OPEN TO ALL
SLEEP DISORDERS
LEGAL AID
Work is underway to refresh the top-level pages of the University website. Known as oxweb, the site acts as the public face of the University, providing information to a range of audiences from prospective students to visitors. Feedback will shortly be sought on the proposed new design of the homepage and a number of specific pages, including news articles and course listings. To view the designs and provide your views, follow the link on www.ox.ac.uk/staff.

A digital facsimile of Shakespeare’s First Folio has been made available online thanks to a public appeal by the Bodleian Libraries which raised £20,000. The Bodleian’s copy of the First Folio is a rarity because it has not been rebound or restored since it was first received by the library in 1623. As a library copy rather than a book in a private collection, it also reveals the tastes of early readers through the condition of its pages: Romeo and Juliet shows considerable wear and tear, whereas King John is in almost pristine condition. The Folio can be viewed at http://shakespeare.bodleian.ox.ac.uk.

Have you recently arrived in Oxford and do you need some guidance about living in the UK? If so, why not visit www.internationalstaff.ac.uk, a website designed for international staff moving to UK universities. The site provides general guidance about living and working in the UK, such as how to register with a GP or open a bank account, as well as information specific to Oxford such as where to find accommodation and what childcare provision is offered by the University.

The University has joined the Stonewall Diversity Champions programme, an employers’ forum to promote and share good practice on recruiting and retaining lesbian, gay and bisexual staff. The programme aims to ensure that University activity is inclusive in terms of language, policy and procedures. It also provides a platform to assess our practices against other employers, and gives the University access to the resources of Stonewall, the LGBT equality body. For more information, contact caroline.kennedy@admin.ox.ac.uk in the Equality & Diversity Unit.

Would you be interested in helping at the Undergraduate Open Days in late June? The Undergraduate Admissions team is looking for volunteers to welcome prospective students and their parents at key locations across Oxford on 26 and 27 June. No specialist knowledge is required – you just need to hand out the Open Days guide and provide directions. If you could spare some time on either day and would like to volunteer, email opendays@admin.ox.ac.uk. Find out more about the Open Days on pp8–9 of this issue of Blueprint.

Take advantage of a new bike hire scheme in Oxford, with 20% off annual membership and daily hire fees. Brompton Dock offers folding Brompton bicycles for long- and short-term hire from Oxford railway station. There are two options available: frequent membership, which costs £36 per year and a £2 hire charge per day; and leisure membership, which costs £8 per year and a £4 daily hire charge. Find out more at www.ox.ac.uk/staff/news/discounted_bike_hire.html.

The launch of a major research centre in big data and drug discovery was marked by a visit from the Prime Minister, David Cameron, on 3 May. Supported by a £20m gift from the Li Ka Shing Foundation and £10m in new funding from HEFCE, the Li Ka Shing Centre for Health Information and Discovery will comprise two institutes located on the Old Road Campus. The Target Discovery Institute, which will become operational shortly, will use high-throughput biology to speed the early stages of drug discovery by identifying better targets for drug development in diseases such as cancer, diabetes, dementia and psychiatric conditions. The second phase of the centre, the Big Data Institute, will focus on the analysis of large medical datasets to develop greater understanding of human disease and its treatment, and will bring together researchers from across genetics, epidemiology and public health, clinical medicine, computer science, statistics and bioinformatics.
RESEARCH ROUND-UP

✦ The legendary ‘Hanging Garden of Babylon’ has since ancient times been recognised as one of the Seven Wonders of the World – but no trace of it has ever been found. After 20 years of research, Dr Stephanie Dalley may have discovered why. She believes the garden was actually created at Nineveh, 300 miles from Babylon, by the Assyrians in the early 7th century BC at the instigation of the Assyrian king Sennacherib. ‘It has taken many years to find the evidence to demonstrate that the gardens and associated system of aqueducts and canals were built by Sennacherib at Nineveh and not by Nebuchadnezzar in Babylon’, says Dr Dalley, an honorary research fellow at Somerville College and part of the Oriental Institute. ‘For the first time it can be shown that the Hanging Garden really did exist.’

✦ A worldwide research collaboration led from Oxford has shown how genetic monitoring of malaria parasites could be used to track the spread of drug resistance. The researchers discovered multiple parasite strains in Western Cambodia that have emerged recently and are resistant to artemisinin, the best treatment against malaria. The scientists were able to characterise distinct genetic patterns or ‘fingerprints’ for each of the strains, demonstrating how resistant strains could quickly be identified – an important step towards effective worldwide surveillance. Professor Nicholas White of Oxford University and Mahidol University in Thailand says: ‘Artemisinin resistance is an emergency which could derail all the good work of global malaria control in recent years. We desperately need methods to track it in order to contain it, and molecular fingerprinting provides this.’

✦ The coalition government has made it a policy to support public sector organisations like hospitals, colleges or housing associations becoming ‘mutual’ organisations, yet how to make the transition has been under-researched. Now, the Oxford Centre for Mutual and Employee-owned Business at Kellogg College has interviewed managers and stakeholders at six public sector mutuals, including Central Manchester Foundation Trust Hospital, Rochdale Boroughwide Housing and Salford Community Leisure Trust, to find out how they made the change successfully. They also discussed the future of mutualisation with Lambeth County Council, the first county council in the country with the declared intention to become a Cooperative Council. ‘We found that governance is not enough: building the member community, making mutual values meaningful, and developing distinctive leadership practices are crucial’, says Dr Ruth Yeoman. ‘For example, one new mutual had all its employees going out to visit users of the service; another reached out to marginalised community members who had never been asked to get involved in decision-making before. Good mutuals are not created from new legal structures – they are made out of reconfigured relationships.’

