carbon emissions.

Seven townhouses were built in Bristol using this construction method, promising fuel bills up to 90% cheaper than an equivalent brick-built house and costing less than the average Bristol house to buy.

The project received widespread interest across the world and shortly after receiving the Q mark certification, was awarded the internationally-recognised Passivhaus accreditation, which acknowledges a building design's energy efficiency.

Read more about Professor Walker's straw research at go.bath.ac.uk/straw-homes

Extensive industry partners

The Faculty's long-standing research pedigree has created a number of exciting industry partnerships enabling placement students to apply their academic knowledge in some of the most reputable and prestigious companies in the UK and abroad. Industry partners such as Caterpillar, Dyson, Siemens, Ford, Airbus, McLaren, Williams and Unilever are just a few examples and it is no surprise that last year was another record year for the number of students placed.

As the Faculty looks to increase its postgraduate provision with extensive involvement from industry, Bath is ensuring that it continues to provide industry with highly qualified and sought-after graduates who have benefitted from the world-leading, pioneering research taking place across the Faculty of Engineering & Design.



Driving automotive emissions and efficiency research

The University's Powertrain & Vehicle Research Centre (PVRC) has a long-standing reputation for excellence in automotive engineering and has been conducting prize-winning automotive research for over four decades. Last year, the University was formally recognised as one of the UK's leading automotive propulsion groups, having been selected as a Spoke of the Advanced Propulsion Centre (APC).

This prestigious status means we will play a strategically important role in conducting specific research into the systems efficiency of internal combustion engine, helping the APC position the UK as a global centre of excellence for low carbon propulsion development and production.

Coupled with a unique new automotive research facility unveiled in September 2015, Bath will be a vital contributor in helping develop more efficient and lower emission vehicles of the future. Our new £2.4 million EPSRC-funded Centre for Low Emission Vehicle Research (CLEVeR) features a state of the art Chassis Dynamometer (rolling road) which will enable Bath to bridge the gap between the lab and the real world by allowing vehicles to be analysed in a series of real-world driving conditions, but within a precisely controlled laboratory environment.

See more at go.bath.ac.uk/clever

Highly satisfied students

The Faculty's student satisfaction ratings speak for themselves - Number one for Architecture (2016 Complete University Guide), Chemical Engineering with 100% student satisfaction (National Student Survey 2015), Electronic & Electrical Engineering named in the top three in the UK for teaching satisfaction (*The Guardian* University Guide 2016), and 96% student satisfaction in Mechanical Engineering (National Student Survey 2015).

Humanities & Social Sciences

The Faculty of Humanities & Social Sciences brings together a unique mix of academic disciplines and professional expertise. Its work has clear and significant influence on policy makers and practitioners across the world.

The Faculty has the largest student intake at the University, is part of a wider consortium – the South West Doctoral Training Centre, and operates a research portfolio worth £14 million.

Staff in the Faculty won two of the major teaching awards made by the University this year and our Faculty Teaching Development Fund continues to support the transfer of best practice and to encourage innovation. Our placement provision is second to none. We have also launched a number of exciting new courses this year – BSc International Development with Economics, BSc Economics and Mathematics, and MSc International Education and Globalisation.

Our academic staff continue to lead on the development of important international research collaborations and through greater public and media engagement, we have taken our work to a global audience measured in hundreds of thousands.

Channelling our expertise

In recognition of our expertise in international security and strategic studies, we launched in 2015 the Centre for War & Technology. Dedicated to the research and analysis of the impact of technology on politics, war and society, the Centre is led by researchers in the Department of Politics, Languages & International Studies (PoLIS) but involves close collaboration with other departments, including Psychology and Computer Science.

Aligned to the Centre, this year the Faculty ran its first MOOC: From State Control to Remote Control: Warfare in the 21st Century (see page 8).

Our Centre for Development Studies, based within the Department of Social & Policy Sciences (SPS), celebrated a major milestone with its 40th anniversary this year, marked with significant events on campus. Since it was established in the mid-1970s, the Centre has become a world leader for international development research and teaching – evidenced by the fact that this year the University was placed in the Top 50 worldwide for Development Studies according to the QS International Rankings.

Hitting the headlines

In the lead up to the UK General Election 2015, researchers from around the Faculty including Economics, PoLIS and SPS were involved in an initiative to profile our expertise to the media in relation to the fault lines between the political parties – rebalancing the economy, Britain's position in Europe, our response to climate change, among others.

With our researchers also focussed on trends in voting behaviour, for two months prior to the election, there was a constant stream of commentary and analysis from academics which helped to hit the national and international headlines. This culminated with the count and declaration for the Bath and North East Somerset seats taking place on campus and British election expert, Dr David Cutts (pictured, below, with BBC Radio 4's Justin Webb), being on hand throughout the night to field media interviews.

