Statistics and commentary

Financial support to students
The University provides financial support to students in the form of bursaries, scholarships and discretionary assistance from hardship funds. In 2009/10, the University disbursed the following amounts in these kinds of financial support:

<table>
<thead>
<tr>
<th>Source</th>
<th>Undergraduate</th>
<th>Postgraduate taught</th>
<th>Postgraduate research</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bursaries</td>
<td>£2.9m</td>
<td>£0.3m</td>
<td>£0.3m</td>
<td>£3.5m</td>
</tr>
<tr>
<td>Scholarships</td>
<td>£0.1m</td>
<td>£1.0m</td>
<td>£1.0m</td>
<td>£2.1m</td>
</tr>
<tr>
<td>Hardship funds</td>
<td>£5.0m</td>
<td>£2.2m</td>
<td>£0.4m</td>
<td>£7.6m</td>
</tr>
</tbody>
</table>

Total student numbers 2009/10

<table>
<thead>
<tr>
<th>Year</th>
<th>Undergraduate</th>
<th>Postgraduate taught</th>
<th>Postgraduate Research</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full-time paid work</td>
<td>5.1%</td>
<td>1.4%</td>
<td>1.8%</td>
<td>7.5%</td>
</tr>
<tr>
<td>Voluntary/unpaid work</td>
<td>5.3%</td>
<td>3.3%</td>
<td>1.8%</td>
<td>9.4%</td>
</tr>
<tr>
<td>Work and further study</td>
<td>7.5%</td>
<td>2.2%</td>
<td>2.2%</td>
<td>11.9%</td>
</tr>
<tr>
<td>Further study</td>
<td>2.2%</td>
<td>0.4%</td>
<td>0.4%</td>
<td>2.9%</td>
</tr>
<tr>
<td>Assumed to be unemployed</td>
<td>5.4%</td>
<td>3.3%</td>
<td>0.4%</td>
<td>8.9%</td>
</tr>
<tr>
<td>Not available for employment</td>
<td>0.7%</td>
<td>1.4%</td>
<td>0.7%</td>
<td>2.5%</td>
</tr>
<tr>
<td>Other</td>
<td>1.4%</td>
<td>2.2%</td>
<td>0.4%</td>
<td>3.9%</td>
</tr>
<tr>
<td>Total</td>
<td>5.4%</td>
<td>3.3%</td>
<td>0.4%</td>
<td>8.9%</td>
</tr>
</tbody>
</table>

The University’s priorities in this area are to:

- be recognised globally for the quality of our research;
- create a positive research environment and infrastructure that will attract and retain the highest quality researchers and postgraduate students worldwide;
- develop our portfolio of flagship and high-impact research, working across and between disciplines to answer important societal questions and contribute to the social, political, environmental and economic well-being of the region, the UK and the wider world;
- seek, manage and provide professional support for strategic relationships and alliances with key national and international partners – business and industry, the public sector, user communities, sponsors of research and policy-makers;
- play a leading intellectual role in enterprise, knowledge exchange and economic and social impact agendas, and continue to be a beacon of good practice and leader of innovation in the city and region;
- develop a sustainable portfolio of research informed by evidence-based leadership, management and administration and supported by high standards of governance.

Bristol leads on National Composites Centre
The University is leading a new centre for design, manufacture and marketing of composite materials for widespread use in industry. The National Composites Centre will form an international hub, linking activities across all sectors of the UK in research, education and training, technology transfer and incubation of new enterprises.

Composites are manufactured from high-performance fibres such as carbon fibre, and their development is a key strategy in cutting the environmental impact of industries (aerospace, construction, automotive, renewable energy, etc) that have traditionally been heavy carbon emitters.

The Centre is being funded by the Department of Business, Innovation and Skills, the South West Regional Development Agency and the European Regional Development Fund. Some of the world’s leading engineering companies are to participate in the centre, including Vesta, Rolls Royce, AgustaWestland, Airbus UK and GKN. A purpose-built facility is under construction at the Science Park (or S-Park) in Emerson’s Green and is expected to be ready in spring 2011.