✦ A 3D printer, custom-built by Oxford University scientists, is being used to create materials with many of the same properties as living tissues. The new type of material consists of thousands of connected water droplets, encapsulated within lipid films, which can perform some of the functions of the cells inside our bodies. Because these ‘droplet networks’ are entirely synthetic, have no genome and do not replicate, they avoid some of the problems associated with other approaches to creating artificial tissues – such as those that use stem cells. The researchers, led by Professor Hagan Bayley of the Department of Chemistry, say the printed droplet networks could in the future be used as a way of delivering drugs where they are needed.

✦ An Oxford academic has found the only known document explaining how a medieval reburial would have been carried out – which could offer crucial guidance for the forthcoming reburial of Richard III. Dr Alexandra Buckle of the Faculty of Music has now used the document, which she found in the British Library, to put together an order of service which would have been used for Richard III’s reburial had his body been found only a few years after his death. Dr Buckle, a musicologist, has even recreated what she believes would have been the correct musical scores for the event. She says: ‘This is an historically important document, even more so given recent events, as it details precisely what a reburial service around the time of Richard III’s death would have involved: from how the bones should be cleansed, washed and blessed, to what prayers should be said, what clergy should be involved and what music is sung.’

For more information, visit www.ox.ac.uk/news and www.ox.ac.uk/staffnews
Ashley Grossman, Professor of Endocrinology, has been awarded the 2014 Geoffrey Harris Prize by the European Endocrine Society. The annual award recognises major advances in neuroendocrinology, the science of hypothalamic and pituitary function and disease.

Dr Anna Mitchell of the Department of Experimental Psychology has received a Medical Research Council Centenary Award. These new awards celebrate 100 years of achievements by MRC scientists and offer early career researchers the opportunity to accelerate their research and career development.

Andrew Pettifrew, Professor of Strategy and Organisation at the Saïd Business School and Senior Golding Fellow at Brasenose College, has recently given the first lecture in a new biannual series of lectures on Business and Management Studies at the British Academy. His contribution to the Sir John Cass’s Foundation Lectures series was entitled ‘Can Leaders Make a Difference to Organisational Performance?’

Andrew Pollard, Professor of Paediatric Infection and Immunity and Fellow of St Cross College, has won the Bill Marshall Award of the European Society for Paediatric Infectious Diseases.

Dr Timothy Power, University Lecturer in Brazilian Studies, St Cross College, has been elected Treasurer of the Latin American Studies Association.

Brian Ripley, Professor of Applied Statistics, has been awarded the Guy Medal in Silver by the Royal Statistical Society for his pioneering contributions to spatial statistics and deep insight in stochastic simulation, his highly influential papers on modelling spatial patterns and on neural networks, and his pivotal role in the open-source R environment for statistical computing and data analysis.

Alex Rogers, Professor in Conservation Biology, has been awarded the Zoological Society of London Marsh Award for Marine and Freshwater Conservation.

The Bodleian Library Shop was awarded a trophy at the ACE (Association for Cultural Enterprises) Awards Ceremony in March. The annual awards recognise excellence in retail and publishing in the museums and heritage sector. The Shop’s Medieval Activity Packs were awarded the Runner-Up Prize in the hotly contested Best New Children’s Product category. The Medieval Knight and Medieval Princess packs contain a selection of engaging and educational activities illustrated with detail from the Romance of Alexander, and have proved to be a big hit with younger visitors. They are on sale in the Bodleian Shop, priced £5 each (10% discount for University staff and 20% for Bodleian staff).
**New Royal Society Fellows**

The Royal Society has elected six Oxford academics as new Fellows.

**Harry Anderson** is Professor of Chemistry and a Fellow of Keble College. He researches the use of synthesis and supramolecular assembly to explore structure–property relationships for the creation of functional molecular materials, and has pioneered the investigation of conjugated porphyrin oligomers, encapsulated π-systems, nanorings and two-photon absorbing dyes.

**Judith Armitage** is Director of the Oxford Centre for Integrative Systems Biology, Professor of Biochemistry and a Fellow of Merton College. Her current research looks at bacterial behaviour, in particular environmental sensing and the control of flagellar motor rotation. Combining biophysics and in vivo light microscopy with molecular genetics, she discovered a new protein partitioning system that exerts spatial control over sensory signalling pathways.

**Gideon Henderson** is Professor and Head of the Department of Earth Sciences and a Fellow of University College. He was formerly co-Director of the 21st Century Ocean Institute, part of the Oxford Martin School, and is also an Associate with the Oxford Geoengineering Programme. His research focuses on understanding long-term climate change and the carbon cycle, aiming to improve prediction of future change, and he has developed new techniques for determining the timescales, magnitude and effects of past global climate change.

**Christopher Schofield** is Professor and Head of Organic Chemistry, a Fellow of Hertford College, and has developed new techniques for aiming to improve prediction of future change, term climate change and the carbon cycle, with the power of modern computers and focuses on theoretical and computational physics, particularly in statistical physics, soft condensed matter and biological physics. She has developed novel numerical and analytical modelling tools to investigate a wide range of complex fluids.