Throughout the year, researchers from the Faculty have been particularly active in the media around major external events, notably the Charlie Hebdo attacks in France, the Greek elections and the refugee crisis in the Mediterranean.





Embedding internationalisation

A delegation from the Faculty visited Brazil in March 2015 to explore new research collaborations with our international partners the University of São Paulo (USP) and the University of Campinas (Unicamp).

This was the first international trip to pilot a new and more targeted approach to research partnership development, matching early career researchers with individuals who share similar or complementary research interests.

This visit has already led to the first ever off-campus multilateral event with international partners, organised by the Faculty and taking place back in Brazil six months later (see page 21).

Coinciding with the 2015 Rugby World Cup, sports scientists from our Department for Health, who for a number of years have been involved in a research programme to reduce injury risk in rugby, brought together an international audience for the World Rugby Science Network Conference. With day one hosted in Bath, day two was beamed live from Cape Town, South Africa.

Significantly, the 2015 Rugby World Cup was also the first to use the new crouch, bind, set engagement technique for scrums – a direct impact of this research.

Science

Bath Institute for Mathematical Innovation



We have established a new University Research Institute to support our research in mathematics and its applications. The Bath Institute for Mathematical Innovation (Bath IMI) is a significant new investment by the University that will provide a framework to translate fundamental insights from the mathematical sciences into economic and societal impact.

As well as its cross-campus reach, Bath IMI will work with businesses and public sector organisations to help them make better decisions, informed by data analysis and mathematical modelling.

Current projects include statistical modelling of exposure to air pollution, which resulted in changes to US legislation around air quality, and working with the UK Met Office to improve the accuracy of weather forecasting.

The Institute offers exciting opportunities to link up researchers across campus, develop new projects, and support the EPSRC Centre for Doctoral Training in Statistical Applied Mathematics that provides a key element of the postgraduate training activity within the Department of Mathematical Sciences.

Bath IMI will also help us promote our high quality research in the mathematical sciences to international audiences including the development of closer links with our international academic partners.

www.bath.ac.uk/imi/

New centre for evolution research

Following a £5 million donation from Bath alumnus Dr Jonathan Milner, the largest ever single donation to the University, we have established the Milner Centre for Evolution. Based within our Department of Biology & Biochemistry, the Centre will be the first in the UK to combine fundamental, applied and education research on evolution. It will concentrate on three strands:

- Fundamental research into how life evolved, from investigating the evolution of genes to studying fossil records;
- Applied evolutionary research, from understanding how species might respond to climate change to following the evolution of microbes in real time and applying this knowledge to improve medical treatments;
- Communication of evolution research to the public, including improving the teaching of evolution in schools at primary and secondary level, running free open access online courses (MOOCs) and using evolution to improve public health messaging.

Construction of the new Milner Centre for Evolution is expected to start in autumn 2016, and it is due to open in December 2017.

go.bath.ac.uk/milner

Research from the Centre is already making the headlines, with the discovery of a fossil of a four-legged snake ancestor: go.bath.ac.uk/four-leg-snake





New device to accelerate drug development

When a medical treatment is injected under the skin, it is subjected to sudden changes in temperature and pH which can limit the amount of the drug that is successfully absorbed into the body. This makes it difficult for pharmaceutical scientists to calculate the dose needed to give the therapeutic effect.

A research team led by Professor Randy Mrsny (Pharmacy & Pharmacology) has developed a device that mimics the environment of the injection site under the skin to predict what happens to the drug after it has been administered.

The patented device, named Sirius Scissor, has been licensed by Sirius Analytical Instruments Ltd; and there has been rapid and broad adoption by pharmaceutical companies to use this device as a new tool to reduce the use of animals in research and improve and accelerate the drug development process.

Professor Mrsny was listed as one of the world's most influential drug creators of 2015 by The Medicine Maker journal.

go.bath.ac.uk/mrsny

Motion capture technology to help athletes and injured service personnel

Our Departments of Computer Science and Health are working together to establish a new £10 million Centre for the Analysis of Motion, Entertainment Research & Applications (CAMERA), that includes £5 million of UK Research Council funding to establish it as a flagship Next Stage Digital Economy Hub. It will create advanced motion tracking technologies for use in the entertainment industry, to enhance athlete performance, and to help develop assistive technologies.