A simple calculation, a world first
Quantum computing is now a step closer, after a team at the Centre for Nanoscience and Quantum Information performed a world-first, part of research led by Professor Jeremy O’Brien, Director of the Centre for Quantum Photonics, is a major step forward in the quest to realise a super-powerful quantum computer. Areas in which quantum computing could fuel major advances include the development of new pharmaceuticals and materials and the arrival of a new standard for encryption and secure internet communications.

Preventing brain injury in newborns: a banner year
Neonatal research at Bristol made several important breakthroughs in 2009/10, mostly through the work of Professor Marianne Thoresen and Professor Andrew Whitehead. The results of a trial involving 42 universities in Europe and Israel – the largest study of its kind – found that brain damage caused by lack of oxygen at birth could be mitigated if infants are given cooling treatment within the first six hours of life. This confirms the research, begun by Professor Thoresen in 1992 and subsequently funded by the Medical Research Council, which suggested that mild cooling reduces injury in the newborn brain after hypoxia.

Cooling by itself only partially reduces disability and does not prevent it in all babies. However, in April it was announced that another pioneering technique developed by Professor Marianne Thoresen had proved successful, when xenon gas was delivered to a newborn baby deprived of oxygen at birth. This was carried out, in combination with the cooling treatment, at St Michael’s Hospital, part of University Hospitals Bristol NHS Foundation Trust. Professor Thoresen developed the use of xenon gas with Dr John Dingley from Swansea University, in a study funded by Sparkos, the medical research charity.
Another line of research bore fruit when details were published of a new treatment that reduces disability in premature babies with serious brain haemorrhage by washing the brain to remove toxic fluid. The development of the technique, known as DRIFT (Drainage, Irrigation and Fibinolitic Therapy), was led by Professor Andrew Whitelaw and Ian Pople (paediatric neurosurgeon at North Bristol NHS Trust), and a randomised trial, funded by grants from Cerebra and the James and Grace Anderson Trust, began in 2003. Its success means that the technique, now known as ventricular lavage, is likely to be set up as a service at Bristol’s Southmead Hospital.

Found: Alfred the Great’s granddaughter Bones excavated in Magdeburg Cathedral in 2008 were confirmed as those of Saxon Princess Eadgyth, Dr Alistair Pike and Professor Mark Horton from the Department of Archaeology studied the teeth preserved in the upper jaw by measuring the strontium and oxygen isotopes that were mineralised in the teeth as they were formed. The results clearly indicated a childhood spent in the chalk regions of southern Britain. Meanwhile, colleagues from the University of Mainz made similar measurements of teeth from burials of people local to Magdeburg and confirmed that these isotopes were completely different. Princess Eadgyth was the granddaughter of Alfred the Great and died in AD 946, making her the oldest surviving member of the royal family. The discovery attracted great media interest; the bones will be reburied in Magdeburg Cathedral later this year, 500 years after their last interment in 1510.

Bristol leads in poverty research The Centre for the Study of Poverty and Social Justice, established in 1998 as the School for Policy Studies, provides a focal point for scholarship and research in criminal justice, socio-legal studies, poverty and social exclusion. During 2009/10 the Centre’s projects included a number of high-profile studies, the outcomes of which are expected to inform government policy and practice. The Centre’s Dr Eldin Fahmy led a study of social exclusion commissioned by the Cabinet Office, building on earlier work led by Professor Ruth Levitas from the Department of Sociology that resulted in the Bristol Social Exclusion Matrix (BSEM). Dr Fahmy used the BSEM framework for the new study, along with data from the General Household Survey and the British Household Panel Survey. The findings, published by the Cabinet Office, indicate that 16 per cent of working-age adults without children over the age of 25 – or 2.6 million people – experience multiple forms of social exclusion at any one time.