**Andrew Wilkie** is Nuffield Professor of Pathology at the Weatherall Institute of Molecular Medicine. His research explores the mechanisms underlying human congenital disorders, particularly those affecting the skeletal system. He discovered the cause of Apert syndrome, a severe condition characterised by craniosynostosis (early closure of the cranial sutures) and syndactyly (fusion between the digits) of the hands and feet. He has also investigated the role of telomere dynamics in congenital anomalies, leading to diagnostic tests in clinical use today.

**Julia Yeomans** is Professor of Physics at the Rudolf Peierls Centre for Theoretical Physics and a Fellow of St Hilda’s College. Her research combines her expertise in statistical physics with the power of modern computers and focuses on understanding long-term climate change and the carbon cycle, aiming to improve prediction of future change, and he has developed new techniques for determining the timescales, magnitude and effects of past global climate change.

**Brain Prize goes to optogenetics**

Professor Gero Miesenböck, Director of the Centre for Neural Circuits and Behaviour, has been awarded the Brain Prize 2013 for his pioneering role in developing optogenetics, a revolutionary technique which uses light to control sets of nerve cells in order to reveal much about the brain. He shares the €1m European award with five other scientists in Germany and the USA who developed the revolutionary optogenetics approach.

Professor Miesenböck was the first scientist to establish the principle of optogenetic control in a pioneering experiment reported in 2002, when he induced genetically modified neurons to fire electrical impulses by shining light on them. In this way, the function of the nerve cells could be influenced remotely, using flashes of light instead of direct electrical connections. In 2005 he was the first to use optogenetic tools to control the behaviour of an animal, engineering fruit flies to harbour light-sensitive nerve cells in different parts of the brain. ‘I knew from our first successful experiment that this could go very far, but the speed with which the idea has been adopted and developed has nevertheless been astonishing’, says Professor Miesenböck. ‘Every other grant application in neuroscience now has an element of optogenetics in it.’

In 2010, optogenetics was named Method of the Year across all fields of science by the journal Nature Methods, and ‘Breakthrough of the Decade’ by the journal Science.

**Computer Scientists Win BCS Awards**

Two Oxford computer scientists have been recognised for their outstanding contributions to the field by BCS, the chartered institute for IT.

Dr Boris Motnik has won the BCS Roger Needham Award, sponsored by Microsoft Research, for his major contributions to the design and standardisation of the OWL2 ontology language, widely used in industrial research and applications. His research develops techniques for intelligent management of large amounts of data and involves building advanced data management systems that can exploit background knowledge about an application domain.

Professor Samson Abramsky has been awarded the BCS Lovelace Medal. His work has had a major impact on the foundations of computer science, most notably domain theory in logical form, game semantics and categorical quantum mechanics. He has shown that methods and concepts developed in theoretical computer science can be applied very directly in quantum information, and to the foundations of quantum mechanics itself.
Seven Oxford researchers are among the 44 new Fellows of the Academy of Medical Sciences.

Barbara Casadei is British Heart Foundation Professor of Cardiovascular Medicine, Honorary Consultant Cardiologist and Senior Research Fellow in the Department of Cardiovascular Medicine. Her research group aims to improve understanding of atrial fibrillation (AF) and she has become one of the UK’s leading experts in the complex processes behind AF, when signals controlling the effective spread of the heart beat are not working properly. She is also exploring a possible link between AF and inflammation, which is particularly linked to coronary heart disease, the major cause of heart attacks.

Mike English is Wellcome Trust Senior Research Fellow in Clinical Science at the Kenya Medical Research Institute (KEMRI) and Professor of International Child Health in the Nuffield Department of Medicine. His work has included developing national, evidence-based guidelines for care of severely ill children and newborns, and long-term studies on initiating and establishing best practices within rural government hospitals. He also advises the Kenyan government and works with the World Health Organisation on issues related to child and newborn survival.

Russell Foster is Professor of Circadian Neuroscience and Head of the Department of Ophthalmology, where his research spans visual and circadian neurobiology, focusing on the mechanisms whereby light regulates vertebrate circadian rhythms. He has been internationally recognised for his discovery of non-rod, non-cone ocular photoreceptors. In collaboration with the Oxford Eye Hospital, his research group is exploring the impact of retinal disease on sleep and circadian rhythm disruption (see pp10–11).

Keith Hawton is Professor of Psychiatry, Consultant Psychiatrist and Director of the Centre for Suicide Research. His research focuses on suicide and self-harm, using epidemiological and interview approaches to examine long-term trends, find causes and develop effective treatment and prevention measures. His research has resulted in treatment and prevention initiatives with proven major benefits in reducing the risk of further self-harm and preventing suicides.

Paul Klenerman is Wellcome Trust Senior Research Fellow in Clinical Science in the Nuffield Department of Medicine, where his research aims to understand T cell responses to viruses, especially hepatitis C virus and HIV. His research group aims to produce better new vaccines against HCV by applying their understanding of the role of host immune responses in determining the outcome of viral infections. They have also established a Translational Immunology lab at the John Radcliffe Hospital to try to bring some of these techniques closer to patients.