The Centre is working in partnership with top visual effects companies including The Imaginarium and The Foundry, and will also work in collaboration with BMT Defence Services, British Skeleton, The Ministry of Defence, Bath & North East Somerset Council, the West of England Local Enterprise Partnership and the Bath Innovation Centre to develop the technology alongside a wide range of users, from elite athletes to injured service personnel.

go.bath.ac.uk/camera

School of Management

Our School of Management is one of the world's leading business schools: our accreditation status from EQUIS, the European Foundation for Management Development's quality inspectorate, puts Bath in the top 1% of business schools worldwide.

We offer the UK's best business degree, ranked first in *The Times* and *The Sunday Times Good University Guide 2016* and *The Complete University Guide 2016*.

Alongside outstanding teaching, the School has an excellent reputation for the quality of its research. Researchers engage directly with organisations to drive innovation and fresh ideas: developing new tools, models and frameworks to influence and change the way in which people think and work.

Our new Bath Centre for Healthcare Innovation & Improvement (CHI²), led by Dr Christos Vasilakis, is addressing the complex challenges facing the UK's health and social care systems.

Improving patient care

Using systems modelling and computer simulation, researchers are working with clinical teams and managers to design solutions that will improve outcomes and experiences for patients and make organisations more effective and efficient.

The Centre will enable commissioners and service providers to shape new service pathways, enhance the performance and quality of existing services, and make better informed decisions about how and where to direct resources.



Dr Christos Vasilakis, Director of the Centre

The 'weekend effect'

Why do hospital patients face a worse prognosis if they are admitted out of hours? Researchers are working with clinicians and NHS managers to understand this global problem.

Value for money

Dr Margaret Greenwood is investigating the impact of radical reform to public audit on audit costs and quality for the NHS, supported by the Economic & Social Research Council.

Better care for stroke patients

Researchers are developing a new computer model to assist in the organisation of stroke prevention services for patients with atrial fibrillation, supported by the West of England Academic Health Science Network.

Expertise where it's needed

An Analysts-in-Residence programme of research at Yeovil District Hospital NHS Foundation Trust is giving clinical teams and managers access to high quality analytical and systems modelling expertise that is 'in-house', yet independent. Combined with a custom designed executive education programme, it is helping to enhance the delivery of care services.



Research in healthcare innovation and improvement will advance patient care nationally and potentially worldwide

Putting a career in place

Our students take on two six-month professional placements in over 250 companies, public sector bodies and charities. A track record in some of the UK's most prestigious companies and organisations puts our students at the forefront of the graduate job market: a striking 97% of our employed Business Administration graduates are working in a professional or managerial job within six months.



Business graduate Kate Crooks is now an Analyst at Accenture, a multinational management consulting services company, following a student placement at the firm. She is mentor to two of our current placement students at Accenture, George Macdonald and Niko Lysandrides.

“Being mentored by a Bath business graduate really brings home the potential life cycle of a student placement and that is just so inspiring.”

George Macdonald



Jules Tran and Rejoice Mawire are on placement with the Strategic Development team at Yeovil District Hospital, a partner of the School's Centre for Healthcare Innovation and Improvement (CHI²).

“Career options for business graduates are so much broader than the City and my placement is testament to that. Our work is directly developing services at the hospital and that feels very meaningful.”

Jules Tran

Internationalisation

As a result of our close ties with a carefully selected network of international partners, the University is reaping the rewards that greater internationalisation brings.

This year, in addition to highly successful international student recruitment, a number of initiatives have helped to raise our international profile resulting in tangible impacts back on campus.

Training future African leaders

This year we developed a ground-breaking partnership with the South African Government to provide doctoral training for next-generation university leaders across the country.

In the first such partnership between a UK university and the South African Government, two cohorts of 27 senior professional and academic staff will study for our Professional Doctorate in Business Administration.

The first residential was delivered by members of our School of Management at the Nelson Mandela Metropolitan University in Port Elizabeth in January 2016.

Late September 2015 at the University of Pretoria, the Vice-Chancellor and Pro-Vice-Chancellor (Internationalisation) signed our ground-breaking agreement with the South Africa government to provide advanced leadership training to senior South African Higher Education professionals.

Delivering international research

Over the past three years the University has invested close to £1 million supporting international partnerships and raising its international profile. As a direct result, new partnerships have emerged which have already generated nearly £3 million in follow-on external research funding.

Year-on-year the number of internationally co-authored publications involving our researchers grows. Co-authored research with colleagues based at our strategic partner institutions is greatest with Nanyang Technological University (Singapore), Stellenbosch (South Africa) and Zhejiang (China); significant both in terms of increasing citations and the international impact of our research.

An excellent example is the work between Professor Furong Li, energy specialist within our Department of Electronic & Electrical Engineering, and colleagues at Zhejiang. Their research collaboration looking at smart grid technologies has important practical implications for new power stations planned both in the UK and overseas.