Meanwhile, one of the Centre’s member groups, the Townsend Centre for International Poverty Research, is a leading partner in the UK’s largest-ever research project into poverty and social exclusion. The initiative is funded by the Economic and Social Research Council, and also involves researchers from Heriot-Watt University, the National Centre for Social Research, Northern Ireland Statistics and Research Agency, The Open University, Queen’s University Belfast, University of Glasgow and the University of York. The project aims to support the ambitions of the Child Poverty Act 2010, which formalises the UK’s commitment to ending child poverty by 2020.

Driverless transport wins award A revolutionary form of driverless travel – the ULTra (Urban Light Transport) – pioneered at the University’s Faculty of Engineering won the Viva Award for 2009. ULTra was conceived by Martin Lowson, Emeritus Professor of Advanced Transport and President of Advanced Transport Systems Ltd. The Viva Award recognises transport innovation or development in Europe. ULTra is an innovative form of Personal Rapid Transit that uses 70 per cent less energy per passenger-kilometre than a car. ULTra was featured at the Science Museum as ‘the 21st-century equivalent of Stephenson’s Rocket’. This year the first public ULTra system – also the first commercial Personal Rapid Transit system anywhere in the world – opened at London’s Heathrow Airport.

Hearing on the wing Bionanoscience is an emerging field of study, as researchers bring computing power and nanoscale technology to bear on the natural world. Professor Daniel Robert’s research group in the School of Biological Sciences investigates some of the smallest working structures in nature, in collaboration with colleagues in the Department of Engineering Mathematics and elsewhere. During 2009/10, members of these groups published two groundbreaking studies of the mechanisms behind insect hearing.

The ear of a tropical butterfly contains a structure that enables it to distinguish between high- and low-pitch sounds, according to a paper in the *Journal of Experimental Biology*. Lead researcher Katie Lucas used a tiny laser beam to scan the surface of the ear, which consists of a membrane at the base of the wing, and found that lower-pitch sounds caused vibrations in only one part of the outer membrane while higher-pitch sounds made the entire membrane vibrate. Lucas and her colleagues (at Bristol, the University of Strathclyde and Carleton University, Ontario) argue that the structure of the membrane may enhance the abilities of these butterflies to listen for birds by detecting the beating of birds’ wings (lower pitch) and tuning into birdsong (higher pitch).

Some of the remarkable features of mosquito hearing – including the male’s ability to hear the faintest beats of the female’s wings without being deafened by much louder noises – have been explained by a mathematical model produced at the Bristol Centre for Applied Nonlinear Mathematics. Building on the discovery by Professor Robert of the process of hearing in male mosquitoes through multiple individual sensory units called scolopidia, postdoctoral researcher Dr Daniele Avitabile and colleagues developed a mechanistic model of the active amplification in the Tanzanian mosquito species *Toxorhynchites brevipalpis*. The model (described in a paper in the *Journal of the Royal Society Interface*) tallies with recent experiments and observations, and also generates new hypotheses about the details of the process.

Lost voyage comes to light Evidence of a previously unknown voyage to North America in 1499, led by Bristol explorer William Weston, was published by Dr Evan Jones from the Department of History in the journal *Historical Research*. In a letter from Henry VII to his Lord Chancellor, the King instructs him to suspend an injunction served against Weston in the Court of Chancery because Weston shall shortly “with God’s grace pass and sail for to search and find if he can the new found land”. The letter had an ancestry of its own, having been miscatalogued, rediscovered and almost destroyed, before Dr Jones finally brought it to public attention.