Xin Lu is Director of the Ludwing Institute for Cancer Research and Professor of Cancer Biology in the Nuffield Department of Medicine, where her research looks to identify molecular mechanisms that suppress tumour growth and metastasis. Her discovery of the ASPP family of proteins connects cell polarity, cell proliferation and cell death to development and tumour suppression. Her group focuses on understanding how to selectively kill cancer cells by studying the role of ASPP proteins in tumour suppression pathways with the aim of identifying therapeutic targets.

Lionel Tarassenko is Professor of Electrical Engineering in the Department of Engineering Science. He is an expert in the application of signal processing to medical systems, with a strong track record in translation to clinical medicine. He has pioneered early warning systems for identifying physiological deterioration in hospital patients, and is also known for developing 3G mobile technology for the management of long-term conditions such as diabetes.
Readers in the Radcliffe Science Library are a hardworking bunch, but it’s not uncommon for them to be seen standing up, looking at A4 frames which dot the walls of the library. These frames hold the winning poems from the Parallel Universe poetry competition, a science poetry competition for Oxford staff, students and alumni which was held in 2010 and is now open to new entrants for 2013.

Ceri Lloyd set up the competition in 2010 to coincide with the 350th anniversary of the Royal Society. The competition, which is being run in collaboration with the Museum of the History of Science, reflects Ceri’s job as a cataloguer in the Radcliffe Science Library and her other life as a poet. ‘The idea came from watching a programme about genetics’, she explains. ‘I had been struggling to understand the topic but the programme had clear metaphors. For example, junk DNA was described as a tower block with only one floor lit – and the floor that is lit is what we know about genetics. This struck me as being such a strong image and just the kind of thing that poets can do for science.’

In 2010, over 80 entries were submitted on topics ranging from dinosaurs to heart surgery, the birth of genetics to the night sky, and Oxford alumni were the largest group of entrants. ‘I think it’s because Oxford offers a Master’s in creative writing and this competition really caught the imagination of its former students’, Ceri says. ‘The quality was really high. Most of the entrants came from an arts background rather than a scientific one but there were some great poems by scientists too.’

Ceri is now organising a second Parallel Universe competition and she is keen to encourage more members of staff to enter this time. She says: ‘A lot of people are scared of the idea of writing poetry – a bit like some people are scared of learning about science – because they think it has to be done in a certain way. But it might be something that they really get into and that excites them.’

The competition has caught people’s imaginations, and not just of readers in the library. A visitor from Bradford University was so impressed with the idea that she set up a science poetry competition in Bradford. Ceri is not surprised that the idea has worked. ‘Poetry and science seem disparate but they have a surprising amount in common’, she explains. ‘They are both concerned with new ideas, and the original expression and explanation of these ideas; striving to see the world from a different perspective. Science can provide poets with fresh and exciting inspiration; poetry can provide scientists with original ways to convey sometimes bewilderingly abstract concepts.’

The deadline for entries is 13 September and the winners will be announced at the beginning of October, with the reception on 11 October. The ten winning poems will be displayed in the library, on the website and in an e-book pamphlet. Poems must be on the theme of ‘Science and Medicine’ and should be no longer than 30 lines. ‘This is partly because we want to challenge entrants to distil an idea into a short, clear piece’, Ceri says. ‘But also because we want their poems to fit into the frames on the library walls!’

For information about this year’s competition, see www.bodleian.ox.ac.uk/science/poetry-competition-2013; 2010’s winning poems are posted at www.mhs.ox.ac.uk/exhibits/universe
How do you organise a collective welcome by 37 colleges and halls, 33 departments and a range of museums and other facilities that conveys the full range of the Oxford student experience to an audience of thousands?

Over two days in June and one in September this is the challenge Oxford takes on, putting on Open Days for more than 10,000 prospective applicants, parents and teachers. It’s no mean feat, but it’s one that everyone involved in agrees is well worth the effort.

‘To my mind, the success of our Open Days can be judged by positive experiences for those who are least familiar with the University’s traditions, structure and admissions processes’, says Idonea Muggeridge, who manages the Open Day logistics for the University’s Undergraduate Admissions and Outreach Office (UAO).

UAO’s role is primarily a coordinating one, with Muggeridge’s team working behind the scenes to promote college and department events through the admissions website pages and Open Days guide, ensuring transportation and signage throughout the city is able to accommodate the thousands of extra visitors, and distributing nearly nine tonnes of publications to colleges and departments. Since 2010 the team has also organised a centrally-located information centre at the Exam Schools, where visitors can meet current students and representatives of many student support services.

A similar amount of time and effort goes into the Open Day preparations at colleges, which often host prospective applicants overnight in addition to putting on a range of talks, tours and information sessions.

Joe Organ, Schools Liaison Officer at Brasenose College, says: ‘Making sure all our visitors get a full sense of the college, and leave feeling happy and having had all their questions answered, is quite a challenge. Although it’s hard work, in a sense it’s an easy gig as we have incredible resources to show off. So it’s just a matter of explaining to visitors how this collegiate University all fits together, and how prospective applicants can put together a strong application – the rest speaks for itself.’

‘Open Days don’t just exist to impress future prospective students with Oxford’s excellence, but to communicate that this excellence is something they can be part of’

With so many potential places of interest for prospective students to visit, many departments supplement the June and September sessions with stand-alone Open Days during less busy times of the year.