New University-wide partnership agreements signed in 2015 with Koç University (Turkey) and undergoing development with Universiti Sains Malaysia (Malaysia), are complementing our pre-existing strategic partnerships. We expect the volume of these collaborations to increase significantly in the years to come.

Investing in staff and student mobility

We are achieving impact with internationalisation through increased student and staff mobility – enabling our researchers and research students to spend time overseas with international partners and for them to come to Bath.

Building on connections made during a Faculty delegation to Brazil earlier in the year, Professor David Galbreath, Associate Dean (Research) for the Faculty of Humanities & Social Sciences, led a multilateral event in Brazil in September 2015 focussed on defence and security, which involved our partners across four continents. This was the first time this kind of event has taken place off-campus and is an exciting prototype for future international initiatives of this scale.

Another significant trip involved researchers across the University to Mexico in April. Building on previous strong engagement in student recruitment, mobility and partnership development, the purpose of this visit was to consolidate collaborations with our strategic partner UNAM as well as exploring new opportunities to promote the University.

Faculty-level partnership agreements with IISER, Pune (India), CIMAT (Mexico) and the Centre for Ecological & Evolutionary Synthesis Oslo (Norway) will further strengthen opportunities for staff and student mobility across different areas.

Internationalisation on campus

On campus we enjoyed regular engagement with visiting international partners across all disciplines. We also welcomed high-profile visitors, including the Ambassadors for South Korea and Hungary, as well as senior representatives from the Embassies of Mexico, China, Egypt and Morocco.

In November 2014, through our Centre for the Analysis of Social Policy and IPR, we hosted a major multilateral event on campus with international partners focussed on transforming social policy in Latin America. Similar events have been organised by the Centre for Sustainable Chemical Technologies with Universidade de São Paulo (Brazil), Ohio State University (US), and Monash University (Australia).

Finally, important internationalisation initiatives on campus have been promoted by the Students' Union and via our important partnership with the International Students' Association. These include intercultural training and campus-wide events, fostering the spirit of internationalism throughout the University community.



HRH Princess Sarvath El Hassan, a pioneering force in education whose influence and links with the University have transformed the opportunities available for young people within Jordan and throughout the region, was awarded an honorary degree (Doctor of Education) at this year's summer graduation ceremonies.

- Our position has improved noticeably in major international league tables (Leiden, *Times Higher Education* and QS) – notably the QS 'Top 50 under 50' ranking in which we are number one in Europe, and the *Times Higher Education* top 100 list of the world's 'most international' universities in which Bath is ranked 82nd.
- International student enrolment is up 10% (undergraduate), over 23% (postgraduate) and 14% (PhD) for 2015/16.
- In 2014/15, 23 awards to research staff were made under the University's Global Mobility Schemes.



Lifelong connections

Whatever our graduates choose to go on and do, many among them will remain connected with the University long after they leave. Joining a 100,000 strong global alumni community, they attend events, offer their skills and experience as mentors, give up their time as volunteers and make financial gifts to support our graduates of tomorrow.

Getting connected and staying involved is a great way for graduates to meet like-minded people, try new activities, and expand their social and professional networks. And it's a community that's growing all the time: over the past year alone, almost 100 events took place around the world, attracting thousands of alumni in more than 40 international networks.

Careers evenings in the City, drinks receptions in Hong Kong, reunions on campus, day trips with old friends, Silicon Valley tours in San Francisco, business advice from alumni in New York, meeting our Chancellor at St James's Palace... the list goes on.

And it's set to get bigger still as we build towards our 50th anniversary celebrations this year. We're planning a birthday to remember including parties on campus, a ceremony at Bath Abbey, academic conferences and showcases, sporting and arts events, plus a huge summer festival for the whole community. We're expecting thousands of alumni to come back to campus throughout the year, forming new connections, strengthening their engagement with us, and with each other too.

As well as staying connected, giving something back is a big part of the alumni way of life too. Many of our graduates enjoy staying in touch to remember what university life was like, to be grateful for the opportunity that studying here provided and to help current students get ahead. From giving talks and judging university competitions through to hosting business networking trips and sharing their skills

and experience through mentoring, our alumni tell us that giving back is a very special and important part of life after they leave.

Bath Connection is a great example. It's an online networking system that enables current students and recent graduates to contact alumni experts for careers support and advice. Nearly 800 experts and mentors have already registered – helping with job applications, giving interview advice, providing insight to a particular industry or offering professional introductions for example.

But sometimes it's financial support that's needed and the beauty of Bath is that we make a difference right across the board. In the last decade alone, thousands of Bath alumni have donated more than £2 million to our charitable fund, providing scholarships, bursaries, placement grants, funding for research projects, societies and sports clubs.