Taking research to market: SETsquared RED manages the University’s SETsquared Business Acceleration Centre, part of the SETsquared Partnership, which also includes the universities of Bath, Southampton and Surrey. This enterprise collective comprises some 6,500 researchers, who together are responsible for 7 per cent of the UK’s research budget. The Centre draws on a house expertise and a wide consultancy network of entrepreneurs, academics and finance experts to support emerging technology companies with high growth potential. Over 100 businesses are currently receiving support through the SETsquared Partnership. It was reported late in 2009 that, despite the recession, companies in SETsquared incubators received £52.5 million from private investors and venture capital funds, creating 142 new jobs in the process. In March 2010, the University’s SETsquared Business Acceleration Centre was identified by FutureStorry – an initiative showing how businesses across the UK are adapting to the new economy – as a key player in ensuring Bristol’s future economic success.

**Research continued**
Enterprising students inspire school kids

Among the dozens of societies run through the Students’ Union are two student enterprise societies – the Social Enterprise Project and Bristol Entrepreneurs. During the spring term, members of these societies visited Bristol University Enterprise Centre to talk to pupils about entrepreneurial career options, and set them a challenge to design and market a new ethical food product. It is hoped that the scheme will develop into a city-wide, student-run annual programme.

Good works: Bristol students in the charitable and voluntary sector

Students at Bristol have a long history of community work and fundraising: the first raising and giving (RAG) event was held in 1965. The Students’ Union emphasises its members the importance of escaping the ‘student bubble’ and engaging with the local community in a positive way – as well as developing and sharpening a range of skills to complement their academic work and enhance their CV.

Grants

The University attracted a total of £118 million in grants during 2009/10. This included the following:

- £4.3 million from the Economic and Social Research Council for a major study of poverty in the UK to be led by Professor Dave Gordon from the Centre for the Study of Poverty and Social Justice. The study will be accompanied by advice and support, which will be available to students.
- £4.5 million from the Arts and Humanities Research Council for a project to investigate the role of the arts in the development of young people. The project will involve researchers from the School of Social Sciences and the College of Arts and Humanities.
- £3.2 million from the Wellcome Trust for a project led by the Department of Clinical Veterinary Science (together with the RSPCA and the Soil Association) to improve the welfare of farm animals in the UK.
- £1.7 million from the Engineering and Physical Sciences Research Council and the Arts and Humanities Research Council (through the RCUK Digital Economy programme) for a project that aims to revolutionise the design of wearable technologies for supporting research.
- £1.3 million from the Welcome Trust for a project led by Professor Chris Probert in the School of Clinical Sciences and Norman Ratcliffe at the University of the West of England, that can ‘sniff out’ the presence of disease.
- £0.7 million from the Economic and Social Research Council and the Arts and Humanities Research Council (through the RCUK Digital Economy programme) for a project that aims to revolutionise the design of wearable technologies for supporting research.
- £0.5 million from the Arts and Humanities Research Council for a project led by the Department of Clinical Veterinary Science (together with the RSPCA and the Soil Association) to improve the welfare of farm animals in the UK.

The University’s priorities in this area are to:

- support a vibrant, active and student-friendly campus
- ensure the provision of learning and skills opportunities that enhance students’ future employability
- support a fair and transparent system of student representation
- provide advice and support for students’ personal welfare and effective integration into the University and local community
- ensure a high-quality education
- provide a range of opportunities that will enable students to excel in every aspect of their lives at Bristol and to make their university career a genuinely transformative experience.

Bristol student team triumphs at MIT

An interdisciplinary team of students from the Bristol Centre for Complexity Sciences (BCCS) won a gold medal and a prize for Best Model after going head-to-head with 111 other teams at a prestigious international competition in the field of synthetic biology.

The team (comprising postgraduate and undergraduate students and staff from the BCCS, the School of Biological Sciences and the Departments of Biochemistry and Engineering Mathematics) travelled to the US to compete in the 2009 iGEM (International Genetically Engineered Machine) Jamboree at Massachusetts Institute of Technology. Having won a bronze medal and the Best Model prize at the 2008 iGEM Jamboree, this year they retained the Best Model prize and upgraded their medal to gold.

The team’s 2009 project, ‘Vesecure’, aims to improve communication between bacteria by developing new methods of packaging signals – a technique that may have much broader applications in the future.