Dr Helen Swift, who is Schools Liaison Officer for the Faculty of Medieval and Modern Languages, says that with so much happening over a relatively short period of time during the Open Days, ‘our main emphasis isn’t on information-giving, or duplicating what’s in the course prospectus, but on giving perspectives from tutors and from current students. It’s all about helping students make quite challenging decisions and get a sense of that right fit, which, for many, requires something more than reading a prospectus.’

Of course, for many prospective applicants the most important perspective may be that of current students – and it will be students proudly wearing their college or department affiliation who first greet many visitors to the Open Days. David Messling, Vice-President for Access and Academic Affairs at the Oxford University Student Union, says student volunteers really help bring alive the full range of life at Oxford. ‘Current students have a unique role as ambassadors for Oxford, enabling future students to visualise themselves here’, he says. ‘Open Days don’t just exist to impress future prospective students with Oxford’s excellence, but to communicate that this excellence is something they can be part of.’ And the experience is no less stimulating for many of the student volunteers: ‘Oxford’s Open Days are a hugely exciting experience, and for the student volunteer few things beat getting to answer the questions of a nervous prospective student, and then going on to see the same student gaining a place and thriving at Oxford.’

More on Open Days at www.admissions.ox.ac.uk/opendays
Harry Dayantis highlights how University researchers are investigating the links between sleep disorders and mental health.
We all need sleep, and most people experience sleeping problems at some point in their lives, yet it is notoriously difficult to pin down causes of sleep disorders – there are complex arrays of environmental and genetic factors at play which vary between individuals. Sleep researchers led by Professor Russell Foster at the Nuffield Laboratory of Ophthalmology are working to pick these factors apart, using a variety of human and animal studies.

‘Sleepiness and sleep disorders cost the economy billions of pounds each year in days off work, lost time, inefficiency and accidents’, says Professor Foster. ‘Biological clocks or “circadian clocks” help time our sleep patterns, alertness, mood, physical strength, blood pressure and much more. The clock is used to anticipate the differing demands of the 24-hour day and fine-tune physiology and behaviour in advance of changing conditions.

The University of Oxford Sleep and Circadian Neuroscience Institute (SCNi) was established in 2012 with a Wellcome Trust Strategic Award to investigate links between mental health and sleep disturbance. Led by Professor Foster, the SCNi uses a holistic approach to sleep research, bringing together neuroscientists, psychiatrists and bioengineers.

Dr Katharina Wulff, who leads the human studies in Professor Foster’s group, looks into the effects of psychological disorders on sleep. ‘Teasing apart cause and effect in the relationship between psychiatric illness and sleep disruption is complex’, she explains. ‘As there are so many different environmental and genetic factors, it is incredibly difficult to isolate specific causes.

‘Everyone has an internal body clock which is adjusted on a daily basis so that our “day within” is synchronised to the change in light intensity at dawn and dusk. We recover from jet lag largely because of light exposure in the new time zone. The body clock in turn regulates our sleep and activity to night and day. Patients with schizophrenia spend more time indoors, which can worsen pre-existing sleep disturbances. All too often we see a vicious cycle whereby psychological anxieties cause sleep disturbances and sleep deprivation aggravates underlying mental health issues. A recent study in people with paranoia by Professor Dan Freeman of the Department of Psychiatry suggests that providing cognitive behavioural therapy to aid sleep also helps to reduce their feelings of persecution. We’re now collaborating to expand this trial.’

‘It doesn’t make sense to treat mental health problems and sleep problems in isolation’, she adds. ‘Although we still don’t understand the causal relationships, it is clear that mental health and sleep are deeply intertwined.’

To track sleep–wake patterns in day-to-day life over weeks, researchers typically use an actigraph. These devices, which look like digital watches, are used to constantly monitor body movement and ambient light levels with a resolution of one minute or higher. Chronobiologists then process these data to determine when people are asleep, as well as their light exposure and activity levels throughout the day. The long-term data series are also being ‘deep mined’ by Dr Gari Clifford in the Institute of Biomedical Engineering, who is exploring their complexity by incorporating correlations over multiple time scales.

As well as the big-picture research on sleep–wake cycles, Dr Wulff also investigates specific neurological functions of sleep in humans. She is currently looking at the effects of sleep deprivation on the formation of ‘intrusive memories’, or ‘flashbacks’.

‘We are seeing that people experience fewer intrusions if they are deprived of sleep for 24 hours after witnessing a simulated traumatic event in the laboratory’, she says. ‘This could have important implications in the immediate treatment of acute traumatic events. Despite recommendations against it, many doctors still prescribe sleeping pills to people after traumatic events.’ The mechanisms by which sleep influences intrusive memory formation are not yet understood, and Dr Wulff hopes to explore these interactions further.

Animal models are also very useful in trying to better understand the complex role of sleep in the human brain. Dr Stuart Peirson, who leads the animal studies in Professor Foster’s group, is looking at the genetic and environmental factors affecting sleep patterns in mice.

“We’re studying mouse models involving genes that are associated with schizophrenia in humans”, he explains. “As well as displaying abnormal behaviour, such mouse models also have irregular sleep patterns consistent with those seen in patients. This suggests that common mechanisms may underlie the abnormal sleep that is common in such disorders.”