We've also received astonishing donations for one-off projects such as £5 million towards a new research centre, from alumnus Dr Jonathan Milner (Applied Biology 1988) to follow his passion for evolutionary research. It's our biggest ever single gift and a fitting way to launch our 50th anniversary fundraising campaign. Every single act of generosity from our alumni helps to make a difference and we make sure that every penny goes where it's needed most.

You can find out more about our alumni community and get in touch at:

Web: www.bath.ac.uk/alumni

Email: alumni@bath.ac.uk

Twitter: [@UniofBathAlumni](https://twitter.com/UniofBathAlumni)

Facebook: www.facebook.com/bath-alumni-community



Community engagement

Public Engagement with Research

The Public Engagement Unit works with the academic community to bring research to and involve the public in the high quality research undertaken in Bath. It provides support, guidance, opportunities and small funds to enable researchers to engage with a broader range of publics, such as the local community, charitable bodies, public sector organisations, industrialists, policy makers, professional groups and young people.

During 2015, our researchers were given the opportunity to present their work through Pint of Science in Bath pubs, a collaboration with Fringe Arts Bath using our online Ignite presentations, and through the annual Images of Research competition.

Below, 'Questioning the straw man', by Professor James Copestake and Fiona Remnant, Department of Social & Policy Sciences, was Winner of Best Image in the Images of Research 2015. The image depicts an Ethiopian farmer tending to his barley crops as he hopes to benefit from a non-governmental organisation (NGO) project aiming to improve farm incomes. The 'Assessing Rural Transformations' research project designed and tested a credible way to assess the impact of development projects in complex contexts – an approach called the QulP – which continues to be used by NGOs. *Photo courtesy of Wolf Ellis, University of Bath partner, Evidence for Development.*

More information about Images of Research can be found at go.bath.ac.uk/images-of-research

Seed funding has enabled engagement events with construction, financial and defence industries; a project understanding participatory video research; collaboration with Bath & North East Somerset Council for supporting fathers' involvement in care and education; inputs for the development of a real-time research information website for healthcare professionals and policymakers; and collaborations between artists and researchers.

The 2015 Vice-Chancellor's Award for Public Engagement with Research was presented to Dr Sarah Bailey (Department of Pharmacy & Pharmacology) for her engaged research looking at causes of and new treatments for anxiety, with her particular emphasis on being open about the use of animals in research.

The 2015 Vice-Chancellor's Postgraduate Prize for Public Engagement with Research was awarded to Jon Chouler (Centre for Sustainable Chemical Technologies) for his engaged research on the role of microbial fuel cells in testing water quality and the initiative he took in developing new opportunities for public engagement.



Reaching out

The University hosts a range of events and activities such as summer schools, open lectures, sporting activities and science workshops to introduce people of all ages and backgrounds to university life. In 2015 the award-winning Bath Taps into Science Fair attracted 1,200 primary school children to our campus-based event and 2,000 children and their families to other activities across the City. Designed to provide information about cutting edge research, Bath Taps into Science allows children and their families to get 'hands-on' with science.

Year 9 school pupils had the opportunity to reflect on the impact that GCSE options can have on future career choices at our popular Futures Days. Through a series of interactive and engaging workshops, 240 students explored their interests and career pathways with 84% reporting that the event had improved their understanding of the post-GCSE choices available.

Following the success of our Year 12 STEM Summer School, we extended our provision to offer a Humanities & Social Sciences Summer School. Targeted at A Level students with very good grades at GCSE, the Summer Schools aim to enhance the A Level curriculum, develop independent study skills and provide information and advice about applying to leading universities.

“The whole experience has been fantastic. It has been great to talk to people who actually study and work at the University. I have gained loads of skills that will help me at college.”

Watch our Year 12 Summer School video at go.bath.ac.uk/summer-school-video

The University also led a successful bid to host the Western Outreach Network (WON), a partnership project designed to raise awareness of further and higher education opportunities to 200 schools and colleges in the western region. The WON focusses on activities for schools currently not in touch with a university, particularly those in rural areas.

won.ac.uk



The Young Researchers' Programme

A collaboration between Dr Paul Shepherd in the Department of Architecture & Civil Engineering and the Bath Royal Literary & Scientific Institution created a Young Researchers' Programme, enabling local teenagers to learn from postgraduate students and early career researchers, what it is like to be a researcher, by completing a meaningful research project.

The programme is modelled on real-life scientific research processes, creating an immersive experience and an opportunity for all participants to reflect on their own learning, and to develop confidence and skills in presenting and communicating. All the young people were new to the idea of research and some felt apprehensive about studying Science, Technology, Engineering and Maths (STEM) subjects. All the postgraduates and early career researchers were new to supervision and most were new to public engagement.