Dr Peirson is also looking at how different photoreceptors – light-sensitive cells in the eye – influence the body clock. Since mice sleep during the day, the roles of photoreceptors are reversed, but the principles remain the same. ‘Certain photoreceptors in the eyes of both humans and mice are “non-image-forming”, meaning they are not used for regular vision’, he explains. ‘These include the photosensitive retinal ganglion cells (pRGCs) – first identified by Professor Foster’s group – which contain the light-sensitive pigment melanopsin and have been shown to play a critical role in both the regulation of the clock and our levels of alertness. So the pRGCs make us feel more alert under bright light and more sleepy in darkness or dim light.

“We know that sleep regulation is impaired in mice without melanopsin, but the contribution of the image-forming photoreceptors, the rods and cones, is unknown. Our group is investigating the roles of different photoreceptors, using wavelengths of light known to stimulate specific cells.

‘Sleep in mice is normally measured by electroencephalography (EEG), which involves implanting electrodes on the skull. We’ve developed a non-invasive alternative to EEG, using night-vision cameras to track movement. Camera data have been verified against EEG readings and found to be extremely reliable. This approach involves no surgery and allows us to rapidly screen animals and identify behavioural changes in response to light. Genome sequencing is already underway on mutant mice screened with this technology, which would not have otherwise been spotted.’

From the innovative use of technology to multi-disciplinary approaches to mental health, sleep research at the University is a flourishing and diverse discipline.

For more information, visit www.eye.ox.ac.uk
When Henry Snaith embarked on his PhD at the University of Cambridge, he didn’t see an academic career beckoning. Rather, his sights were more firmly set on a career in industry.

‘I’ve always had commercial aspirations’, he explains. ‘So when I first started my PhD, I thought I wanted to go on to work in industry so I could develop real technologies.’ Fast forward 13 years and he’s a University Lecturer in the Department of Physics here at Oxford, leading a research group of 20 people. Clearly, something changed his mind.

‘During my PhD it became clear that you can work on emerging, and potentially successful, technologies as an academic’, he admits. So that’s what he did, undertaking post-doctoral studies at the École Polytechnique Fédérale de Lausanne (EPFL) in Switzerland and later at the Cavendish Laboratory in Cambridge, before arriving at Oxford’s Clarendon Laboratory in 2007. Since then he’s set up a research team focused on developing efficient, low-cost solar cells.

While the market may be dominated by crystalline silicon solar panels – the black slabs you see on eco-friendly homes – Dr Snaith is confident his research provides a very real challenger. He’s spent the last ten years working with dye-sensitised solar cells, which use a semiconducting dye to capture energy from the sun and convert it into electricity. Crucially, because they rely on dye, they can be made more or less transparent; the darker they are the more energy they create, but semi-transparent panels can replace windows and still create energy. ‘In the future, you’d be able to clad a building in these kinds of cells’, he explains. ‘Your entire building could be photovoltaic.’

‘I’m convinced that all of our power needs can be provided by photovoltaics’

That’s a tempting proposition, especially when you consider the figures. Snaith and his team can already achieve 13% efficiency with a new ‘perovskite’ structured pigment; that compares well with crystalline silicon, which achieves 25% but costs more to manufacture. Eventually he hopes to create a cell with 50% transparency and 10% efficiency at that level of transparency.

With such promise it’s unsurprising that the research became a commercial venture, Oxford Photovoltaics Ltd, in 2010. Based at the Begbroke Science Park just outside Oxford, the team is currently honing the technology, creating A4-sized samples to test and improve upon.

They won’t always stay that small though: the team hopes soon to be producing panels as large as three metres across, which will end up on buildings. ‘That’s where the technology will have to prove itself’, explains Snaith. The next step will be to introduce the cells into solar farms, where acres of panels generate energy at a commercial scale. ‘I’m convinced that all of our power needs can be provided by photovoltaics’, he says. ‘And pigment or dye-sensitised solar cells will be a part of that.’

His confidence reveals a raw streak of ambition that’s fundamental to the success of Oxford Photovoltaics – reflected by the effort he pours into the project. ‘It’s a lot of hard work’, he explains. ‘I’ll just be happy when we eventually have a real product on sale.’ In fact, his passion is such that it raises the question of why more academics aren’t busy turning research into products. ‘There’s a lot of technology which lies undeveloped in universities, even Oxford’, he says. ‘But that’s because teaching loads and grant applications get in the way for a lot of academics.’

As Dr Snaith no longer has any college teaching obligations, he can devote the majority of his time to research. ‘My main ambition is to create efficient, affordable photovoltaics’, he admits. ‘That’s the thing I’m 100% committed to.’
**Exhibitions**

**Stradivarius**
13 June – 11 August 2013
Ashmolean Museum
Tickets £6/£4, under 18s free
www.ashmolean.org/exhibitions

The Ashmolean’s summer exhibition features 20 instruments of Antonio Stradivari (c.1644–1737), some of which have never been shown in public.

**Talks**

**Building stars, planets and the ingredients for life between the stars**
Wednesday 29 May, 5pm
Martin Wood Lecture Theatre, Department of Physics
www2.physics.ox.ac.uk/events

Ewine van Dishoeck, Professor of Molecular Astrophysics at Leiden Observatory, gives the 2013 Halley lecture: how stars and planets are born in the cold and tenuous clouds between the stars and the Milky Way.

**Gerard Mortier lecture**
Thursday 6 June, 5pm
Merton College
www.humanities.ox.ac.uk/humanitas

Lecture by Gerard Mortier, General Director of the Teatro Real de Madrid, who is currently Humanitas Visiting Professor in Opera Studies.