“It was exciting to see my research from a different perspective. The most important aspect was linked to human interaction, with young researchers and postgraduates sharing their ideas, collaborating, engaging and communicating, each bringing different ideas to the table, as a source of creativity.”

Ammar Azzouz (Postgraduate researcher)

Sport

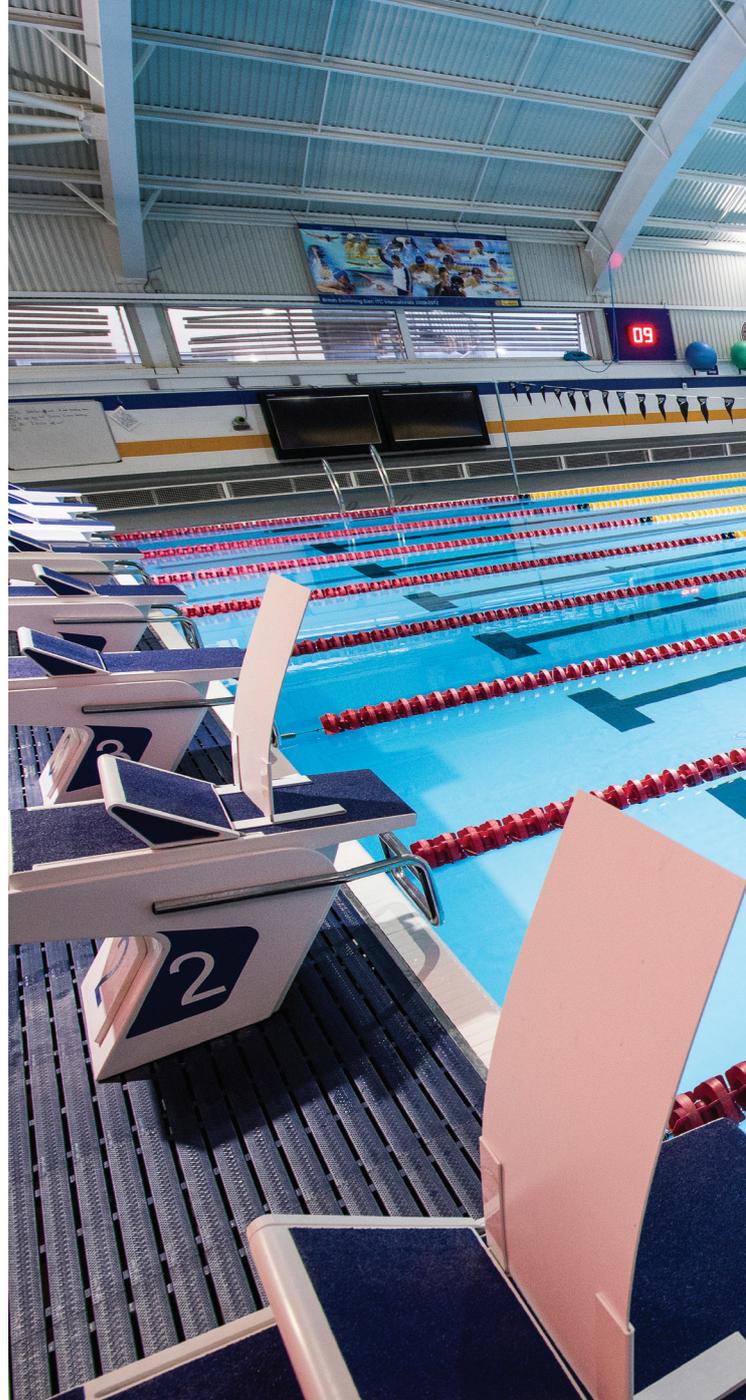
Another sporting year to remember saw the University host major international teams and events while our athletes, past and present, enjoyed great success on the world stage.



Welcoming the Wallabies

Australia became the latest international team to train at the University when they set up Team Base here during the early stages of the 2015 Rugby World Cup. Head Coach Michael Cheika and his world-famous Wallabies – who went on to reach the final – were full of praise for the “first-class facilities” and warm welcome they received.

The Webb Ellis Trophy itself also paid a visit to the University in July, where it was greeted by a spectacular flash-mob dance featuring local school children.