In real life: The transformative nature of film
Friday 7 June, 5pm
JCR, Mansfield College
www.mansfield.ox.ac.uk/about/events

Talk by filmmaker Beeban Kidron, whose work includes Oranges Are Not the Only Fruit and Bridget Jones: The Edge of Reason.

**Concerts**

**Oxford Philomusica and Nigel Kennedy**
Thursday 13 June, 8pm
Sheldonian Theatre
Tickets £12–£40
www.oxfordphil.com

Nigel Kennedy joins Oxford Philomusica in a programme featuring Vaughan Williams’ The Lark Ascending and Vivaldi’s Four Seasons.

**The Dawn of the Stradivarius**
Friday 14 June, 7.30pm
Sheldonian Theatre
Tickets £10–£42
www.ashmolean.org/exhibitions

To celebrate the opening of the Stradivarius exhibition at the Ashmolean, Canadian virtuoso James Ehnes will perform music by Bach and Paganini on a number of Stradivarius violins – the first time one player has done so in a concert setting.

**Family Friendly**

**Making Music**
Tuesday 28 May, 1–4pm
Harcourt Arboretum
www.harcourt-arboretum.ox.ac.uk/whats

Joint event with the Pitt Rivers Museum and the Bate Collection: make a woodland-inspired instrument, take part in a music workshop, and learn to play the giant log xylophone. Tea and homemade cake available from 2pm.

**Tipi Tales**
Thursday 30 May – Saturday 1 June, 1–4pm
Pitt Rivers Museum
www.prm.ox.ac.uk/events

Explore the American Great Plains with Native American crafts and activities. Free drop-in session for children aged 5+.

**Special Events**

**LiveFriday: Wilderness in the City**
Friday 31 May, 7–10.30pm
Ashmolean Museum
www.ashmolean.org/livefriday

The Wilderness Festival steps out of the wilds to create an enchanting evening of musical performance, theatrical spectacle, magic and games at the Ashmolean. Part of the LiveFriday series of free evening events at the museum.

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**Helping Hands for New Researchers**

Are you an early career researcher who’s interested in finding out more about professional development opportunities at Oxford? If so, make a date for Research Connections, the first University of Oxford research staff conference, which takes place on Thursday 11 July at the Exam Schools.

The focus of the event, which is being organised by the Oxford Learning Institute, is on making connections – with fellow researchers, with other academic disciplines, and with bodies that fund and utilise research. Attend talks and panel discussions on topics such as public engagement and impact; choose from a range of workshops to help broaden your skills in areas such as networking and time management; and browse the exhibition to find out about the services available to you as a researcher at Oxford. The conference will conclude with a drinks reception and the official re-launch of the Oxford Research Staff Society, a cross-divisional society designed to act as a professional and social network for Oxford research staff.

To find out more about the conference and to book your place, visit www.learning.ox.ac.uk/researchconnections.

The conference is the latest addition to a range of communications activities aimed at researchers at Oxford. Subscribe to the research staff mailing list to keep up with the latest developments (email researchstaff-subscribe@mailist.ox.ac.uk); follow @ResStaffOxford on Twitter for information about courses, training and events; and visit www.learning.ox.ac.uk/support/research to find out about personal and professional development opportunities. And if you’ve recently joined the University, you may wish to attend one of the regular welcome events for research staff, which are run each term by the Learning Institute. These information and networking sessions provide a forum to meet other new researchers, hear about career and professional development opportunities, and talk to representatives from a range of University services.
The price of bread: Oxford students provided vital international perspectives for a class action.
Putting bread in the mouths of millions is generally a matter of vast aid efforts, but graduate law students at Oxford are helping to do so by volunteering their expertise in support of a legal reform bid in South Africa.

The students are volunteers with the award-winning Oxford Pro Bono Publico (OPBP), an organisation that mobilises graduate students and faculty members dedicated to the practice of law ‘for the public good’ (pro bono publico). The volunteers provide free, high-quality comparative law research for lawyers acting pro bono around the world as well as promoting pro bono law more broadly.

The Oxford students furnished vital international perspectives to help the South African Supreme Court of Appeal hear a class action suit over price-fixing by bread manufacturers. No guidelines existed in South Africa for handling such suits, but in just two and a half weeks OPBP delivered a report on class action procedures in other countries. It is likely to make a lasting impact on the justice system there.

‘These class actions have a huge impact’, says OPBP chairperson Chris McConnachie, a South African DPhil candidate. ‘You can bring big claims just by bringing one action representing hundreds of thousands of people who wouldn’t be able to access lawyers themselves.’

OPBP was started in 2001 as Oxford Public Interest Lawyers, a Law Faculty initiative for faculty staff. Co-founders Professor Sandra Fredman QC of Pembroke College and Liara Lazarus of St Anne’s remain active, but OPBP is now run primarily by and for graduate students.

Requests for comparative research come from across the globe, from human rights lawyers and even from policy-making bodies. After approval by the OPBP committee and the Dean of the Faculty, a student coordinator calls for volunteers with relevant expertise, and assignments are parcelled out in an adrenaline-fuelled brainstorming session. A faculty member oversees the work, which usually takes four to six weeks.

Some 60% of Oxford’s graduate law students hold overseas law degrees. ‘It means you don’t have to spend a lot of time learning about different countries’, says Chris McConnachie.

Since 2010 OPBP has completed 14 research projects, involving 99 graduate student volunteers and seven faculty members – some £15,500 worth of free legal research. The organisation also provides £500 Internship Fund Awards to help candidates work pro bono at public-interest organisations. Last year’s crop of eight awards was funded by the Law Faculty, the Magdalen College Trust, St John’s MCR, and donations from philanthropist Kofi Adjepong-Boateng and from law firms Monckton Chambers and Herbert Smith LLP.

The comparative research projects are run on a shoestring £500 a year – only just higher than a QC may charge for half a day in court. ‘We’d love a bigger budget’, says Chris, ‘but we do the sort of work lawyers around the world aren’t able to do but we can do quite quickly and easily. It’s mainly library-based work, tapping into resources – what graduate students are doing every day.’

‘We do the sort of work lawyers around the world aren’t able to do but we can do quite quickly and easily’

Volunteers also provided research in a landmark case in Botswana on the right of women to inherit property. The presiding high court judge went on to strike down the customary law as discriminatory.

The most high-profile case followed the horrific and fatal gang rape of a woman on a bus in New Delhi in December. A high-powered triumvirate in India was given a month to deliver a massive review of existing laws relating to women. Eight OPBP volunteers furnished research from Australia, South Africa, Canada and the UK. Parts of the Oxford submission were used verbatim in the final 700-page Indian report, including recommendations that marital rape be criminalised and that the law focus on women’s rights rather than on traditional issues of honour and dignity.

OPBP has recently won the 2013 LawWorks and Attorney General Pro Bono Award for Best Contribution by a Team of Students, which was presented by Attorney General Dominic Grieve. Says Chris McConnachie: ‘We were up against universities who provide lots of institutional support and resources for their pro bono initiatives, so the fact that OPBP got some recognition for our work was quite an amazing thing.’

More about the work of Oxford Pro Bono Publico at www.law.ox.ac.uk/opbp/index.php
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Why am I here?

Brona O’Toole
Chief Executive, Oxford University Student Union (OUSU)

What exactly is OUSU?
It's the official representative channel for all 21,500 matriculated students of the University and also offers many support services to students: an independent advice service, welfare services, common room support and training to all colleges. OUSU also runs induction services such as Freshers’ Fair and works in partnership with the University on access projects. It supports the student newspaper The Oxford Student and student radio. All students are automatically members unless they opt out.

OUSU has six Sabbatical Officers, elected annually by the student body. They represent the student body to the University and locally and nationally, and campaign on issues affecting students. They sit on over 40 University committees to ensure that the student view is heard and incorporated into decision making, and also act as trustees to ensure that the union remains student-led.

So what’s your role?
My job was created when OUSU registered as a charity separate from the University in 2010 (required by the Charities Act 2006). I report to the trustee board and provide long-term strategic focus for OUSU’s planning, operations and services, as well as its relationships with key University officers. I manage our permanent staff and also manage the constant transition inherent in the annual turnover of student officers, by ensuring they are trained and inducted to be effective in post as quickly as possible. There’s never a dull moment!

What do you most enjoy/dislike about it?
Working with Oxford students is a daily privilege. They are so bright, quick, capable and motivated by a desire to make a contribution. The extraordinary influx of energy from our new officers every year makes it a dynamic and exciting environment to be in, and I am blessed with the most wonderful, dedicated team of permanent staff. The downside is that it can sometimes feel like groundhog day, making it hard to focus on longer-term objectives.

Childhood ambition? And your first job?
Early ambitions to be a ballet dancer or a singer were scotched by a sad lack of talent. My first proper job was as a librarian, in the Command Library Service in British Forces Germany (I was an Army brat and brought up travelling the world). I am still quietly passionate about information management and a geek about classification and filing.

So how did you get from there to here?
I trained as a stage manager after my librarian days, and worked in theatre and opera before coming to Oxford as a mature undergraduate to read English (a long-held, secret ambition). After graduating, I started working for the University as Head of Events, running big ceremonial events such as the Chancellor’s Court of Benefactors. I then became the first Head of Development for the newly-formed Medical Sciences Division, and worked to establish strategic fundraising across the division and refocus medical alumni activity.

After a stint working for several Oxfordshire charities, I was brought in to make some big projects happen within the University, starting with the first ever Alumni Weekend in 2007. The wonderful Nancy Kenny and I had eight months to pull together a range of events involving all departments and colleges, to which all 175,000 alumni would be invited. We had absolutely no idea how many people would turn up so had to create enough flexibility that events could be scaled up or down. It’s now a firm fixture in Oxford’s calendar.

Wadham College then invited me to project-manage its 400th anniversary celebrations in 2010 – a special privilege for me, as an alumna. We ran a fantastic range of events including commissioning a new choral piece, a launch event in St Paul’s (Wren was a Wadham alumnus), a collaboration with the Royal Society and innumerable social events. When the job at OUSU came up, it seemed meant to be, as the student union had been very important to me as an undergraduate.

What’s the most unexpected thing you’ve found yourself doing?
Singing ‘Sugar Sugar’ with the Archbishop of Canterbury to the Warden of Wadham, Melvyn Bragg and several other guests in the Warden’s lodgings after Melvyn’s lecture on the Royal Society. Dr Williams and I were the only ones who knew the words. My knowledge of cheesy 70s pop tunes finally became useful. I don’t now remember why it was deemed necessary that this be sung!