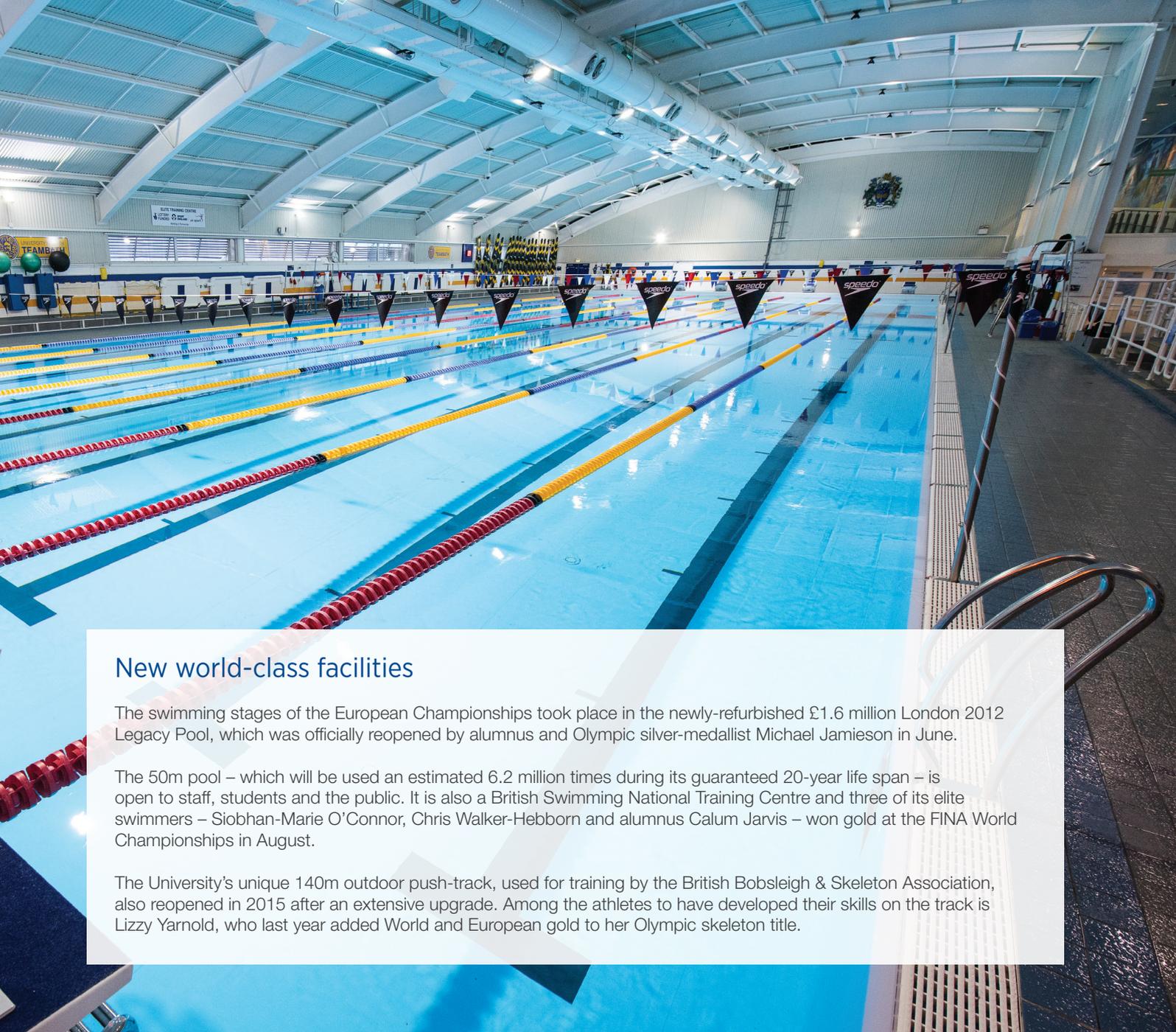


Europe comes to Bath

The Sports Training Village once again demonstrated its ability to stage world-class events when it hosted the Modern Pentathlon European Championships in August. More than 100 athletes from across the continent were watched by almost 3,000 spectators as they competed for Rio 2016 Olympic Games qualifying quota places. Two places went to Pentathlon GB athletes who train at the University – Sports Performance graduate Kate French and Mathematics student Joe Choong.

Road to Rio

French & Politics graduate Samantha Murray also set the Olympic qualifying standard with a top-five finish at the World Championships and is among a host of University-based athletes bidding to compete at Rio 2016 this summer.



New world-class facilities

The swimming stages of the European Championships took place in the newly-refurbished £1.6 million London 2012 Legacy Pool, which was officially reopened by alumnus and Olympic silver-medallist Michael Jamieson in June.

The 50m pool – which will be used an estimated 6.2 million times during its guaranteed 20-year life span – is open to staff, students and the public. It is also a British Swimming National Training Centre and three of its elite swimmers – Siobhan-Marie O’Connor, Chris Walker-Hebborn and alumnus Calum Jarvis – won gold at the FINA World Championships in August.

The University’s unique 140m outdoor push-track, used for training by the British Bobsleigh & Skeleton Association, also reopened in 2015 after an extensive upgrade. Among the athletes to have developed their skills on the track is Lizzy Yarnold, who last year added World and European gold to her Olympic skeleton title.

Student success

They include athletes Paul Blake, who brilliantly defended his IPC World Championships T36 800m title in Doha, and Eilidh Child, who won 4x400m relay bronze at the IAAF World Championships in Beijing.

Bath-based wheelchair fencer, Piers Gilliver, ended the year ranked number one in the world after claiming three World Cup gold medals; and judoka Ben Fletcher is well placed for Olympic qualification after winning titles in Tunis and Mauritius.

Among our alumni targeting Rio success is Heather Stanning, who in 2015 won World and European Rowing Championships gold in the women’s pair with Helen Glover. Both started their careers at the University and were named as Female Crew of the Year by FISA, World Rowing’s governing body.

Five athletes and two coaches represented the University and Great Britain with distinction at the World University Games in South Korea. Sports Performance student Jay Lelliott won gold and silver in the swimming pool, while tennis player Alex Walker – who graduated in Business Masters last summer – claimed mixed doubles silver.

The University’s rugby team was once again crowned European champions when they won a dramatic Red Bull 7s final in front of more than 12,000 spectators at Bath Rugby to retain the title.

Finally, Sports Performance student Lloyd Wallace made history when he won Britain’s first-ever Europa Cup Aerials skiing gold medal. Lloyd is one of 18 student-athletes to be awarded a University of Bath Sporting Scholarship in the last academic year.

Consolidated income and expenditure account for year ended 31 July 2015

Consolidated		
	2015	2014
	£000	£000
Income		
Funding council grants	36,352	41,032
Tuition fees and education contracts	120,240	106,577
Research grants and contracts	36,747	30,719
Other income	47,596	42,746
Endowment and investment income	2,460	1,699
Total income	243,395	222,773
Expenditure		
Staff costs	125,571	117,061
Other operating expenses	76,764	70,272
Depreciation	19,851	13,413
Interest payable	4,975	4,828
Total expenditure	227,161	205,574
Surplus after depreciation of tangible fixed assets at cost/valuation and before exceptional items	16,234	17,199
Exceptional Items		
Surplus/(Loss) on disposal of fixed assets	107	(475)
Surplus after depreciation of tangible fixed assets at cost/valuation and after exceptional items	16,341	16,724
Taxation	(692)	
Surplus on continuing operations after depreciation of assets at cost/valuation, exceptional items and tax	15,649	16,724
Transfer from accumulated income in endowment funds	114	141
Surplus for year retained within general reserves	15,763	16,865

Balance sheet as at 31 July 2015

	Consolidated		University	
	2015	2014	2015	2014
	£000	£000	£000	£000
Fixed Assets				
Tangible assets	598,389	569,470	599,890	571,472
Investments	724	775	724	775
Total fixed assets	599,113	570,245	600,614	572,247
Endowment Asset Investments	5,117	4,785	5,117	4,785
Current Assets				
Stock	849	746	849	746
Debtors	17,974	14,084	17,974	14,084
Investments	113,339	111,252	113,339	111,252
Cash at bank and in hand	2,994	10,833	2,849	10,729
	135,156	136,915	135,011	136,811
Creditors : Amounts Falling Due Within One Year	(54,296)	(49,633)	(54,296)	(49,633)
Net Current Assets	80,860	87,282	80,715	87,178
Total Assets Less Current Liabilities	685,090	662,312	686,446	664,210
Creditors : Amounts Falling Due After More Than One Year	(159,640)	(161,720)	(159,640)	(161,720)
Net Assets Excluding Pension Liability	525,450	500,592	526,806	502,490
Net Pension Liability	(33,166)	(26,047)	(33,166)	(26,047)
Net Assets Including Pension Liability	492,284	474,545	493,640	476,443
Deferred Capital Grants	93,328	85,820	93,236	85,716
Endowments				
Expendable 3,163	2,943	3,163	2,943	
Permanent	1,954	1,842	1,954	1,842
	5,117	4,785	5,117	4,785
Reserves				
Revaluation reserve	271,934	271,934	271,934	271,934
Income and expenditure account excluding Pension reserve	155,071	138,053	156,519	140,055
Pension reserve	(33,166)	(26,047)	(33,166)	(26,047)
Total Reserves	393,839	383,940	395,287	385,942
Total Funds	492,284	474,545	493,640	476,443



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